博士論文

Multi-Scalar Regional Relationships & Regional Connectivity through Cross-Border Productive Integration: A Study from South America

(国境を越えた生産統合の観点からみたマルチ・スケールの地域連携と連結性：南アメリカを事例として)

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In a polarized world, building bridges is not just an option, it’s a life mission.

¡Viva Latinoamérica Unida!

Abstract

Despite the proliferation of macroregions worldwide (e.g., ASEAN, EU, MERCOSUR), there has been limited interdisciplinary research on the impact of these integration schemes on cross-border regions, with macroregions mainly studied from the fields of international relations or regionalism and cross-border regions from geography, social sciences, or regional development. This schism has resulted in weak academic discussions on the effectiveness of macroregional integration in promoting local economic development at the cross-border scale, and the lack of research tools to push this debate further. This dissertation takes a multi-scalar approach, conducting a comprehensive analysis of macro- and micro-level factors, to address this research gap. By developing theoretical, methodological, and conceptual tools, this dissertation provides a more detailed picture of the impact of macroregional integration on cross-border regions in South America and sheds light on the relationship between macroregions and cross-border regions in promoting local economic development.

To measure the impact of macroregional mechanisms on local economic development, Chapter 2 constructs a theoretical framework to evaluate the articulation of local productive capacities across borders and to domestic and international markets. A comprehensive Systematic Literature Review of over 10.5 million articles provides an in-depth analysis of the existing literature, highlighting the lack of consensus and theoretical proposals on this topic. The review results in the selection of 16 sources that are rigorously analyzed and served to identify 36 'connectedness voids' –barriers to develop cross-border productive integration– and evaluate the 1260 possible causal relationships between them. This chapter provides new insights into the cross-border product articulation and the interrelationships between its development barriers. This approach is recommended for cross-border regions with low density of productive actors, weak participation of public entities, and emerging agroindustry and basic manufacturing –specially in Latin America and South and Southeast Asia.

Chapter 3 represents a methodological contribution to the study by providing analytical tools for both the macro and micro levels. The chapter begins with a review of previous methods and proposes a statistical analysis and comparative institutional analysis at the macro level. The focus then shifts to the micro level, where the opportunity to implement Causal Graph Models in border studies is highlighted, offering an innovative approach that allows mixed-method research and addresses limitations in data collection due to scarce or disparate datasets in borderlands. In addition, the chapter provides a well-designed field research method based on 150 interviews conducted in previous field research experiences, making it a valuable resource for future cross-border studies.

Chapter 4 presents a comprehensive worldwide overview of the promotion of border and cross-border mechanisms in 100 macroregions, selected and analyzed based on 689 references. This analysis

reveals correlation between both mechanisms and classifies the macroregions into four types based on their approaches towards Cross-Border Cooperation: non-engaged, cooperative, supportive, and interventionist. Out of the 100 regions, 42 have participated in cross-border integration, with only 28 (interventionist type) having developed up to eight macroregional cross-border mechanisms by themselves (e.g., zoning tools, funding mechanisms, cross-border legal structures). The highest number of initiatives in this regard can be seen in Western Europe, South America, and West Africa.

In order to contribute to the lack of non-Eurocentric comparative studies between macroregions, Chapter 5 analyzes how the Andean Community (CAN) and the Southern Common Market (MERCOSUR) target cross-border development as they are the most representative South American cases. Descriptive and comparative analyses are conducted based on 448 primary and secondary sources. Although they have different territorial and institutional systems, both CAN and MERCOSUR have promoted cross-border mechanisms, albeit from almost opposite approaches and with varying levels of success. Results indicate that their mechanisms have not been very effective due to limitations in governance, funding, and technical capacity, but highlight potential for improvement through cross-learning. However, the CAN projects deserves special attention due to its relative success and orientation towards cross-border productive articulation.

Focusing on the coffee cross-border value chain project of the CAN –considered the best experience in the region, Chapter 6 evaluates its effectiveness in closing the connectedness voids and promoting sustainable local development. The field research took place in 18 cities and communities in Peru and Bolivia and included 105 interviews, 10 technical visits, and focus groups (106 hours of recordings). Using Causal Graph Models and machine learning tools (confusion matrix), the theoretical framework is validated by comparing with the 1260 causal relationships observed in the case study. The analysis indicates that several connectedness voids were covered while the project was in implementation. However, the progress did not last over time due to the interrelationship between the voids, especially due to the low connectivity and institutional incompatibility in the cross-border region.

The results of this study suggest that while targeting cross-border development through macroregional integration schemes has potential, it has not been effectively realized in South America. This dissertation calls for the development of comprehensive and sustainable cross-border mechanisms, including concertation mechanisms, special macroregional funds for cross-border initiatives, and enhancing technical capacities of public officers in cross-border regions. These strategies, if sustained over time, have the potential to strengthen local productive capacities and drive cross-border development.

Keywords: macroregions, cross-border regions, productive articulation, cross-border value chains, local economic development, regional planning, multilateral cooperation, CAN, MERCOSUR

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List of Acronyms & Abbreviations

ADEMAF	Agency for the Development of Macroregions and Border Zones
AECID	Spanish Agency for International Cooperation
ALT	Binational Autonomous Authority of Lake Titicaca
AMFIM	Association of Municipalities of Integrated Borders of MERCOSUR
ANPROCA	National Association of Coffee Producers
ANT	Actor-Network Theory
APCA	Apolo Coffee Producers Association
APOCOM	Association of Organic Coffee Producers Madidi San Fermín and Cocos Lanza
AR	Argentine Republic
ASEAN	Association of SouthEast Asian Nations
AT	Assemblage Theory
AU	African Union
BENELUX	Benelux Union
BO	Plurinational State of Bolivia
BPIF	Bank of Border Integration & Development Projects
BR	Federative 25mazonian25f Brazil
BVC	Binational Value Chain
CAC	Agrarian Coffee Cooperatives
CAF	Development Bank of Latin America
CAMRE	Andean Council of Foreign Affairs Ministers
CAN	Andean Community
CBC	Cross-Border Cooperation
CBD	Cross-Border Territorial Development
CBG	Cross-Border Governance
CBGS	Cross-Border Governance System

CBI	Cross-Border Integration
CBI&D	Cross-Border Integration & Development
CBIT	Cross-Border Informal Trade
CBL	Cross-Border Locality
CBR	Cross-Border Region
CBRIS	Cross-Border Regional Innovation System
CBVC	Cross-Border Value Chain
CE	Council of the Entente
CEBAF	Binational Border Service Center
CECOALP	Central of Alpaca Special Services Cooperatives of Puno
CECOVASA	Central of Agrarian Coffee Cooperatives of the Sandia Valleys
CELAC	Community of Latin American and Caribbean States
CEMAC	Economic and Monetary Community of Central Africa
CEN-SAD	Community of Sahel–Saharan States
CEPGL	Economic Community of the Great Lakes Countries
CESCAN	Project to Support Economic and Social Cohesion in the Andean Community
CGM	Causal Graph Model
C-GVC	Coffee Global Value Chain
CIF	Cross-Border Integration Committees
CIS	Commonwealth of Independent States
CITE	Productive Innovation and Technology Transfer Center
CMC	Common Market Council
CO	26mazonian26f Colombia
COMESA	Common Market for Eastern and Southern Africa
CONADIF	National Council for Development and Border Integration
Coop64	CAC San Juan del Oro
COPIF	Border Cooperation and Integration Fund

CS	Case Study
CV	Connectedness Void
DEVIDA	National Commission for Development and Life without Drugs
EAC	East African Community
EC	27mazonian27f Ecuador
ECCAS	Economic Community of Central African States
ECOWAS	Economic Community of West African States
ERDF	European Regional Development Fund
ESSIR	Social and Solidarity Economy for Regional Integration
EU	European Union
EUROsociAL+	EU Programme for Social Cohesion in Latin America
FCCR	Consultative Forum of Municipalities, Federated States, Provinces and Departments of MERCOSUR
FECAFEB	Federation of Exporting Coffee Growers of Bolivia
FM index	Fowlkes–Mallows Index
FOCEM	Structural Convergence Fund
FTA	Free Trade Agreement
GAHIF	Ad Hoc Group on Cross-Border Integration
GANIDF	High-Level Task Force for Cross-Border Integration and Development
GDP	Gross Domestic Product
GMC	Common Market Group
GTEF	Border Schools Working Group
GTIF	Working Group on Border Integration
GVC	Global Value Chain
IADB	Inter-American Development Bank
ICO	International Coffee Organization
IGAD	Intergovernmental Authority on Development

IIRSA	Initiative for the Integration of the Regional Infrastructure of South America
INPANDES	Participatory Regional Integration in the Andean Community
INTERREG	European Territorial Co-operation
IO	International Organization
ISM	MERCOSUR Social Institute
IWRM	Integrated Water Resources Management
JNC	Coffee National Board
JUNAC	Cartagena Agreement Board
LAIA	Latin American Integration Association
LFV	Linked Border Communities
LGA	Liptako-Gourma Integrated Development Authority
MCC (φ)	Matthews Correlation Coefficient
MERCOSUR	Southern Common Market
MIDAGRI	[Peruvian] Ministry of Agrarian Development and Irrigation
MKIS	Marketing Information System
MMAP	Municipal Commonwealth of the Amazon of Puno
MMNPT	Commonwealth of Municipalities of the Tropical North of La Paz
MPS	Provincial Municipality of Sandia
MR	Macroregion
MRC	Mekong River Commission
MRCB	Macroregional cross-border
MR-CBR	Macroregion & Cross-border region relationship
MRU	Mano River Union
MSRR	Multi-Scalar Regional Relationship
NORDEN	Nordic Council – Nordic Cooperation
NT	Non-tariff barriers
OBE	Outcome-Based Evaluation

ODA	Official Development Assistance
OTCA	Amazon Cooperation Treaty Organization
PA	29mazonian29f Paraguay
PACTF	Andean Platform for Cross-Border Cooperation
PAMA	Aphthous-Fever Free MERCOSUR Action Programme
PASAFRO	Andean Health Plan on Borders
PE	29mazonian29f Peru
PEIBF	Border Intercultural Bilingual Schools Programme
PIDS	Integrated Social Development Plan
PIFM	MERCOSUR Border Integration Project
PNA-CAFÉ	National Action Plan for the Peruvian Coffee
PNC	[Bolivian] Coffee National Program
PPP	Public–Private Partnership
PARA	Andean Regional Programme
PROSUR	Forum for the Progress and Development of South America
R&D	Research & Development
RECM	Specialized Meeting on Cooperative
RIA	Regional Integration Agreement
RMADS	Meeting of Ministers and Authorities of Social Development of MERCOSUR
RTA	Regional Trade Agreements
RVC	Regional Value Chain
SADC	Southern African Development Community
SENASA	[Peruvian] National Agricultural Health Service
SENASAG	[Bolivian] National Agricultural Health and Food Safety Service
SGCAN	General Secretary of the Andean Community
SGT18	Working Subgroup N° 18: Border Integration
SICA	Central American Integration System

SJDO	San Juan del Oro
SL	Strategic Line
SLR	Systematic Literature Review
SME	Small and Medium-sized Enterprises
SNIP	National Public Investment System
SOCICAN	Action with Civil Society for Andean Integration
SPPP	San Pedro de Putina Punco
SPS	Sanitary and Phytosanitary
SSE	Highlands & Jungle Exporter
TB	Tariff barriers
TBT	Technical Barriers to Trade
TTF	Trade & Transport Facilitation
TVF	Border Neighborhood Transit
UEMOA	West African Economic and Monetary Union
UNASUR	South American Union
UR	Oriental 30mazonian30f Uruguay
USMCA	United States-Mexico-Canada Agreement
V4	Visegrád Group
VC	Value Chain
VCA	Value Chain Approach/ Analysis
ZIF	Cross-Border Integration Zones
Δvoids	Changes of situation in Connectedness Voids

Chapter 1 Introduction

Chapter 1. Introduction

1. Prelude

From the second half of the last century, supranational regional integration has been considered as inherently positive and desired by national governments to achieve greater development and insert themselves in the emerging global governance of economic development (Schiff and Winters, 2003). In the practice, this long-awaited transaction has not been completely fulfilled since regional experiences in Europe, Africa, or Asia have shown that growth achieved from political and economic integration might have led to higher levels of economic, social, or spatial inequality (Fau, 2016; Jetin and Mikic, 2016; Ametoglo, Guo and Wonyra, 2018; Beckfield, 2019; Santos‐Paulino, DiCaprio and Sokolova, 2019).

The post-cold war rescaling process have brought new institutional and territorial dynamics such as new regionalisms, governance transfers, or 'debordering' nation-state territories (Albert and Brock, 1996; Jessop, 2002; Koff, 2008; Börzel and van Hüllen, 2015a). These have represented an opportunity for some integration schemes to better address these inequalities by considering a spatial approach in policymaking and targeting development in specific geographic areas, such as the borderlands – territories which have a close relationship with the former regional integration processes (Lombaerde, 2010; Söderbaum, 2017). This is because the proliferation of supranational regions –called macroregions in the present research– has led to imagine a 'borderless' world (Ohmae, 1990; Newman, 2006; O'Dowd, 2010; Hansen and Papademetriou, 2013) where borders are not the traditional Westphalian barriers between the 'us' and the 'others' but become inner boundaries or hinges of integration. Thus, the promotion of cross-border integration across these borders implies a process of territorial cohesion at a micro-scale within the macroregional schemes.

The European Union's INTERREG, also known as the European Territorial Cooperation (ETC), is among the most famous examples of how a macroregion stimulates cooperation across borders, reinforcing the processes of region-building of the European cross-border regions, and providing resources to reduce development disparities and increase quality of life (Reitel, Wassenberg and Peyrony, 2018; Interreg Europe, 2022). However, whether they have achieved this goal is a debatable issue, with arguments in favor (Heinrichs, Schultz-Zehden and Toben, 2005; Gumeniuk, 2013), and against it (Harguindéguy and Bray, 2009; Martín-Uceda and Vicente Rufí, 2021). This is even more complex with other integration schemes because most of them have not built sufficiently mature formal institutions. Nevertheless, several macroregions around the world have adapted the EU mechanisms,

interrelated with emerging cross-border mechanisms, or created their own ones according to their specific contexts, having experiences that should be further explored such as the CAN's Cross-Border Integration Zones, the ECOWAS' Cross-Border Initiatives Program, or the NORDEN-supported Kvarken Council (Medina and Diallo, 2020; OECD, 2021a; Wong Villanueva, 2022). Thereby, the lack of consensus in the effectiveness of the EU case and the scarcity of research outside EU (Scott, 1999; Blatter, 2004) stokes the doubt about whether it is possible to promote development in cross-border regions from a macroregional approach (Koff, 2008).

The present dissertation is framed under one central research question: **Do macroregional integration schemes promote local economic development in cross-border regions? If so, how?** This chapter interprets this question under the theoretical framework of Multi-Scalar Regional Relationships to formulate the hypothesis that we want to test. This is followed by displaying the research sub-questions, objectives and how we plan to develop them chapter by chapter. Finally, we highlight the scope of this research, its originality, and its relevance for scholars and policymakers oriented to regional development planning of cross-border regions.

2. Multi-Scalar Regional Relationships (MSRR)

Studying the relationship between macroregions and cross-border microregions implies a discussion on scales and regions in today's world[1]. The boom of globalization and neoliberalist institutions represented not only the geographical reorganization of production towards the global integration of trade (Gereffi, Humphrey and Sturgeon, 2005), but also an overaccumulation and uneven accumulation of capital on a world scale (Harvey, 1995; Clarke, 2001). This internationalization of capital and reconcentration of financial and productive resources was accompanied by a process of 'accumulation by dispossession', where wealth and power were further centralized in a few hands by opening the economies of non-capitalist territories to trade, and the privatization and commodification of public assets (Harvey, 2017). This led to an erosion of the nation-states as the main political-economic spaces where to anchor economic agglomeration and governance, hindering government capacities to address uneven urban and regional economic development through macroeconomic policies (Jessop, 2002).

[1] The present section strives to explore the MSRR framework in terms of its main concepts and relationships. More comprehensive definitions of 'scales' and 'regions' are in **Chapter 2** (Ontology of Scale) and **Chapter 4** (Regional Integration & Macroregions) respectively.

The crisis of the national scale was accompanied by a process of governance transfer whereby national governments, in order to better address socio-economic disparities, embarked on new territorial strategies by relocating resources and capacities to other scales, building new 'competitive spaces' which can be rearticulated to the global networks of circulation and accumulation of capital (Brenner, 1999; Swyngedouw, 2000). This process of re-territorialization or re-scaling would lead to a 'Relativization of Scale' (Collinge, 1996), with new scalar configurations 'under' and 'above' the national scale (e.g., cross-border, macroregion, glocalization, glurbanization, etc.), or even outside the 'physical realm' (e.g., cyberspace) (Kitchin, 1998; Jessop, 2002; Börzel and van Hüllen, 2015a; Dilla Alfonso, Cabezas and Figueroa, 2022).

The proliferation of scales and spatiotemporal processes have led to a great variety of regional or socio-political projects, although few of them get institutionalized or become part of region-building processes (Paasi, 1986; Jessop, 2002; Gualini, 2006). Nevertheless, their production and reproduction in collective imaginaries, research publications, and policies led to consider them in scales-in-the-making that can eventually emerge (Metzger, 2013). Thus, a scale is beyond their spatial configuration metrics (size, level) but it is a 'Relation of relations' between geopolitics, territory, culture, power, history and so on (Howitt, 1998).

Of special interest for our discussion are the 'interrelation between scalar articulations' (Jessop, 2002), the 'relational evolution of scales' (Brenner, 2001), or the 'intertwinement of social spaces' (Lefebvre, 1974), where the production and evolution of scales are relationally determined by its linkages and positioning with other scales within a relational grid of interdependent processes (Brenner, 2001). Thus, **Multi-Scalar Regional Relationships (MSRR) refers to this plethora of relationships between a multiplicity of 'old' and 'new' territorial scales** that occurs within dispersed inter-scalar networks, or tangled hierarchies/nested sets of scales (Lefebvre, 1974; Brenner, 2001; Jessop, 2002). Examples of MSRRs are inter-regional cooperation schemes or also called inter-/trans-regionalism (e.g., relationships between macroregions such as EU-CELAC or CAN-MERCOSUR) (Ribeiro-Hoffmann, 2016; EEAS, 2018), interlocalization (e.g., relationship between urban centers in the same macroregion like Mercociudades network) (Jessop, 2002; Granato and Oddone, 2008), or the relationship between macroregions and microregions (e.g., INTERREG program linking EU with its cross-border regions).

Multi-scalar regional relationships refer to the inter-connectedness and interdependence between different regional arrangements located at different scales. Simultaneously, these relationships can even exist at different scales (relationships happening even within a district or across the world) or in different dimensions (institutional relationships, economic relationships, social/cultural relationships, etc.). MSRRs have been a crucial element in the building process of regions and scales, from the most traditional examples such as how the Westphalian States relate to their provinces through economic policies, or with rural areas with infrastructure constructions, to most contemporary pictures like our

research topic. This concept highlights that in our current world, regional development is influenced by a complex and multifaceted network of connections and interactions between regions at different scales. Studying these relationships – emerging processes, connectedness, power dynamics, common values, and so on– can improve the way we make decisions and formulate regional planning mechanisms.

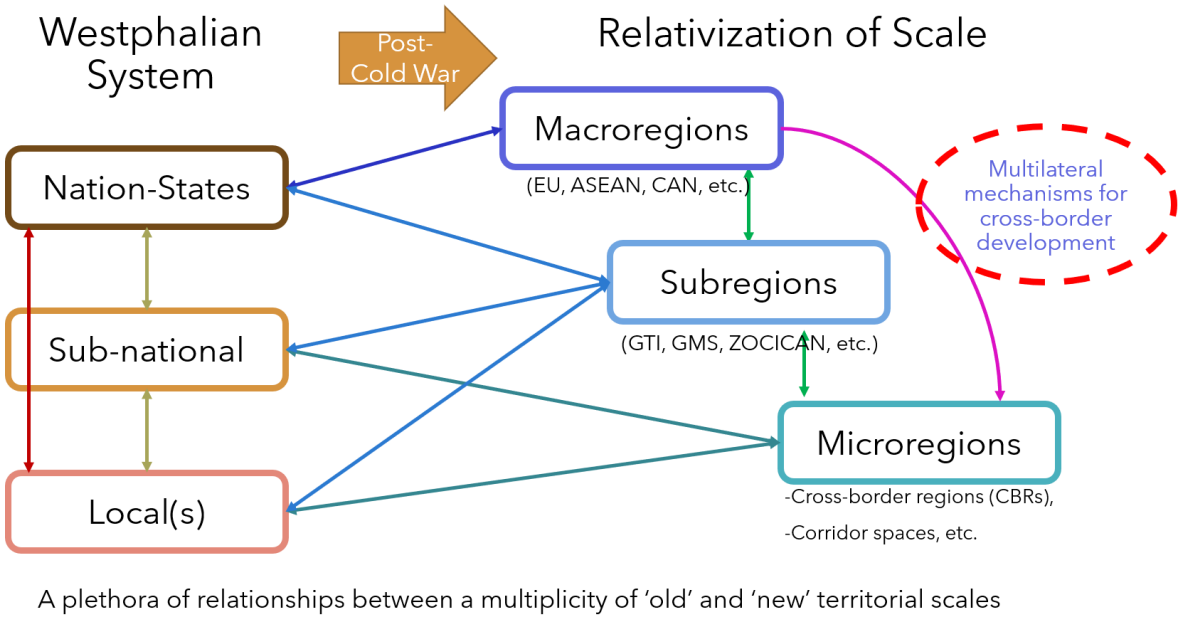

***Figure 1.1**. Overview of Multi-Scalar Regional Relationships (Author's elaboration)*

The present MSRR framework draws upon a relational view (Massey, 2005a; Allen and Cochrane, 2007; Allen, 2012) to study geographies of scales, two approaches often considered in opposition (Goodwin, 2013). The notion of **'relational scales' or 'scalar relationality'**, explored by cited scholars such as Neil Brenner, Bob Jessop, or Erik Swyngedouw, marries both approaches to understand scales as socio-political constructions relationally contested, relationally linked, and even relationally constructed (Yeung, 2005). This relational-scalar perspective has been especially operationalized in actor-network analysis and global production networks chains (Yeung, 2005; Alan Latham, 2012; Coe and Yeung, 2015), useful approaches to study regions as assemblages, and the interrelation of their components within the region and between them (Allen and Cochrane, 2007).

The concept of multi-scalar relationships or articulations has been explicitly used by scholars as a methodological tool to compare spatial planning systems and cultures (Getimis, 2012), to discuss the effectiveness of spatial planning systems on the relationship between urban and rural areas (Carmo, 2013), or to address economic development issues in center-periphery scalar relations (Brandão, 2019). In addition, relational perspective of scales goes beyond the rescaling argument (national scale as a residual of globalization), and reconciliate the contemporary political-economic scales with the

traditional ones (Mansfield, 2005). Thus, MSRRs serves as a theoretical tool to overcome 'methodological nationalism' in cross-border studies (Amelina *et al.*, 2012), while considering the persistent role of nation-states in reconfiguring scales – as happened during the COVID-19 pandemic when they undermined (vaccine nationalism) or encouraged (COVAX) regional cooperation (Amaya and De Lombaerde, 2021).

To study the relationships between regions, we draw upon the notion of 'connectedness'[2] – usually used in graph theory and social sciences to express 1) the existence of links between elements (potentiality of interconnection), and 2) the quality of those links in their interdependencies (functionality of the interconnection) (Barnes, 1969; Szyrmer, 1986; Opermanis *et al.*, 2012; Dong *et al.*, 2020). Incorporating this concept in our MSRR framework, **scalar connectedness** represents how well connected are two regions (as sets of interconnected actors, processes, territories, etc.) 'located' at different scales. Thereby, two types of connectedness are particularly relevant for studying MSRRs. First, **institutional connectedness** refers to the institutional channels (common institutionality, institutional quality, etc.) that allows the existence and development of integrated plans or policies, sharing common values and imaginaries, and coordinated informal or formal actions (Grillitsch, 2015; Dong *et al.*, 2020). Second, **economic connectedness** relates to economic channels (e.g., trade networks, global connections) that allows the existence and development of in- and out- flows (goods, knowledge, technology, financing, etc.) (Lorenzen and Mudambi, 2015; Lorenzen, Mudambi and Schotter, 2020).

3. Connecting Macroregions and Cross-Border Microregions (MR-CBR)

A specific type of MSRR is the relationship between macroregions and cross-border microregions (MR-CBR). The study of these relationships has been dominated by case studies and only few theoretical discussions have taken place. To be more precise, only three research address them explicitly. First, Söderbaum (2005) stated that MR can trigger reactions and responses in CBRs and vice versa based on the analysis of Europe (EU and Euroregions), Southeast Asia (ASEAN and growth triangles), and Africa (AU and Spatial Development Initiatives and Development Corridors). Then, he proposed three future alternatives for the MR-CBR relationships: fading, complementarity, and increasing 'regionness' (how much a region is a region). De Lombaerde (2010) built on the previous research by pointing that both macro and micro regions have evolved over time to even converge in

[2] 'Connectedness' and 'connectivity' are related terms usually treated as synonyms, but also used separately to highlight specific properties of graphs and structures (Barnes, 1969; Szyrmer, 1986; Opermanis *et al.*, 2012; Diestel, 2017). Our research considers both (the existence of links and the quality of their linking) under the term 'connectedness' to not confuse with the notion of 'connectivity' commonly used in sectoral integration policies (e.g., trade & transport connectivity, energy connectivity, etc.). To make a simple distinction, connectedness refers to inter-relations between scale/regions, and connectivity to intra-relations within a scale/region.

similar objectives or issues to deal with. Thereby, he defined three types of MR-CBR relationships: top-down or bottom-up complementarity (e.g., EU and CAN), competition (e.g., AU), and systemic parallelism (e.g., ASEAN) (**Table 1.1**). Finally, Söderbaum (2017) discussed about the poor conceptualization on the topic, the limitations behind this issue, and the need to explore more the phenomena as there is no cohesive theoretical framework to explore the several regional experiences around the world.

Table 1.1. *Types of interactions between macroregions and cross-border microregions (based on (Söderbaum, 2005, 2017; Lombaerde, 2010))*

Types of MR-CBR relationships	
Complementarity	**Top-down complementarity (multilateral development mechanisms):** • MRs promote policies and incentives to target problems in CBRs. • MRs facilitate the generation of trust across borders. • MRs incentivize CBC by promoting common polices/objectives. • MRs bring border areas at the center of macroregional integration. • Examples: EU, CAN
	Bottom-up complementarity (concertation mechanisms): • Interaction between stakeholders related to CBRs calls for creating or modifying current MR regulatory framework. • CBRs represent geoeconomic projects or engines to promote regional economic integration. • CBRs as building blocs to pave the way for MR integration. • Example: EU, ASEAN
Competition or Substitution	**Incompatible or Competing development models:** • MR tries to prevent projects at micro-level scale. • Tax-exemption zones at micro-level can distort MR integration. • CBRs are designed as economic projects to avoid the burden of macro-level politics or bureaucracy. • Examples: Africa, Asia
Systemic Parallelism	**Soft regionalism and shared values & logics:** • MR-CBR relationship is determined by common set of values (historical, cultural, political, institutional, or economic). • MR-CBR relationship is based on similar logics to respond globalization and economic transformation • Example: ASEAN

Since early 2000s, scholars have pointed that MR-CBR relationships have been understudied (Söderbaum, 2005). This **literature gap** is due to the division between international relations and regional studies, and the presence of fixed and pre-given regional delimitations – two problems that have led to the generalization of dynamics to avoid the complexity/heterogeneity that demands regional interdisciplinary studies (Söderbaum, 2017).

First, the analysis of macroregions have been mainly studied from international relations specialists and economists in regionalism studies to answer questions related to economic and trade integration, globalization and global order, security cooperation and regional governance (Gamble and Payne, 1996; Hettne and Söderbaum, 1998; Lombaerde, 2010). By the other side, cross-border regions are a central element in border and cross-border studies and have been explored by social scientists such as geographers, sociologists, economists, anthropologists, and so on, focusing their discussion on the local dynamics and flows, cross-border networks and cooperation, and sociospatial practices, imaginaries, and spatialities (Van Houtum, 2000; Amelina *et al.*, 2012; Wong Villanueva, Kidokoro and Seta, 2022). Thus, the lack of interdisciplinary approaches – most research interconnecting them have been case studies– have undermined the development of theoretical and methodological tools to explore the MR-CBR relationships.

Closely related to the first issue, the lack of interdisciplinary approach has led to conceptual limitations and the predominance of fixed and pre-given delimitations (Söderbaum, 2005, 2017). Four limitations are found in the communion of geographical and sociological accounts in international relations. First, the 'territorial trap' (regions as containers(of the field have limited to the study of regionalism into scales that are taken as closed and bounded, where regions are mere 'containers of societies' (O'loughlin and Anselin, 1991; Agnew, 1994; Cohen, 2014). Second, there is a tendency towards a 'socio-spatial fetishism' or reifications of regions and nations (regions as agents), where the power relations, dynamics, and complexities are encapsuled in 'agentic capacities' attributed to spaces (Tamaki, 2015; Testa, 2015; Paasi and Metzger, 2017; Paasi, 2021). Third, there has been an 'institutional reductionism' (regions as entities), linking macroregions to the existence of an international organization without considering the different region-building processes imbued in the 'becoming of regions' (Paasi, 1986; Metzger, 2013). Finally, regionalism studies have been criticized by considering regions by default (regions as pre-given) and not as spatiotemporal processes of 'coming together' or better said, their emerging, organization, recreation, and assimilation in collective imaginaries and regionalization dynamics (Pred, 1984; Law, 1992; Callon and Law, 1997; MacLeod and Goodwin, 1999; Latour, 2005; Marres, 2005; Metzger, 2013).

As explained, **the lack of an interdisciplinary approach to study of MR-CBR relationships have led to theoretical, methodological, and conceptual limitations** that do not only leads to the generalization of the phenomena but also hinders the comprehension of the institutional and economic connectedness – issues that we need to address in this research. However, one question is still pending: **why to study MR-CBR relationships?** Aside from the academic contribution on scalar relationality, a central motivation for the study of MR-CBR relationships is that "under certain circumstances, regionalism will be exclusionary, exploitative, or reinforce asymmetries and imbalances" (Söderbaum, 2005). Connecting with our opening discussion, the lack of connectedness between macroregions and cross-border regions can lead to economic, social, or spatial inequalities or uneven development in the

latter. There are several case studies around the world that shed light on this issue, and the need to give more importance to this research niche towards bringing development to borderlands and 'leaving no one behind'.

We start this discussion with Europe and especially the European Union as it is the most studied and developed MR-CBR relationship according to European scholars (Söderbaum, 2017). Cross-border policy took a central role in the 'European Territorial Cooperation' (European regional and cohesion policy) to reduce social and territorial asymmetries across borders with mechanisms such as the European Regional Development Fund (ERDF) or INTERREG (Reitel, Wassenberg and Peyrony, 2018). In other words, these mechanisms represented means to integrate politics and economics in "deeper and more extensive forms of democracy capable of encompassing production and cross-border contexts" (Anderson, 2001). Looking closer to the cross-border reality, Kaucic & Sohn (Kaucic and Sohn, 2022) mapped more than 200 cross-border cooperation initiatives in Europe (between INTERREG initiatives, CBRs, or cooperation networks), leading to the conclusion that most of them operated/are operating at a subregional scale (58%) rather than cross-border local one (28%), echoing previous research (Terlouw, 2008; Varró, 2014) about how top-down funded projects as INTERREG are not exactly "concerned with the integrated spatial development of the cross-border territory".

Focusing on the INTERREG projects, Wassenberg & Reitel (Wassenberg and Reitel, 2015) highlighted the increase of projects from 14 initiatives by 1989 to 100 ones in 2020, becoming more complex, intensive, and suitable for a wider range of objectives, participants, and targets (**Table 1.2**) and reducing the distances between stakeholders across borders and promoting a joint European framework of decentralized management (Reitel, Wassenberg and Peyrony, 2018). Even more, the proliferation of European CBRs has been closely related to the implementation of INTERREG as a territorial innovation strategy or 'institutional entrepreneurship' where border actors could articulate with international actors such as the European Commission or the Association of European Border Regions (AEBR) (Perkmann, 2003), with the development of around 20,000 cross-border experiences across EU borders (IN74). However, the budget increase has not been enough to ensure territorial cohesion of cross-border regions, eliminate high economic disparities across borders, nor reduce social tensions between border populations due to the impact of nation-state-specific conditions, the lack of professionals in CBRs to design technical dossiers, marginal interest from public authorities, or lack of involvement of local actors or economic stakeholders (Jouen, 2003; Perkmann, 2003; Wassenberg and Reitel, 2015, p. 35).

Table 1.2. *The three strands of INTERREG (Wassenberg and Reitel, 2015)*

Table 2 – The three strands of Interreg (beginning with Interreg II)

Strands	Spatial emphasis	Integration	Stakeholder level
A. Cross-border	Proximity	Contiguity	Local, regional
B. Transnational	Cohesion	Planning as the overarching theme (transport, environment, etc.)	Regional, supraregional, national
C. Interregional	Network	Interactions	Regional, supraregional, local

Sources: INTERACT, The Community Initiative INTERREG; LRDP LTD, *Ex-post* Evaluations

These general studies can be complemented and supported by several implemented case studies. Scholars evaluating the policy and projects (2007-2020) in the Spain-France border (Martín-Uceda and Vicente Rufí, 2021) determined that political asymmetries (imbalance of participating actors and territories, different government capacities, legal and administrative asymmetries) were too strong to enable good cross-border cooperation (most oriented to local economic development) and therefore, reduce cross-border inequalities. These results seconded previous research on that border (Harguindéguy and Bray, 2009) that suggested the low effectiveness of INTERREG in empowering of local public actors as outcomes depended on their regional autonomy (effective regional decentralization policy), and cross-border networks (significant capacity in cross-border management in stable networks). In other border areas, EU-promoted cross-border cooperation has been considered successful as in the Dutch-German EUROREGIO experience (Perkmann, 2005) or INTERREG Ireland-Wales (Lagana, 2022), but weak or ineffective in the PAMINA region (France-Germany) (Terlouw, 2008), the Tyrol Euroregion (Austria-Italy) (Perkmann, 2007b) or in the Jämtland-Trøndelag CBR (Sweden-Norway) (Shepherd and Ioannides, 2020), questioning whether INTERREG is the best framework to support border local actors.

While the European experience brings mix results or conditioned successes, the implementation of MR-CBR initiatives in America, Africa, and Asia have not been as abundant or as studied as in Europe. In Latin America, many cross-border cooperation initiatives were promoted by macroregional integration schemes and decentralization processes that allowed subregional governments to articulate in paradiplomacy relations (Celata, Coletti and Sanna, 2013; Oddone, 2017). Starting with Central America, the role of SICA supporting the Trifinio Region (Guatemala-El Salvador-Honduras) has been limited due to the lack of communication channels, no funding mechanisms, weak training of local public officers, and so on (Coletti and Sanna, 2012). Other mechanisms such as the Lempa River Trinational Commonwealth were not directly supported by SICA but through the Trifinio Plan Trinational Commission and presented positive outcomes in terms of water accessibility (Ayala

Esquivel, Echeverría Rodríguez and Henríquez Figueroa, 2021) but limited ones in food security (Juárez Velásquez, 2013). In South America, the Andean Community (CAN) and MERCOSUR also reported several mechanisms to promote cross-border cooperation. However, among the most important ones, the CAN's Cross-Border Integration Zones (ZIF) were not as effective as expected, with territorial scales larger than the nature of cross-border dynamics (Ramírez, 2008). MERCOSUR's FOCEM or Structural Convergence Fund emerged as a mechanism similar to the ERDF, but with a limited impact on cross-border regions (Ferreira, 2020).

In Africa, cross-border cooperation has been envisioned as a decolonization mechanism and means to resolve border disputes across poorly delineated borderlines (Brunet-Jailly, 2022). The African Union Border Programme (AUBP) represents the most developed and inclusive tool for cross-border cooperation in the region (Asiwaju, 2012), although its follow-up in more tangible actions depended on the Regional Economic Communities (RECs) (other African macroregions) – leading to different degrees and forms of operationalization (Medina and Diallo, 2020). Other studies highlight the interaction between African macroregions with other formal and informal spatial-economic configurations such as the Maputo Development Corridor, the Zambezi Valley Spatial Development Initiative, or the Zambia-Malawi-Mozambique Growth Triangle (Söderbaum and Taylor, 2008). However, it is debatable whether their scalar arrangements are oriented toward the development of the local border population, even more so considering the little impact of development corridors on the reduction of unemployment, poverty, and inequality (Harrison and Todes, 1996; Dzumbira, Geyer and Geyer, 2017).

In Asia, especially in East and Southeast Asia, there have been a number of integration schemes at macro, sub, and micro level – although most of them have not been directly articulated or nested to a macroregional initiative (Brunet-Jailly, 2022). Focusing on ASEAN, scholars have suggested that the lack of articulated institutionality is, until certain point, replaced by a 'soft regionalism' or 'parallel evolution': several scalar arrangements within ASEAN space follow similar sets of values under the umbrella of the 'ASEAN Way' (Lombaerde, 2010; Söderbaum, 2017). Thus, various regional arrangements have emerged –call them growth triangles, growth areas, growth polygons, export processing zones, etc.– mainly aimed at promoting economic integration. However, whether they are considered at subregional level or cross-border level is an on-going conceptual discussion: For example, while some experts consider the SIJORI Growth Triangle (Singapore-Malaysia-Indonesia) or the BIMP-EAGA Growth Area (Brunei Darussalam-Indonesia-Malaysia-Philippines) as subregional schemes (Asian Development Bank, 2013; Ishida, 2013), other scholars name them as cross-border microregional projects (Söderbaum, 2005, 2017; Lombaerde, 2010). More 'local' initiatives can be found not under the ASEAN scheme, but under the Greater Mekong Subregion (GMS), with spatial-economic configurations for cross-border productive integration such as the mini-growth triangles (Ishida, 2013), the GMS Corridor Towns Development project (GMS, 2021), or the cross-border special

economic zones (Abonyi and Zola, 2014). However, their outcomes have been limited by the harmonization of their legal and administrative frameworks, access to logistics corridors, or lack of cohesive cross-border cooperation strategy.

Finally, comparative studies on MR-CBR relationships have been mainly focused on comparing the European experience with other regional initiatives (SICA, MERCOSUR, African Union, ASEAN, etc.) (Briceño Ruiz and Ruiz, 2006; Asiwaju, 2012; Coletti and Sanna, 2012; Nadalutti, 2017), overshadowing South-South comparative research. Among these non-Eurocentric research, most of them have been executed within Latin America (Albújar Carbajal, 2019; Wong Villanueva, 2022), and few with other regions (e.g., Central America and West Africa) (Medina and Diallo, 2020), but all of them provide an interesting perspective about how similar issues are targeted from different approaches in different parts of the world.

This brief review of MR-CBR relationships does not intend to provide a comprehensive answer on the effectiveness of the multiple experiences, but to highlight the importance of how, in different continents, there are macroregional integration initiatives that strives to facilitate bottom-up processes –being even the main support for some CBRs. A constant among these investigations has been to question the effectiveness of the various mechanisms aimed at reducing disparities or promoting local economic development, highlighting the relevance of our research question in today's world and the need to bring a better understanding in how macroregions can be more effective platforms for cross-border integration and development. In this research, we focus our analysis on how macroregions affect cross-border microregions through multilateral mechanisms for cross-border development – that we call macroregional cross-border (MRCB) mechanisms (**Table 1.1**). The opposite is also possible (micro affecting macro through concertation mechanisms as happened in the development of the European policy), however, this is subject for future studies.

To study the MR-CBR relationships, we consider the two types of scales connectedness, in the following way:

- Institutional connectedness expressed as how macroregional organizations promote cross-border local dynamics and processes through the development of a macroregional cross-border institutionality (policies, institutions, projects, etc.).
- Economic connectedness expressed as the articulation of cross-border local production (exporting regions) with foreign markets (importing regions) by inserting the former in international value chains (global value chains, regional value chains, binational value chains).

Despite of the mixed results in our previous analysis, there are positive experiences showing that macroregional cross-border institutionality can promote specific productive goals to increase the economic connectedness of cross-border regions –with their own macroregion or with other more profitable markets in global trade networks. That said, our hypothesis states: **Macroregional facilitation of bottom-up processes in cross-border regions (institutional connectedness) can promote local development by articulating them to international value chains (economic connectedness).**

While our MSRR framework articulates both types of scalar connectedness, it is not clear yet how this leads to local economic development. To get started, economic connectedness is not a panacea for income growth or sustainable economic development because, while connectedness or trade can increase income based on specialization, but it requires a technological accumulation for developing productive capacities to sustain income growth in the long run (Romer, 1990; Gould, Kenett and Panterov, 2021). The present dissertation considers **cross-border value chains** –spatial-economic configurations that promote cross-border productive articulation– as the economic channel to link up the concept of economic connectedness with local economic development in cross-border regions. Drawing upon theories and concepts of global value chains and global production networks and their limitations for micro-level analysis (Kano, Tsang and Yeung, 2020), we focus our discussion on the bottlenecks or barriers that cross-border regions face when creating and capturing value in their insertion in international value chains. Based on development studies on emerging markets (Khanna, Palepu and Bullock, 2010), we call these obstacles as **institutional** or **connectedness voids**.

4. Research Inquires

Our MSRR framework establishes the relationship between institutional connectedness, economic connectedness, and local economic development, and frames the central research question and hypothesis for this dissertation. To deliver an answer, we develop the present research in six sub-questions. The first three questions (Q1, Q2, Q3) are oriented to explore and formulate the theoretical, methodological, and conceptual tools to understand MR-CBR relationships. The next three sub-question (Q4, Q5, Q6) aim to answer our central question and test the hypothesis. **Table 1.3** summarizes the main statements, questions and objectives of the dissertation.

- **Q1: How to understand and evaluate the articulation of cross-border local production (cross-border value chains) with international value chains?**

To analyze the economic connectedness, we need to explore the theories and concepts behind them: What is a cross-border value chain /production network? What makes it the best spatial-economic configuration to study economic development in cross-border regions? How does 'economic connectedness' can be understood with connectedness voids? How do these voids interconnect and affect the cross-border economic/productive reality?

- **Q2: How to evaluate the impact of macroregional cross-border institutionality in the articulation of cross-border value chains?**

This question strives to articulate both types of scalar connectedness by considering a case study of a macroregional cross-border mechanism and evaluate its impact with our proposed theoretical model. Focusing on the methodological tools to achieve it, we must ask: How to collect and process the field data? What analytical tool can be suitable to instrumentalize the theoretical model?

- **Q3: How to understand and evaluate macroregional cross-border institutionality?**

This question invites to analyze the institutional connectedness but as we have explained, there is not clarity about the concepts: What is exactly a macroregion? What types of macroregional cross-border mechanisms exist? Apart from EU, what macroregions are worth to study? How to analyze and compare them? Among all cross-border mechanisms, what is/are the most relevant one/s to further explore through a case study?

- **Q4: What are the voids and their causal relationships in this case study?**

This question focuses on exploring the selected MRCB mechanism, the cross-border region, and the cross-border value chain to identify the connectedness voids. Based on the collected data, we explored what kind of problems the MRCB faced (ex-ante evaluation), what were the implemented measures (project evaluation), and what were the outcomes (ex-post evaluation).

- **Q5: Can the theoretical model reflect the Cross-Border Value Chain reality?**

Based on the proposed theoretical model from Q1, and the processed data from Q4, this question aims to evaluate its explanatory potential by comparing the causal relationships between the connectedness voids (theoretical model vs. case study).

- **Q6: Did the studied intervention promote local development based on its outcomes and effects on the existing connectedness voids?**

Finally, this question strives to measure the effectiveness of MRCB mechanism to articulate cross-border local production to international value chains, giving a final answer to our central question, explaining the reasons behind those results, and proposing policy recommendations for future interventions.

Table 1.3. *Research Question & Hypothesis (Author's elaboration)*

Research Question & Hypothesis
Research problem:
Mixed results and conditioned successes have led to a lack of consensus on whether it is possible to promote development in cross-border regions from a macroregional approach.
Central Question:
Do macroregional integration schemes promote local economic development in cross-border regions? If so, how?
Hypothesis:
Macroregional facilitation of bottom-up processes in cross-border regions (institutional connectedness) can promote local economic development by articulating them to international value chains (economic connectedness). • Institutional connectedness expressed as how macroregional organizations promote cross-border local dynamics and processes through the development of a macroregional cross-border institutionality (policies, institutions, projects, etc.). • Economic connectedness expressed as the articulation of cross-border local production (exporting region) with foreign markets (importing regions) by inserting the former in international value chains (global value chains, regional value chains, binational value chains).
Sub-questions:
• Q1: How to understand and evaluate the articulation of cross-border local production (cross-border value chains) with international value chains? • Q2: How to evaluate the impact of macroregional cross-border institutionality in the articulation of cross-border value chains? • Q3: How to understand and evaluate macroregional cross-border institutionality? • Q4: What are the voids and their causal relationships in this case study? • Q5: Can the theoretical model reflect the Cross-Border Value Chain reality? • Q6: Did the studied intervention promote local development based on its outcomes and effects on the existing connectedness voids?
Research Objectives:
• O1. Construct a theoretical framework to measure economic connectedness. • O2. Explore institutional & economic connectedness from a macro--& micro approach. • O3. Identify the main macroregional cross-border mechanisms and compare them. • O4. Build the causal network from the case study. • O5. Validate the theoretical framework based on the case study. • O6. Instrumentalize the causal network for project evaluation.

5. Dissertation Structure

Based on the presented research inquires, the dissertation divides in seven chapters as explained in **Figure 1.2**. **Chapter 1** has focused on exploring the Multi-Scalar Regional Relationship between macroregions and cross-border regions, by delving into the notion of scalar relationality, highlighting the theoretical, methodological, and conceptual gaps in its study, and exploring case studies around the world. Thus, the central question of our dissertation arises as a need to fill these gaps and contribute to this discussion from a multi-scalar & interdisciplinary approach rooted in regional planning & development studies.

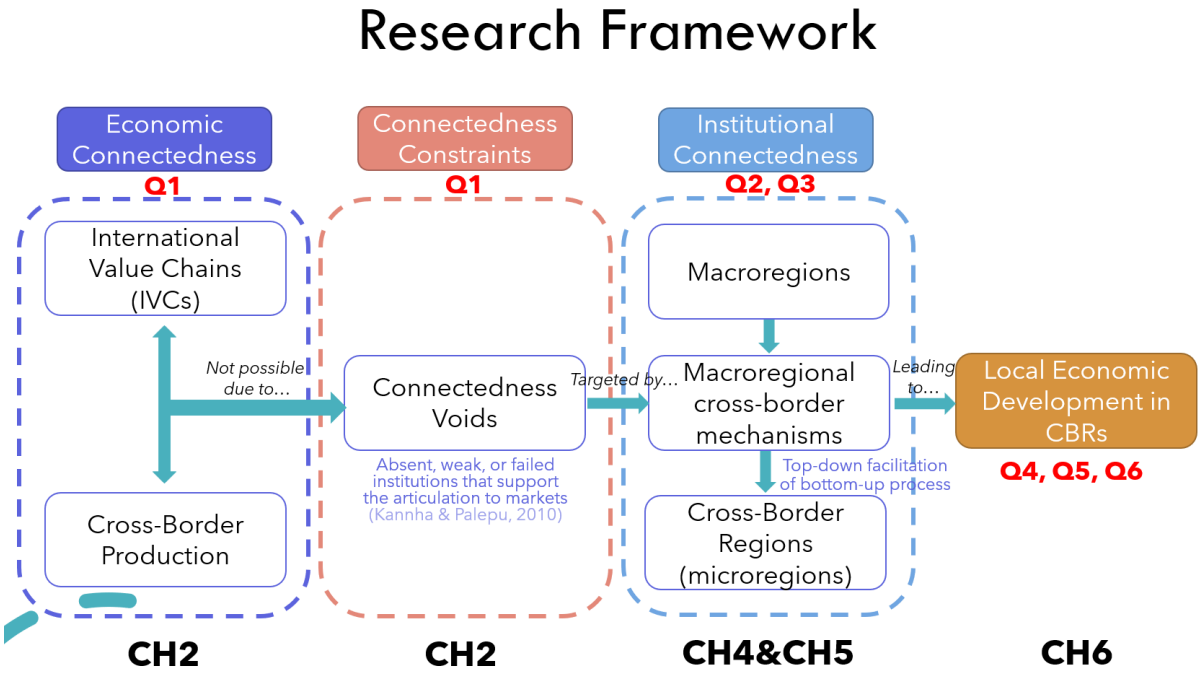

Figure 1.2. *Research Framework (Author's elaboration)*

Chapter 2 (answering Q1) engages in building a theoretical-analytical framework to analyzing how connected are Cross-Border Value Chains across the borders and with markets embedded in international value chains. The first challenge that we face is the scarcity of literature and lack of consensus on cross-border value chain or production networks at that scale, as most research works focus at global or 'domestic' (national) level. Thus, a Systematic Literature Review (SLR) is conducted to explore all related articles, books, reports, or academic/practitioners sources related to value creation and capture through production in cross-border regions. Adapting Okoli & Schabram (2010)'s methodology, the SLR begins by framing the idea of cross-border value chains in four theoretical claims

(Ontology of Scale, Neo-Institutional Theory, New Institutional Economics, Cross-Border Governance Theory) and three main conceptual approaches (Value Chain Approach, Cross-Border Territorial Development, Institutional Voids).

Sixteen sources are selected and analyzed to explore CBVCs in terms of the definitions imbued in the existing literature, the relevance (why are they important?) and functioning (how do they work?). Special emphasis is given to explore the institutional/connectedness voids with a 'writing-as-analysis' methodological approach (Augustine, 2014), producing small compositions that embed the definitions, problematic, potentialities, and opportunities/risks for each of the 36 identified connectedness voids. By identifying the causal relationships between these voids and conducting a cluster network analysis, this chapter finalizes by delivering a theoretical framework model to understand how connectedness voids are interrelated.

Chapter 3 (answering Q2) summarizes the methodological approaches that are considered for the macro-level analysis (Chapter 4 and Chapter 5), and micro-level analysis (Chapter 6). For the macro analysis, the methodology for Chapter 4 takes and exploratory approach to select and classify 100 macroregions in terms of their macroregional cross-border mechanisms with a descriptive and statistical analysis. Chapter 5 methodology explains about the analytical framework (Scott, 1999; Blatter, 2004) to compare the macroregional cross-border mechanisms from two macroregions: the CAN and MERCOSUR. This analysis is conducted in five analytical categories.

For the micro-level analysis, we start introducing the Causal Graph Model (CGM) as an analytical tool to operationalize the proposed theoretical model in Chapter 2. We discuss the pertinence of CGM in cross-border studies and for our research on cross-border value chains. This is followed by describing the case study methodology and main decisions during the field study. Finally, we describe the methodology for Chapter 6 and how we address Q4, Q5, and Q6 based on the CGMs, field study, and previous chapters.

For our macro-level analysis, **Chapter 4** (answering Q3) focuses on identifying and comparing the position of macroregions towards their 'internal' borders by exploring the type of border and cross-border policies that have been promoted as part of their integration schemes. This chapter starts defining macroregions and making a distinction between macroregional border mechanisms and macroregional cross-border mechanisms to bring clarity in what kind of interventions we want to focus. Taking as reference two datasets of Regional Integration Agreements (RIAs) (Börzel and Risse, 2016; UNU-CRIS, 2021), we review their official websites, documents, and related research, extracting their main attributes and policies related to our research (689 references). By implementing dummy variables and conducting statistical analysis, we classify the macroregions in terms of how they have operationalize their cross-border integration agendas. Special consideration we give to the 'interventionist macroregions': 28 regions that have developed eight types of MRCB mechanisms.

Chapter 5 (answering Q3) focuses on giving an overview of how macroregions target cross-border integration & development (CBI&D) by comparing the MRCB systems in the South America macroregions of CAN and MERCOSUR. Those regions are selected from South America based on their relevance in Chapter 4 and to contribute to the scarce non-Eurocentric literature on MR-CBR relationships as they have been understudied and case studies in their more complex settings can bring relevant research outcomes for other regions. The analysis is divided in five sections: macroregional context of CBRs (common characteristics), MRCB institutional approach (role and evolution of CBI&D in the macroregion), MRCB governance (main entities, structures and rules promoting CBI&D), the policy system (review of the MRCB mechanisms), and sectoral-spatial strategies (explore main targeted problems in CBRs).

This analysis is conducted by reviewing 448 primary sources, reports, books, previous research, and so on, complementing this data with interviews to researchers and officers from both organizations. Our research highlights that productive articulation was a priority in both cases, with more success in the Andean Community. Finally, one MRCB mechanism from the CAN (the coffee CBVC from INPANDES project) is selected, not only due to its relation to our research, but because it was considered as the best productive articulation experience in the CAN and therefore, in South America.

Our micro-level analysis is conducted in **Chapter 6**, answering Q4, Q5, Q6 to test our hypothesis. Thus, each sub-question embodies each research objective to be developed. Objective 1 (answering Q4) consists in building the CGM that maps the relationships between connectedness voids present in this case study. This starts by conducting four descriptive analyses (to explore the INPANDES project, Global Value Chain, and cross-border local dynamics), a value chain analysis (focusing on the processing stages), and a Mixed-Methods Spatial Analysis (focusing on the spatial configurations of the project and productive dynamics). The processed data is used for the Connectedness Voids Analysis (adaptation of an ex-ante/implementation/ex-post analysis to the voids), that will be used to analyze the causal relationships between voids and build the CGM.

Objective 2 (answering Q5) aims to validate the proposed theory (Chapter 2) by comparing with the developed CGM from the case study. In both cases, the causal networks of connectedness voids can be parametrized in directed (unweighted) adjacency matrices. This allows us to compare them from a quantitative approach using machine learning tools (confusion matrix), and networks analysis tools (network clustering). The results point the effectiveness of the model to reproduce reality and therefore, to test our hypothesis. Objective 3 (answering Q6) instrumentalizes the CGM for project evaluation. This goal has a double purpose: first, to measure the effectiveness of the project per void (what was executed and what were the outcomes) and second, to determine why these results occurred as they did. This section ends by providing some recommendations for the formulation of CBVC-oriented policies within this case study.

Our dissertation finishes with **Chapter 7**, by answering our central question, summarizing each chapter, and highlighting how the outcomes and faced limitations lead to further research exploration on this topic. Exploring the MSRR between macroregions and cross-border regions refreshes an implemented approach to address territorial inequalities that have been theoretically understudied, and casuistically unexplored outside the EU. This dissertation strives to fill the gaps and to incentive further studies to properly address development and leave no one behind.

6. Peroration

My personal interest on this topic started with my Master research (Wong Villanueva, 2019) on cross-border studies and subsequent three publications on cross-border integration, cooperation, and governance during the PhD (Wong Villanueva, 2022; Wong Villanueva, Kidokoro and Seta, 2022, 2023). Analyzing the cross-border dynamics in the MAP region (CBR between Peru, Brazil, and Bolivia) I could perceived how the OTCA (Amazon Cooperation Treaty Organization), the international organization for protecting and preserving the Amazon region, promoted local dynamics for environmental conservation. As part of a regional project, the OTCA shaped research networks to study climate change in the Amazon, even across borders. The cross-border experience between the three countries did not stop after the project concluded but built on their research outcomes and shaped a civil society-driven cross-border governance scheme known as the MAP Initiative. Twenty years after its creation, this initiative had elaborated several bottom-up experiences (informal Early Warning System, knowledge transfer sessions, international conferences, thematic workgroups, etc.), involving more than 5000 stakeholders from universities, indigenous populations, local businesspeople, local and national governments, and more. Elaborating on the indirect impact of the OTCA on the MAP Initiative, I wanted to explore more how these regions outside the Westphalian paradigm relate and promote development.

The present dissertation roots on a critical perspective to analyze regions influenced by previous approaches perceived in Habermas' critical theory (Bohman, 2005; Ann-Christin Raschdorf, 2006), post-structuralist geography (Harvey, 1996; Murdoch, 2005; Woodward, Dixon and Jones III, 2009; Emerson, 2014), critical geopolitics (Agnew, 2005; Clark and Christopherson, 2009; Pezzoli, Hibbard and Huntoon, 2009; Kuus, 2017), critical border studies (Parker and Vaughan-Williams, 2009, 2012; Johnson *et al.*, 2011; Amelina *et al.*, 2012; Salter, 2012), social & spatial justice (Kanbur and Venables, 2005; Soja, 2010; Israel and Frenkel, 2018; Alston, 2020; Jones, Goodwin‐Hawkins and Woods, 2020), or collective capabilities (Sassen, 2009; Ibrahim, 2017; Robeyns and Byskov, 2020; Leßmann, 2022). In other words, our research highlights how territorial inequalities at the borders have been

poorly addressed by national governments, and that alternative scalar arrangements can contribute to reducing them by promoting more innovative development approaches such as macroregional mechanisms for cross-border productive articulation. Thus, macroregions become platforms to properly address development.

Finally, one question is left: What is the research significance of this research? Based on the analysis of the state-of-the-art and research gaps, we can mention three main challenges: the lack of a comprehensive approach due to the scarcity of interdisciplinarity (both MRs and CBRs studied from different fields), the few theoretical discussions on MR-CBR relationships, and the lack of theoretical, methodological, and conceptual tools. This research takes a **multi-scalar approach** (macro- and cross-border micro- scales) to address these issues. The expected outcomes from our research lie in four lines.

- First, we conduct a cohesive analysis from the macro-level (to analyze the macroregional cross-border mechanisms), to the micro-level (case study) to articulate the developed policies with their implementations and direct results.
- Second, as interdisciplinary research oriented to regional planning & development studies, this dissertation aims to provide theoretical, methodological, and conceptual tools to study MR-CBR relationships. Thus, each chapter strives to be a contribution for scholars and practitioners from different research fields under mixed method approaches (**Table 1.4**).
- Third, the present research focuses on testing the hypothesis and generating a research agenda. Although it is out of scope to answer the research question for all corners in the world, our dissertation can deliver a reliable answer for the South American context – and even provide insights for other regions, outlining future lines of research and comparative studies.
- Fourth, this dissertation expects to contribute to the body of knowledge of scalar relationality, and the concepts related to the geography of networks & networked geographies (e.g., relational regions, networked topologies, spaces of flows/places, spaces of dependence/engagement, etc.) (Cox, 1998; Macleod and Jones, 2007; Goodwin, 2013; Warf, 2015). Thus, we finalize our dissertation by providing a gradual approach to articulate MSRR through spatial-economic configurations.

Table 1.4. *Dissertation in a Nutshell (Author's elaboration)*

Ch.	Dissertation Structure	Research Topic	Complement. Research field	Objective	Methodology	Relevance	Originality	Main results
1	Introduction	Overview of MR-CBR relationships	Geography	Outline the main research inquires	-	-State of Art -Framing research	-Interdisciplinary approach on MSRRs	-Frame research on literature gap
2	Literature Review	Cross-Border Value Chains & Connectedness voids	Dev. studies, econ. geography & biz. Strategy	Identify the CBVC voids and their interrelation	Systematic Literature Review	-State of Art -Theoretical & analytical proposal	-No previous SLR nor consensus on this topic -Causal Graph Models	-List of 36 voids -Theoretical model
3	Methodology	MSRR institutional & economic connectedness	Social sciences & probability/ graph theory	Describe the implemented methodologies	-	-Instrumentalize theoretical model -Micro-oriented	-Alternative methods to study MSRR connectedness	-Mix-methods -Eval. Institutional & economic connect.
4	Macro-level analysis	Overview of 100 MRs & MRCB mechanisms	Political economy & Int. relations	Identify the border and cross-border mechanisms	Statistical Analysis	-State of Art -Classification of mechanisms	-Interdisciplinary & mix-method approach -100 macroregions	-Main macroregions -Eight MRCB mechanisms
5	Macro-level analysis	MRCB systems in the CAN and MERCOSUR	Institutional & Governance studies	Analyze and compare both MRCB systems	Policy Analysis (descriptive & comparative)	-Comprehensive multi-analysis -Generalizable	-Previous research are partial or not detailed -Non-Eurocentric	-Policy 52mazonian. -Case study selection
6	Micro-level analysis	Case Study	Cross-border studies	Evaluate impact of CAN project into CBVC articulation	Explanatory Case Study	-Impact analysis -Theory validation -Hypothesis testing	-The CAN project has been understudied -Causal graph models	-Validated theory -Tested hypothesis
7	Final Comments	Does MR-CBR relationship promote local development?	Regional development & planning	Highlight main outcomes & further research	-	-Summary & final evaluation	-Research agenda for MSRRs of MR-CBR	-No sustainable, but effective while operating.

Chapter 2 Unraveling the Value in Connecting Borders: A Methodological Approach to Study the Regional Connectedness of Cross-Border Value Chains

Chapter 2. Unraveling the Value in Connecting Borders: A Methodological Approach to Study the Regional Connectedness of Cross-Border Value Chains

0. Chapter Abstract

To measure the impact of macroregional cross-border productive articulation, Chapter 2 constructs an analytical framework to evaluate the connectedness of cross-border value chains to domestic and international markets. Due to the lack of consensus on this topic, a Systemic Literature Review screens and filters 10.5M related articles, to finally select 16 sources. Approximately 3000 quotes are extracted and analyzed from these references to bring clarity on the cross-border value chains and their 36 'connectedness voids' –barriers to develop cross-border productive integration. Based on the identified literature, 1260 possible causal relationships between these voids are to shape a causal network that is analyzed and interpreted with a network clustering analysis.

Keywords: cross-border productive articulation, productive integration, institutional voids, cross-border value chain, value chain analysis, local economic development

1. Introduction

In the last half-century, the concept of value chains has emerged to position itself with a predominant role within today's international trade systems. The mantra of globalization has set the conditions to fostering more interconnected economies and societies, but simultaneously, it has orchestrated a quest for lower production costs and higher added value, promoting the deterritorialization of productive activities. Although this represents a clear challenge for the development of lagging regions, such as cross-border regions, it also hides an opportunity for the implementation of space-economic configurations that ensure better living conditions through cross-border productive integration.

Among these configurations, the Cross-Border Value Chain (CBVC) emerges as a development model to link global trade flows with value creation processes in cross-border regions. However, a fast look on any academic search engine reveals that there is no strong body of knowledge to understand

what a CBVC is and, more importantly, how scholars and policymakers can evaluate them to design better solution proposals. The CBVC literature is scattered, non-uniform, and highlights different priorities from one another. Thus, while the research concern is not the lack of information but rather the lack of uniformity, there is an imperative to explore the references, connect them, and reach a consensus. A better understanding of CBVCs would contribute to more efficient solutions, resource optimization, and promotion of more accurate public policies to promoting sustainable economic development in cross-border regions.

This chapter engages in building a theoretical-analytical framework to analyzing how connected are Cross-Border Value Chains across the borders and with markets embedded in international value chains. To interpreting this 'connectedness', we utilize the conceptual tool of 'institutional voids', understanding them as the absence of information, capacities, or agents that are present in the value chains operating in cross-border regions. Taking in consideration the lack of uniformity and consensus on CBVCs –and even more their connectedness voids–, the first sections articulate the main theories and concepts for understanding these phenomena. What follows is a Systematic Literature Review adapted from Okoli & Schabram (2010)'s eight-steps methodology to explore, select, and review the existing literature on CBVCs. The identified list of 'connectedness voids' is further analyzed by identifying causal relationships between them and applying a network clustering analysis. The present has a two-fold purpose: to enable a better comprehension of what cross-border value chains are, their relevance and functioning, and to outline the institutional voids and their relationships that should be considered in the study of regional connectedness of CBVCs. The proposed theoretical framework aims to reduce the complexity of our proposal for policymaking, while retaining scientific rigor for academic research.

2. Literature Review on the Theories of Cross-Border Value Chains

This Chapter strives to understand a Cross-Border Value Chain as a 'development model' or strategy to study value chain initiatives coming from cross-border regions. This means, to consider CBVCs as an approach that comprehend functional relationships between their involved variables. In this section, four theoretical claims are collected to explain this phenomenon. As a starting point to define and interpret CBVCs, each theory is explained in terms of their principles and main arguments, and how they interpret both cross-border cooperation and value chains.

2.1. Ontology of Scale

In human geography, discussions on the ontology –studying the existence of something– of scale have strong arguments in both sides to weight its relevance and how it can be useful for spatial and regional studies. The political economy of scale claimed the attention of several scholars in the 1990s, when the idea of scales as fixed and external entities to the social was replaced by their examination as social constructions (MacKinnon, 2011). Since then, the concept of scale has become one of the central pillars in geography (Cox, 1998; Smith, 2012) but, what exactly is it?

Considering the importance of scales for understanding a world of nations, spaces, or regions, the current scalar debate is between political-economic approaches and post-structural approaches (MacKinnon, 2011). From the former approach, scalar configurations are socially constructed from a variety of fields (politics, economics, social processes, etc.) and continuously redefined, contested and restructured (Swyngedouw, 2004). However, once they become into existence, a momentary degree of fixity allows them to play as platforms that can be used by actors to gain a better hand in the political game (e.g., scale jumping, scale bending) (Cox, 1998; Smith, 2004). Thereby, periodic scalar fixes establish nested hierarchical structures that constraints the spatiotemporal organization of social actions (Harvey, 1982; Brenner, 2001; Jessop, 2006; MacKinnon, 2011). The idea of coexistence between multiple spatialities have led to the appearance of frameworks to interconnect them such as the TPSN (Territory-Place-Scale-Network) framework (Jessop, Brenner and Jones, 2008).

The political-economic reification of scale is questioned by post-structuralist geographers: scales are socially constructed through practices and discursive frames and need to be performed in everyday action and social relations (Moore, 2008). Thereby, these scholars have given more relevance to the performativity, fluidity and multiplicity of scales, the scalar politics, the scalar narratives, and relational thinking (Massey, 1999; GONZÁLEZ, 2006; Moore, 2008; Jones, 2009). For example, Doreen Massey's 'Power-Geometry' implies that places (e.g., a country, a region, a community) and thus their boundaries, are not just geographical areas but labelled 'envelopes of time-space' or, better said, 'spatiotemporal events' or 'articulated moments in networks of social relations' (Massey, 1999, 2012). From this approach, the multiple scales influence each other and are not exactly hierarchized but interconnected in their performativity, reproducing power dynamics within society (Latham, 2002). However, at the same time, the concept scale may not be enough to collect the 'constellation of temporary coherence' that social relations represent (Massey, 2005b).

Facing this dichotomy between political-economic and post-structural approaches, academic works such as MacKinnon (2011) offer a proposal to marry both approaches by focusing simultaneously on the material construction process and the social performativity of scales in four elements: political

projects, discourses, preexisting structures, and creating new arrangements. However, since the 2000s, the very existence of a scale has been contested by other poststructuralist researchers such as Sallie Marston who call for flat ontologies or, better said, a human geography without scales (Marston, 2000; Marston, Jones and Woodward, 2005). By questioning 'What exactly is a scale: A boundary? A hierarchy? An extension?', she builds her proposition on the incoherence of that concept that has been taken as given and is inefficient to explain 'the social'. Thereby, she proposes a flat ontology or an ontology of sites –self-organized event-spaces composed by tangibles, intangibles, and actions – to bring clarity to the problematic of space.

The critique of scale and the questioning of its existence and necessity have given rise to several supporters and detractors because, as the latter responds, scales are embedded in our daily lives (e.g., political divisions in a country, operational divisions of transnational companies, etc.) (Brenner, 2001; Collinge, 2006; Leitner and Miller, 2007; Moore, 2008). As a result, the theoretical understanding of the production of scale is an on-going debate closely related with the theoretical discussion on space(-time). Multiple approaches have emerged from academic fields such as sociology, geography, or philosophy to support the debate in favor or against the production of scale or space. Among the most popular, Assemblage Theory (AT) and Actor-Network Theory (ANT) can be found in both extremes of the scalar/space question[3], but with similarities that can allow their juxtaposition (Müller, 2015; Müller and Schurr, 2016). The concept of Multi-Scalar Regional Relationships (see **Chapter 1**) benefits from this coupling, considering scale as a quantum category (that can exist or not simultaneously) to analyze scalar articulations (Latham, 2002; Sum, 2002).

Considering how processes of scaling and rescaling affect and are affected by region-building processes (Paasi, 1991; GONZÁLEZ, 2006; Shenhav, 2006), the concept of scale is at the heart of cross-border regions as scaling and bordering processes are jointly deployed in the *realpolitik* of countries periphery: bordering is based on the multiplicity of arrangements of material, immaterial, and actions, while scaling is a mean and result of this reconfiguration of space. Thereby, cross-border micro-scales connect bordering (context) and scaling (scope) processes (Bürkner, 2019), which leads to the re-scaling and re-territorialization of space in the so-called cross-border regions (Perkmann, 2007a). In addition, considering scale as an epistemological factor, it conditions the way that an actor interprets border reality, generating a 'scale difference' between conceptualizations, relations, and actions (e.g., a

[3] Although Assemblage Theory (AT) and Actor-Network Theory (ANT) do not directly address the scalar or space issue and both are closer to being approaches rather than theories, they can be utilized to have a better understanding of the socio-material constitution of nature and relations. Building on the work of Deleuze and Guattari, DeLanda (DeLanda, 2016) promoted the concept of assemblages to understand the complex interconnection of components as nested emergent wholes with arising properties. By the other side, scholars such as Latour, Callon, and Law (Latour, 2005) proposed a flat ontology with the idea of actor-networks, considering actors as networks of connections between human and non-human elements, and where the social is not taken as granted but continuously constructed through a multiplicity of interactions in a determined space-time.

national regulatory agency perceives 'informality' of cross-border trade different from a local producer) (Wong Villanueva, Kidokoro and Seta, 2023).

While cross-border scales have a strong relationship with space, value chains have detached from territory to give more relevance to their networks. Understanding value chains from a relational approach allows to focus on how actors' relationships connect geographies of production in the pursue of value creation (Kano, 2018). However, another lecture of scale in value chain literature refers to the size/extension of production or distribution, making difference between international value chains such as Global Value Chains (GVCs), Regional Value Chains (RVCs), or Binational Value Chains (BVCs) (Gereffi, Humphrey and Sturgeon, 2005; Padilla Pérez, 2017; Pasquali, Godfrey and Nadvi, 2021). These terminologies put back on the table the concept of territoriality through the articulation of territories based on the complementarity of their productive activities. In this way, a flexible understanding of scale allows to consider cross-border dynamics and value chain ones within the same realm.

2.2. Neo-Institutional Theory

Institutional Theory emerged as a theoretical framework to analyze 'the social' as this is composed by institutions or, better said, social structures such as practices, rules, norms, or routines that set conditions for social behaviors and actions (Lawrence and Shadnam, 2008). The set of institutions and their relationships in a particular situation shapes the institutional context or environment, which support and constraint individuals and organizations (Lawrence and Shadnam, 2008; Albiston, 2009; Scott, 2014). The resurgence of institutional approaches occurred in the 1970s, when scholars introduced Neo-Institutional Theory to the study of the effects of institutional contexts on organizations (Lawrence and Shadnam, 2008; Scott, 2014): how social facts institutionalize, change, relate, and affect social actors. Thus, new institutionalism differed from the old one as the latter focused on power processes, norms, or values within an organization, and the former gave more importance to cultural and constitutive processes, legitimacy processes, or routines occurring in the environment of organizations (Powell and DiMaggio, 1991; Scott, 2014).

William Richard Scott, in his masterpiece 'Institutions and Organizations' (2014), defined institutions as the regulative, normative, and cultural-cognitive elements which, associated with activities and resources, provide stability to the social. Under these three elements or pillars, institutions constraint, route, and denote social actions, having an impact on organizational operations and goals and, therefore, productivity and innovation (Powell and DiMaggio, 1991; Scott, 2014; Battersby, 2017). However, rational actors of institutionalized fields –actors sharing common sets of institutions– make

their organizations more similar or isomorphic[4], not in the pursue of greater competitivity or efficiency, but to achieve 'structural equivalence' or 'connectedness'[5] between themselves and improve interfirm relationships (DiMaggio and Powell, 1983). Simultaneously, all organizations working in the same field are not subject to the same institutional processes, making the adoption of similar management practices generate different benefits –and not necessarily an improvement of productivity (Scott, 2014).

Cross-border institutionality implies a process of institutionalization (Paasi, 1986) or embodies a process of 'becoming' (Metzger, 2013): Embedding the idea of 'cross-border' into a social structure means that actions are taken based on the principles that cross-border cooperation/governance/region portray. To transform the 'cross-border' proposition into an institution –and therefore, acquiring a regulative, normative, and cultural-cognitive value–, actions across borders should represent an increase of returns (establishing common conditions to reduce costs or maximize benefits), commitments (infusing value in social entanglements and the collectivity), and objectification (converting meanings into shared beliefs and promoting their 'translation' to other parties) (Scott, 2014). Thereby, although articulating into cross-border cooperation implies a cost in terms of negotiations, mobilization of resources, or involvement in new projects (Cappellin and Batey, 1993; Coelho Paquete, 2005), actors pursue stronger networks and commitments in the implementation of cross-border actions, restructuring governance at the borders, and leading to the creation of cross-border institutions (Church and Reid, 1999).

Value chains can also be considered as institutions as they set the relationships between suppliers, resources, regulatory agencies, and the totality of actors involved in the process of moving goods and services (DiMaggio and Powell, 1983). Thus, to improve coordination throughout the value chain, actors develop institutional mechanisms that are regulative (e.g., considering the global governance of trade through international agreements such as GATT rules, SPSs or NTBs), normative (e.g., standardization of practices through certifications, grades, standards), and cultural-cognitive (e.g., industry culture or network kindships in governance models of global value chains) (Gereffi, Humphrey and Sturgeon, 2005). The lack of adequate institutions or the constraints imposed by their institutional arrangements can generate situations which bring little support to penetrate markets –called in this chapter as institutional voids–, that needs to be understood to deinstitutionalize them (Martí and Mair,

[4] The concept of isomorphism can be applied for the three pillars that shape institutions (Kite, 2013). In the regulative pillar, coercive isomorphism promotes compliance by expedience of rules, laws, and sanctions. In the normative pillar, normative isomorphism pushes compliance by social obligation, certifications, and accreditations. In the cultural-cognitive pillar, mimetic isomorphism established compliance based on what's taken for granted and established prevalence.

[5] DiMaggio & Powell (1983) explain connectedness in terms of the existence of transactions that tie organizations one to another: starting from informal relationships between personnel flows, to labor unions or contractual relationships between companies. Structural equivalence appears when two or more organizations, working in the same productive level, have the same kind of ties to the same set of organizations even if they are not interconnected.

2009; Trienekens, 2011). In this way, Neo-Institutional Theory brings a better comprehension of the institutional environments that shapes and constraints cross-border cooperation and value chains.

2.3. New Institutional Economics

In the last century, the field of New Institutional Economics appeared as a branch of economics –and as an application of the Neo-Institutional Theory in economics– to explain the political, legal, and social institutions in economic terms, and therefore, the rationale behind the emergence of governance schemes (Klein, 1998; Trienekens, 2011; Scott, 2014)[6]. The institutional approach to firms, better known as Transaction Costs Economics (TCE), emerged in the 30s with Ronald Coase and further developed by Williamson from the 70s (Klein, 1998; Rindfleisch, 2020). Under this theory, economic organizations are based on complex contracts that are usually incomplete (economic uncertainty), leading to the imposition of costs (Klein, 1998). Facing this issue, companies select an economic governance model that minimizes the costs of transactions – that means the economic losses coming from relational contracting, transferring goods and services, or coordinating strategies and operations within a firm (Coelho Paquete, 2005; Trienekens, 2011; Rindfleisch, 2020). Thereby, this cost comes from transactions inside and outside the company such as accessing to information (e.g., searching relevant prices, screening market alternatives), negotiating or bargaining, contracting, conducting inspections, locating partners, solving disputes, among others (Loader and Hobbs, 1996; Klein, 1998; Rindfleisch, 2020).

TCE allows to decipher the 'black box' of companies by taking a microanalytic perspective and considering the economic impact of organization forms working in various circumstances (Williamson, 1985; Klein, 1998). This implies that successful coordination within a company depends on how effectively managers match people and inputs to current technologies and markets (Klein, 1998). Governing transactions represents the selection of strategies or alternative governances to protect parties with more effective contracts such as relational contracts (e.g., shared goals, company internal regulations), implicit contracts (e.g., widely understood principles), or long-term contracts (Williamson, 1979; Klein, 1998). Thereby, the governance model and final price of a product are based on both the

[6] Williamson (1998) proposed a four-levels framework for analyzing the economics of institutions, linking the Neo-Institutional Theory with the Transaction Cost Economics. At the top, the 'social embeddedness' level refers to informal institutions, traditions, norms, religion, etc. that are taken for granted but shape socioeconomic behavior. Under this level, the 'institutional environment' level is the product of politics and provides the 'rules of the game' for economic transactions (e.g., property, bureaucracy, etc.). The third level is where the institutions of governance are located. This 'governance' level represents the game by itself and where TCE happens. The fourth and last level holds the dynamics of resource allocation and employment to respond to changes in prices and quantities.

production costs (technical choices) and transaction costs (contractual choices) that are intertwined as access to productive knowledge can lead to more efficient production (Langlois, 1995).

Under this approach, borders represent an increase of transaction costs as they entail the meeting between different economic, cultural, political, and legal systems, and therefore, the presence of multiple barrier effects. However, proximity, border asymmetries, and commonalities could represent an opportunity to generate transaction benefits (Sohn, 2014). Thereby, cross-border cooperation embodies an alternative bilateral mechanism to reduce transactions costs: if the transaction costs of working across borders is lower than the costs of working separately, CBC creates a competitive advantage for firms (Coelho Paquete, 2005).

According to Gary Gereffi, one of the main promoters of Value Chain Analysis, Transaction Cost Theory is a fundamental theoretical claim for understanding the governance of Global Value Chains (Gereffi, Humphrey and Sturgeon, 2005). Comprehending value chains in terms of the complexity of their interfirm relationships embedded in moving products to end consumers, TCE allow to explain the formation of governance models that adapt to the transactions that take place (Dekker, 2003; Gereffi, Humphrey and Sturgeon, 2005). Better contracts and product standardization/customization can provide asset specificity, a dimension of economic transaction that can reduce coordination problems and risks across the value chain (Williamson, 1975; Gereffi, Humphrey and Sturgeon, 2005). In this way, Transaction Costs Economics can lead to understand the possible cross-border governance models and the articulation of value chains.

2.4. Cross-Border Governance Theory

The relativization of scales led to the formation of new regional configurations, shaping them as alternatives to transfer governance capabilities from the nation-states to upper or lower territorial orders (Jessop, 2002; Börzel and van Hüllen, 2015a). Rather than talking about one cohesive or fundamental theory, there are several theoretical proposals that explains why, how, and what cross-border actors do to govern the cross-border regions. Thus, border scholars have mainly studied Cross-Border Governance (CBG) from three ways: an institutional perspective (instrumentalizing governance to improve cooperation efficiency), a structural perspective (understanding governance as an institutional environment), and a theoretical perspective (interpreting the nature of governance and its relationships) (Wong Villanueva, Kidokoro and Seta, 2023).

In the last decade, the pursue for a consensus have led to explore CBG as an evolutionary process to integrate already developed concepts and approaches with more robust theoretical frameworks (Blasco, Guia and Prats, 2014; Durand and Nelles, 2014; Wong Villanueva, Kidokoro and

Seta, 2023). According to Wong Villanueva, Kidokoro and Seta (Wong Villanueva, Kidokoro and Seta, 2022, 2023), cross-border governance, as the act of governing the cross-border region, is the means and result of the territorialization of interaction processes between actors across the borders. Thereby, governance is a set of processes where actors construct commonalities, articulate relationships, decide together, implement joint projects, and explore new alternatives based on their results.

CBG Theory allows to understand how the articulation of actors in CBRs shapes cross-border cooperation (CBC) initiatives as a political strategy to promote cross-border integration (CBI), that is, to foster a positive impact by promoting the formation of a cross-border region (CBR) (Wong Villanueva, Kidokoro and Seta, 2022). Improving relationships, increasing territorial flows, and reducing territorial gaps are the three main drivers for integrating the CBR and, in this way, generate the conditions and mechanisms for joint development. Within this approach, CBI implies the instrumentalization of borders as resources –not their elimination and can facilitate development by promoting a 'geo-economic model' or a 'territorial project' (Sohn, 2014). In addition, as CBI leads to the emergence of cross-border 'regionness' (see **Chapter 4**), cross-border zoning appears not only as the last step of the institutionalization of cross-border regional processes, but as a complementary instrument to facilitate cross-border cooperation (Lina and Bedrule-Grigoruta, 2009).

In terms of value chains, while this Chapter strives to address the relationship between them and cross-border regions, it is widely understood that globalization and technological development have promoted the fragmentation of production and the deterritorialization of labor, allowing productive networks to function in multiple countries for the sake of greater added value (Gereffi, Humphrey and Sturgeon, 2005). Thus, as Global Value Chains operate at an international scale, it creates the opportunity to locate productive stages in cross-border regions as long as the territorial capacities and characteristics of those areas (e.g., spatial proximity, trust, reputation, etc.) can add more value to the products and reduce transaction costs. In this way, CBG Theory links the concept of development and value within the territorial scope of cross-border regions.

3. Literature Review on the Concepts of Cross-Border Value Chains

The implementation of a Systematic Literature Review requires initial assumptions to arrive to more complex definitions. Having explained the main theoretical claims, this section focuses on building the main definitions for understanding cross-border value chains. These concepts represent the means (value chain approach), objectives (cross-border regional development), and obstacles (institutional voids) of CBVCs. They represent respectively three principles or values that are considered relevant for shaping cross-border productive articulation at cross-border scale: inclusiveness,

regionness, and effectiveness. These three concepts will be later used during the SLR to discern what fits and what does not in the study of their connectedness.

3.1.Value Chain Approach

Since Michael Porter's 1985 publication 'Competitive Advantage: Creating and Sustaining Superior Performance' (Porter, 1985), the Value Chain Approach (VCA) has been one of the most relevant pillars for international business. Breaking with the traditional approach of productive development at industry/sector level, Porter focused on the firm level and how they can achieve long-term profitability. The value chain represents the firm's business model that encompass core and support activities to generate profit margin based on the value creation of a product or service (**Figure 2.1**). At the same time, the firm's value chain is embedded in a large stream of activities –known as value system, with a flow of materials into the company (upstream activities), and a flow away from the company (downstream activities) that finally reaches end markets and consumers. As every value chain depends on its history, context, and management, competitive advantage arises from how the performance of value chain activities achieves lower costs and greater efficiency than competitors.

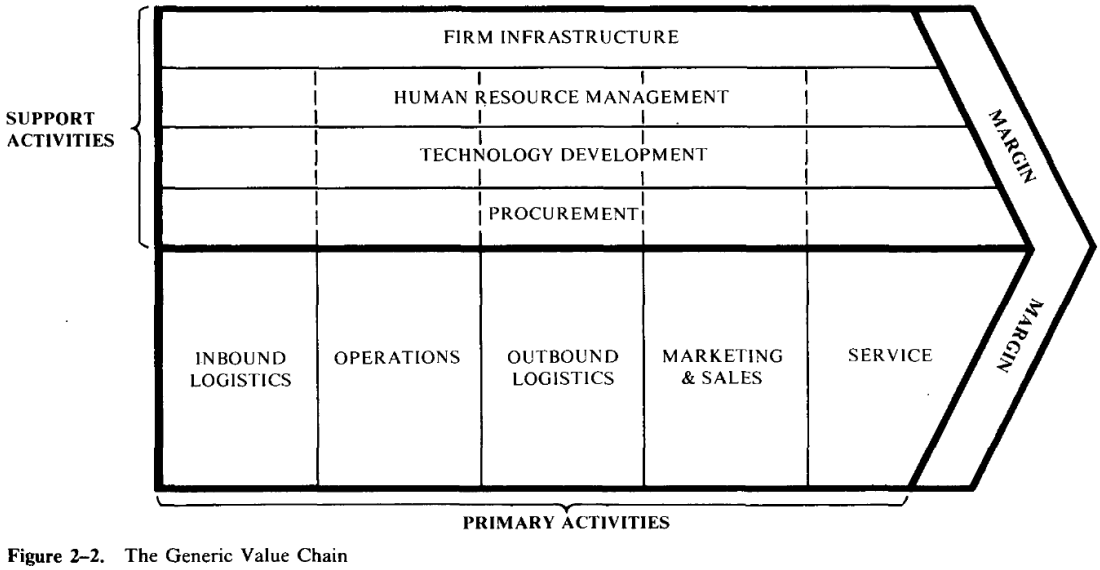

Figure 2.1. *Porter's Generic Value Chain Model (Porter, 1985)*

The globalization of trade, fragmentation of production, and deterritorialization of labor have led to the reorganization of industrial structures in terms of production and distribution, integrating both in more complex systems to achieve a better position in global markets (Gereffi, Humphrey and Sturgeon, 2005). The 'integration of trade' and 'disintegration of production' have strengthened international networks at different geographical scales such as Global Value Chains, shaping their own governance dynamics based on the complexity of transactions, the degree of reducing this complexity through the 'codification' (internalization and diffusion) of information, and the capabilities of suppliers to fulfill buyer's requirements (Gereffi, Humphrey and Sturgeon, 2005). The examination of these dynamics throughout the value chain is relevant as the processes of value creation and value capture – and therefore, the profits obtained by producers– are subjectively determined by the buyers and users (Bowman and Ambrosini, 2000; Lepak, Smith and Taylor, 2007).

Since value chains represent mechanisms for making profits through value, there is a need to understand what value is and how it is generated (**Figure 2.2**). Value creation and value capture focus respectively on the generation of use value (the value perceived by buyers on how well a product or service satisfies their needs) and exchange value (the monetary amount that users are willing to pay and is paid for the use value). Thus, while value is created through the transformation of a product or service based on technology, innovation, capital investment, or well-sounded regulations, it is captured in the bargaining relationships, factor & demand conditions, intangible resources, or in their network position (Bowman and Ambrosini, 2000; Lepak, Smith and Taylor, 2007; Argandoña, 2011; Gans and Ryall, 2017).

Facing this delimitation, the location of the firm's activities along the value chain and how much value they generate determine who and how much benefits. Theoretical representations such as Shin's 'Smiling Curve' concept reveal that value is concentrated at the beginning (component-level), in activities such as Research & Development, and at the end (product-level), in marketing, branding and sales activities (Shin, Kraemer and Dedrick, 2012; Padilla Pérez and Oddone, 2016). This inequal distribution of profit accumulation, that particularly relegates poor producers or producers in poor countries –without taking into consideration the existing obstacles to inserting themselves within the value chain–, demands the participation of public sector and more socially responsible companies to link business results with sustainable development and promote inclusiveness (Kaplinsky, 2004; Argandoña, 2011; Porter *et al.*, 2011; Schmidt *et al.*, 2019).

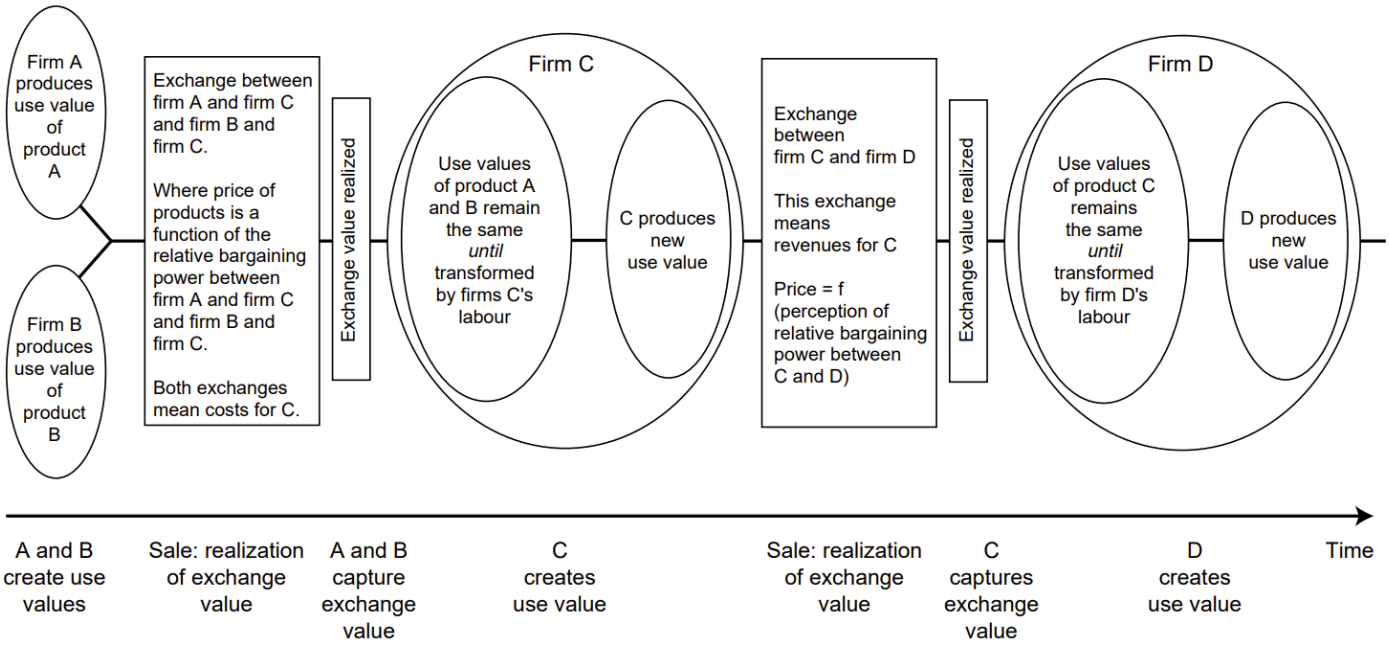

Figure 4. The process of value creation and value capture: summary

Figure 2.2. *The process of value creation and value capture (Bowman and Ambrosini, 2000)*

The theoretical body of knowledge about value chains is always evolving and adapting to today's needs, where new approaches move towards 'value networks' to include the different actors, processes, or assets that are involved in the creation and capture of value (Ricciotti, 2020). Under a relational-scalar perspective on spatial-economic development (Lagendijk, 2002), the concept of Global Production Network (GPN) (Henderson *et al.*, 2002; Coe and Yeung, 2015) understands 'chains' as 'networks' and considers not only the logistics linkages but socio-economic processes in the creation, enhancement, and capture of value (**Figure 2.3**). Thereby, production networks interconnected functions and operations through which goods and services are produced, distributed, and consumed at different scales (Henderson *et al.*, 2002). For the present dissertation, the term of value chains[7] is used in an inclusive and cross-disciplinary perspective, drawing on the scholarship of the productive networks as previous research have implemented to analyze productive dynamics at micro and macro level (Kano, Tsang and Yeung, 2020).

[7] Both terminologies (value chains and productive networks) were included in our Systematic Literature Review. As **Table 2.5** reveals, most of the research that were finally considered have in their titles the term of 'value chain' rather than 'productive network'. Thus, the present research considered 'cross-border value chains' to match with the existing literature, although the term of 'cross-border productive networks' is also feasible and can be used interchangeable.

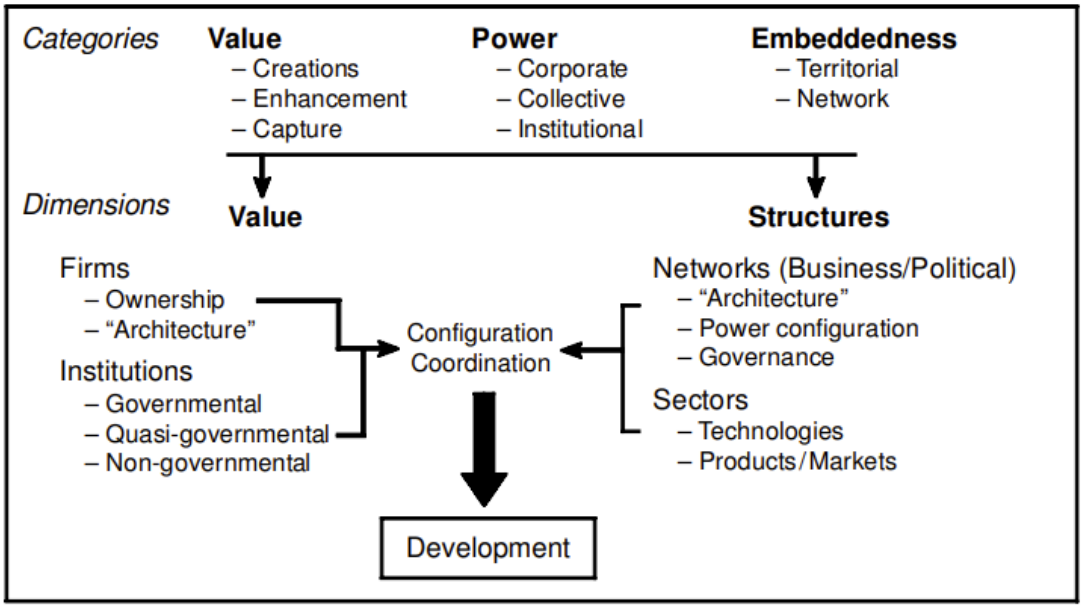

Figure 1 A framework for GPN analysis

Figure 2.3. *The Global Productive Network Framework (Henderson et al., 2002)*

3.2. Cross-Border Territorial Development

While cross-border cooperation and integration have been widely studied, the concept of local or regional development in cross-border territories requires to be updated to current theoretical and practical discussions. To synthetize the previous explanations, Cross-Border Cooperation is a political strategy to achieve Cross-Border Integration (stronger social capital, more flows, and more convergence) and therefore, generate the conditions and means to cross-borderly achieve development (Wong Villanueva, Kidokoro and Seta, 2022). However, development has been taken as granted. Although border scholars and policy makers support the idea of cooperation for integration-driven development, CBC initiatives do not necessarily lead to the expected results and can even increase asymmetrical development across the borders (Blatter, 2000; Stoffelen and Vanneste, 2017).

Approaching to a concept for Cross-Border Territorial Development (CBD), first we need to clarify one relevant question: What is Local and Regional Development and for whom? According to Andy Pike, Andrés Rodríguez-Pose, and John Tomaney (2007, 2016), the concept of local and regional development has been dominated by an economic-oriented tradition and driven by the increase of employment, income, and productivity. The emergence of alternative theories and the pursuit for sustainability have led to the evolution of this concept towards multidimensional and self-determination

approaches, emphasizing that the people who live in these areas must be the main judges to define an adequate development for them. Thus, the 'local' and the 'regional' are socially and politically constructed and, under this reading, development becomes scale-dependent, where each scale cannot be considered separately from the processes that occurs in others (Perrons, 2004; Pike, Rodríguez-Pose and Tomaney, 2007, 2016).

From an institutional approach, development represents the establishment of conditions and institutions to foster the capabilities and fulfillment of people, communities, and places (Sen, 1999; Pike, Rodríguez-Pose and Tomaney, 2007). Cross-border regions, as the geographical meeting of different country peripheries, pose the challenge of articulating areas with different levels of development, which demands a minimum economic, political, geographic, and social distance to cooperate (Van Houtum, 2000; Ghemawat, 2001). Building on those minimum conditions, cooperation strategies for Cross-Border Integration seek to continue shortening these distances, not with the intention of 'erasing the borders', but to strengthen relationships, reduce border barrier effects, and increase territorial cohesion (Wong Villanueva, Kidokoro and Seta, 2022). In addition, by favoring this multidimensional border proximity, cross-border actors reduce their transaction costs and are willing to cooperate more (Wong Villanueva, Kidokoro and Seta, 2023). Closing the gaps in these three CBI dimensions creates a framework from where to promote a local and regional development that is more balanced, cohesive, holistic, and sustainable across borders and with other territorial scales (Pike, Rodríguez-Pose and Tomaney, 2007; Leibenath, Korcelli-Olejniczak and Knippschild, 2008). Simplifying into a clearer definition and aligning with current development approaches, cross-border local and regional development involves how people living in cross-border localities and regions adapt the model of the Sustainable Development Goals (SDGs) to their areas.

The concept of territory, as the geographical space produced by the socio-technical practices of networks (Painter, 2010), leads to understand that borders are not only the meeting of nation-states, but also a plethora of actors, each of them drawing their own territorial configuration. In this way, the emergence of a cross-border scale is a constant overlay process between multiple territorialities (Agnew and Oslender, 2010; Painter, 2010), where bordering processes and practices produce new territorial configurations and imaginaries (Brambilla, Laine and Bocchi, 2016). The emergence of cross-border territories and their dynamics have led to the theorization of typologies to understand their development (Jessop, 2002; Wróblewski, 2020). However, a discussion on how cross-border territorial development happens should start not with fixed classifications of complex phenomena, but with the question of where development happens.

Understanding development as capacity-building institutions, sustainability is more probable when these institutions are attached to the territory. In the words of David Harvey (2001a, 2001b), development requires a 'spatial fix' –'fix' as a solution and as an attachment– by fixing investments in

the lands that are considered as local or regional to create the socioeconomic capacities (e.g., productive infrastructure, logistic hubs, stronger organizations, etc.), incorporate logics of 'spaces of flows' to 'spaces of places', and promote the circulation and accumulation of capital (Blatter, 2004; Castells, 2009). Thereby, the geographic scale of cross-border cooperation matters for a better spatial distribution of development (**Figure 2.4**), since the spatial allocation of investments will determine how direct the impact of policies and projects is (Krätke, 2002). This is particularly relevant in cross-border value chains as, opposing to the conventional views on trade as an engine of growth, this is only possible if trade flows are connected to the value creation processes of the cross-border production system (Mullan, 2020).

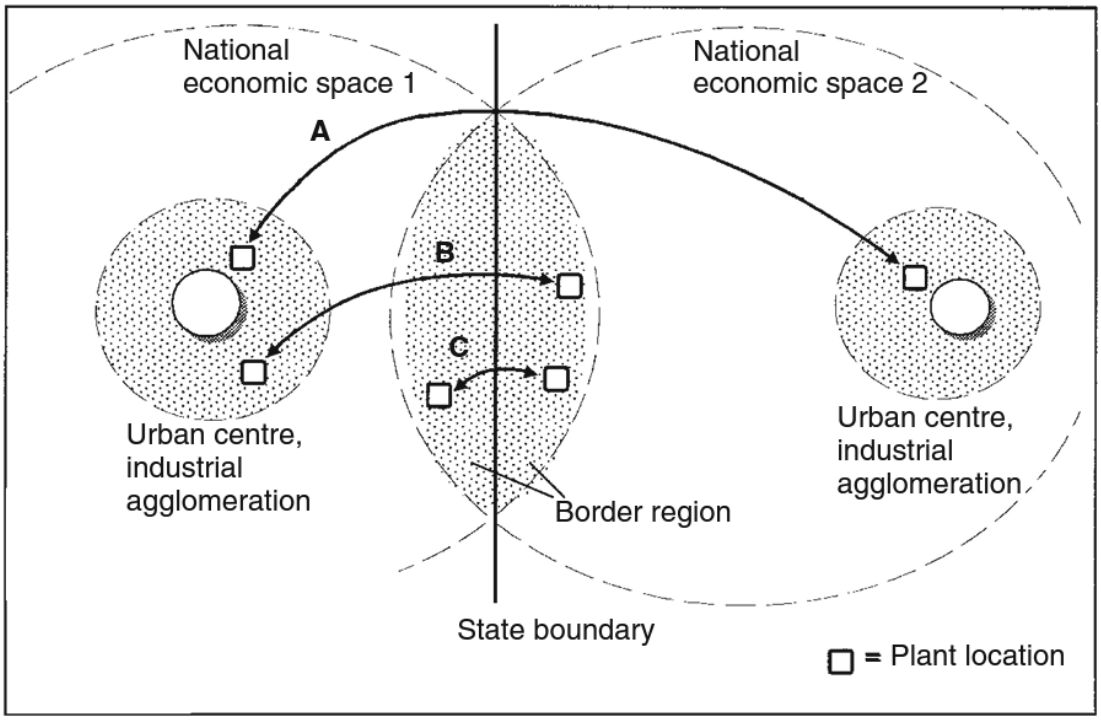

Figure 6.2 Geographic scales of cross-border cooperation: Type A – long-distance pattern (international); Type B – supraregional; Type C– regionally integrated

Figure 2.4. *Geographic scales of cross-border cooperation (Krätke, 2002)*

Shaping Cross-Border Territorial Development policies resonates with other approaches such as place-based development (McCann and Rodríguez-Pose, 2011; Neumark and Simpson, 2015), area-based development (Harfst, 2006; Marczis, 2013), or endogenous development (Ray, 1999; Shucksmith, 2000; Vázquez Barquero, 2007). Contrasting with 'space-neutral' policies, these territory-oriented development approaches highlight three main statements to encouraging local responses: First, they

propose breaking the traditional center-periphery dependency to develop lagging territories that implies the need of exogenous forces for growth. This means to promote local/regional self-determination and appropriation of the decision-making processes and means of capital accumulation before targeting geo-economic efficiency. Second, they focus on mobilizing the existing and potential resources and capacities by encouraging local knowledge, indigenous innovation, entrepreneurship, territorial identity, productive diversification, local participation, people's willingness to act, flexible governance models, and more. Finally, they highlight the relevance of local context to promoting local capacities, as the presence of underdevelopment traps inhibits growth potentials.

Under this approach, cross-border value chains can be considered as cooperation strategies to promote economic development in the cross-border territories. However, where exactly are the boundaries of the cross-border territories? Although a consensus on their geographical extension is still a debate in cross-border studies, some works are contributing to bring clarity through data-driven policy proposals (Medeiros, 2020). For practical purposes, some estimations can be given. While **cross-border localities (CBL)** are immediately next to the border and their inhabitants enjoy a cross-border daily life (approximately one hour walk to the border), the **cross-border regions (CBR)** comprise these localities and the cross-border territories that may not be in direct contact with the borders but are relevant to their cross-border regional economic development (approximately one to two hours' travel from the border) (SELA, 2013). Thus, implementing differentiated Integration-Driven Development policies for each cross-border territoriality could promote a better formation of CBVCs.

3.3. Institutional Voids

The concept of Institutional Voids was coined in 1997 by Tarun Khanna and Krishna Palepu based on emerging market research (Leff, 1978; Khanna and Palepu, 1997; Bothello, Nason and Schnyder, 2019). Considering the theoretical claims from the Neo-Institutional Theories and New Institutional Economics, both researchers highlighted the relevance of institutional context to shape 'the rules of the game', and the impact of transaction costs to discourage the efficient functioning of markets (Khanna and Palepu, 2000; Mair, Marti and Ganly, 2007; Bothello, Nason and Schnyder, 2019). In developing countries, the contract-enforcement institutions to efficiently facilitate transactions with other firms and consumers are lacking, avoiding markets to emerge as transactional arenas that can bring buyers and sellers together(Khanna, Palepu and Bullock, 2010; Khanna, 2018).

Under this approach, an institutional void is an institution that is absent, weak, or fails to effectively support the market as a meeting space to bring people together and allow them to make transactions (Mair, Marti and Ganly, 2007; Khanna, 2018). In developing countries, emerging markets

are characterized by the interrelationship of several institutional voids, setting institutional arrangements that demands systemic solutions: to untie a value creation transaction (e.g., product sales), multiple transactions need to be simultaneously untied for system success (e.g., lack of supply/demand, weak logistics, inadequate regulations, inefficient management, etc.) (Khanna, 2018). The concept of institutional voids echoes others that have been utilized in economic and development studies such as poverty traps (Matsuyama, 2010; Kraay and McKenzie, 2014) or underdevelopment traps (Berthélemy, 2006; Collier, 2007). However, the main difference with the latter lies in how the voids approach focuses on the specific institutional context where organizations are embedded in certain geographies and business sectors. This represents a more appropriate path to study cross-border value chains.

Building efficient institutions of a market infrastructure implies filling the existing voids, but how exactly do developed markets work? Khanna and Palepu (Khanna and Palepu, 1997; Khanna, Palepu and Bullock, 2010) compared the institutions of three primary markets (product, labor, and capital) in dysfunctional and developed economies. Institutional voids can be found in any or all three markets in different ways, but both researchers highlight two main issues across them: the lack of information for buyers and sellers to find themselves, and the lack of trust, credibility, and mechanisms to secure transactions (Khanna and Palepu, 1997, 1999; Palepu and Khanna, 1998; Khanna, 2018). To correct these soft infrastructure issues, new regulatory institutions (e.g., sector policies, contract enforcement laws, etc.), and market intermediaries (e.g., information providers, marketing agencies, financial entities, etc.) should be inserted in emerging markets (Khanna and Palepu, 1997; Palepu and Khanna, 1998; Bothello, Nason and Schnyder, 2019).

Although the institutional voids can be seen as challenges at first glance, entrepreneurs can perceive this lack of institutions as an opportunity to innovate, scale up businesses, and generate a positive social impact while making profits and building inclusive markets (Mair and Martí, 2006; Mair, Marti and Ganly, 2007; Mair, Martí and Ventresca, 2012; Khanna, 2018). Outlining an instrumental function, the voids approach can incentive organizational responses to foster institutional development, highlighting how entrepreneurship in the private sector or through public-private cooperation can create solutions for these gaps (Mair and Martí, 2006; Mair and Marti, 2009; Mair, Martí and Ventresca, 2012; Khanna, 2018; Bothello, Nason and Schnyder, 2019). In this way, Mair, Martí, and Ventresca (2012) propose to view these voids not as gaps, inefficiencies, or dysfunctionalities, but as 'interfaces' of institutional plurality, each with their own logics and practices that open alternative paths of development: empirical data shows that replicating traditional Western institutions when they are 'absent' or 'weak' is not ideal, and it is recommended to build on the existing on-ground dynamics and the institutional interplay between formal and informal institutions (Mair, Martí and Ventresca, 2012; Bothello, Nason and Schnyder, 2019).

Following the relevance of social enterprises for fixing markets, researchers have highlighted how these organizations, even when surrounded by several context constraints, can create and capture value in their core economic activities by targeting multiple institutional voids as opportunity spaces to create even more value (Mair and Marti, 2009; Khanna, 2018). However, the focus on social enterprises as intermediary actors does not imply private-based solutions but invites to deploy the complex assemblage of institutions through a multistakeholder approach for inclusive market building (Mair, Martí and Ventresca, 2012). This resonates with comparative studies between institutional configurations that reinforce the relevance of government participation for promoting social enterprises: active involvement through the provision of institutional support is more beneficial than considering low governmental participation as a trigger for greater demand to cover social needs (Murphy, 2007; Stephan, Uhlaner and Stride, 2015).

A last question remains: how to target institutional voids? Whether they are considered as gaps or opportunities for entrepreneurial intervention (Khanna, Palepu and Bullock, 2010), or as analytical interfaces that works as problem-sensing tools (Mair, Martí and Ventresca, 2012), they need to be addressed for inclusive market building. However, while Mair's approach is more analytical-theorical, Khanna's one is oriented to business solutions, being the latter more suitable to understanding the interrelation of value chains with the institutional context of cross-border regions.

Returning to Khanna (Khanna, Palepu and Bullock, 2010; Khanna, 2018)'s arguments, he highlights four important considerations to address institutional voids –although results are not exactly guaranteed due to the complexity of each context. The first is the need of specialized and holistic knowledge that entrepreneurs must have about their venture: shaping a business that responds to existing voids implies understanding it from the cradle to the grave. Entrepreneurs can understand the interrelationship of institutional voids by deconstructing the value creation processes and analyzing how these are embedded into their institutional environments. Secondly, the deconstruction of business models must give way to the identification of the most important business objectives and of the value creation process that can generate economies of scale. A scale-based entrepreneurship enables cost reduction, efficiency-oriented improvements, and good outcomes.

Third, in the face of the voids and opportunities for scalability, institutional structure must be built/complemented by inserting market intermediaries such as credibility enhancers (e.g., auditors, certification, proficiency tests), information providers (e.g., financial analysists, market research firms), aggregator and distributors (e.g., insurance companies, mass retailers, training institutions), transaction facilitators (e.g., brokers, recruiter offices), adjudicators (e.g., courts), and regulators (e.g., contract enforcers). Finally, investments must be prioritized according to the main objectives and must be orchestrated as a whole: the complementarity of investments is necessary to provide solutions with a

systems approach. In this way, although results should not be taken for granted, it is possible to ensure a certain degree of 'effectiveness' within the institutions that allows the proper functioning of the market.

4. Systematic Literature Review on Cross-Border Value Chains

A Systematic Literature Review (SLR) is a methodological approach that systematize explicit procedures to conduct a literature review on past research –identify, evaluate, and synthetize the existing body of knowledge– that is comprehensive, reproducible, and bring accuracy and precision to academic discussions (Mulrow, 1994; Fink, 2005; Okoli and Schabram, 2010; Xiao and Watson, 2019). Its main difference with other types of literature review – such as a theoretical background review or a narrative literature review– lies on its scope and rigor: the set of reviewed articles is particularly smaller as SLR only includes publications that meet specific criteria for the research question (Rother, 2007; Okoli and Schabram, 2010). The present research adapts the Okoli and Schabram (2010)'s methodology to conducting SLR in eight steps (**Table 2.1**). This section explains the taken approach step by step and the most relevant details considerations to ensuring research rigor.

Table 2.1. *Methodological Steps to Conducting Systematic Literature Review (based on (Okoli and Schabram, 2010))*

Methodological Steps to Conducting Systematic Literature Review	
Defining Purpose	Identify the main objective and intended goals of the review.
Protocol & Plan	Clarity on the detailed procedures to be followed in the literature search.
Screening for Inclusion	Conduct a practical review (e.g., abstract reading, skimming) of the articles without further examination of their content.
Screening for Exclusion	Elaborate qualitative criteria to judge the preselected articles using a score system.
Refining	Review other articles that are related to the selected ones (e.g., included in references).
Data Extraction	Systematic extraction of information that is relevant for the study.
Synthesis	Coding, analysis, and classification of the information accompanied by quantitative and qualitative techniques.
Writing	Report the findings and details of the methodology and synthesis.

4.1. Defining a Purpose

Although academic literature on cross-border value chains exists, it is quite dispersed and confusing: the 'cross-border' concept does not exactly refers to countries sharing a common border, the

utilization of different jargons to express the same phenomenon or, as related with this research, the studied productive dynamics does not ensure the value creation processes. Thereby, the main research objective is to respond to the lack of uniformity and consensus on the body of knowledge of cross-border value chains. Four leading questions are developed to enabling a better comprehension of what they are, their relevance, how they operate, and the institutional voids –understood from a negative connotation and from a positive one– that should be considered in the study of regional connectedness of CBVCs. That said, according to scholars and their previous publications, we identify:

- What is a Cross-Border Value Chain?
- Why are CBVCs relevant?
- How do CBVCs operate?
- What institutional voids can be found?
    - Negative connotation: barriers, obstacles, struggles, etc.
    - Positive connotation: opportunities, potentialities, benefits, etc.

4.2. Protocol & Plan

As each methodological step is explained in the next points, this one focuses on delimiting the scope and limitations. In relation to the scope, the first three questions focus on bringing a definition, the triggers, and the mechanisms behind them. However, it is necessary to highlight a crucial discussion. This research pretends to start a discussion on spatial-economic configurations that promote the connectedness of cross-border regions between themselves, and with external markets by embedding their flows into international trade flows. Under this approach, cross-border value chains are a type of spatial-economic configuration such as cross-border productive networks, cross-border clusters, cross-border special economic zones, among others. However, making sharp distinctions of these configurations within the cross-border context might be a weak methodological beginning.

Considering the works of Humphrey & Schmitz (2000) and Rosenfeld (2001) that bring some categorizations and distinctions between value chains and clusters, both configurations intertwine in the cross-border territory. Working with value chains coming from the same territory leads to imply a slight geographical clusterization or obtaining benefits from the border proximity, common social norms, or cross-border governance initiatives that are common to clusters but not for value chains. However, considering them as clusters might not be the most ideal option as contractual relationships, inter-firm networks, and the governance of GVCs still occupy a relevant place on trade dynamics. As CBVCs locate in-between both conceptualizations, the methodology focuses on the previously explained theories & concepts rather than on strong definitions –expecting them to emerge from the analysis.

While the first three questions are explored and itemized, the last guiding question represents the core of this research as it discusses in detail every identified void. Ensuring methodological rigor by systematizing every step and complementing them with a mix of qualitative methods, the list of voids intends to reflect the reality of value chain initiatives in cross-border regions. As defined in the theoretical and conceptual framework, context matters. Thereby, it is not possible to expect a consensus between all primary sources pointing the same voids in all of them. While that case is ideally expected, it might not be possible as academic sources come from different geographies or have different approaches. Thus, it is expected that each void is present in at least a third of the articles. If they do not accomplish this target, it is considered if they can be merged with other voids, stand alone in the list, or discarded.

This research also acknowledges limitations that were taken into consideration during the present study, but which should be further addressed in future works in order to enhance the validity. First, this SLR is limited by the academic sources that are available online and appear in the selected search engines, screened languages, or used keywords. Second, due to the number of articles, it would have been recommended to carry out this research with more people involved to reduce bias in screening processes (control panel). Third, due to the lack of previous research works of this type, the heterogeneity of spatial-economic configurations and the broad scope of cross-border productive articulation (phenomenon & context) represent a challenge for achieving a consensus on the most relevant voids. Furthermore, there is a concern of falling into generalizations (e.g., consider high transaction cost as a void), or being too specific (e.g., considering particularities of a specific context).

To palliate these constraints, first, nine keywords are searched in three languages and in fifteen online engines. Second, to reduce personal bias, the qualitative screening (step 4) was repeated three times with at least one week apart, and new articles were collected based on their references (step 5). In addition, the qualitative criteria were continuously revised to contrast the conceptual framework with the articles that were remaining. Third, the analysis of the voids was executed in three iterations, implementing a writing-as-analysis method (Augustine, 2014) in the last one to create self-explanatory categories. In other words, although a void might relate to others by causation relations, each of them satisfies minimum 'composition criteria' to be considered as one. This list represents the first one on this topic and under this methodology, so it should be contested and evaluated by later works.

Throughout the following steps, to support qualitative analysis, reading and note-taking techniques were relevant for sorting and classifying the codes, facilitating the analysis, and elaborating the final compositions. Some of the implemented techniques were reading techniques such as skimming, scanning, or detailed reading, and note-taking techniques like outlining (topic-subtopic structure), sentence-method (recording short sentences), memo-writing (short paragraphs), charting (organizing drafts), among others.

4.3.Screening for Inclusion

The practical screening or screening for inclusion is the initial data collection process by using academic search engines. Based on some trial searches, it is needed to highlight four considerations. First, Boolean operators ("AND", "OR", "NOT", etc.) do not work in the same way in every search engine and some of them are very sensitive to the position of words. Second, the selection of key words was based on the three explained concepts (e.g., "value chain", "cross border", "inclusive", etc.) and related words. Eventually, the keywords 'institutional voids' were added to the searches, but they did not reflect any meaningful variation.

Third, the search operations yield different amount of search results depending on when it was executed. This methodological step was executed in December 2021. The number of results of some keyword searches increased or decreased (depending on the search engine) when it was re-checked six months later. Although this could be due to several factors (e.g., change in algorithms, new publications, etc.), as methodological rigor was ensured in the previous execution, it was not required to do it again. Fourth, to provide greater clarity in local production & capacities, value chains for products were prioritized over those for services. Thus, there was no consideration for cross-border tourism although some researchers considered it as a service-based cross-border value chain.

The practical screening started by designing a list of keywords (KW) In three languages: English, Spanish, and Portuguese (**Table 2.2**). Then, fifteen academic search engines were selected to conduct the screening. During this process, the inclusion conditions relied on the articles complying with the three conceptualizations: if they referred to value chains, productive articulation or value creation processes, if they referred to a contiguous border or small waterbody in-between, and if they were case studies, proposals, or theoretical articles that give any hint of possible barriers or potentialities. To evaluate these conditions, each search page was explored by skimming the article titles (get a general overview) and scanning the abstracts if needed (find specific facts). This process implied to be fast and if there were doubts about any article, it was included by default. In addition, ending conditions were established to stop each search: the screening stops when less than two casualties (two articles that fit the inclusion criteria) were found in the last twenty articles.

Table 2.3 summarizes the amount of search results and collected articles (written in parentheses). The practical screening consisted in 405 searches, finding approximately 10.5 million articles (research papers, theoretical frameworks, project proposals, case studies, etc.). Based on the inclusion criteria, 258 articles were considered, being 54 of them repeated. This gave a total number of 204 references (0.002%) that were included for further evaluation in the next step.

Table 2.2. *List of Keywords (KW) for Systematic Literature Review (Author's elaboration)*

KW#	English	Spanish	Portuguese
KW1	Value Chain AND Cross Border	(Cadenas Transfronterizas) OR (Cadenas de Valor Transfronterizas)	(Cadeias Transfronteiriças) OR (Cadeias de Valor Transfronteiriças)
KW2	Value Chain AND Cross Border AND Productive	Cadenas Productivas Transfronterizas	Cadeias de Produção Transfronteiriças
KW3	Value Chain AND Cross Border AND (Inclusive OR Inclusion OR Inclusivity OR Inclusiveness)	Cadenas Transfronterizas AND (Inclusion OR Inclusividad)	Cadeias Transfronteiriças AND (Inclusão OR Inclusividade)
KW4	Productive Chain AND (Inclusive OR Inclusion OR Inclusivity OR Inclusiveness)	Cadenas Productivas AND (Inclusion OR Inclusividad OR Inclusivas)	Cadeias de Produção AND (Inclusão OR Inclusividade OR Inclusivas)
KW5	Value Chain AND (Connectivity OR Connectedness OR Embeddedness)	Cadenas de Valor AND (Conectividad OR Integración)	Cadeias de Valor AND (Conectividade OR Integração)
KW6	Cross Border Production Networks	Redes de Producción Transfronterizas	Redes de Produção Transfronteiriças
KW7	Cross Border Productive AND (Collaboration OR Cooperation)	(Cooperación OR Colaboración) AND Productiva Transfronteriza	(Cooperação OR Colaboração) AND Produtivo Transfronteiriço
KW8	Cross Border Economic Development AND (Productive OR Production)	Desarrollo Económico Transfronterizo AND (Productivo OR Producción)	Desenvolvimento Econômico Transfronteiriço AND (Produtivo OR Produção)
KW9	Cross Border Productive Integration	Integración Productiva Transfronteriza	Integração Produtiva Transfronteiriça

Table 2.3. *Total amount of Search Results (and Collected Articles) (Author's elaboration)*

405 searches (9 Keywords*15 engines *3 languages)

10.5M articles ► 204 pre-selected (54 repeated)

Engines/KWs	KW1	KW2	KW3	KW4	KW5	KW6	KW7	KW8	KW9	Total
Dialnet	154 (7)	14 (0)	11 (0)	496 (0)	570 (5)	117 (2)	38 (15)	1175 (19)	63 (2)	**2638 (50)**
Emerald	7795 (8)	1679 (0)	2458 (0)	4123 (0)	2006 (0)	4355 (6)	1137 (0)	8861 (1)	1166 (0)	**33580 (15)**
Google Scholar	924360 (37)	278630 (13)	296660 (6)	627800 (4)	1194000 (17)	461300 (10)	155100 (5)	818500 (4)	169050 (2)	**4925400 (98)**
IEEE	9 (0)	1 (0)	1 (0)	2 (0)	74 (0)	30 (0)	4 (0)	73 (0)	4 (0)	**198 (0)**
ProQuest	749498 (7)	401357 (5)	506184 (1)	320184 (2)	193247 (1)	60304 (3)	35451 (1)	102409 (4)	33483 (2)	**2402117 (26)**
PubMed	49 (1)	29 (1)	1 (0)	2114 (0)	1537 (0)	73 (0)	177 (0)	126 (0)	70 (0)	**4176 (2)**
Redalyc	95982 (1)	420082 (0)	2029 (0)	1726 (0)	1251 (2)	829657 (1)	134849 (1)	71369 (1)	620720 (2)	**2177665 (8)**
Research Gate	430 (4)	225 (0)	12 (0)	2 (0)	16 (4)	356 (3)	269 (3)	164 (2)	319 (3)	**1793 (19)**
Sage	11202 (0)	4057 (0)	10747 (1)	4188 (0)	5443 (0)	26749 (0)	9720 (0)	42791 (1)	10151 (0)	**125048 (2)**
SciELO	3 (1)	2 (0)	0 (0)	12 (0)	34 (0)	0 (0)	1 (0)	2 (0)	0 (0)	**54 (1)**
ScienceDirect	53838 (0)	6031 (1)	14627 (1)	2711 (0)	23383 (1)	44820 (0)	7218 (0)	39175 (0)	9555 (0)	**201358 (3)**
Scopus	320 (0)	5 (0)	7 (0)	151 (0)	1037 (0)	26 (0)	29 (0)	2212 (0)	27 (0)	**3814 (0)**
Springer	72739 (3)	15317 (0)	25044 (0)	8343 (0)	11642 (2)	79722 (5)	23199 (0)	90684 (7)	21439 (0)	**348129 (17)**
Taylor & Francis	28596 (1)	9145 (5)	27486 (0)	9631 (0)	12723 (0)	66336 (1)	23373 (0)	98430 (1)	24181 (0)	**299901 (8)**
Web of Science	340 (3)	3 (0)	13 (0)	1 (0)	8 (0)	335 (3)	33 (0)	256 (3)	22 (0)	**1011 (9)**
Total	**1945315 (73)**	**1136577 (25)**	**885280 (9)**	**981484 (6)**	**1446971 (32)**	**1574180 (34)**	**390598 (25)**	**1276227 (43)**	**890250 (11)**	**10526882 (258)**

*Legend per cell: #Total References (#Collected References after screening)
**Searches were executed in December 2021

4.4. Screening for Exclusion

The qualitative screening or screening for exclusion represents the filtering process to select the final set of articles that would be used as primary sources to analyze what scholars have told on the topic. For this step, it is indispensable the design of clear qualitative criteria to conduct source analysis. Based on Mårtensson *et al.* (2016)'s recommendations to ensure research quality standards and following a more specific contextualization of the three main concepts, **Table 2.4** reflects the qualitative criteria and scoring system for source analysis.

The qualitative criteria have a maximum score of eight (8) points that are distributed in two parts. The first section (A, B, and C) evaluates the credibility of each source by identifying the type of research, its reliability, and methodological rigor. Theoretical frameworks, case studies, policy documents and project proposals coming from relevant institutions or journals were prioritized.

The second section evaluates the articles based on their contribution to the research questions in four categories. The first one (D) is related to the geographical scale and if the article fits the idea of cross-border cooperation, preferably if it is a formal initiative supported by local or subnational governments rather than informal dynamics. The second I is oriented to determine if the development is fixed to the cross-border space, that said, that value creation processes (focus on production rather than trade) are driven by local actors, capacities, and resources. That said, this screening focuses on exploring the cross-border productive articulation in primary & secondary agroindustry and basic manufacturing. The third one (F) is oriented to understand the value chain processes by studying detailed case studies or conceptualizations. Finally, the fourth category (G) evaluates if the source contributes to determining institutional voids in a negative or positive connotation.

The review process consisted of first scanning the introduction and results sections of each article. If there were doubts about the source, a detailed reading throughout the whole article was executed to give them a score. The "-1" score was established to debug options that were outside the theoretical and conceptual framework. As explained in the protocol & plan, this qualitative screening was executed in three different occasions to reduce personal bias. The final selection of sources was achievable with a minimum score of 7.5 points (being 8.0 the maximum achievable). From this step, thirteen sources were selected.

Table 2.4. *Qualitative Criteria and Scoring System for Source Analysis (Author's Elaboration)*

I	**Credibility (0-1 points)**	
A	**Type of Research:**	Theoretical Paper? Case Study? Policy Document? Other?
B	**Reliability:**	Peer Review? Relevant Institution? #Citations?
C	**Rigor:**	Proper Data? Proper Method? Relevant Conclusions?
0	All three criteria do not apply	
1	All three criteria apply	
II	**Contributory (0-7 points)**	
D	**Cross-Border Territory & Cooperation (0-3 points):**	
D1	**Does it refer to cross-border territory at local or subnational level?**	
-1	National or one side of border	
0	may be or not a Cross-Border Territory	
1	Cross-border Territory	
D2	**Is the cross-border initiative formal (participation of local authorities) or informal?**	
0	Not related/Not explained	
0.5	Informal Initiative OR Formal Proposal	
1	Formal CBVC project OR formal/informal business cooperation/connection	
E	**Cross-Border Territorial Development (0-2 points):**	
E1	**Does it involve local actors (producers/businesses) or moved to the CBR?**	
0	Not related/Not explained	
0.5	Subnational border actors	
1	Local border actors	
E2	**Does it focus on cross-border production (agroindustry, basic manufacturing)?**	
-1	Not related/Not explained	
0	CBC based on economic complementarity (no description on cross-border production)	
0.5	Economic area, Cluster, OR innovation space (little description on cross-border production)	
1	Cooperation through CBVC (description or schemes on cross-border production)	
E3	**Does it create/capture value from cross-border production or only trade/market?**	
-1	Not related/Not explained	
0	Only about cross-border trade or supply (not added value to the product)	
0.5	Partial Complementarity (CBC may or not add value to the product)	
1	Cross-Border Value Chain (CBC adds product value)	
F	**Value Chain Approach (0-1 points):**	
F1	**Does it describe in detail the value chain of a product (processes)?**	
-1	Not related/Not explained	
0.5	Many Value Chains (partially described)	
1	One or more Value Chains explained in detail	
G	**Institutional Voids Approach (0-1 points):**	
0	No listing	
1	Listing barriers and/or opportunities	

*-1: Exclusion

4.5. Refining

During the qualitative screening, some sources referred to other academic works or publications that fit in the scope of this research. Eleven new references were identified, and three of them successfully met the criteria. **Table 2.5** summarizes the final list of the sixteen selected sources coded as L1, L63, L64, L68, L70, L79, L88, L111, L117, L118, L158, L170, L180, L208, L211, L215 (these codes will be references for the writing section).

4.6. Data Extraction

The sixth step refers to the data extraction process. This implies to consider the sixteen academic works as primary sources for designing a better body of knowledge. The process consisted in deep reading each article while highlighting the phrases, lines, sections that were related to the research questions, and taking notes about them. Two important actions were executed: First, writing a characterization of each source by pointing the location, methodology, or main theoretical concepts as shown in **Table 2.5**. Second, the most important quotes were extracted (copied as written in the source) and simultaneously, a note was written by its side (this coding technique will be examined in more detail in the Synthesis). Approximately, a total of 3000 extracts were transcribed from the 16 sources.

4.7. Synthesis

The synthesis/analysis process can be divided in three parts: the source analysis, the CBVC questions (definition, relevance, and mechanisms), and the list of voids. The first one was related with a brief evaluation of each source: to identify the main results, strengths, weaknesses of the articles as shown in **Table 2.5**. In addition, a brief analysis of the spatial location of this research, their scope, and future lines of research were drawn. For the second section, coding each extract (transcribing quotes and adding short notes or tags to them) helped their classification into each question and sorting the main ideas to answer them. In relation to the voids (called categories), the sorting process (grouping ideas based on their similarities) was even more complex due to the number of extracts that were involved. To facilitate this process and arrive to the final list of voids, three sorting iterations were executed. In the first round, memos taken up to that moment were used to generate preliminary categories. A mental mapping technique helped to sort the memos (**Figure 2.5**), generating a list of 68 possible voids.

Table 2.5. *Review of Literature on Cross-Border Value Chains (Author's Elaboration)*

List N°	Author (Year)	Source Type (Lang.)	Location	Aim of Study	Theoretical background	Methodology	Main Results	Strengths	Weaknesses
L1	**(Fernández Jardón, 2014)**	Academic Book & Consultancy Study (SPA)	Argentina – Paraguay (Posadas – Itapúa)	Evaluate the possibilities for productive integration in Argentina-Paraguay CBR.	Cross-Border Value Chain (Local Productive Integration in CBR)	Single Case Study (Quantitative & Qualitative)	Proposal: local complementarity and engagement of CBVCs through networks, clusters, & joint projects.	Evaluation of the possibility of generating CBVCs. Structured methodology based on articulated concepts.	It is a proposal, so it is not clear if current CBVC dynamics are happening (or their intensity).
L63	**(Dong and He, 2018)**	Academic Paper (ENG)	China-Myanmar (Yunnan – Kachin/Shan)	Investigate the timber value chain along the border areas.	Value Chain Approach	Single Case Study (Qualitative)	Need to improve CBVC governance through transparency and accountability.	Detailed explanation of CBVC trade in terms of actors, governance, and profits.	Mentioning but not including about the local timber production and impact on CBR.
L64	**(The Anh and Van Tinh, 2020)**	Academic Book Chapter (ENG)	Cambodia-Vietnam (Takéo – An-Giang)	Describe the rice CBVC from Takéo to An-Giang.	Value Chain Approach	Single Case Study (Qualitative)	Joint policies for rice CBVC are needed to increase export standards, create value, reduce spillovers.	Analysis of CBVC, its actors' roles, impacts, and opportunities.	Not so much detail about the spatial configuration of rice production in the CBR.
L68	**(Pérez Rozzi, 2014)**	Methodological Guide & Consultancy Study (SPA)	Central America (three CBRs)	Describe and explain the inclusive CBVC approach.	Inclusive Chains & Cross-Border Local Development	Theoretical Study & Multiple Case Study (Qualitative)	Policy recommendations for three CBVCs from a macroregional perspective.	Detailed description of the theoretical claims that are described and used to analyze the three case studies.	The main case study does not delve into the cross-border nature of the value chain.
L70	**(Dilla Alfonso et al., 2017)**	Consultancy Study (SPA)	Dominican Republic – Haiti (Elías Piña – Plateau Central)	Study six CBVCs, their context, limitations, and opportunities.	Value Chain Approach	Multiple Case Study (Qualitative)	CBVCs can be supported by improving producer associations capacity, better legal/fiscal frameworks, and infrastructure.	The study explores the formal and informal CBVCs and weight their impact on local economy.	Detail on every CBVC could be improved to give more specific recommendations.
L79	**(Sánchez and Bustamante, 2008)**	Academic Paper (SPA)	Colombia – Venezuela (Norte de Santander – Tachira)	Analyze the state and potential of orienting local car production into a value chain within the CBR.	Value Chain Approach	Single Case Study (Qualitative)	Although it is not currently a CBVC (or even VC), there are dynamics that reveal the potential across borders.	Comprehensive analysis of the automobile CBVC between border local businesses.	Analysis was based on companies self-evaluation. Most of the collected data came from one side.
L88	**(Kwaschik, 2011)**	Policy Document (ENG)	India – Nepal, China – Laos	Identify international/external drivers of NTFP-based livelihoods and governance.	Cross-Border Value Chain	Multiple Case Study (Qualitative)	Further benefits are possible enhancing productive knowledge, adding value, and reducing bottlenecks.	Identify several problems and solutions to connect the CBVCs of four products (two cases).	It does not clarify the scope of the cross-border area: can be local or subnational.
L111	**(Yoshida and Hemmavanh, 2010; Yuzhe *et al.*, 2011)**	Academic Paper (ENG)	China – Laos (Yunnan – Phongsaly)	Examine the tea dev. model in Lao-China CBR through the lenses of CBC.	Sustainable Local Development for Peace	Single Case Study (Quantitative & Qualitative)	CBVC can generate a win-win situation by fostering local economic development.	Comparison of the scenario before and after the CBVC project.	No clarity on the metric to weight the project outcomes, and the lagging issues.

(Continued)

(Continued)

L117	**(Lord and Chang, 2019)**	Consultancy Study (ENG)	Indonesia – Malaysia (West Kalimantan – Sarawak)	Determine the optimal configuration for an integrated CBR programme.	Cross-Border Value Chains (Mix-methods)	Single Case Study (Quantitative & Qualitative)	Integrated Project Design based on the analysis of potentialities in CBVC (trade, investment, development plan).	Studied the existing and potential CBVCs to develop clusters in Border Economic Area.	The analysis has a more subnational approach, without considering the impact at local levels.
L118	**(Lord and Chang, 2018)**	Consultancy Study (ENG)	Indonesia – Malaysia (North Kalimantan – Sabah)	Identify the most optimal configuration for an integrated CBR programme.	Cross-Border Value Chains (Cost-Benefit Analysis & Non-Monetarized Project Appraisal)	Single Case Study (Quantitative & Qualitative)	Integrated Project Design based on the analysis of potentialities in CBVC (trade, investment, development plan).	Studied the existing and potential CBVCs and selected the most recommended ones to further develop.	The analysis has a more subnational approach, without considering the impact at local levels.
L158	**(González, Bergesio and Golovanevsky, 2014)**	Academic Paper (SPA)	Argentina – Bolivia (Jujuy – Potosí)	Analyze the Binational Camelids Fair (FBC) based on actors' dynamics and CBC potential.	Cross-Border Cooperation & Development	Single Case Study (Qualitative)	Explain factors that lead to the development and stoppage of the FBC.	Explanation the benefits from the FBC to the camelids CBVC and the participation of every actor.	Not so much detail on the tangible results on llama production.
L170	**(Oddone, 2019)**	Methodological Guide (SPA)	Central America	Describe the methodological approach to identify bottlenecks and strengthen CBVCs.	Cross-Border Value Chain (Regional Connectedness)	Theoretical Study	Development of a tool for Quantitative, Qualitative, and Political Analysis of CBVCs.	Methodology to guide consensus. Generated based on regional experiences of IGOs.	No clarity of what kind of bottlenecks a CBVC could face.
L180	**(Ilbery and Maye, 2005)**	Academic Paper (ENG)	England – Scotland CBR	Analyze the sustainability of VCs operated by small rural enterprises in the CBR.	Short Food Value Chains	Multiple Case Study (Qualitative)	Businesses (and their CBVCs) are not particularly sustainable but driven by a strong economic imperative.	The six cases give details about their food CBVCs & spatial configurations.	Not so much detailed on the cross-border spillovers that affect businesses (focus on remoteness issues).
L208	**(Haarich, 2018)**	Final Project Report (ENG)	Latin America (four CBRs)	Report the development of CBVC projects.	Smart Specialization (S3 & RIS3) Approach	Multiple Case Study (Qualitative)	Latin American CBRs differ from European ones, making difficult the transference of policies such as SME innovation, clusters, and business competitiveness.	Summary of learnings of the four executed CBVCs (learnings for CBRs, and for international cooperation).	The description of cases and their implementation measures were not so detailed.
L211	**(EC - DG Regio, 2015)**	Consultancy Study (ENG)	Brazil – Peru (Amazonas – Loreto/San Martin)	Identify innovative key sectors to promote cross-border cooperation in the Amazon CBRs.	Cross-Border Regional Innovation Systems	Single Case Study (Qualitative)	Cross-Border Cluster proposal for Aquaculture Value chain based on SWOT Analysis.	Strategic approach at regional level to coordinate and align the different stakeholders in the CBR.	Not so much detail about the local spatial configurations, involvement, and repercussions.
L215	**(Comunidad Andina, 2019)**	Final Project Report (SPA)	Bolivia – Peru (three CBRs)	Report the execution of the CBVC projects in the ZIF Peru-Bolivia.	Cross-Border Value Chains	Multiple Case Study (Qualitative)	Description of the development of two CBVCs (Alpaca and Coffee).	Promotion of CBC with a variety of stakeholders along the whole value chains.	No explanation of the theoretical framework to developing CBVCs and how it was reflected in the project.

Languages (lang.): SPA: Spanish, ENG: English

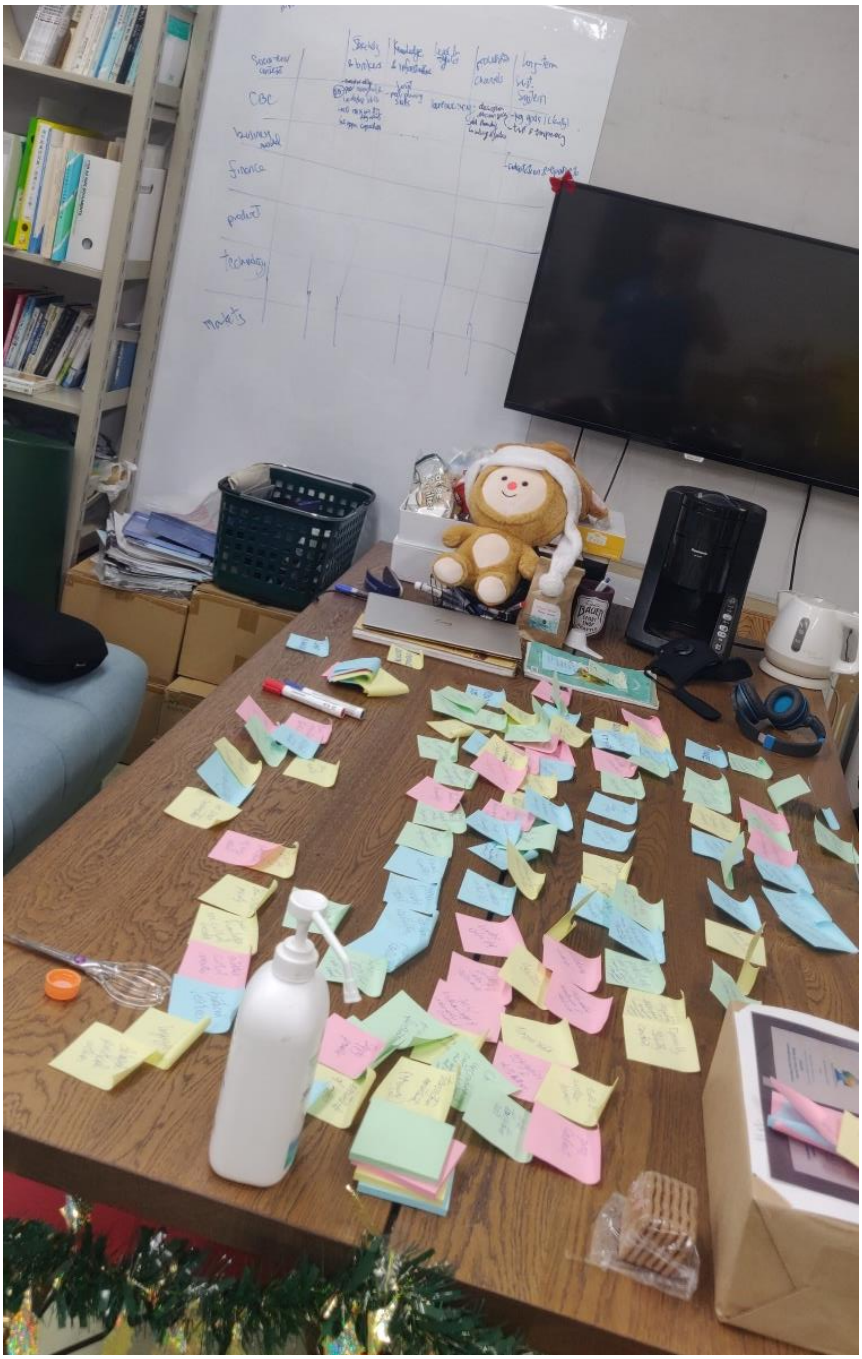

Figure 2.5. *Mental Mapping (Author's elaboration)*

In the second iteration, based on these preliminary categories, the coded extracts were sorted while observing the probable interconnections between them: although they were interconnected and could be considered within the same category, some extracts related more to the problematic, other to potentialities, and other to risks). Based on this analysis, the coded extracts were grouped in 48 categories. The third iteration was carried out simultaneously with the writing process (last step).

4.8. Writing

For this research, writing is considered as an analytical step rather than simply reporting. Taking Augustine, S. (2014)'s 'writing-as-analysis' methodological approach, reading and writing processes become 'a force' that enables complex relationships. The main purpose of this step was to write each 'void' category as a small composition, based on the theoretical and conceptual framework, and the outcomes from the SLR (the sources, extracts, notes, memos, drafts, or any other produced writing). This was complemented with other references to fill the theoretical gaps ('theoretical sufficiency'). In the process of constructing each composition, writing-as-analysis means assembling ideas while new ones arise (meaning, properties), connect (compare, merge, exclude, etc.), and justify themselves (bring examples and other academic references), shaping stronger argumentations[8] –similar methodological approach as implemented in Grounded Theory Analysis (Charmaz, 2006; Wong Villanueva, Kidokoro and Seta, 2023).

During this process, each composition had four sections: it starts with a definition to give meaning to the void category, followed by a description of the problematic (why this void represents a problem and the negative effects on the CBVCs). The third part explains the potentialities of solving the void: what would be the positive consequences of implementing a solution. The last one is related to the opportunities and risks of solving this void, that said, the issues that should be considered as this void is interconnected with others. Each composition was written in an average range of 500 to 1200 words. Finally, the final list was reduced to a total of 36 institutional voids (approximately 24,000 words).

5. Outcomes of the Systematic Literature Review

The analysis of the selected articles gives some insights about the conceptualization of cross-border value chains. First, most of the sources were published in the 2010s (87.5%), especially in the second half (56.3%). This implies that the adaptation of the value chain approach into cross-border regions is a relatively new territorial strategy (developed in the last fifteen years) – at least in the areas from which the sources come from. In addition, most of the articles does not explicitly mention the 'cross-border value chain' terminology: six of them explicitly coin the term (37.6%), six consider a

[8] This writing-as-analysis process is very similar to the last steps of the Grounded Theory methodology as documented in Wong, Kidokoro, and Seta (2023). However, the present methodology cannot be considered as Grounded Theory because there was an already defined theoretical framework, the coding process did not focus on finding actions or processes, and the present work does not strive to be a middle-range theory but an analytical framework.

value chain approach across border territories (37.6%), and the rest works under the same theoretical and conceptual frameworks of this research but under other names (e.g., cross-border corridor, cross-border regional innovation system, cross-border smart specialization etc.). This gives the idea that cross-border value chain has been a very specialized mechanism for some contexts.

From the selected sources, six are academic case studies (43.8%), six are case evaluations for consulting proposals or policy recommendations (31.3%), two are final project reports of executed CBVC initiatives (12.5%), and two are methodological guides (12.5%). In relation to the first type of sources, these academic case studies explore the CBVCs experiences that have already taken place, whether they were formally supported by local governments (two experiences), or if they were mainly informal dynamics or with little supported from governments (four experiences)[9]. The consulting proposals mainly target the potentialities of formalizing cross-border productive and trade dynamics to shape stronger CBVCs. In addition, two sources document the experiences of formal CBVC projects executed by the EU and CAN in Latin America. Finally, the last two are theoretical-methodological approaches to consider in the elaboration of CBVCs (especially in Central America). This evaluation highlights the efforts of bringing a stronger participation of public entities into shaping CBVCs, but few have been materialized in formal projects.

In terms of the productive sector of each value chain, most of them (68.8%) are agriculture value chains including agroforestry products, livestock, and crops. Three of the sources show a mix of CBVC alternatives between the agriculture sector and manufacture one(18.8%), and only one source is related to cross-border automobile manufacture (6.3%). The focus on primary sector or basic infrastructure is related with the location of the cross-border regions (**Figure 2.6**). Most of the sources are cases from South-East Asia (37.5%), South America (37.5%), and Central America (18.9%). Only one case is reported in Europe (the England-Scotland CBR). Thereby, 93.8% of the articles refer to the Global South, where most cross-border regions between developing countries are characterized by low population density, high-environmental value, strong illegal flows, and lack of participation of governments or border political struggles. Under these characteristics, it is possible to understand CBVCs as development strategies in lagging regions that promote productive articulation based on primary sector development and basic manufacture processes.

[9] Although these cross-border value chains consider some flows that would fit conceptually as cross-border informal trade, participation of governments in promoting formal flows through new regulations, and the presence of local productive infrastructure to process raw materials imply that, although the supply may informally cross the border, value creation is generated (partially) in the cross-border region.

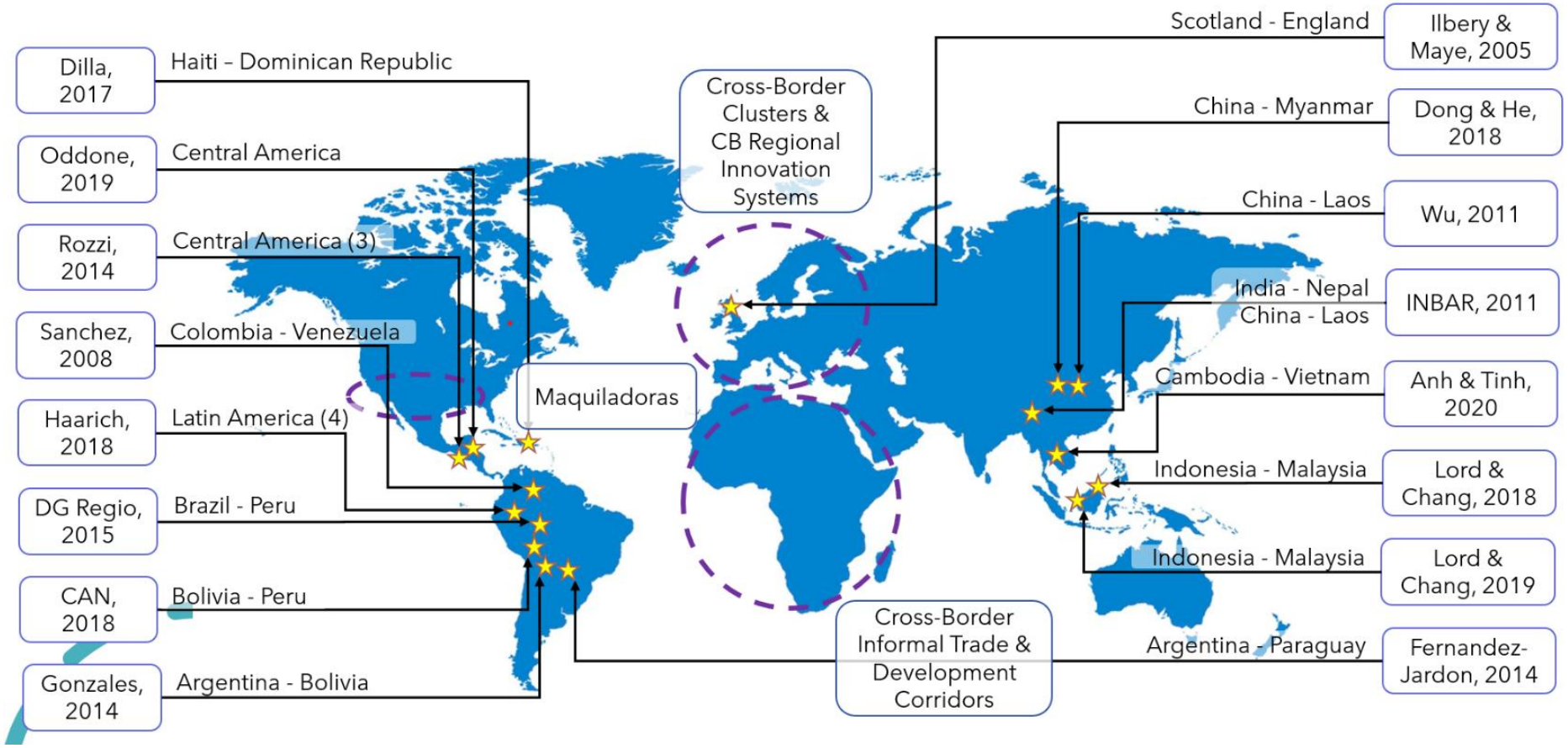

Figure 2.6. *Location of Literature (Author's elaboration)*

One last question arises not from the areas to which the sources refer, but from those that are not mentioned: why are there no references in North America, Europe, or Africa? During the practical screening, there were no or scarce articles from Central Asia, Middle East, or East Asia, (This echoes the results from **Chapter 4**). However, North America, Europe, and Africa appeared during the practical screening but using different concepts. In the first case, most literature referred to the maquiladoras between Mexico and USA, but they were not considered as a CBVC because of the low value creation that assembling manufacture brings to the CBRs (referring to the previously cited 'Smiling curve' effect).

In the case of Europe, Eastern European cases on productive articulation follows the methodologies created by Western Europe. In the European Union, due to the higher population in CBRs, technological development, and legal compatibility, it is possible to play stronger under economies of scales. Thus, concepts such as cross-border clusters or cross-border regional innovation systems (CBRIS) predominate in literature of that part of the world. In a certain way, references indicate that value chain approaches have been already implemented and, due to the degree of development, clusterization is the main spatial-economic configuration for current European CBRs (implying a linear evolution from value chains to clusters).

Finally, the literature about Africa reveals the persistent political struggle across African borders, with low participation of the government and low productivity. Most references evaluate the situation of cross-border informal trade (CBIT), with low value creation across borders. Productive articulation in Africa is mainly focused on the promotion of Development Corridors, that means, articulating the factor endowments from main urban centers rather than fostering development of CBRs (subregional scale rather than cross-border scale).

This cross-evaluation of sources gives some insights about CBVCs. As a spatial-economic configuration for developing cross-border regions, a CBVC can be considered as a localized phenomenon in Latin American and South Asian contexts, to develop lagging CBRs based on the productive articulation of primary sector and basic manufacture. Thereby, a CBVC approach becomes a spatial-political development tool that builds on existing productive and trade flows across borders. However, initiatives to formalize them is more a recent trend that have been explored in the last two decades (as an alternative to other more 'developed' spatial-economic strategies such as clusters), but with few achieved projects – and even less project evaluations– in both regions. While this explanation emerges from the selected sources, new literature reviews and qualitative research are recommended to discuss these hypotheses.

6. About Cross-Border Value Chains

Answering the research questions, the Systematic Literature Review give us some highlights about the relevance of CBVCs, how they operate, and what exactly they are. Emphasizing what was mentioned above about the scope and limitations, the objective of this research is to begin a conversation rather than setting strong definitions. However, methodological rigor gives this research a good start to on bringing more clarity on cross-border value chains, their triggers, and mechanisms.

6.1. What Is a Cross-Border Value Chain?

The SLR reveals that not so many scholars have adventured in defining a CBVC: Only a quarter of all sources (L1, L68, L70, L170) have coined a definition under concepts such as 'cross-border productive articulation', 'cross-border productive chains', 'corporate chain in CBRs', or 'cross-border agricultural value chains'. Although there are some variants between them, those definitions match with the selected parameters in the theoretical and conceptual framework, highlighting three main elements: the product, the place, and the cooperation.

A Cross-Border value Chain (CBVC) is a concatenation of activities in which each of them add value to a product, and whose value creation is carried out partially or totally throughout the cross-border region. The 'cross-border' nature requires the participation and concentration of not only the private sector but also of the public one and other related stakeholders, working together towards a common or complementary productive development goal.

Thereby, a CBVC becomes a political-economic initiative with local social impact, which incorporates a concept of territoriality that instrumentalize the borders and their benefits to create value through new cross-border configurations of productive articulation, technological transformations, cooperation schemes, marketing channels, and more. That said, a CBVC product value embodies the impact of a cross-border region over domestic and international markets, that is ultimately determined by the price consumers are willing to pay.

6.2. Why Are Cross-Border Value Chains Relevant?

The Why-question focuses on understanding the value of cross-border value chains: What are they aiming for? What do they stand for? Are they important? If so, why? Thereby, this section seeks to identify the purpose(s) or potential behind considering CBVCs as a development option for CBRs. Answering these questions, the SLR reveals six main reasons that support the implementation of CBVCs as they root for regional integration, global economic engagement, innovation, sustainable development, value creation, and peace.

- **Multi-scalar Regional Integration**

Cross-Border Value Chains are considered as comprehensive strategies to achieving regional integration at different levels and in different dimensions, not only in the economic one (L208). Thereby, 'CBVCs for Regional Integration' is born out of the need to overcome the territorial fragmentation and peripheralization of territories created by the Westphalian model of nation states (L208). At macroregional or subregional scale, CBVCs promote economic integration by strengthening intraregional trade, and trade relationships (L170). At local scale, it allows countries to articulate their border areas and value chain nodes by taking advantage of their productive affinity, territorial proximity, trade complementarity (L170).

The CBVCs entails to close the social, economic, environmental flaws and gaps throughout the territory by articulating and strengthening the natural resources, institutions, and productive activities (L1). Thereby, a CBVC embeds a framework to address spatial problems through cooperation (L1) and, at the same time, a process that leads to the emergence of cross-border regions and promote multi-scalar integration between the overlapping regional arrangements (L70).

- **Insertion in the Global Economy**

Considering 'CBVCs for Global Economy' invites to interpret them as an internationalization project to articulating territorial enclaves to the global economic networks (L170). Thereby, CBVCs use their cross-border origin and create a competitive advantage to penetrating and positioning in the Global Value Chains and emerging markets, breaking with the lagging asymmetries created by national economies (L118, L170). The establishment of cross-border productive systems strive to consolidate productive complementarity and promote a better and more competitive insertion into global production and markets, ensuring profits to local producers and companies (L111, L118, L170).

- **Cross-Border Sustainable Development**

In multiple CBRs, marginalized and poor communities depend on the production and sale of their natural resources to receive a basic income and get out of poverty (L88). Thereby, CBVCs interconnect with the economic, social, and environmental conditions that surround local communities and become a mean to tackle their problematic (L1, L88, L111, L118). 'CBVCs for Sustainable Local Development' address these issues and face the needed changes through the territorialization of value chains: the value of products emerges from the cross-border articulation of the territory and should be retained in their institutions, capacities, and people, appropriating the mechanisms for their own local development (L1, L68, L70, L180). The value embedded in value chains is reflected in higher and stable incomes, the reduction of socioeconomic gaps in living conditions, and the improvement of well-being through environmental sounded productive practices (L1, L88, L111).

- **Value Generators**

'CBVCs as Value Generators' embrace borders and cross-border regions as a source of value creation, and therefore, a key determinant in establishing a competitive advantage and expand regional market, increase price, reduce transaction costs, improve border industries, etc. (L88, L111, L118, L170) While products, geographic conditions, marketing strategies or other factors exist and can be better in other productive regions, borders do not, bringing uniqueness and opportunities to leverage the value of products. The value in cross-border value chains emerges not only from its designation of origin, but because it enables the development and internationalization of local businesses and governments by exploiting differences and complementarities across borders, moving production to higher value activities, or inserting themselves in regional and international value chains (L117, L118, L170).

- **Peace**

Although this one has not been mentioned as frequent as the others, 'CBVCs for Peace' intersect the relationship between peace and development: Considering peace as the equitable distribution of economic, political, and social opportunities and freedoms, development becomes a mechanism to tackle the structural factors that perpetuate inequality, violence, and poverty (Barnett, 2008). Thereby, productive articulation, cross-border cooperation, and a comprehensive territorial approach in CBVCs serves to target the needs of producers that depend on the production of illegal drug trafficking supplies that proliferate in CBRs, promoting the eradication of illegal flows from the plantations (L63, L111).

- **Innovation Labs**

Following the idea of cross-border regions as laboratories, to think about 'CBVCs as innovation labs' is to consider them as innovation spaces to promote international cooperation, local development, and multisectoral articulation (L208). CBVCs become into development engines to overcome the lagging issues of CBRs with a smart, sustainable, and innovative approach, highlighting the value of cross-border 'localities'[10] (Massey, 1993) (L68, L111, L180).

6.3. How Do Cross-Border Value Chains Operate?

How do they promote regional integration? What are the mechanisms for connecting CBRs to the global economy? In which way do they engage in peace and development? These questions strive to understand the mechanisms and paths that CBVCs take to achieve their 'whys', in other words, their operationalization. Six mechanisms can be identified: benefiting from proximity and complementarity, generating scale economies, fostering cross-cutting strategies, promoting area-based development, building Cross-Border Governance, and reducing negative spillovers.

- **Benefiting from Proximity & Complementarity**

The geographical proximity between border regions opens the possibility to benefit from the local factor endowments (capital, labor, land, and entrepreneurship) and competitive advantages of the other side, leading to economic complementarity (L1, L118, L170) (Amidi and Fagheh Majidi, 2020). This is achieved by strengthening intraregional trade of intermediate goods, articulating value chain nodes across borders, facilitating the exchange of resources, building local productive capacities, linking labor supply and technical training needs with productive activities, cross-hauling investment, and more (L64, L68, L111, L170).

Economic complementarity relates to the instrumentalization of existing cross-border spillovers or externalities (unexpected outcomes from one side's doing that affect the other side) in favor of a positive economic interdependence between both economies (L64, L70, L111). For example, in the CBR between Cambodia and Vietnam, the differences on rice price, seasonal demand, quality

[10] In her 'Questions of Locality', Doreen Massey (1993) distinguishes between 'places' and 'localities', considering the latter as a more comprehensive conception of place: a locality is the meeting of several networks, events, or places in a single space. Thereby, the value of cross-border localities lies in the instrumentalization of this plethora of relationships to enhancing CBVCs. In other words, how the advantages that a CBR possesses can support its own development.

perception and land ownership establish a dynamic flow of rice from the former to the latter, benefiting both producer populations (L64). In addition, economic complementarity leads to a mutual leverage of capacities to increase productivity (L118), generating new productive logics and joint competitive advantages (L170). Thereby, proximity and complementary promotes regional integration and foster the emergence of scale economies, and international competitiveness (L111, L117).

- **Generating Economy of Scale**

Addressing the remoteness and spatial dispersion of productive activities in CBRs, CBVCs are mechanisms to increasing the density of cross-border production and trade flows across borders, leading to an economy of scale (L170). This is achieved by the instrumentalization of cooperative actions, concentration of processing stages, or exploitation of the difference between factor endowments (L1, L117, L118).

Agglomeration allows the bypass of certain productive activities to one side of the border to the other, enabling the specialization of productive activities and the redistribution of resources, technology, and labor (L117, L118, L170). In addition, economies of scale facilitate the attraction of technological firms and financing sources, the accumulation and diffusion of knowledge appropriate to the territorial capacities, the increase of export capacity, or the reduction of transaction costs (L64, L68, L118, L170). By promoting economies of scale through measures such adequate governance schemes or legal and regulatory frameworks, this strategy leads to the clusterization of cross-border production, promoting deeper regional integration and insertion in the global economy (L118, L170).

- **Promoting Area-Based Development**

While Global Value Chains reinforce the idea of deterritorialization of production, Cross-Border Value Chains highlights the cross-border territory as the main axis to develop themselves and competing in global markets. CBVCs encourage development strategies (labor creation, infrastructure, technical training, etc.) to increasing income in the determined area and reach large sectors of the local population (L88). Thereby, this type of value chain positions territory at the center of development, considering the creation of local employments, environmental impact of production, the potential on territorial identity to positioning products, or the rescue of local knowledge to improve production (L68, L88, L211). Thus, territory is the origin of product value, and strives to be the destiny of its profitability, promoting sustainable local development.

This development reaches the local population through their training to become skilled laborers and through their involvement in several value chain nodes (L88, L118). Thereby, the insertion of

producers into more profitable markets, formal economies, and economic opportunities, lead to a gradual increase of stable incomes, living standards and sustainable practices, reducing the economic, social, and environmental problems in CBRs (L88, L111). In addition, linking better living standards with the relevance of own products incentives to abandon passive attitudes towards production, increase producers' motivation, and replace the dependency to subsidies by more innovative approaches (L68) – producing virtuous cycles of intangible resources to sustain the flourishment of CBVCs.

- **Building Cross-Border Governance**

As a political-economic initiative, CBVCs entail cross-border cooperation between a plethora of actors coming the from public and private sector, civil society, academia, etc. (L68). This demands the formation of 'good enough' cross-border governance schemes to facilitate productive articulation, mobilize and engage local actors, or generate discussion spaces (L68). Success on this realm leads to the emergence of a cross-border institutionality (joint agencies, agreements, common programmes, etc.) that instrumentalize CBVCs to achieving cross-border sustainable development.

- **Replacing Negative Cross-Border Spillovers**

As peace and development are interlinked in cross-border regions, public policies promoting CBVCs can help curb illegal flows by addressing them from the cradle: enabling stable incomes for poor farmers gives them an alternative to the cultivation of opium poppy, coca bush, or psilocybin mushroom, limiting the main supply for narcotic drug manufacturing (L63, L111). This approach can curb other illegal practices such as trafficking of endangered species, or illegal logging.

- **Fostering Cross-Cutting & Leap-Frogging Strategy**

CBVCs can be seen as innovation labs where successive technological transformations add value to local production and address local problems (L68). Innovation is a permanent condition throughout the value chain, starting from Research & Development activities based on local knowledge and capacities (L68), going through the reduction of related local problems (e.g., tackling underemployment, reducing energy demand, etc.) (L88, L180), to marketing and positioning the product in more profitable or emerging markets (L118, L180). Thereby, cross-cutting & leapfrogging strategies 'retain' the economic value of the product in the local economy by fostering and establishing creative capacities, addressing the triggers of peripheralization from unconventional approaches, and finding ways to benefit from the potential of the CBR and the product (L68, L180, L208).

7. Connectedness Voids

Based on the analysis of the sixteen sources, this section unravels a list of institutional voids that should be considered to study the regional-economic connectedness of CBVCs with themselves, and with other scalar arrangements (BVCs/RVCs/GVCs). The list of voids intents to become an analytical framework to unraveling the 'black box' of development: how exactly does a development initiative lead to its final outcomes? How did it fail? What should have been done different to promote local development (e.g., more income, more exports, better satisfaction)?

While a list of 36 categories seems overwhelming, each void is an institution (or factor that affect or is affected by other institutions)[11] that exists in cross-border value chains and that should be considered. However, the opposite represents a worse approach: Reducing the complexity of cross-border regions into a single-concept problem (e.g., "the problem is high transaction costs", "the problem is lack of information", "the problem is trade barriers") leads to the formulation of weak development initiatives, poorly conditioned to the real context, and destined to generate few benefits or even create new problems. Thereby, considering these 36 categories implies to reconsider how solutions should be promoted in their content (e.g., objectives, scope, activities, etc.) and layout (e.g., means of implementing such as policies, project, plans, etc.). The idea of this list is not about moving from one big black box of uncertainties to smaller ones. The purpose lies on understanding development not as a 'black box' but as a 'Pandora's box', where the multiple voids interrelate and cannot be target with one-sided solutions, highlighting the need to address territorial inequalities by considering the intersectional nature of development issues.

Table 2.6 represents the final list of institutional voids or, to focus more on this work, the connectedness voids. The table reveals the sources where each void was mentioned, from the highest score to the lowest (see quotes per void in **Appendix 1**). Most voids (72.2%) are present in at least half of the sources. Any void is considered in all the articles, and only three of them can be found in 13 of 16 sources. Although some voids could be considered similar, related, very complex or very simple, each one has a logic and own explanation. This section strives to break down some big boxes (e.g., high transaction cost, lack of information, etc.) into smaller units. For the following explanation, the voids have been organized in ten issues or thematic areas and embedded in the Canvas of Connectedness Voids or 'Connectedness Canvas' (**Table 2.7**). Each void composition is divided in four sections: definition or meaning [1M], problematic [2P], potentialities [3T], and opportunities & risks [4R].

[11] Some connectedness voids can be considered as institutions, while in others they are factors or drivers that impact or are impacted by institutions. Even though, most of the time they represent collective behaviors, beliefs, values, or relationships that can become institutionalized if they are repeated and reinforced over time, and widely recognize by the society or a group of people.

Table 2.6. *List of Connectedness Voids and their mention in the selected Literature (Author's elaboration)*

N°	Connectedness Voids	Reps.	L1	L63	L64	L68	L70	L79	L88	L111	L117	L118	L158	L170	L180	L208	L211	L215
1	Lack of Businesses or Nodes in the Cross-Border Value Chain	**13**	x		x	x	x	x	x	x	x	x			x	x	x	x
2	Lack of Productive Knowledge & Skilled Technicians	**13**	x		x	x	x	x	x	x	x	x		x		x	x	x
3	Lack of Marketing Channels	**13**			x	x	x		x	x	x	x	x	x	x	x	x	x
4	No Motivation for Cooperating/Producing	**12**	x			x	x	x	x	x	x	x	x			x	x	x
5	Low Change Capacity	**12**				x	x	x	x	x	x	x		x	x	x	x	x
6	Low Connectivity and Trade & Transport Performance	**12**	x	x		x	x	x	x		x	x	x			x	x	x
7	No Harmonization of Business/Industrial Development Policies	**11**	x	x	x	x		x	x	x		x		x			x	x
8	Lack of Productive Supplies, Equipment & Infrastructure	**11**			x	x	x	x	x	x	x				x	x	x	x
9	Presence of Trade Barriers	**11**	x	x	x		x	x	x	x		x	x			x		x
10	Operational Instability: Small & Inconsistent Supply/Volume	**11**		x	x	x	x		x	x	x	x				x	x	x
11	Weak Articulation of the Cross-Border Social Capital	**10**		x		x	x	x	x	x	x				x	x	x	
12	Difficulty in Knowledge Transfer	**10**				x	x		x	x	x	x	x			x	x	x
13	Lack of Access to Financing Sources	**10**	x	x		x	x	x	x	x				x			x	x
14	Low Product Quality & Standardization	**10**				x	x	x	x		x	x	x		x		x	x
15	Weak Cross-Border Governance & Joint Management Capabilities	**9**				x			x		x	x	x	x		x	x	x
16	No Harmonization of Border Policies & Policies at the Borders	**9**					x	x	x		x	x		x		x	x	x
17	Informality of Cross-Border Economies	**9**	x		x	x	x	x			x	x				x	x	
18	No Clarity of a Joint Identity	**9**	x	x		x	x		x				x			x	x	x

(Continued)

(Continued)

N°	Connectedness Voids	Reps.	L1	L63	L64	L68	L70	L79	L88	L111	L117	L118	L158	L170	L180	L208	L211	L215
19	Lack of Trust, Transparency & Accountability	**9**	x	x		x	x		x		x	x		x		x		
20	No Presence of Development Partners	**9**			x		x	x	x	x	x					x	x	x
21	Lack of Business Knowledge & Skilled Professionals/ Stewardship	**9**	x			x		x	x		x	x				x	x	x
22	Absence of Intermediation Functions	**9**		x	x		x		x	x	x	x			x			x
23	High Environmental Degradation	**9**		x		x			x	x	x	x				x	x	x
24	Lack of Leaderships & Participation of Key Actors	**8**				x		x		x	x	x		x			x	x
25	Weak Marketing Information Systems	**8**				x		x	x	x	x	x				x	x	
26	Poverty & Demographic Decline	**8**				x	x	x			x	x				x	x	x
27	No Institutional Mix	**7**				x		x	x	x				x		x		x
28	Lack of Dialogue & Decision-Making Spaces	**7**				x				x			x	x		x	x	x
29	Presence of Illegal Flows	**7**		x		x			x	x	x	x				x		
30	Low Access to Secure & Quality Land	**7**			x	x	x		x		x	x				x		
31	Limited Capacities of Public Institutions	**6**				x	x	x		x						x		x
32	Low Associativity Capacity	**6**				x	x				x	x				x		x
33	Market Access Instability: Fluctuating Demand & Price	**6**						x	x	x					x	x		x
34	Low Bargaining Power	**6**				x			x	x			x			x	x	
35	Utility Scarcity	**5**				x					x					x	x	x
36	Gender Inequity	**2**				x												x
			11	**11**	**11**	**31**	**23**	**21**	**28**	**23**	**26**	**24**	**10**	**11**	**8**	**30**	**26**	**29**

Table 2.7. *The Connectedness Canvas (Author's elaboration)*

The Connectedness Canvas			
(I)	**Governance Voids**	1	Weak Articulation of the Cross-Border Social Capital
		2	No Institutional Mix
		3	Weak Cross-Border Governance & Joint Management Capabilities
		4	Lack of Dialogue & Decision-Making Spaces
(II)	**Stakeholders Voids**	5	Lack of Businesses or Nodes in the Cross-Border Value Chain
		6	Lack of Leaderships & Participation of Key Actors
		7	No Presence of Development Partners
		8	Absence of Intermediation Functions
		9	Limited Capacities of Public Institutions
(III)	**Knowledge Voids**	10	Lack of Business Knowledge & Skilled Professionals/ Stewardship
		11	Lack of Productive Knowledge & Skilled Technicians
		12	Weak Marketing Information Systems
(IV)	**Product Voids**	13	Operational Instability: Small & Inconsistent Supply/Volume
		14	Market Access Instability: Fluctuating Demand & Price
		15	Low Product Quality & Standardization
(V)	**Resources Voids**	16	Lack of Productive Supplies, Equipment & Infrastructure
		17	Lack of Access to Financing Sources
		18	Lack of Marketing Channels
		19	Low Connectivity and Trade & Transport Performance
		20	Utility Scarcity
(VI)	**Context Voids**	21	Poverty & Demographic Decline
		22	Low Access to Secure & Quality Land
		23	High Environmental Degradation
		24	Gender Inequity
(VII)	**Borders Voids**	25	Informality of Cross-Border Economies
		26	Presence of Illegal Flows
(VIII)	**Legal Voids**	27	No Harmonization of Border Policies & Policies at the Borders
		28	No Harmonization of Business/Industrial Development Policies
		29	Presence of Trade Barriers
(IX)	**Intangible Voids**	30	Lack of Trust, Transparency & Accountability
		31	No Motivation for Cooperating/Producing
		32	No Clarity of a Joint Identity
		33	Low Bargaining Power
(X)	**Capacities Voids**	34	Low Change Capacity
		35	Low Associativity Capacity
		36	Difficulty in Knowledge Transfer

7.1. Governance Voids

This set of voids refer to mechanisms related to the cross-border articulation of stakeholders such as the existence of cross-border social capital (CV01), institutional mix (CV02), a governance system or management capabilities (CV03), and dialogue and decision-making spaces (CV04).

CV01: Weak Articulation of the Cross-Border Social Capital

[1Meaning] One of the identified voids in the formation of CBVCs is the weak articulation of the social capital in cross-border regions (L63, L68, L70, L79, L88, L111, L117, L180, L208, L211). Cross-Border Social Capital can be considered as a fundamental and endemic process of the socio-spatial formation of cross-border regions, characterized by the relationships (linkages between actors), social constructions (social norms, values, collective imaginaries, etc.), and interactions (socialization of those constructions) that are mobilized and established across the borders (Wong Villanueva, Kidokoro and Seta, 2022). Based on the shared experience generated by how actors use and relate across the borders for fulfilling their needs, there is an 'articulation of relationships'; a phenomenon of mutual capacity development that generates the conditions for cooperation (Wong Villanueva, Kidokoro and Seta, 2023). The concept of social embeddedness suggests that economic behavior is mediated by a complex web of social relations (180). Thereby, the confluence of social and economic actors –such as municipalities, communities, international cooperation, wholesalers, etc. (L70)– and their constructs – trust, local ties, price, markets, etc. (L180)– are important for the success and sustainability of cooperation in cross-border value chains.

[2Problematic] As border regions tend to be at the geographical, political, and economic periphery of the countries, they have limited possibilities to build a critical mass of people and institutions along the CBVC (L208). This creates a situation in which linkages are scarce and, rather than being a means of cooperation or concentration of capacities, they are more of a contingency plan in the face of needs or emergencies (L79). Thus, the lack of social capital makes extremely difficult the development of joint projects (L208) or even more, with multiple businesses working isolated in the same sector and without a consolidated productive agglomeration, there is competition rather than collaboration (L79). In the opposite case, strong social networks generated around the political-historical construction of cross-border externalities or negative spillovers tend to sustain illegal flows, corruption-based transactions, or dependency patterns, limiting the possibilities to establish 'good enough' governance models for CBVCs (L63).

[3Potentialities] Cross-border social capital relates to different kind of relationships, from the informal personal ones to formal complex relational systems. Personal interactions are necessary to start shaping informal relationship-based business practices and, over time, allowing the consolidation of institutional agreements or the organization of cluster arrangements (L117). The preexistence of good and strategic relationships at multiple levels (bi-local, bi-subnational, and bi-national) allows the gradual emergence of non-formal and formal initiatives that can complement among themselves and provide support on productive activities (e.g., educational networks from local universities and research institutes with companies to train their human resource) (L211). Working with those relationships makes available the already existing knowledge, resources, and capacities, avoiding repeating the learning curve (L88). Furthermore, their consolidation can lead to the formation of institutions that assembles the cross-border territoriality, such as the appearance of cross-border committees or entities that can attract or articulate more efficiently investments, programmes, and projects (L70).

[4Opportunities & Risks] The social construction of the CBR through personal relationships, networks, and institutions is a key factor for developing CBVCs (L68, L180). The development and implementation of initiatives should reflect the complexity of socio-political relationships that underpin the cross-border social capital (L63). In this way, the promotion of networks benefits the process of identifying and managing projects with cross-border productive and social impact (L68). Strengthening the cross-border social capital, especially actors engaged in the productive sector of the value chain, represents a mean to expand the base of members who actively and systematically collaborate across the borders and the related productive activities (L211). These benefits are widely amplified with the reduction of trade barriers, that foster more formal relationships across borders (L111).

Stronger articulations set the conditions to fulfill other voids by stimulating the appearance of concertation processes and spaces, cross-border quadruple-helix collaboration, local initiatives based on joint identity, and more (L70, L79, L111). However, not all actors would be part of the CBVC, and not all relationships are convenient (e.g., the participation of regulatory actors in early stages can lead to the disassembling of social capital) (L158), showing that this void is interrelated with other issues such as the need of trust, motivated entities, progressive approach, and others.

CV02: No Institutional Mix

[1M] The lack of institutional mix is also considered a critical void to connecting CBVCs (L68, L79, L88, L111, L170, L208, L215). Borders are the meeting of a plethora of stakeholders with common and opposite interests, frameworks, and ideas about border development (Wong Villanueva, Kidokoro and Seta, 2023). A Cross-Border Value Chain, as a political-economic initiative with social impact, implies the participation of multiple types of stakeholders (public, private sector, civil society, etc.)

acting at different scales (local, subnational, national, international, etc.) or sectors (agriculture, productive, social development, etc.). At the same time, stakeholders should consider interrelation configurations that could be horizontal (within the same territorial space, development stage, similar needs, etc.), or vertical (actors involved in the upstream and downstream activities of the value chain) (L170).

[2P] The cross-border articulation of productive activities, as a cooperation strategy, demands the consensus on common goals for productive development (L170). However, in addition to the problems related to the concertation of interests, the lack of presence, participation, or opposition of stakeholders contribute to the lack of knowledge and available capacities that contribute to the proper development of CBVCs (L88). Due to the peripheral condition of borders, in many cases those actors are not present in the area, generating multiple troubles and externalities such as 'rigid' borders, productive gaps in the value chains, business dispersion, the predominance of cross-border informal markets, and more.

[3T] The role of public institutions is a determinant to ensuring the success of cross-border cooperation initiatives (L68). Public authorities add the political dimension to the CBVCs, and each of them fulfills a different role to articulate other stakeholders. Supranational entities have the capacity to anchoring large sets of stakeholders into territorial initiatives and attracting financing opportunities (L68). National governments (Foreign Affairs, Sectoral Ministries, regulatory entities, etc.) play a relevant role in facilitating binational cooperation (e.g., reducing trade barriers, signing cooperation agreements, etc.) and developing capacities at regional and local level (L88, L208). Finally, subnational, and local governments can coordinate inter-district actions, develop inclusive chains, attract investments, promote local leadership, and ensure social impact components in the projects and policies. (L68, L111).

On the other hand, private sector –smallholder producers, SMEs, producer cooperatives, logistic companies, trade associations, and more– has a fundamental role as they are the main component of the value generation processes. The participation of diverse upstream and downstream actors increases available business and productive knowledge that promotes the reduction of production and logistic costs (L88, L117, L118). In addition, considering civil society represents an opportunity to foster inclusive articulations into the value chains (L68). While the academia and some NGOs have had a relevant role in value chains as knowledge and training partners (L68), communities and producers' families are great opportunities –most of the time underrated– to better aligning development plans with the territory and include sociocultural assets in the design and implementation of CBVCs (e.g., gender equity, ethnicity, etc.) (L215).

[4R] While the absence of stakeholders generates multiple hassles, their excess demands more suitable governance models in cross-border contexts, and therefore the risk of failure increases. More

partners create the need to prioritize among all the territorial problems (L215) and deciding between them calls for strong leadership, agile coordination, and reaching consensus between the different actors to aligning them towards the consolidation of the CBVC (L79). On the contrary, the minimum number and type of stakeholders that are needed varies from cases to case. Mapping the key actors brings different perspectives to discuss at the table and is fundamental for success (L88, L111, L215). However, their relationship with the generation, acquisition, and transmission of the knowledge to develop the CBVC should reflect the complexity of cross-border regions (L208) to address the multiple flaws that arise when two (or more) different systems meet at the borders (Wong Villanueva, Kidokoro and Seta, 2023).

CV03: Weak Cross-Border Governance & Joint Management Capacities

[1M] Literature review highlights multiple times the lack or weak governance of cross-border value chains and joint management capacities as a connectedness void (L68, L88, L117, L118, L158, L170, L208, L211, L215). Cross-Border Governance, the 'act of governing cross-border regions', refers to a political decision process where actors (not only from public sector) organize themselves for a better use of their own capacities and achieving better outcomes (Wong Villanueva, Kidokoro and Seta, 2022). The governance of Cross-Border Value Chains, promotes a political-economic initiative with a territorial approach, that is, how the involved stakeholders are related and operate in adding-value activities within the CBR –more frequently, in the early stages of product extraction and processing. Thereby, this governance is interconnected and partially embedded in the initial stages of the governance of Global Value Chains (Gereffi, Humphrey and Sturgeon, 2005).

[2P] While multiple factors affect the governance of CBVCs, there are a few elements that deserve attention in terms of the organizational and managerial aspects of governance (how stakeholders relate, organize, and operate). The lack of cross-border cooperation frameworks and the low degree of collaboration between stakeholders (especially in the productive sector) generates productive gaps along the value chain, leading to selective collaboration based on low value-added benefits (cooperation mostly in terms of commercialization rather than in a strategic or technological approach) (L211). In addition, working across borders demands articulation that most of the time escapes from the formal or legal ways of cooperation. Thus, low experience in CBC or unpreparedness for upcoming challenges or changes can delay actions, discourage cooperation, or even threaten the success of the entire initiative (L68, L208). Furthermore, motivation for immediate and practical results clouds the idea of consolidating long-term cooperation vision, affecting the continuity of CBC initiatives (L158, L215). Those problems lead to weak governance models that hinders the development of cross-border value chains.

[3T] Improving governance could be summarized in three objectives: focusing on increasing and strengthening relationships, leveraging its organization through clear rules and processes, and developing management capacities and solid institutions. First, increasing participation in the CBVC governance demands to being engaged not only in the productive activities, but also in the ruling of the system. For example, involving private actors can benefit the governance system by taking on the role of technical advisors in the design, implementation and evaluation of public policies or programmes, or supporting the operations of joint technical committees (L68, L170, L215).

Second, to shape a more organized system, it is worth knowing what determines the behavior of the actors by having sufficient information on the types of their links and relationships, and how they are affected or will react by the introduction or modification of rules and roles (L170). This leads to a better configuration of the conditions, roles, capacities, and leadership that each actor has and that are put into play through spaces and mechanisms for dialogue, decision-making, reporting, and feedback. (L68) (Wong Villanueva, Kidokoro and Seta, 2022). To keep accountability, all decisions need to be incorporated in their internal regulations and other institutional documents (L215).

Third, articulation and concertation of actors needs to be crystalized in strategies, policies, and institutions (L170) and even more, embedded in the stakeholders' own development plans, participatory budgets, and development programmes (L211, L215). Thereby, the monitoring and evaluation process would be easily conducted through the assessment of institutional reports of events, projects, interventions, etc. (L215). To do so, developing management capacities implicates training public officers, company managers, community leaders, and other actors that play a key role. In addition, higher degrees of CBVC governance, such as the formation of clusters, demand a formal institutional structure (e.g., cross-border agency) that provides a sustainable and cohesive networking arrangement (L117). In addition, shaping a temporal or more permanent governance structure for CBVCs (e.g., agencies or project teams with own budget and functions) can lead to the direct provision of professional and technical knowledge (L170, L215).

[4R] Limited knowledge on the GVC governance at local level raises the need to specify the critical requirements for productive collaboration and create a feasible operating system to reduce costs and expand operations of companies (L88, L117). Therefore, the consolidation of governance in cross-border value chains should be supported by two 'movements' or recommendations. First, involving stakeholders with previous CBC experiences allows to reduce the learning curve based on their knowledge on place-based policies, previous joint projects, or implemented collaborative frameworks (L208, L211). This is convenient for certain regions such as Latin America, where multiple Ios such as IADB, CEPAL, UN system organizations or ODA agencies have developed CBC projects (L208, L211). In addition, aligning with other governance frameworks – such as regional or global models, can allow

to incorporate their management and evaluation mechanisms to guide and monitor local action (e.g., using the UN SDG model for CBC.) (L208).

Second, at early stages, governance falls more on individuals, groups, or specific departments from institutions, giving relevance to personal relationships, social bonding, and intangible infrastructure (L68). Betting for cross-border governance supposes a gradual shift from informal to formal collaboration mechanisms (L118), where leaders must make the effort to bring the complexity of CBVC dynamics to a joint bureaucratic system that is less political and more administrative. Thus, decision-making spaces are means and results of higher cross-border governance. Facing this challenge, cross-border agencies, as joint management institutions, have the capacity to carry out this bureaucratic change by evaluating informal and formal mechanisms (e.g., discussion tables, technical committees, etc.), providing technical support for legal and administrative tasks, monitoring the joint design and fulfillment of their productive policies, or making investments in both sides of the border, reducing the budgeting obstacles (L208, 215).

CV04: Lack of Dialogue & Decision-Making Spaces

[1M] Dialogue and decision-making spaces have a relevant role in the good functioning of governance systems, and therefore, a void to consider for CBVCs (L68, L111, L158, L170, L208, L211, L215). Productive articulation in strategies, policies and programmes demands participation and concertation of the institutional mix of actors (L68, L170) and, to the extent that stakeholders relate, organize, and operate, they precise spaces for knowledge socialization, discussion and deliberation, consensus achievement, feedback, and dispute resolution (Wong Villanueva, Kidokoro and Seta, 2023).

[2P] Multi-stakeholders meeting spaces entails dialogue difficulties between actors (L170). For example, Public-Public dialogue is hampered by coordination errors, competency gaps, overlap of functions, lack of coherent strategies, different productive and border priorities, and low efficacy on value chain competitivity. In private-private dialogues, the low associativity capacities and disperse governance in existing ones reveal the obstacles to strategically coordinate and arrive to decisions. Furthermore, in public-private partnerships, competing interests or incompatibility of systems leads to unsuccessful or slow synergies (L170, L211).

In addition, multi-stakeholders meeting spaces have several other dimensions to consider in terms of participation, adequacy of the spaces and their purpose towards strengthening productive sectors. The low participation and low frequency of events delay decision-making and joint action (L215). In addition, leaving actors such as civil society away from decision-making can relegate the current dynamics that are relevant for inclusive development (L68). As an example, lack of gender

parity in dialogue and decision-making reduces the effectiveness of CBVC policies and programmes as women play a relevant role in several value chains: in the Bolivia-Peru CBVCs, women oversee quality control processes in the coffee and alpaca value chain. Even more, while their husbands are not available, women often manage the family lands and therefore the production (L215).

[3T] Political decision-making needs multilevel institutional arrangements that must include mechanisms for knowledge management and diffusion, articulation of public entities' agendas, insertion of productive and social innovations, and promotion of new governance and business models (L170, L211). As productive articulation, in most cases, is the synthesis of competing interests, improving the dialogue channels allows a better harmonization of strategies and common productive policies and their insertion in own institutional systems and productive sector policies (L170, L215).

Agile processes and clear identification of each stakeholder's needs promote a good functioning of public-public dialogue, creating an appropriate context for public-private partnerships (L170). In addition, CBVC brokers or leaders can work as mediators for dispute resolution between public agencies, producers and regulatory entities, businesses and civil society, etc. (L158) One example is the role of the Phongsaly provincial agriculture department in mediating between local farmers and Yunnan investors by brokering direct trade contracts to reducing conflicts and promoting the provincial tea policy (L111).

[4R] As voids could be understood as a lack of knowledge, the generation, accumulation and circulation of information and knowledge flows related to CBVCs represent a relevant mechanism to promoting multilevel and multisectoral dialogue (L170). Thereby, the organization of multilevel learning spaces, such as workshops, conferences, or events, can improve the socialization of CBVC knowledge (L208, L215). In addition, there are multiple initiatives to promote more efficient dialogue and decision-making spaces: public-private partnerships (L170), pluriactoral concertation pacts (L68), binational technical committees (L215), etc. However, these are often a reflection of a relatively good or advanced level of dialogue rather than a starting point for resolving disputes between actors (L68).

Generating effective mechanisms should start by following the existing –and most of the time– informal dynamics and strengthening them without breaking the cross-border social fabric: several experiences in Latin American CBRs (e.g., the binational Camelid Fairs or MAP Initiative workgroups) reveals that producers and local SMEs demotivate in front of regulatory agencies as their legal frameworks exclude them from a more formal conversation about cross-border collaboration (L158) (Wong Villanueva, Kidokoro and Seta, 2022). Giving vulnerable populations –the poor, the women, the elderly, ethnic minorities, and more– a seat at the decision-making table begins by addressing the intersectionality between their lagging issues and the connectedness voids and their relevance in the cross-border value chain.

7.2. Stakeholders Voids

This set of voids refer to the existence of stakeholders or the capacities that they can bring to the cross-border value chain such as presence of businesses or processing capacities (CV05), leaders and key actors (CV06), development partners (CV07), intermediary functions (CV08), and public sector entities (CV09).

CV05: Lack of Businesses or Nodes in the Cross-Border Value Chain

[1M] The lack of businesses or value chain nodes (processing stages of a product's value creation and capture) is considered an important connectedness void in almost all the collected literature (L1, L64, L68, L70, L79, L88, L111, L117, L118, L180, L208, L211, L215). The concept of CBVC implies to articulating businesses and productive activities located in the CBR to make them competitive in foreign markets. However, fragmentation and disorganization of value chain nodes undermine this initiative. In response, the Integration and Development of CBVCs – the articulation of businesses, resources, and capacities in productive processes to fulfill the value chain–, rises as an alternative to turn the sector into an engine of territorial development and poverty reduction (L211).

[2P] The presence of value chain gaps, productive activities, or absence of nodes is common in border regions: the lack of raw material and supplies, processing technologies, logistic facilities, transportation & distribution, or marketing hinder border companies' effectiveness to articulate with their product's value chains (L64, L211). In some cases, the nodes to fulfill the value chain are found at the other side of border, generating productive complementarity, but also negative outcomes such as unhealth trade dependency patterns (L70). Other contexts have more challenging situations with a lack of value chain nodes or a limited number of businesses throughout the cross-border region (L180).

The value chain fragmentation is exacerbated by the disorganization of some productive activities: the lack of association between producers or businesses generates a dispersion of resources and capacities –or also their concentration in few nodes, hindering their articulation with upstream and downstream activities (L117, L208). The fragmentation and disorganization of the productive system generates a lack of awareness of belonging to a value chain, lack of cohesion, and low degree of cooperation within the productive sector (producers, knowledge generators, SMEs, etc.) (L117, L211): businesses operate independently, in isolation or compete against each other, increasing the transaction cost of entering new markets (L79, L118). Shaping CBVCs presents additional challenges. The bad identification or weak incorporation of actors related to the CBVC, generate knowledge gaps or asymmetric capacities throughout the value chain – especially in terms of business and productive

practices (L88). This gets worse with the lack of other knowledge providers (e.g., market research companies), ancillary activities (e.g., packaging), financial partners, or technical services in the cross-border region (L215).

[3T] Business' locations and dynamics within the cross-border region configurates the possible productive articulations, bringing the opportunity to connect them across borders to fill the value chain gaps that exist if working unilaterally. Similar conditions in terms of geography, needs, and resources, have led to the appearance of several smallholder producers with the same products, representing a potential economy if scale. Grouping and organizing them in producer associations and cooperatives favors the spatial concentration of productive processes and construct new CBVC nodes (L64, L79). In addition, the spatial division of labor –that means, the distribution and concentration of productive activities across the CBR – can lead to specialization of productive processes to complement themselves (L1), allowing to add more value, reduce costs, and generate profits before entering the market (L68, L118). Thereby, the effective management of value chain nodes is a source of value and competitive advantage for cross-border companies and producers (L68).

The existence of a clear value chain, good governance, strong leadership, accountability, installed capacities, and common vision and objectives embedded in policies, programmes, and projects generate the conditions for making a **cross-border cluster** (L117). This means a specialized value chain with socio-territorial capital among the members in the cross-border (local) region, that have articulated a critical mass of companies, resources, capacities, and knowledge in their value-adding processes (L117, L211).

[4R] Achieving good quality and quantity of the articulations between CBVC nodes presents several challenges. Lack of contractual relationships or common criteria – ensuring contractual quality through approval procedures, public certifications, quality standardization processes, or branding– difficulties linking producers and companies under the same productive activity, and this problem is exacerbated in cross-border regions where these criteria vary from one country to another (L211). In terms of quantity, the absence of nodes or limited number of companies in the border localities, connecting to businesses located in the nearest subnational urban centers or capitals can fill those gaps while maintaining the benefits of cross-border cooperation in value chains (e.g., common culture, proximity, etc.).

Connecting with more distant companies (L215) or moving them to the CBR can be alternatives to weight (L111). However, CBVC integration and development should consider the potential embedded in actors that, occasionally, are left behind due to their low volume or informal condition such as smallholder producers, small associations, entrepreneurs, and SMEs (L68). In any of these cases, the quality of their business, productive and market knowledge is relevant to forge better articulations

based on mutual support or complementarity (e.g., transfer of technology, provision of services, joint commercialization, etc.) (L111, L117, L208).

The inclusion of informal economy can represent a fourth path to integrate the value chain: their formalization can increase core production and ancillary processes, defragmenting cross-border productive systems while promoting endogenous development. Other strategies for scaling-up value chains such as vertical or horizontal integration or outsourcing, could be evaluated based on their resources, opportunities, and plans (L117).

Finally, yet importantly, embedding the CBVC initiatives in broader regional integration schemes such as cross-border corridors or economic zones is an opportunity to associate with complementary services or shape an extended value chain (e.g., aligning the Indonesia-Malaysia CBVC projects in the West Borneo Economic Corridor and therefore, in the BIMP-EAGA subregional strategy) (L117, L118, L211). Nevertheless, it is required to consider the possible environmental impact (and benefits) of production, either to reduce it (if negative), or use it as a competitive advantage (if positive) (L88).

Although there is not clear recipe for achieving CBVC integration and development, governments have a relevant role to support business development. Governments should encourage more formal productive and distribution activities (L117), considering the analysis of value chains and territorial assets to promote better interventions and if needed, prioritizing the most critical activities of the value chain (L215). The existence of established companies and SMEs working in the core productive activities (L211), and the emergence of 'champions' (individuals and institutions) (L118) are potential assets that could be encouraged by supporting their growth plans or expansion strategies (L79) through comprehensive sectoral or industrial policies.

CV06: Lack of Leaderships & Participation of Key Actors

[1M] Key actors and leaders are relevant for governing the CBVCs and their absence has been reported as a connectedness void by multiple researchers (L68, L79, L111, L117, L118, L170, L211, L215). These special stakeholders, also considered as 'system brokers', have a great capacity to strengthening relationships and capacity development, leveraging CBC by articulating large number of actors (individuals, groups, or entities) through processes such as social bonding, institutional leveling, intercultural understanding, or institutional channeling. Some of those brokers, depending on their institutional capacities (political, economic, social, etc.), take the role of leaders, contributing to the better governance of the cross-border value chains (Wong Villanueva, Kidokoro and Seta, 2023).

[2P] Starting and consolidating CBVCs require the commitment of stakeholders and specially, the full participation of some of them who would be the brokers and leaders. Those actors fulfill several functions such as representation, organization, articulation, mediation, and more (L68). The lack of brokers within the CBVC can hinder the exercise of those functions (e.g., no productive organizations that can mediate with other sectors or public authorities, no agency that can promote the association of producers, etc.) (L79, L117).

[3T] The idea of single-leader governance must be replaced by governance systems guided by networks of brokers or leaders, as each of them answers different needs of the CBVC: Political entities mediating conflicts between companies and farmers (L111), community leaders mobilizing local capacities (L68), supranational organizations promoting cross-border projects (L68, L215), and more. The main requirement to be considered a broker/leader would be the large amount of time those individuals or entities spend in the field meeting individual participants, identifying collaborative projects, mobilizing relevant stakeholders, and organizing networking events. (L117).

Political leaders can promote complex institutional arrangements and provide legitimacy to the process of strengthening the CBVC (L170). Leading companies and producers (the private sector 'champions') represent a strong potential for expansion of cross-border exports, moving to new upstream and downstream productive activities, or even being a keystone for the formation of clusters (L117). Civil society brings a broad range of leading actors such as community leaders promoting the local agenda (L117), specialized NGOs grouping productive professionals and leveraging their capacities (L68), or even academia, shaping networks and bringing together actors into CBVC proposals (e.g., the civil society-driven 'MAP initiative' had members involved in the organization of chestnut CBVCs) (Wong Villanueva, 2019; Wong Villanueva, Kidokoro and Seta, 2022).

[4R] Leaders do not only emerge because of their institutional legitimacy (e.g., being a local government with power over its jurisdiction), but because they answer needs and/or seek opportunities that are beneficial for a group or the whole (Wong Villanueva, Kidokoro and Seta, 2022, 2023). Therefore, shaping CBC based on *de jure* capacities can undermine the implementation and sustainability of CBVC initiatives (L215). Most *de facto* brokers/leaders have the capacity to promote CBC informally, going beyond the borders of their jurisdiction or functions (L211). In one experience, the local authorities agreed that one would assume responsibilities as if it were a binational management entity, managing the budget of both municipalities – a fact that would be considered illegal under both legal systems (Wong Villanueva, Kidokoro and Seta, 2023).

The creation of binational or cross-border agencies (e.g., working groups, intergovernmental authorities, joint committees, etc.) represents an opportunity to transcend the border paradigms and facilitate CBVC initiatives (L117, L215). For instance, the Titicaca Lake Authority, an international public law entity, has full autonomy in technical, administrative, economic, and financial decisions,

facilitating the development of CBVC projects in the CBRs between Peru and Bolivia. However, shaping them (formally and legally) is more the exception than the rule and even more, they may not represent the *de facto* leadership of the cross-border initiatives (L215).

CV07: No Presence of Development Partners

[1M] The lack of development partners can be considered as a subdivision of the 'Lack of Leaderships & Participation of Key Actors' but considering stakeholders with a supportive function. For the purposes of this list, the partners are considered a separate void due to the accumulation of resources they represent, which has been highlighted by many researchers as an opportunity to facilitate the CBVC learning curve improvement (L64, L70, L79, L88, L111, L117, L208, L211, L215). [2P] However, in multiple cases, ignoring what kind of knowledge they need to develop CBVCs and the little analysis of those who can provide it make it difficult to identify and relate to potential development partners and the benefits they can bring to the initiatives (L79).

[3T] Development partners may not exactly belong to the cross-border region but have interests on it and can contribute with their broader perspective of the product dynamics, market knowledge, technological know-how, business model, or other resource/knowledge that can be helpful to support other voids. Some examples of this type of entities are IGOs (L215), International or regional NGOs or networks (L208), specialized companies (L64 L111), technical or specialized public agencies (L70, L211, L215), or chambers of commerce (L215).

In terms of knowledge, partners can support CBVC stallholders by providing technical support or learning platforms (L111, L208, L215), facilitating transfer of technology (L117, L208), organizing events (L208, L215), strengthening business governance (L215), advising the design of CBVC plans, or even brokering relationships with other important stakeholders or possible partners (L208, L215). In terms of finance, they support by providing financial resources and knowledge (L215), connecting with donor sources or funds (L88), and facilitating relationships with investors (L111), engaging with new markets (L88).

[4R] Identifying and establishing agreements or joint ventures with partners (L111, L211) can leverage the game by providing economic, social, institutional, or technological knowledge or resources that are tailored for the CBR conditions. However, there is always risk of wrong policy transfer due to outdated practices or lack of local knowledge (L215).

CV08: Absence of Intermediation Functions

[1M] Intermediaries, or middlemen, are stakeholders that connect the supply and demand, that means, they act as 'third parties' and fulfill intermediation functions (distribution, matchmaking, consulting, evaluating, etc.) so that producers and associations reach the final user (Rubinstein and Wolinsky, 1987; Rosenbloom, 2011; Bessy and Chauvin, 2013). These intermediaries serve to reduce transaction cost by using market information, reaching more customers, targeting more profitable markets, simplifying logistics, marketing the goods, or ensuring safe transactions (Rubinstein and Wolinsky, 1987; Niehans, 1989). Thereby, without altering the product, they add value to them by making more efficient markets (Cole and Aitken, 2020).

Examples of intermediaries are negotiators or channelers (wholesalers, agents, brokers, retailers, traders, etc.), facilitating agencies or distributors (transport, storage, order processing, etc.), financial firms (lenders, raters, portfolio managers, etc.), insurance firms, and more others (Rubinstein and Wolinsky, 1987; Rosenbloom, 2011; Bessy and Chauvin, 2013). In CBVCs, most of these functions are lacking, being a connectedness void for bridging producers to the markets (L63, L64, L70, L88, L111, L117, L118, L180, L215) that is fulfilled by a small group of middlemen.

[2P] The difficult conditions surrounding CBRs have led to the emergence of middlemen as a controversial link connecting producers to consumers, and in some cases, the most important link to fulfill the cross-border value chain (L63, L64). As former producers or SME owners, middlemen have the productive knowledge to evaluate quality, bargain with farmers, or evaluate factories and processing activities (L64), and the market knowledge to work as export/import agencies doing customs paperwork, institutional permits, facing legal irregularities, informal taxes, and many other obstacles (L63, L88). In addition, their social capital (established relationships with authorities, public officers, companies, wholesalers, or other middlemen) and language proficiency (from both countries) give them a good understanding of cultures across borders and turns them into key brokers to facilitating trade (L63).

In some extends, middlemen fulfill many connectedness voids in CBVCs, behaving as distributors –providing logistics and delivery services by boats, vans, or trucks (L64, L180), as facilitating agencies –providing storage facilities while demand and prices fluctuate (L88), or even as governmental agencies –ensuring supervision and management functions (L63). In this way, middlemen become inevitable in the CBVC (L88), but at the same time, they can throw producers' profits below production costs (L70, L215). In most cases, the middlemen systems obey a territorial multilevel hierarchy with unfair quota fees, driven by a rent-seeking behavior to dominate trade in a region (L63, L70, L117). For example, in the avocado CBVC between Haiti and Dominican Republic, there are four levels of intermediaries between the producer and consumers, and while the producers earn 1.0 peso per unit, middlemen earn more than 19.3 pesos in the same transaction (L70).

The incompatible legal and regulatory frameworks create a complex system that turn them into legal brokers that face regulatory irregularities by paying informal taxes, hidden royalties, and arbitrary bribes at the expense of producers and companies (L70, L88). In Myanmar, small middlemen must pay quota fees and hidden fees to leading intermediaries to gain permits, and the latter pay other fees to coordinate with market controllers, militaries, politicians, central and district government officers (L63). These taxes and fees represent up to 40% of timber price in China, and most of these payments end up in the hands of government agents (only a small part is retained by small and leading middlemen), incentivizing corruption, and giving rise to an institutional way to formalizing illegal practices such as logging of endangered species (L63).

[3T] Although the previous discussion has centered on middlemen, they are not precisely the main problem, but a rudimentary means to overcome connectedness voids in the CBVCs. The presence of stakeholders or mechanisms that fulfill intermediary functions, such as trade associations, can promote the removal of trade barriers and concrete agreement terms (L88). Central distribution systems can facilitate logistics services by ensuring quality conditions, fleet capacity, or delivery reliability (L64, L118). Direct trading schemes can connect producers directly to companies, not only ensuring the sale in foreign markets but also extra services (L111, L215): In the tea CBVC, the Chinese company goes to the Laotian villages every week during harvesting season and buy them their production at market price (L111). As them, several other stakeholders and mechanisms can reduce the number of intermediary levels and generating a good impact on producers. Coming back to the avocado CBVC, just removing the first middlemen level can increase profits by 400% (L70).

[4R] The activation of intermediation functions, and therefore the replacement of middlemen, starts by the identification of distribution systems for their respective marketing channels (L117, L118). This means, to identify the current operating stakeholders and the ones that should be working in the area, and to consider if it is possible their incorporation in a more efficient system. For example, as some local companies act as export/import agencies by facilitating paperwork (L63), while one option leads to their substitution, a more practical one would be their formalization and building on current local practices.

Bringing back intermediation functions to the CBVC demands proper legal frameworks, guidelines, and mechanisms (L88), and the facilities that should fulfill the functions such as rural logistics centers, distribution networks, etc. However, to untangle the role of middlemen in current CBVCs, policymakers and practitioners should consider not only their function as traders and facilitators, but also their function in the sociocultural fabric of communities: in Latin America, middlemen tend to be the *compadres* (coparents) of producers and their families, providing mutually supportive relationships and social support, representing kinship linkages that go beyond transaction costs (Gill-Hopple and Brage-Hudson, 2012).

CV09: Limited Capacities of Public Institutions

[1M] Public institutions, or even more, what capacities they bring to the table, is considered as an important void for this study (L68, L70, L79, L111, L208, L215). Aside from the low presence of public stakeholders at the borders, their limited capacities represent a problem for shaping CBVC with government's support. The lack of resources (e.g., limited financial resources, productive knowledge, etc.), efficient processes (e.g., bureaucratic delays, institutional and legal barriers, etc.) and human capital (e.g., high personnel turnover, non-qualified staff, low productivity, etc.) generates a complex scenario with weak public actors and slow progress (L68, L215). In addition to undermining their tasks to ensure added value in production activities (L208), this situation can lead them to vicious loops of low retention of human resources, limited capacities to mobilize resources in their localities, and difficulties on motivating actors to cooperate (even themselves) or to get involved in pilot experiences (L208).

[2P] Additionally, the dominant role of some national stakeholders (as it is the case of many Latin American countries), coupled with slow and unsuccessful decentralization processes, have undermined the development of capacities at subnational and local levels, conditioning their maneuverability to get involved in joint cross-border actions, or even more, to respond their own productive needs in their side of the border (L68, L70, L208). In the worst cases, as borders are a matter of national concern, countries with low orientation to border development tend to send military forces or regulatory entities reinforcing the concept of 'rigid' borders, hampering CBVC coordination (L70).

Within their own national systems, public entities must work inter-level and inter-sectoral between themselves despite their low levels of institutional autonomy or limited capacities. However, at the borders, this is an alternative rather than the norm. Thereby, government-to-government coordination for local CBVCs would represent a meeting of the institutional flaws coming from two different national systems (Wong Villanueva, Kidokoro and Seta, 2023). This lack of coordination is even more aggravated by the geographical distance between public institutions – within national borders, and across them (L215).

[3T] Under efficient conditions, local public institutions can promote development policies to foster local industrial development, attract investments, promote training for own local staff, and more (L111, L215). This generates access to local knowledge of the region, provides them with Best-Case Practices to share with other municipalities, and allows them to better value the opportunities embedded in Cross-Border Cooperation (L215). Thereby, CBC comes as an alternative to fill other capacity gaps in public management and enter a feedback loop of joint capacity-building and public innovation (OECD, 2021b).

[4R] Mechanisms for institutional leveling (Wong Villanueva, Kidokoro and Seta, 2023), such as cross-border internships or exchanging experiences can strengthen local capacities through the improvement of local officers' municipal management skills, productive knowledge, and more (L215). Another strategy is to plan considering the dominant role of national stakeholders from the beginning to weight the possible threats and opportunities (L208). In that scenario, incorporating supranational organizations can promote faster consensus between national governments (L68, L215). If not possible, national policies should consider subnational and local levels in analysis and decision-making, to promote a governance environment that foster multi-level participation and facilitate shaping CBVC strategies at those levels (L208).

7.3. Knowledge Voids

The Knowledge voids are related with the lack of information or professionals that hold this know-how. This can be divided in business knowledge (CV10), technical knowledge (CV11), and market knowledge (CV12).

CV10: Lack of Business Knowledge & Skilled Professionals/ Stewardship

[1M] Another relevant void is the lack of business knowledge, capacities and resources, especially human ones (L1, L68, L79, L88, L117, L118, L208, L211, L215). More specifically, this section refers to private sector entities and individuals without the knowledge or professionals for running their enterprises at functional level (human resources, marketing, accounting, legal processes, etc.), and business level (business development, resource efficiency, external relations, etc.).

[2P] Due to the lack of agglomeration in border regions, access to business education (especially in value chain and manufacturing businesses) and supply of professionals might not be as possible as in urban centers or capitals (L208, L211). Moreover, due to the low socioeconomic indicators in peripheral and border regions, low-schooling rate is a common trend that difficulties to targeting growth in a medium and long term since educational level is correlated with innovation, knowledge, and capacities (e.g., difficulty speaking English to close contracts with foreign buyers) (L211).

Apart from the lack of professional supply, high personnel turnover, due to poor staff retention strategies, requires the training and development of new human resources (L79). Although companies train their own personnel, they do not manage to do it with the due intensity to ensure personnel

according to the needs that those positions demand (L79). These problems generate businesses and SMEs with basic skills to guide their activities, explore tech-upgrading opportunities, assess quality, or even conduct market research. A greater challenge would be to consider more advantage strategies such as outsourcing activities, M&A, R&D, among others (L79).

Independent smallholder producers have a more challenging reality: in addition to the technical knowledge that they need to produce, they also require functional and business knowledge for legal registration, accounting, or even opening markets for themselves. That is, they independently execute all the activities carried out by an entire company or cooperative. In lagging border regions, producers are mostly engaged in subsistence farming, living from the informal economies, and with limited technology and opportunities to train themselves and leverage their game (L211).

[3T] Competitive companies depend on their skilled personnel, and even more in the knowhow that they have generated based. Skilled professionals and business know-how bring the opportunity to develop their own knowledge management system and generate business strategies in the productive sector, and train own personnel (L68). In addition, the existence of cross-border labor market opens the opportunity for 'importing' qualified staff or technical expertise, closing capacity gaps (L1, L117).

[4R] Capacity building programmes should consider training spaces for skilled professionals, not only in terms of the functional/business skills, but also incorporating productive/technical ones (e.g., international certification requirements, productive technologies, etc.) (L117, L118). At the same time, these programmes are a good opportunity to link managers and engineers with long-term development partners or even better, building professional trust between them or other actors, especially with their pairs at the other side of the borders to foster business relationships (L117).

Designing training programmes begins by identifying key companies and producers, their personnel demand, and knowledge transfer requirements for the professionals (L117). This implies that professionals in charge of designing these programmes understand the product dynamics and value chain (L211). While there may be large capacity gaps, programs need to be tailored to the most critical needs, i.e., move gradually from elementary aspects (e.g., inventory, billing, business legal framework, etc.) to more complex ones (L215).

CV11: Lack of Productive Knowledge & Skilled Technicians

[1M] While the previous section has targeted the lack of business knowledge and skilled professionals, the picture would not be complete without considering the lack or low levels of technical and operational knowledge within the government or business personnel oriented to provide productive or technical assistance –also called as technicians, extension agents, agriculture public officers, etc.–, technical staff in businesses, and producers. Researchers have considered the lack of this productive knowledge as a connectedness void (L1, L64, L68, L70, L79, L88, L111, L117, L118, L170, L208, L211, L215) and should be addressed to develop CBVCs.

[2P] In CBRs, the subsistence conditions that make up the peasant economy (e.g., smallholdings, monocultures, low productivity, and poor legal, technical, and financial qualifications) demand the provision of technical and operational knowledge on productive activities, financial or legal preparation to overcome their precariousness and foster local development (L64, L68, L70). However, the limited access to technical knowledge and assistance for both the governments and producers reduce their capacity to train their technical personnel and develop the product's value chain (L111, L170, L211), leading to a negative impact on productivity and profitability (L88). Little technical knowledge hinders the knowledge transfer programmes and implementation of improvements. In addition, the low population density, reduced number of companies, and scarce number of research centers leads to a low number of technicians in the CBR, combined with the low schooling level in those areas, reduce the amount of personnel technically qualified in the field and the quality to conduct training activities (L208, L211).

[3T] Much of the competitiveness of producers and associations depends on the available technology that adds value to the products (L1), from the most operational knowledge (e.g., cleaning, sorting, packaging, etc.), to the most technical one (e.g., farming techniques, insect management, pest control, installation of equipment, etc.) (L88, L215). Thus, technical assistance – through technical visits, pilot training centers, training workshops, demonstration fairs, internships, exchange of experiences, etc. (L215)– becomes an opportunity to introduce tools for their productive activities (L111), implement the public strategies for productive development (L208), promote good practices and techniques (L215), among other objectives. As technical improvement increases quality and quantity of production, it leads to higher incomes for producers involved in the CBVC and improving local economy (L215).

[4R] Governments and businesses (specially producer associations) should focus on training their personnel to train producers, and among the latter, pay more attention in the productive champions, talented producers, companies technical staff (L111). This requires identifying those specialists, their weaknesses, and knowledge transfer requirements (L117, L211) to elaborating a curricular plan for

‘Training the Trainers’: what are the main productive knowledge gaps among public officers and how to close them (L215). This initiative can be supported by mapping the number of specialists and graduates related to the product’s value chain (L118) and creating a ‘bank of specialized technicians/professionals’ to keep a track of the availability of technical knowledge in the local areas (L79). To increase the technical and operational knowledge gaps in the CBR, local technical schools can be established in the area, involving border youth in the product’s value chain, and orienting them to satisfy the labor demand needed for productive activities (L79). To do so, there is a need for interinstitutional and intersectoral articulation to prevent coordination flaws (L170).

CV12: Weak Marketing Information System

[1M] A Marketing Information System (MKIS) is a structure of people, equipment, and processes that operates to provide relevant information to marketing decisionmakers (Kotler, Saliba and Wrenn, 1991; Hess, Rubin and West, 2004). This implies the systemic and continuous collection, analysis, evaluation, and distribution of this market knowledge for the involved stakeholders. MKIS relies on four developing information sources (internal reports, marketing intelligence, marketing research and marketing decision support analysis) (Kotler, Saliba and Wrenn, 1991; Hess, Rubin and West, 2004; Burns and Bush, 2006), that based on the CBVC literature (L68, L79, L88, L111, L117, L118, L208, L211), this information is embedded in the businesses/sector/industry knowledge, the territorial knowledge, and the market knowledge.

[2P] The low understanding of global value chains (L88) and the CBVC production (L211) hinder the industry’s capacities to penetrate foreign markets (L111). The absence of market information about prices, buyers, competitors, traders, and other components is detrimental for choosing the best marketing strategies and channels. Adding to this, companies do not receive and provide enough information – purposely or because of the lack of good market research–, interfering with the decision-making processes and leading to inefficient management, resource loss, and high uncertainty (L79). A weak MKIS not only affects local governments and companies, but also has a negative impact at local level, where producers have limited access to information, especially about product price, consumer perception, and market demands (L68, L88).

[3T] Marketing Information Systems, thinking of them as cooperative articulations between public and private sectors, have a great potential for promoting the insertion of products in foreign markets. The benefits are even high in CBVCs where sharing information from both sides of the border allows better analysis and design of marketing channels (L208). Market research includes the own business/industry assessment (e.g., supply capacity, competitors, intermediaries, export process, etc.) (L88, L211), the territorial assessment (e.g., potential of cross-border economies, crop variations,

geospatial data, etc.) (L68), and the market assessment (e.g., domestic/international end-market behavior, their potential demand, market requirements, consumer trends, etc.) (L117, L118, L211). At local level, producers with a better understanding of the market (e.g., to know the reasons behind the decline in demand and prices) can take better decisions, reduce irregular supply/demand risks, and increase their bargaining power to deal with traders (L88).

[4R] Gathering information about the industry, territory and market is the starting point for improving MKIS and more-informed decision making (L88, L208). Apart from companies, public agencies, chambers of commerce, or research centers can provide information about the local business sector, facilitating agencies, export costs, etc. (L118) To know more about the territory, capitalization of GIS/TIS knowledge on CBRs can help forecasting future local trends or integrated data based on a geospatial approach (L68) (Hess, Rubin and West, 2004). Finally, articulating with foreign experts and consulting companies can give more knowledge about the products' GVCs and market niches (L111). Market information should not only be for public officers and company managers but arrive to the local population. Available spaces and tools such as community meetings or mobile phones can be useful not only to provide it to them, but to collect it and provide feedback to decision makers (L88).

7.4. Product Voids

This sets of voids related to three main aspects of production in terms of supply and demand: volume (CV13), market access (CV14), and quality of product and processes (CV15).

CV13: Operational Instability: Small & Inconsistent Supply/Volume

[1M] Cross-Border Value Chains faces serious limitations when referring to supply (production volume): the inconsistency or small volume of raw materials restrict the subsequent nodes and productive activities, leading to fluctuating incomes and hindering a lifestyle based on their own production. Therefore, this problem can be considered as a connectedness void (L63, L64, L68, L70, L88, L111, L117, L118, L208, L211, L215) that leads to operational instability.

[2P] Product supply is directly related to the availability of trees/crops/livestock, that depends on the arable land size, crop yield, degree of technification, availability of equipment/infrastructure, and the will of producers to engage in their gathering (L64, L70, L88). The lack of raw material –and therefore, the absence of an economy of scale– hampers the ability of producers to compete, bargain, and position their products (L63, L68). Even considering associative schemes, the low number of

producers in border regions may set difficulties when competing with other productive regions or productive clusters. Small volumes hinder the sale process, especially exports as buyers and container capacity demand minimum volume requirements (L88). At individual/family level, lower supply base results in the loss of an important source of household income, limiting producers' financial capacities (L88).

The seasonal variation of every product determines the productive cycles for harvesting, recollection, and other manufacturing processes. The irregular production of raw materials leads to a lack of consistency in the supply to companies, limiting or even scaling down industrial sector growth, reducing reliability, and undermining contracts with their buyers (L117, L118, L211). In the opposite case, during peak seasons and large availability of supply, productive activities are limited by the processing technology, storage facilities, or high demand of labor during that period, hindering to operate at full capacity (L88).

[3T][4R] As previously explained, CBVCs open the access to a broader supply market by considering the production and manufacturing capacity of the other side of the border. In addition, associating producers or businesses is a strategy for incrementing supply and shaping an economy of scale (L208). However, as volume size cannot be the main driver for competing in local and international markets, other properties such as quality, distinctiveness, or origin should become a competitive advantage to position the product (L208).

To maintain a stable market supply, CBVC planning should embrace the seasonality of products, forecast expected production based on periodical monitoring of plantations, and elaborate risk management strategies to prevent the main operational bottlenecks (L111). For example, in the alpaca CBVC project, the government technical support was provided following the traditional alpaca calendar which defines the productive stages from mating to shearing (L215). In addition, the diversification of products with different seasonality or implementation of new technologies reduces supply vulnerability, and therefore, ensures more stable income (e.g., aquaculture production avoids the seasonal nature of traditional fishing) (L88, L211). Finally, yet importantly, in front of the supply insecurity, agile adaptation to change (e.g., changing suppliers, buyers, etc.) is a key capacity for SMEs to get more profit or keep the business running, even more in CBRs (L180).

CV14: Market Access Instability: Fluctuating Demand & Price

[1M] The constant fluctuations of the international markets and product prices bring several issues to local producers involved in CBVCs. This problem is even more difficult in CBRs as the limited access to good markets reduce their opportunities to sell and receive good prices. The opposite case is also detrimental: the access to a large market demand can discourage innovation and new efforts to improve the quality of products or optimize processes (L79). Based on the literature review on CBVCs, the inconsistency on demand and prices represents a connectedness void (L79, L88, L111, L180, L208, L215) that leads to market access instability, and access to more adequate and profitable markets becomes a relevant factor for local development in CBRs.

[2P] Producers in border regions suffer from difficult market access due to remoteness, and those that are close and available, are small ones (L208). This problem can be aggravated even more in CBRs, where the existence of too many producers and businesses on the same product generates an environment with high competition –within or across borders–, saturating local markets (L180) and dropping prices (L88).

Although there might be large untapped local and regional markets, accessing to them depends on the operationalization of market information and on the engagement and connection with buyers (L88, L180). This challenge is even more difficult facing other international markets where trade barriers are even higher (L88). Even if products have a high quality, the lack of demand and connection with purchasers do not allow to sell their production (L180). With small available markets, the dependency on one main customer or buyer increases demand vulnerability, as fortuitus contract break or their business closure put in risk the release of the product to the market (L180). In addition, the fluctuation of world markets and product demand increase vulnerability, even more if a producer is economic dependent on one or few products (L208), putting in risk their stable income and livelihoods as many families depend on their product sales to subsisting (L88, L180).

The competition environment is particularly noticeable in CBRs, where the pendular behavior of cross-border markets affect the own prices, fluctuating positively or negatively depending on the strengthen of the other sides' economy, international trends, and other factors (L111). Lower prices discourage production and move producers to other economic activities (L88). Due to their low socioeconomic conditions and the low price that they receive on their products, accessing better markets and prices becomes a need to stabilize operations.

[3T][4R] Market expansion –by upgrading/moving to other VCs or by value differentiation in exclusive niches on international markets– provides new alternatives to develop and engage more stable market demands and prices (L88, L111). In addition to marketing channel strategies such as joint cross-border branding, businesses and producers can benefit from connecting with more stable or traditional

alternatives (e.g., independent retail, own farm shops) (L180), or developing better linkages with outsider traders (L88). To achieve the latter, international fairs and contests represent good opportunities to meet new buyers where signing letters of intent to purchase (LOI) can ensure new markets at differentiated prices (L215). Another good alternative is direct trading schemes to ensure access to market by linking companies and producers while ensuring a fair price (L111). Thereby, stronger alliances not only bring more operational stability, but also reduce the participation of intermediaries, increasing producers' income (L215).

While the previous strategies also can promote more stable prices, in front of the demand insecurity, agile adaptation to change (e.g., changing suppliers, buyers, etc.) is a key capacity for SMEs to get more profit or keep the business running, even more in CBRs (L180). For example, Make to Order (MTO) schemes can reduce financial problems and adapt to market fluctuations (L79). However, more important is that local people know the reasons behind the decreasing demand and prices, so they can make better decisions and foster innovation in their businesses (L88).

CV15: Low Product Quality & Standardization

[1M] Low quality is a relevant problem to consider in CBVCs (L68, L70, L79, L88, L117, L118, L158, L180, L211, L215) and, as much as it is related to other voids, it is a meeting between business and productive flaws with the market demands. The low quality of supplies, unsuitable productive and inspection processes, and the lack of quality knowledge and skilled personnel lead to products with low or irregular quality (L79, L88, L211).

[2P] Quality variation reduces product competitiveness in foreign markets (L88) and contribute for an unfavorable business environment (L68), since poor quality limits the relationship with larger companies and buyers (L70). Cross-border value chains intensifies those issues as the differences in raw materials and technologies hinder quality standardization even more. Adding to this, certification process is also a concern, as applying for them tends to be expensive for most individual producers (L88) and requires prior knowledges that they may not have (L215), and better quality of raw materials and supplies (L180).

[3T] Increasing product quality, quality standardization, and high-quality production volume allow minimizing the participation of middlemen in the value chain, which leads to a better and more direct access to national and international markets, receiving a fairer and more stable price, and reducing precarious conditions of smallholder producers (L88, L117, L215). Certification of products and productive processes leads to a better position of products, even reaching prices up to four times higher than conventional varieties in global markets (L117). In addition, certifications offer cross-border

collaborative opportunities as they promote quality standardization in the whole CBR, leading to the organization of value-adding activities at cross-border local level (L88, L118). For example, global forest certifications can help Indonesian companies in North Kalimantan to meet the quality standards of large Malaysian sawmills in Sabah, promoting a cross-border wood cluster with high-quality products (L118).

[4R] Increasing quality imply rigorous monitoring and formalization of product supplies, productive processes, and facilities from the cradle (seeds selection, farming techniques, etc.) going by processing nodes (harvesting processes, collection centers, etc.) to ensuring the quality of the final products. To achieve this, quality control inspections should be incorporated along the value chain from the beginning to the end to ensure whether products meet market demands (L215). This implies the need of clear production standards in companies and associations which should be embedded in their statutes, high-quality training programs and quality control inspections, ensuring compliance with existing technical standards and certifications at national and international levels (L79, L117, L215).

In current times, consumer preferences have led to consider 'local', 'organic', or 'agri-food' as synonyms of quality, food safety standards, eco-friendly, and peasant development in opposition to mass food production, germplasm modification, and unsustainable practices (L180). Multiple product qualifications have appeared to take in advantage of this 'turn to quality' wave and back up the products and the productive processes behind them (L180) such national and international certifications and regulations on fair trade, organic provenance, locally produced, among others (L117).

Governments should align their own technical standards and product's policies with international certifications to improving the competitiveness of the sector and positioning products in specific market niches (L118, L177, L215). This implies the involvement of national regulatory entities to promote their adoption at business and farm levels to meet the specified conditions and quality criteria (L118, L158, L215). To achieve those goals, instead of strict or punitive inspections, audit processes must have a development approach. This means, to encompassing learning experiences accompanied by improvement targets for future visits or incentives to motivate companies and producers (L158, L215).

7.5. Resources Voids

This set of voids refers to input resources or settings to produce and commercialize such as productive supplies, equipment, and infrastructure (CV16), financial resources (CV17), marketing channels (CV18), logistics infrastructure (CV19), and utilities (water and energy) (CV20).

CV16: Lack of Productive Supplies, Equipment & Infrastructure

[1M] The scarce of funding and low investment for the design and engineering of productive processes, infrastructure, and equipment (L79, L208) have multiple roots such as capital, and knowledge, and experience (L64, L211). Although those investment can be occurring, they are limited by the business capacities, slowing the process of productive and technological upgrade (L64). Thereby, multiple researchers have highlighted the lack of supplies, tools, equipment, and productive infrastructures as a void that should be considered with the previous ones to have a better development of cross-border productive systems (L64, L68, L70, L79, L88, L111, L117, L180, L208, L211, L215).

[2P] Equipment and productive infrastructure (e.g., industrial toasters, shearing modules, tech innovation centers, etc.) are vital for technological upgrading and process optimization (L68, L215). Inadequate equipment and infrastructure (L68, L211) hinders production in terms of quantity, as it is not possible to operate at full capacity during peak seasons (L64), or in terms of quality, as the technological systems to ensure good conditions of the products is not available (e.g., lack of refrigeration systems for aquaculture production or non-proper storage compartments for stick lac) (L88, L117).

Their acquisition is also complicated due to the lack of information and personnel in the field –so there is a lack of knowledge of what to buy (L211), combined with the lack of subnational or even national technology providers – acquiring old versions in the market or with low renewal of existing equipment (L79, L215). In addition, the absence of ancillary services (e.g., printing labels, translating documentation, etc.) undermines the stable flow of productive activities.

The availability and quality of raw materials, supplies, and tools (e.g., seeds, grasses, fertilizers, male alpacas, tea cultivation tools, etc.) are problems in several value chain nodes (L111, L211, L215). If those resource are scarce and must be imported, the increasing dependence on suppliers and providers outside the CBR augments the fragility and weakness of local systems (L180) as a possible shortage of materials reduces efficient throughput (L64).

[3T] In CBRs, the borders portray cost-effective alternative channels to get raw materials, technical tools, ancillary services, or even productive facilities (L117). CBVC projects offers the opportunity to share equipment, build joint productive infrastructure or innovation centers (L215), reducing the investment needed for productive upgrade and processing industry (L211). For example, the construction of binational R&D Centers or cross-border market platforms can stimulate local and national demand on quality products in the CBR (L208). In addition, CBC opens the opportunity for more supplies, product diversity, and ancillary services located at the other side of the border, allowing to increase the economy of scale and support product transformation (L68, L117, L211). CBVCs, as they increase the demand of productive inputs, it influences positively the availability and supply of those resources at local markets, making them self-sufficient and boosting local economy (L111, L211).

[4R] Considering the limitations on financing sources, the provision of technological inputs for (the main) productive activities should start with an analysis of the minimum requirements, prioritizing the needs of producer associations and cooperatives (L70). In addition, the provision or sale of supplies and productive equipment should be accompanied by the respective knowledge transfer process to the involved actors, from professionals to producers (L111).

Adding to this, local knowledge and resources must be a central axis in decision-making to choose improvement technologies and reduce the dependency of external supplies and practices, as this issue embeds a risk of poor adaptation to the environmental and sociocultural conditions (e.g., rather the buying high-quality male alpacas for genetic improvement, it is better to use the best ones of the herd and promote and endogenous improvement over time) (L215).

In the case of cross-border productive infrastructure or joint equipment, their implementation implies good deliberation spaces to coordinate their technical specifications, location, financing sources, and other sensitive issues. However, as CBVC infrastructure will have an impact at cross-border local or even cross-border subnational level, they can be considered as Regional Public Goods (RPGs) and priority infrastructures for macroregional integration, opening new financing opportunities, accelerating their construction, and launching (L117) (Estevadeordal, Frantz and Nguyen, 2003; Estevadeordal and Goodman, 2017).

CV17: Lack of Access to Financing Sources

[1M] Overcoming the lagging conditions of CBVCs, which have been under several constraints over time, requires not only knowledge but financing schemes that can support the endogenous growth of local producers and companies (L70, L111). However, the lack of access to those sources, for both the private and public sectors, is a relevant void to consider (L1, L63, L68, L70, L79, L88, L111, L117, L170, L211, L215) and can be divided in two problematics: the ones that depend on the borrowers (producers, cooperatives, companies, etc.), and those that depend on financing opportunities (fiscal budget, foreign investors, etc.).

[2P] The lack of capital and the low capacity to find and manage financing sources for short to long terms (L79, L111, L215) impose several limitations to producers and companies to finance themselves, thus reinvesting mainly depends on their sales –that may not be stable enough. Lack of lending culture (L211) and financial education (L170, L215) reduce the producers and companies' capacities to access, retain or renew financial resources, limiting their capacities to reinvest or even use it for their productive activities (L211, L215). Even if they can get financing, high interest rates, hidden costs, or low effectiveness in obtaining concrete outputs could generate non-payments, distrust, or uncertainty among investors, putting the continuity of the financing scheme at risk (L63, L211). At individual level, poor financial management or lower supply result in lower household income and precariousness, factors that can lead producers to poverty –or making it more difficult for them to get out of poverty (L88).

Weak financial systems in the region or country foil the process of accessing capital, since bureaucracy, lack of regulation, or other factors hinder business financing (L1). The problem is exacerbated by the lack of public financing instruments: subnational and local budgets are relatively low and spread out in several productive activities (L111). The lack of public resources can make companies or even local governments dependent on foreign investors, increasing the market and capital risk or even the primacy of investors' interests over public goals (L111). In addition, funding sources might not be adapted to the needs or characteristics of the product's value chain, business model or local credit culture, limiting their access to financing or type of available financing (L68, L211). Moreover, as countries do not have the legal frameworks to support fiscal spending on cross-border projects or have different currencies, investing in joint CBVC projects becomes more difficult or even illegal.

[3T] Financing brings the opportunity to increase the quality and quantity of productive processes and outputs, and therefore generate more profits and raising producers' quality of life (L70, L111, L211, L215). Considering the financing opportunities at the other side of the border, cross-border investment becomes a lever for better cooperation schemes, more productivity, and better relationships

(L63). CBC also helps sharing fixed costs and resources, reducing the amount of required financing (L117) In addition, the social dimension of CBVCs (lagging regions, rural producers, low levels of development, etc.) make them ideal investment destinations for social entrepreneurs (L88).

[4R] In cross-border systems, adopting new practices and governance schemes can channel private interests into CBVC opportunities (L170). For example, combined systems of financial support based on monitoring, regulation compliance and accountability allow resolving the restrictions of access to financing and consolidating the position of new actors in the integrated market (L170). In addition, CBVC initiatives should consider how to articulate producers and companies with financing entities, giving them the knowledge to manage the credits and invest it wisely for their productive cycles (L215). In the Peru-Bolivia alpaca CBVC project, the rural bank and credit cooperative gave workshops to the producers on the credit system, getting two producer associations to apply under reasonable interest rates and improve their collection systems (L215).

For improving the access to financing opportunities, subnational or local governments should establish clear fiscal policies and design their own financing instruments –or put pressure to national agencies to do it– to promote business and industrial development plans while creating a friendly environment for investors and other possible financing schemes (L70, L79, L111, L170). Coherent financing plans and multi-fund investments can help them to avoid market and capital risks and align investors' interests to public ones (L111). Promoting joint-ventures enterprises can ensure access to financing sources while establishing a fixed demand, and therefore, stable income (L111).

Shaping clusters opens the opportunity to channel more financing resources to producers and knowledge generators, building an optimal environment for innovation and productive upgrade (L211). Another alternative appears with the possibility of articulating the CBVC initiatives with cross-border corridors or special economic zones, as those schemes can attract investment faster and reduce production and logistic costs by installing complementary services in the area (L117). In addition, due to the social characteristics of CBVC initiatives, marketing their social impact can attract new investors or funds. Finally, yet importantly, special consideration should be taken in not promoting welfarist patterns (continuous public funding).

CV18: Lack of Marketing Channels

[1M] Marketing channels refers to the means or tools to bridging producers with consumers by creating costumer value in the acquisition, consumption, and disposition of products (Pelton, Strutton and Lumpkin, 2014). In other words, marketing channels build on the use value of the product and expand it based on how well they serve market needs. Marketing channel management, as part of the distribution strategy – and complementing the logistics management component, has a big impact in calibrating the correct marketing mix (product, price, place, and promotion) and developing strategies to reach specific markets (Rosenbloom, 2011). The lack of marketing channels was recognized as a void for almost all references (L64, L68, L70, L88, L111, L117, L118, L158, L170, L180, L208, L211, L215), and this section explains the most common troubles and applications in CBVCs.

[2P] Although the lack of processing activities is a missed opportunity to adding value to the product, how these unprocessed products are sold is relevant to reaching new and expanding markets (L88). Otherwise, good quality does not ensure sale, as weak marketing activities (e.g., inconsistence branding or poor provision of information to consumers) reduce product position, and therefore value, in domestic and international markets (L64).

Due to the lack of market knowledge, inconsistence supply, weak distribution, among other factors, producers tend to follow traditional sale channels, having low bargaining power to negotiate higher prices (L88). The challenges are even higher when it comes to reaching and positioning in large foreign markets with more demanding consumers in terms of quantity and quality (L211). The lack of a local or regional brand of the territory and value chain builds on those problems, hindering access to adding-value marketing channels (L211).

[3T] As cross-border economies cannot compete with others in terms of volume size or critical mass, the market potential of CBVC products is mainly determined by their origin, quality, and distinctiveness (L208). Thereby, the promotion and dissemination of CBVC initiatives are a key element for increasing marketing channels (L211). In other words, selling the value embedded in the "local", "cross-border", or "rural" of the products to engage with social entrepreneurs or interested buyers in larger, more sophisticated, and more profitable markets (L88, L211). This means, to create and position the 'image' of the region in the product's global networks, platforms, or specific market niches (L170, L118, L211). To achieve this, there are several marketing channels that can be used, starting from direct sales, specialist shops, or mail orders (L180) to online promotion and virtual platforms (L215). This section highlights five of them that are particularly common in CBVCs: certifications, international fairs, cross-border markets, joint branding, and articulation with regional initiatives.

Certifications, especially international ones, are common grounds that ensure high quality standards as they ensure not only how good is a product but the quality of the productive processes, infrastructure or equipment, evaluation mechanisms, environmental practices or even working conditions (L64, L88, L211, L215). Although the costs and standards of international certifications can be high – requiring more knowledge to achieve them, they create trust and credibility with the buyers and consumers, facilitating the access of products to more sophisticated and profitable markets (L88): Certifications can double the price (or even more) of a conventional product (L118).

International fairs, such as international certifying contests or worldwide demonstration fairs, are a clear opportunity to 'sell the territory' and promote CBVC products (L215). Cross-border fairs are international *de facto*, so they meet the economic and political requirements for promoting the value of CBVCs and give light to small-scale production (L158). Cross-border Markets are another opportunity for stimulate local and subnational demand, promote local economy, and serve as physical meeting spaces to collecting CBVC subproducts to generate more volume (L70, L208).

The generation of local brands is a marketing tool to develop foreign markets and get a better price. CBVCs can benefit of cross-border branding or regional/binational designations of origin to leverage product value by positioning geolocation of its production as synonym of high-quality standards (L111, L211, L215). In the Peru-Bolivia CBR, the coffee CBVC project launched to the market the 'Café Frontera' brand (Border Coffee), meeting European standards, and selling coffee in its first year for more than $140,000 to the German market (L215).

The existence of regional initiatives or leveraging opportunities –such as economic corridors, ecotourism corridors or Special Economic Zones– allows CBVCs to get stronger articulation with market opportunities (L111, L208). As both tourism and agri-food value chains have several similarities, cross-border eco-tourist corridors can promote their joint development and marketing (L68, L117, L118, L208), and use the local culture and the physical spaces as territorial assets (L111). For example, to promote the tea CBVC chain, the initiative considered to holding caravans and cultural events through the ancient tea road that crosses the China-Laos CBR (L111). Interconnecting with cross-border corridors generates the possibility of impacting the sectors related to the CBVC, having a trickle-down effect on local economies (L211).

[4R] Strategic collaboration through joint marketing strategies can promote more comprehensive approaches for adding value to the CBVCs (L211). Market expansion of CBVC products and their value differentiation in exclusive niches on international markets start with better market research (L208) to identify and develop better marketing channels (L88). However, marketing channels are not a panacea for positioning products as the legal and productive context may limit the impact of those interventions: e.g., the alpaca CBVC project between Peru and Bolivia tried to position alpaca fiber as a binational brand, imitating the success of the border coffee. However, as there was no

adequate legal environment, it was only possible to register the brand in the Peruvian side, with a still weak position in international markets (L215). At the same time, the presence of multiple brands in the same geographic area can be counterproductive and make them lose competitiveness in the global market if they do not reach the correct market niches (L111).

Finally, yet importantly, consumer education to understand product relevance is relevant for ensuring good market penetration as it influence their purchasing behavior and therefore, trade patterns (L88). That said, market-driven production can be detrimental for biodiversity because, as is common with many products, large populations consume few species, favoring their production over others, putting them at risk of extinction (L88).

CV19: Low Connectivity and Trade & Transport Performance

[1M] The complex geography, lack of infrastructure investment, and poor logistic facilities have led to a disconnection between cross-border economies and their end-markets. Low connectivity and weak trade and transport logistics performance are considered unsuitable responses in front of the geographical challenges, becoming a connectedness void (L1, L63, L68, L70, L79, L88, L117, L118, L158, L208, L211, L215) as it increases transaction costs in terms of time, expenses, and reliability.

[2P] Around the world, many border regions have been isolated from the main urban centers and markets, imposing several challenges in terms of the long and steep pathways, lack of physical infrastructure, and lack of transport logistics services and technology (L208, L211, L215). The constrained connectivity and regional fragmentation of CBRs implies functional disconnection with the regional economic dynamics, limiting their access to suppliers, buyers, and GVCs (L70, L79, L158, L208). For example, the Bolivian community of Cocos Lanza does not have a physical road to its regional capital, taking two days of walking through the jungle, and hindering any possibility to sell its coffee to the Bolivian side (L125). Furthermore, the geographical dispersion of stakeholders within the CBR –and with stakeholders outside of it– makes it difficult for them to meet and associate, the transference of knowledge, access to specialized training and services, the movement of equipment and supplies, or even the presence of public agencies to support and regulate dynamics (L208, L211, L215).

Remoteness and isolation increase transportation costs, making them less competitive compared with similar businesses with better geolocation (L88, L118, L208). In addition, the long distances, limited accessways, difficulty topography, and low road quality lead to higher costs for construction and maintenance of roadways (L1, L70, L208, L211). Moreover, infrastructure funding tends to be scarce or inappropriate (L208) and this problem has even led companies or communities to construct roads by themselves to have a little access to local plantations – as local governments do not

have the funds or technical expertise to design infrastructure proposals to solve connectivity issues (L63, L111, L215).

Poor infrastructure, and therefore complicated logistics, is another factor that influence the bonding between producers and middlemen as the latter carry the burden of connecting the formers to the market, but for a higher price (L70). Adding to this, the lack of telecommunication infrastructure (antennas or optical fiber) (L208, L211), terminal facilities (airports and seaports) (L1, L63) and logistics hubs hinders the establishment of logistics services and technology in borders and CBRs, increasing the transportation costs of CBVC products. The lack of logistics infrastructure such as Customs, Immigration and Quarantine (CIQ) facilities also foster the growth of unofficial exports and therefore, a higher density of informal economies across the border (L117, L118).

[3T] In response to these problems, Trade and Transport Facilitation (TTF) has emerged as a strategy to achieve seamless connectivity and sustainable regional development. To achieve this, TTF promotes the simplification and harmonization of international transport procedures and the information flows associated with them by upgrading countries' capacity to trade (ESCAP, 2004; UNECE, 2021), and increases trade and transport logistics performance through the improvement of hard and soft infrastructure (Lakshmanan *et al.*, 2001; Wilson, Mann and Otsuki, 2004; Portugal-Perez and Wilson, 2012). While physical infrastructure and transport logistics technologies are considered as the 'hard' components of the equation, business and regulatory environment, and border and transport services represent the 'soft' constituents. The improvement of both types of infrastructure facilitates freight transport and promote cross-border trade (L70, L117, L118). Adequate investment in TTF promotes a more efficient use of transport infrastructure, reduces the dependency of communities on middlemen, and reduces the risks of fluctuating markets (L88).

Physical infrastructure, better said, infrastructure quality, is considered as one of the most important determinants of commercial activity and economic expansion in CBVCs (L118). The construction of land, sea, and air transport networks, enhancement of terminal facilities and border crossings, and a good road network upgrade system enhance multimodal connectivity (L1, L63, L70, L117, L118) (Korinek and Sourdin, 2011). Logistics hubs concentrate a series of transport, logistics, and productive services, facilitating storage technology, distribution means, or even sanitary or quality control centers (L68, L88, L118, L215). Transport logistics technology involves several Information and Communications Technologies (ICTs) such as electronic seals, Electronic Data interchange (EDI), telecommunication infrastructure, and more. Articulating transport logistics with mobile phone technology (L88), that is vastly used in CBRs, can reduce export days, and increase intraregional trade (Nguenkwe and Tchitchoua, 2019).

Hard infrastructure should be accompanied by the coherent business & regulatory environment (L117, L118) and efficient border & transport services (L63, L117, L118). Academic works highlight

the high correlation between institutional quality and trade growth and the great initial benefit that can be gained from leveraging trade governance (Dollar and Kraay, 2003). That said, public-private cooperation that jointly address transport problems has a positive effect on cross-border trade (L88) (Devlin and Yee, 2005). Finally, the efficiency of border and transport, constrained by the three previous components, is a key aspect to consider for improving customs clearance and inspection procedures and reducing border compliance in terms of time, cost, and reliability (World Bank, 2019). Ensuring the presence of regulatory authorities (L63, L215), improving border crossings checkpoints and CIQ facilities (L63, L117, L118), and streamlining logistics through paperless trade, adequate risk management, or automate compliance, aim to reducing bottlenecks in cross-border operations and logistics (ESCAP, 2021; Kuhlmann, 2021; UNCTAD, 2021).

Adding to the benefits from TTF measures, CBVCs opens to possibility to benefit from the installed infrastructure and logistics capacities that exist at the other side of the border (L208). Sharing the same geolocation allows them to reduce costs, not only in term of getting easier access to suppliers, but also because the concentration of companies attracts facilitating agencies and other logistics services (L1, L117). For example, coming back to the case of Cocos Lanza, while the nearest Bolivian market is two days away, the Peruvian coffee market and companies are less than two hours away, allowing them to sell their products to the local cooperatives (L215).

[4R] Financing Trade and Transport Facilitation, especially physical infrastructure, is high-cost investment. However, embedding those initiatives in broader regional schemes such cross-border economic corridors can bring investment and facilitating agencies, improving border crossings and logistics services to promote more efficient cross-border movement of goods and reduce transportation costs (L117). In addition, the construction of multipurpose logistic hubs is another possibility to reduce costs and concentrate related technical services (L68, L118). For example, to promote aquaculture CBVC, the Indonesian government proposed an integrated maritime affairs and fisheries center (SKBT) that would serve to supporting the financing of fishing boats and gear, storage rooms for seaweed, integrated cold storage facilities, floating docks, and other related facilities (L118).

These initiatives should be accompanied by logistics and distribution plans that interconnect from the plantations to the end-markets, ensuring the quality and traceability of products (L88, L215). Finally, yet importantly, it is needed to highlight that the main problem is not the lack of infrastructure, but how to bridge producers and consumers. For example, innovation in logistics by leapfrogging poor infrastructure and transport can be achieved through better vehicles that are more conditioned to the rough terrains (e.g., maneuverable mini trucks) or using renewable technologies to improve storage conditions (e.g., trucks with solar panels for feeding cooling systems) (Arkalgud, 2011). Thus, increasing connectivity in and to CBRs should also consider the adequacy of TTF systems for the

movement of services (financial, monitoring, ancillary, etc.) and people (professionals, technicians, potential buyers, etc.).

CV20: Utility Scarcity

[1M] Water and energy security are two relevant aspects to consider in CBVCs as their availability affect production capacities and increase production cost (L211). Researchers have highlighted this issue as a void (L68, L117, L208, L211, L215), and brought ideas to solve it or consider them in the development of CBVCs.

[2P] Water scarcity and lack of energy supplies are critical issues not only for living, but also for productive activities, especially for agri-food systems (L68, L208). Due to the geographical conditions, piping and wiring becomes not only an engineering challenge to start productive activities, but a high-cost investment, even more for industrial or agro-industrial activities that demand more resources (L211). The amount of usable water is even lower in some CBRs due to the conflicts on water sources between communities, urban expansion, or pollution (L211). The same case happens with electricity, where there are inefficient energy systems, irregular power supply, lack of hydro-electric sources, or strong dependency to fossil fuels (L68, L211). Lack of energy hinder the promotion of new CBVC nodes as some manufacturing processes uses large amounts of energy. For example, the aquaculture CBVCs requires cold chain storage and logistics that requires great amount of energy (L211). Aluminum smelters depend on energy-intensive equipment, demanding to be located near the power sources (L117).

[3T] Decentralized provision of utilities becomes a relevant approach to solve utility scarcity and provide the minimum productive requirements (L215). By one side, CBVC initiatives can consider equipment to facilitating water and energy production, such as the installation of motor pumps for efficient irrigation of natural grass, or power units for roasting equipment or shearing machines (L215). However, fostering rural innovation by embracing both, technical knowledge and local capacities, is another path to considering: For example, promoting local producers to construct wells by themselves to water their fields, or developing alternative technologies that are less energy-intensive such as bain-marie for milk pasteurization (L68).

[4R] Finally, yet importantly, utility demand for household consumption and CBVC productive activities should be incorporated in the Energy System Planning and Integrated Water Resources Management (IWRM) (L215), considering related issues such as energy transition, resource optimization, or ecosystem impact.

7.6. Context voids

This set refers to contextual factors that undermine CBVCs: poverty and demographic decline (CV21), land issues (CV22), environmental degradation (CV23), and gender inequity (CV24).

CV21: Poverty & Demographic Decline

[1M] Literature Review reveals that poverty and demographic decline are serious problems that affects the sustainability of CBVCs (L68, L70, L79, L117, L118, L208, L211, L215), as they increase the precariousness and vulnerability of local population and leads to the loss of traditional sociocultural practices.

[2P] Peripheral regions reveal several socioeconomic problems that push them in a situation of extreme vulnerability: Many families under subsistence farming lives in a precarious peasant economy, with unsatisfied basic needs, low social security, and little access social infrastructure and social services (L70, L117, L208). It is not uncommon in CBRs that poverty and precariousness force producers to live day-by-day without considering their own crop productivity or reinvesting in their productive activities. Even more, precariousness pushes producers to participate in more profitable economic activities, that tend to be illegal (e.g., leave rice or coffee production for poppy or coca cultivation).

Adding to the remoteness and isolation of CBRs, these territories have a low population density (L118, L208, L211), and tend to suffer from outmigration to urban centers (L208, L211). The low retention of population –especially youth people that cannot find profitable employment opportunities at the borders– drives to a decline of cultural practices, devaluation of sociocultural traditions, reduction of innovation capacities, and a smaller pool for local professionals and technicians (L208). This endangers the sustainability of productive initiatives because elder population become the main sustain of local production and knowledge.

[3T][4R] A Cross-Border Value Chain, as a political-economic initiative with social impact, should consider a comprehensive territorial approach, targeting sustainable development goals for local population by impacting in related fields such as labor security, environment, cultural conservation, gender equity, and more (L68, L208, L215). Although structural poverty has multiple root causes, CBVC initiatives are opportunities to addressing them from a multisectoral and cross-cutting perspective, including poverty-reduction measures in their implementation activities, attracting investment and infrastructure, and strengthening institutions at the borders.

To reduce the demographic and sociocultural decline, addressing the rural-urban migration triggers (e.g., lack of job security) through CBVC activities can promote better border futures: the establishment of technical schools for youth professionals, their allocation in local CBVCs, and technical training replicating traditional knowledge and techniques can promote the retention of local labor and knowledge (L79, L215).

CV22: Low Access to Secure & Quality Land

[1M] The lack of land tenure, small land size, or low land quality are some factors that have an impact on developing CBVCs and improving their productive potential. Researchers have highlighted these issues (L64, L68, L70, L88, L117, L118, L208) and, although they are common in several agricultural systems, CBRs provide opportunities that can benefit land scarcity and quality.

[2P] Although capacity building programmes can provide technical support, lack of land tenure disincentivized any investment, hindering the access to credit –informal financing sources or under high interest rates, and shrinking producers' motivation to develop their productive systems (L68, L70, L88). Nevertheless, property rights are not a panacea. In some regions with high tenure, most producers hold small size farmlands, and not all the extension is arable or productive (L64, L70). This problem worsens with the land atomization triggered by inheritance transfers (Janvry and Sadoulet, 2001). In addition, land degradation due to intensive agricultural practices or aging plantations, lower soil productivity in quantity and quality (L88, L117, L118). Adding other factors such as extreme climate conditions, unfertile lands, and water scarcity (L70, L208), land issues push several families to live on subsistence farming (L64, L70).

[3T] As previously explained, CBC makes available the lands at the other side of the border (L118). Even more, in some CBRs, producers in one country lease farming land in the other, carrying out land improvements and more capital-intensive agriculture (L64).

[4R] According to some researchers, ensuring land tenure through property rights is a path for economic development: Land security facilitates access to formal credits, allows producers to associate, and enables them to receive technical support, improving their productive conditions (L68, L70) (Soto, 2000). However, other scholars have challenged the direct causation between tenure and development (Fernandes, 2002; Manders, 2004). Other land issues, such as farm size, determine the possible income that they can obtain, limiting the possibilities of having a life based solely on agriculture (L70). Community land or forest management is another mechanism to promoting producer communities to harvest and trade resources while not reducing land size (L88). However, managing Common Property Resources (CPRs) requires good governance schemes considering multiple factors such as community

participation, or political will (Ostrom, 1992). This is particularly relevant in CBRs because, as explained in the previous example, cross-border ownership or leasing of lands can also have a negative impact due to unsustainable productive practices.

CV23: High Environmental Degradation

[1M] Previous sections have shown the negative environmental effects of unsustainable border and cross-border production: cross-border economies can lead to cross-border air and water pollution, illegal flows embrace cross-border trafficking of endangered species or illegal logging, and lack of land security may generate environmental deterioration under cross-border leasing schemes. While environmental degradation is a *de facto* consequence of those voids, it is also a cause and a void to consider in CBVCs (L63, L68, L88, L111, L117, L118, L208, L211, L215) as it lowers productive efficiency and undermines long-term sustainability.

[2P] Large scale conversion (e.g., deforesting tropical forest to convert them into palm oil plantations) has a devastating impact on the production of other crops as it reduces the goods and services that biodiversity provides (UNEP FI, 2008), fragmentates natural habitats, and increases soil erosion (L63, L117, L118) (WWF, no date). Furthermore, monoculture farming makes economies dependent on a single crop, rising economic risks, and limiting available land (L118).

Pressure on natural resources due to intensive agriculture expansion or unregulated harvesting drive resources into rapid depletion, endanger species, and pollute land, air, and water resources, generating long-term environmental and productive problems (L63, L88, L211) (WWF, no date). For example, exceeding the carrying capacity of forest pushes producers to cut down trees that have not reached their optimum age and, therefore, leads to lower production (L88). These issues are intensified by the challenging climate conditions and natural hazards (L208).

[3T][4R] Considering the environmental impact of cross-border dynamics in the design and development of CBVC initiatives should link environmental with socioeconomic development and promote long-term sustainability (L111). This demands the combination of strong governance models and technological resources that provide mechanisms and practices to reduce pressure on environmental resources (L211) (Wong Villanueva, Kidokoro and Seta, 2022). Development models such as circular economy or green economy allows a common vision that aligns with cooperative governance and local development (L68, L208). They also promote sustainable harvesting practices in local communities as they protect biodiversity and ensure sustainable long-term livelihoods (L88, L118).

Although some methods can be considered controversial, such as swidden agriculture (rotational farming), they can foster biodiversity and stable income sources under regulated conditions

(L117) (Li *et al.*, 2014). More environmental sounded alternatives such as agroforestry systems, polyculture cropping systems, or organic agriculture raise as opportunities for CBVCs production with less negative outcomes (L118, L215) (Rahman et al., 2017). These options should be linked with other environment's friendly initiatives such as ecotourism (L118, L211), and embedded in subnational and national programmes for ecosystem conservation, IWRM, comprehensive CBVC management, integrated waste management program, or even health and labor security programmes (L215). For that, sustainable resource management should be reflected in the policies, legal and regulatory frameworks, bringing more monitoring instruments for concession regimes, harvesting processing methods or other productive practices (L88, L118).

CV24: Gender Inequity

[1M] Gender equity in value chains has been a traditional underexplored topic, although gender relations affect and are affected in value chains processes (Edna Mutua, Njuki and Waithanji, 2014). This absence is clear in CBVC literature, where only few researchers have raised the issue (L68, L215), but have brought clarity on their relevance. Operationalization of gender equity in CBVCs promises women's empowerment, and how their development mutually reinforces male's empowerment (Stoian *et al.*, 2018), opening and opportunity for fairer gender dynamics.

[2P] In rural and border areas, due to their traditional idiosyncrasy on gender stereotypes, women labor tends to concentrate in housework or precarious and low-income productive activities (L68). [3T] Nevertheless, they also fulfill relevant roles in CBVCs, and when men leave their productive activities, women oversee the lands, production, and family. For example, in the coffee CBVC, women have a critical role in the bagging process, conservation of seedbeds, feeding coffee workers, and even in quality control and coffee selection (they select coffee grains one by one using their own hands). Therefore, female participation could be considered even higher than male roles (L215). The alpaca CBVC has similar characteristics: the quality selection process of fiber in entirely organized by female classifying experts (L215), and depending on the middlemen, producers received their income based on the fiber quality. However, due to gender stereotypes in the rurality, women are not normally the target audience for technical assistance programs, reducing the effectiveness of those programs.

[4R] Gender equity policies should be included in any CBVC initiative to promote a comprehensive social participation (L68, L215). To achieve this, the consolidation and involvement of women organizations is a relevant task to accomplish (L68). In some cases, although they are included in the joint CBVC projects, they display a low participation (L215). With many reasons behind these behaviors – lagging gender stereotypes, intensive housework, etc.–, women should be included from the design of CBVC initiatives to understand their interests, obstacles, and needs and foster their

participation (L215). However, apart from improving women's participation in the household realm and division of labor, deeper understanding is needed to explore the intertwined relationships between gender development and CBVC development (Stoian *et al.*, 2018).

7.7. Borders Voids

These two voids refer to contextual factors that are particular from border areas: the informality of cross-border economies (in terms of market labor, trade, and production) (CV25), and illegal flows (CV26).

CV25: Informality of Cross-Border Economies

[1M] Although the informality of labor, production, and trade could be considered a consequence of the lack of harmonization of policies, regulations, and laws, this is only one trigger among several others –such as state fragility, inequality, remoteness, or economic empowerment– that are constitutive elements of the socioeconomic fabric of cross-border economies (L211) (Kahiya and Kadirov, 2020). Cross-border informality has been repeatedly reported as a void due to their relevance in CBRs and how their formalization would bring inclusive development and promotion of CBVCs (L1, L64, L68, L70, L79, L117, L118, L208, L211).

[2P] The incompatibility of exchange policies between countries hampers the integration of CBVCs as it leaves behind multiple producers living in the informal economy (L1). The high rate of informality has a considerable impact on cross-border regions as it gives rise to multiple market failures such as lack of information, uncertainty, or lack of critical mass (L211). Furthermore, it creates a risk in CBRs to hold illegal practices or flows such as exploitation of people, illegal extraction of endangered species, or cross-border pollution.

Three types of informal economic systems can be highlighted in CBVCs. Regardless of legal compatibility, informality in cross-border labor market is based on the availability of low-skill employment, mainly in the primary sector – that represents the main economic sector in multiple CBVCs with low-technology intensity (L70, L211). However, uncontrolled labor migration can promote conflictive situations between border societies, bad practices, and job insecurity (L70, L79). Informality in cross-border production lies down in the difficulties to formalizing SMEs or associations, lack of productive technology (available at the other side), or the lack of knowledge to formalize productive processes (L64). This can lead to the unofficial export of large volumes of products with

low added value and therefore, making lower profits (L118). Informality in cross-border trade has multiple triggers such as the lack of common currency, tariff and non-tariff barriers, or weak institutional and logistic capacities to address border trade (L70, L79, L208, L211). CBIT has a significant weight in local economies as cross-border flows can lead to price fluctuations in the other-side market, pushing down the domestic price and affecting the income of local producers (L64).

Being informal does not mean that they are exempt of paying fees: informal transactions are subject of several monetary impositions exercised by border regulatory entities, municipalities, corrupted groups, middlemen, and other actors related to the informal CBVCs. This elevates the arbitrariness of payments, generates a favorable environment for corruption practices, and increases the transaction costs up to twenty times the producer's profits (L70). The main distinction between formal and informal economies is the vulnerability and precariousness (labor market insecurity, employment insecurity, income insecurity) of their activities (L70) (Berrington, Tammes and Roberts, 2014).

[3T] In multiple cases, the socioeconomic similarities of border regions leave them away from the potential that urban centers or capitals enjoy (L211). However, border complementarity represents an opportunity for mutual benefit in terms of labor, production, and trade: while Posadas (Argentina) suffers from unemployment problems, opening the 'labor border' could be a solution as Itápua (Brazil) has underemployment issues (L1). In Vietnam and Cambodia border regions, the rice production dynamics (although Vietnam is one of the largest rice producers, it also imports that product from Cambodia) reveals the potentiality of the formalization in terms of productive complementarity, increasing production volume, product diversification in local and foreign markets, and reducing the variability of seasonal demands (L64). In Haiti-Dominican Republic cross-border regions, the border rural population of the former have found in the latter stronger urban markets to sell their products, increasing incomes for smallholder producers, promoting the urbanization of the border fringes, and augmenting the critical mass of the CBR (L70).

[4R] Informal dynamics should be part of the discussion of connecting CBVCs as, in many developing regions, formal flows do not reflect the whole potential of border economies (L68) and tackling informality in border rural economies has a great importance in poverty alleviation as 90% of world production is held in developing countries and smallholder families (L211). The formalization of informal economies mainly falls in the political capital of the national governments in office and their motivation to reduce those problems. Legal frameworks should be adapted to incorporate the bulk of informal and non-professionalized producers and workers, and ensure their social security (L79, L211). To achieve it, border economic analysis must contemplate cross-border dynamics embedded in the local labor markets, productive systems, and trading schemes (L68). This includes, to explore what motivates and discourages the people making a living from informal economies to formalize their activities (L117,

L118) and provide training and education to small producers, especially those who may be involved in informal practices (L211).

CV26: Presence of Illegal Flows

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[1M] Literature review (L63, L68, L88, L111, L117, L118, L208) reveals how illegal flows represent a problem for stabilizing CBVCs as both are intertwined with the existing connectedness voids in the same cross-border territory.

[2P] The lack of comprehensive cross-border legal and regulatory regimes generates externalities that have a social impact (such as forced displacements, crime networks) or an environmental one (illegal logging or illegal trade of endangered species) (L68, L117, L208). However, illegal dynamics are a complex network of dynamics that does not only depend on better legal frameworks. In the case of West Kalimantan, although better regulatory measures were imposed and uncontrolled logging was partially curtailed a decade ago, currently only 4 of 300 timber concessions apply sustainable methods and an illegal logging network still operates deep in the border areas without being detected (L117).

The stakes rise with the cultivation of illicit crops (L68, L111, L208), that represents the main income source for local families in some CBRs. For example, the China-Myanmar CBR is not only famous because of illegal logging but also because it is part of the infamous 'golden triangle', the largest production regions for opium poppy and other narcotraffic drug supplies (L63). Due to the low socioeconomic conditions of people living in the area, illegal logging and traffic of endangered species become the 'lesser evil' as illegal drug value chains generate more profits: poppy farmers can earn 13 times more money from poppy than rice crops (IRIN News, 2011), becoming a strong pull factor to ensuring the sustainability of illegal cultivation while reducing the motivation to continuing with legal crops. Even more, illegal flows are usually accompanied by the presence of mafias or armed groups, representing a security challenge for local population and an obstacle for governmental participation (L208).

[3T][4R] Preventing illegal flows starts by addressing the multidimensionality of those dynamics that do not only depend on more presence of the national governments through military intervention or through legal and regulatory harmonization. While external pressure coming from international certifications and trade data statistics (L88, L118) can push governments to modify their regulations and policies, comprehensive approaches should be implemented to tackle the root causes and triggers of those illegal practices. For example, the Laotian Phongsaly government, also located in the golden triangle, developed an alternative crop programme to reducing the dependency on opium

poppy production. By establishing a CBVC partnership with a Chinese tea factory, the government ensured the sale of local production at a fair price and improved socioeconomic conditions (L111).

7.8. Legal Voids

This set of voids relate to the harmonization of legal, normative, and policy frameworks in terms of border development (or multisectoral actions at the borders) (CV27), industrial development (CV28), or trade (tariff and non-tariff barriers) (CV29).

CV27: No Harmonization of Border Policies & Policies at the Borders

[1M] The lack of harmonization of sectoral and border development policies is one of the main connectedness voids that incentives other issues in developing CBVCs (L70, L79, L88, L117, L118, L170, L208, L211, L215). Regulatory and legal diversity in cross-border regions turns to an engine of articulation, exchange, and complementarity between economies located on both sides of the borders in multiple fields such as exchange of goods, availability of skilled labor, availability of arable or building land, and more (L170). Instead of pointing to this diversity between national systems as the main problem, it is the limited maneuverability between border policies, sectoral policies and legal and regulatory systems that brings multiple cross-border dynamics to informality, or even more, illegality.

[2P] Incompatibility of policy frameworks – referring to national, subnational, and local plans, sectoral policies, and border development policies– is a very simple issue to understand, but complex to solve: While some countries have policies in place to promote CBVCs, others do not. This generates a situation where, efforts of one side can be easily neutralized at the border (L88). Even more, in many Latin American countries, there are not unilateral development and integration border policies, reinforcing the traditional Westphalian role of stiff or rigid borders to ensuring national sovereignty (L70).

While the lack of compatible policies hinders paradiplomacy efforts on joint CBVC projects, the lack of regulatory and legal compatibility leads them to informality or illegality. This is a common issue in Latin America where, although countries are part of many international organizations, those have been ineffective to reduce legal barriers (L208). For example, when the Argentinian province of Misiones started involving in the production of modified cassava starch, the private sectors perceived a great learning opportunity from the transfer of technical know-how from the Brazilian State of Parana. However, the presence of multiple barriers such as the export/import regime, the national regulatory

agencies, sanitary and phytosanitary regulation, customs, and others, triggered higher transaction costs, collapsing down the productive cooperation (L70).

[3T] Policy harmonization is elemental for shaping CBVCs (L88) and it starts by considering the role of borders within the national systems: the promotion of development policies in border regions creates the conditions where CBC might represent a convenient strategy for local industrial development (L118). The case study of border regions from Indonesia and Malaysia shows that, although national and subnational plans, border development policies, and industrial policies might differ across levels, sectors, and approaches, as both have a border development approach, there are multiple commonalities that create an ideal environment for developing CBVCs (L117, L118).

Legal harmonization starts with the identification of regulatory and legal obstacles for cross-border collaboration (e.g., know-how exchange, movement of goods, budgeting for cross-border projects, etc.) (L117). This should be accompanied by an analysis of their impact at subnational, local, and especially at cross-border scale, where multiple previous formal and informal initiatives reveal the imposed challenges for CBVCs (L208). Considering these issues in national legislation fosters a legal environment that takes advantage of cross-border dynamics (e.g., the formalization of cross-border markets) (L70) that can be reinforced by involving regulatory agencies and industrial entities to improve the regulatory knowledge socialization or business promotion environment (e.g., tax education rather than strong sanctions) (L79). Legal and regulatory improvements alleviate the presence of other challenges such as limited-size markets, remoteness, low density and lack of investments or skilled labor (L208).

[4R] Stability in relations between national governments and cross-border agreements – a desirable setting for policy and legal harmonization (L211), stems from aligning government objectives in integrated binational or regional schemes (L118, L215). The low efficiency of macroregional policies, international agreements, or binational governance schemes, leads to evaluate in detail how national actors interact, nay, how multilevel consensus is achieved, and consider more flexible and wider approaches to shape CBVCs (L70, L208). However, Latin American central governments should learn to overcome legal and administrative outcomes, building on natural or existing partnerships to promote more efficient CBI&D instruments (L208).

CV28: No Harmonization of Business/Industrial Development Policies

[1M] While the lack of border policies or their harmonization (within and across borders) has been previously discussed, several researchers have highlighted the same issues but applying to the public instruments for business and/or industrial development (L1, L63, L64, L68, L79, L88, L111, L118, L170, L211, L215).

[2P] The absence of industrial policies and instruments for specific products (L11, L68, L79, L88, L111, L211) reflect the lack of clarity of product strategies at national, subnational, and local levels (L68, L88). In addition, poor design, or enforcement of public policies (L68) reflects that, apart from the limited knowledge in the product's value chain and sector, there are methodological and instrumental limitations to correctly address the in-situ problematic (L211). For example, the India forest regulation not only banned illegal collection of forestry resources but imposed several requirements.

Apart from generating contradictions between the regulation and their promotion policy, it also incentivized Nepal government to ban exports, leading several producers to participate in cross-border illegal markets (L88). Similar problems happen with policies and legal frameworks for business development that can suppress the formalization and consolidation of subsistence producers and SMEs (L79, 211): the legal barriers for establishing companies in Colombia made them to move to the Venezuelan side, that consolidated their car production sector.

Harmonization of policies within the national system is also an issue affecting CBVC as they are not tailored for cross-border markets (L68, L79, L88). On one side, high levels of bureaucracy discourages production and export, missing several business opportunities (L88). For example, Peninsular Malaysia, Sabah, and Sarawak have each of them its own regulatory authority for wood processing, setting a very fragmented regulatory framework (L118). On the order, the disarticulation of product-based policies with policies, plans, and programmes from other sectors can have a negative impact on the product's value chain (L79, L118): In Venezuela, the GLP law affected automobile production and hindered CBC with Colombia (auto part production) because producing GLP-based motors was against the Venezuelan Chamber of Automobile Industry's technical standards and involved modifying Colombian production (L79).

Harmonization of business and industrial development strategies across borders is even a more complex task as it also requires understanding the existing dynamics in the cross-border economies. Mismatches can generate an unfavorable environment for CBC or even promote competition with the other side's companies or producers, disincentivizing foreign investments (L1, L111).

[3T] Public policies and legal frameworks for business and industrial development have a great potential for fostering local development, even more if they are comprehensive national policies as they can promote co-financing schemes, PPPs, sectoral employment, friendly business environment, and more (L79). Public policies allow to allocate fiscal spending and public resources in the sector (L88, L215), setting realistic and data-based goals at medium and long-term (L215), involve other specialized public agencies into joint activities (L79) or raise quality standards though national certifications and their incorporation in the national technical standards (L118, L215). Thereby, public instruments bring the opportunities to protect the rights of both the investors and producers, while promoting the product's value chain by contemplating investors' incentives such as property protection, fast communication channels, clear delivery terms, etc. (L111).

The articulation of the border governments' strategies can promote a more Integrated regional industry. For example, the agreement between Chinese Yunnan government and Laotian Phongsaly government allowed the former to promote tea investments in the latter, supporting this financial scheme with technical support, agricultural trials, and exchange of experiences to consolidate the CBR production and market (L111). In the Vietnam-Cambodia CBR, Vietnamese An Giang government signed an agreement with Cambodian Takeo and Kandal governments to provide technical support and training events in rice farming techniques to farmers and public officers (L64). Cooperation in CBVCs evolves with collaborative frameworks for R&D that facilitate the mobilization of resources and capacities (L88, L211) to add more value to the products (L215).

[4R] Developing industrial policies for product's value chains starts by assessing the overall state of the product resources, involved producers, and local practices (L111). This should be accompanied with an assessment of the legal and regulatory environment, the examination of foreign markets requirements, and a comparison with international best-case practices from successful countries (L88, L118).

Special emphasis should be given to the articulation and consistency of policies, legal and regulatory frameworks within the same county, and how they interact with the neighboring country system to foster CBVCs (L88, L211). This demands stronger cooperation and coordination at national level, involving several government departments –and high political capital within their nations (L63). To facilitate this process, participatory planning spaces between the main actors, private sector, and civil society can promote a faster design, policy alignment, and implementation of consensuses (L68). Finally, cross-border agreements can facilitate the incorporation of joint decisions into their own policies and plans (L215).

Although public instruments can promote development and alleviate poverty, a great risk hides behind their formulation and implementation. Policies that promote good practices such as sustainable extraction or banning non-processed products may have negative effects as they hinder informal and

illegal cross-border flows (L88, L118). The participation of regulatory entities may lead to intimidating or undermining private initiatives coming from entrepreneurs and SMEs rather than promoting their consolidation (L79). Thereby, legal, and regulatory changes should consider other risks and problems such the seasonal nature of political cycles, the adaptability of partners in the region, greater availability of information, etc. (L68, 211). Development partners can provide advice in the design of public policies and in their implementation (L68, L215). Having said that, a better approach consists in developing government capacities to design and manage their own instruments by themselves (L170).

CV29: Presence of Trade Barriers

[1M] While previous sections have talked about the cross-border compatibilization of policies, legal and regulatory frameworks of border regions and industrial development, CBVCs face similar issues with trade limitations. The presence of tariff barriers (TBs) and non-tariff barriers (NTBs) in foreign trade policies, legislations, and agreements hinder the possibility of productive articulation (L1), even more in CBRs as they create a suitable environment for cross-border economies and illegal flows. Although, Trade and Transport Facilitation strives for a better regulatory environment, it mainly considers the reduction of NTBs related with transport and logistics, leaving out other NTBs and TBs that protect unilateral action, incentive trade disruption, and increase transaction costs (Kuhlmann, 2021). Several CBVC sources (L1, L63, L64, L70, L79, L88, L111, L118, L158, L208, L215) criticize the presence of trade barriers while highlighting the application of international standards and guidelines to achieve regulatory convergence.

[2P] Incompatibility and conflict between foreign trade policies and regulations generate a hostile legal and regulatory environment for CBVCs. For example, measures such as quota systems or concession mechanisms can promote illegal extraction or rent-seeking dynamics (L63). In addition, mercantilist behaviors (protectionism, trade imbalance, neomercantilism, etc.) reflected in legal frameworks, regulations and agencies undermine CBC, restricting trade through multiple barriers (L70). On one hand, tariff barriers and customs fees increase the transaction costs, hindering the process of getting supplies or raw materials from the other side of the border (L79). On the other hand, the presence of non-tariff barriers, such as Sanitary and Phytosanitary (SPS) requirements, (L158) Technical Barriers to Trade (TBT) (L88), excessive documentation for customs clearance (L63, L88), or even the different weight or volume units that govern transactions (L70) slow down and discourage trade.

The rigid approach to Imposing SPS"and 'BTs mismatches with the living reality of cross-border informal trade and markets: even though cross-border economies and producers do not comply with quality standards, productive infrastructure, legal permits, or correct documentation, their products will probably reach the other side or even foreign markets due to the low enforcement power in border

areas (e.g., Peruvian middlemen buy Bolivian coffee that does not meet quality standards, mix it with other batches, and sell it to producers associations, finishing in foreign markets) (L70, L215). The problem is exacerbated with the noninvolvement of governments in cross-border trade of goods, the absence of regulatory agencies and proper border crossing facilities, lengthy and bureaucratic processes, and the producers' lack of knowledge on export/import processes (L88, L158). The 'icing on the cake' is the poor or no implementation of already signed agreements due to political, economic, or technical factors (L70).

[3T] In current times, the reduction of trade barriers has been accompanied by the proliferation of Regional Trade Agreements (RTAs) such as Free Trade Agreements (FTAs), Customs Unions (Cus), or Preferential Trade Agreements (PTAs) (Nugroho, 2007; Kuhlmann, 2021). These trade arrangements can promote the reduction of tariff and non-tariff barriers (L70, L88) and through the inclusion of specific clauses or articles, it can support poverty alleviation, environmental conservation, SME development, and even gender rights (L88) (Kuhlmann, 2021). Furthermore, differential treatment provisions or transitional time periods are mechanisms to reduce trade imbalances between countries and promote trade and productive interdependence (L70) (Kuhlmann, 2021).

As binding documents, RTAs have an impact on national legislation and trade policy development, incentivizing more transparent and market-friendly regulations (L118), establishing preferential tax policies or tax exemption for importing/exporting certain products (L64), or promoting digital and paperless trade (Kuhlmann, 2021). Moreover, the articulation of foreign trade policies with productive and business development ones allows more opened economies and development of cross-border markets (L63, L88).

[4R] Replacing the existing protectionist or mercantilist behavior –one of the main triggers for competing foreign policies– by productive articulation and cooperation schemes (L70) requires clarity about the benefits of economic cooperation and integration, followed by more coordination and consensus between central governments (L64). This articulation should consider the need of more flexible and realistic cross-border legal regimes that allows faster transaction of raw materials and supplies (L70, L79) and reinvents the concepts of 'formality' and 'legality' to including cross-border informal economies (L70). However, as every legal and regulatory modification, it requires political will and capital to be approved by national parliaments – and where macroregional organizations can play a relevant role to foster major integration. As legal improvements tend to be long-term goals, taking advantage of product's benefits can promote a faster development of CBVCs (e.g., alpaca fiber is easier to trade since, unlike meat, it is not subject to SPS requirements) (L158).

Further government support can bring other cooperation schemes with legal backing. Direct trading schemes can connect companies and producers across borders, removing the middlemen from the equation and generating stable incomes (e.g., the Chinese tea factory singing a tea cooperation with

Laotian farmers, increasing their profits from tea production) (L79, L111, L208, L215). Cooperative R&D Agreements or TRIPS agreements can promote a cross-border innovation environment for developing CBVCs (L63) (Kuhlmann, 2021). Other mechanisms such as counter trade or compensation schemes lead to exchanging raw materials and supplies for the provision of services such as improving the access of tracks, technical training, labor, equipment, or transport, leading to the reduction of other connectedness voids in the CBVC (L63).

7.9. Intangible Voids

The intangible voids refer to four factors related to the lack of trust or credibility (CV30), motivation to cooperate or produce (CV31), joint identity (CV32), or bargaining power (CV33).

CV30: Lack of Trust, Transparency & Accountability

[1M] Lack of credibility between CBVC stakeholders is considered as another connectedness void (L1, L63, L68, L70, L88, L117, L118, L170, L208). The formation of social bonds based on credibility or trust is relevant for shaping CBG and value chains (Pomeroy *et al.*, 2017; Wong Villanueva, Kidokoro and Seta, 2023). Credible commitments, as well as trust, transparency, and accountability, are relevant ensuring contractual relationships (Argyres and Liebeskind, 1999). While this section does not explore the complex relationship between all these variables (Ghosh and Fedorowicz, 2008), it focuses on sketching these intangible resources at individual level (personal and professional relationships) and group level (between public entities, firms, etc.).

[2P] Lack of credibility or trust between governments can be originated by several factors such as xenophobia, prejudices, suspiciousness, misunderstandings, asynchrony of political wills, or the perception of efficiency of the other government's political and economic management (L70). This problem leads to avoiding cooperation opportunities, encouraging productive competition, protectionism, or even more, turning the border into barriers. Corruption is another trigger of distrust among actors, as the proliferation of bad practices increases transaction costs, reduces producers' profits or even worse, promotes cross-border illegal flows (L63). At a more individual level, mistrust among producers or with local cooperatives makes cross-border collaboration more difficult and precarious (L118).

[3T] Proximity across borders incentives the rapprochement between border societies and establish trust linkages (L1). Building credibility is a long-term process that, in terms of CBVCs, begins

from encouraging personal interactions and informal relationships as the basis for shaping cross-border business practices (L68, L117). By shaping stronger producer associations, or more efficient public-private partnerships, trust becomes an important element in the relational capital between stakeholders, reducing transaction costs and the risk associated with the failure of cooperation (L1). Transparency in value chain activities –mainly related to legal extraction processes, proper documentation, trade permits and clear accountability– are very important to generate credibility in the processes and governance, promoting mutual trust between private and public entities and buyers (L63, L88, L170).

[4R] Strategies such as dialogue spaces, partnering opportunities or study visits allows public and/or private leaders to get to know each other and develop mutual trust (L208) (Wong Villanueva, Kidokoro and Seta, 2023). Leaders in CBVC initiatives should foster personal and informal relationships between the involved stakeholders to create growing trust (L117). The promotion of good business practices, fair treatment, and a trust environment can improve motivational factors (Whipple, 2019), contributing to the reduction of other connectedness voids. However, capitalizing on social intangibles requires cross-border stakeholders to share common communication codes or a relational framework to foster better understanding. (e.g., CBR territory facilitates companies to sharing common culture, improving their relationships, and reducing transaction costs) (L1) (Wong Villanueva, Kidokoro and Seta, 2022).

CV31: No Motivation for Cooperating/Producing

[1M] The lack or low motivation for cooperating or producing has been reported by multiple scholars as another connectedness void to consider in leveraging CBVCs (L1, L68, L70, L79, L88, L111, L117, L118, L158, L208, L211, L215). The lack of 'motivation' or 'will', coming from national governments, has been considered as one of the main obstacles for CBC (Wong Villanueva, Kidokoro and Seta, 2022). However, as CBVCs involve a mix of stakeholders, not only the motivation from governments but also from companies or individual producers should be considered in the equation. This part rescues some ideas about motivation of those three: governments, businesses, and individual producers.

[2P] The political dimension of CBVC is a relevant aspect for shaping agile processes and a common agenda (L68): Lack of political will (L158) discourages involving in cross-border productive policies or their continuation (L215), appropriation of joint initiatives (L68), brokering stronger linkages between industry and markets (L88), or reducing trade barriers (L118). As CBVC is a political-economic initiative, cooperating without public sector raises several challenges: if one side does not consider the product's value chain as a priority, CBC has little or no chance of happening (L1). Adding to this, political instability and rapidly shifting policies magnifies those problems and reduce the

motivation to cooperate (L1, L211), either to focus on their own issues, or because the other side's struggles do not provide the necessary trust.

In the private sector, the lack of knowledge on CBVCs or negative perception on the costs, benefits and risks demotivates companies to engage in those initiatives. Companies might have a lack of motivation to cooperate with similar industries from the other side of the border, as this strategy may not contribute to their current business strategies (L117) or is not perceived as a competitive advantage or opportunity for productive upgrade (L79) This problem is reinforced by the lack of perception or awareness that they belong to a value chain (L211).

In relation to producers, excessive traditionalism makes them to fear or reject change from status quo (to adopt new technologies, to associate, to become formal, etc.) (L211, L215). Moreover, individualism leads to a lack of common vision within the sector and difficulties generating a unique value proposition (L211). In addition, motivation to increase productivity[12] is overshadowed by several other factors such as land conflicts, or low access to credit (L70). These factors undermine support initiatives, where absenteeism, and poor implementation of learnings may represent a waste of public and private funds (L215).

[3T] Shaping CBVCs demands governments to use their political capital and additional efforts to promote decentralized political structures that allow them to coordinate joint collaborations, common agreements (L1, L68). Thereby, political will of national, and subnational authorities can promote better decentralized development strategies in terms of governance, R&D innovation, and Trade Transport Facilitation (e.g., introducing hard and soft infrastructure to promote cross-border trade and investment) (L118, 208). Although local governments have fewer resources, political will makes them use their available ones in non-traditional ways. For example, providing construction materials and involving civil society and local producers as workforce for constructing productive infrastructure (L215). In addition, good results generate positive feedback loops and make authorities more conscious about productive articulation (L215).

Special attention should be given to the 'champions': 'leading' or 'dedicated' individuals, agencies, or companies on both sides of the border that supports the CBVC initiative and spend a great deal of time to increasing their productivity (leading by example), connecting stakeholders, promoting concrete areas for CBC, or developing export markets (L118). As motivated producers portrait a change attitude, their commitment presents them as potential (or existing) brokers or leaders, and they are key

[12] Agricultural or Industrial productivity is as complex –or even more– as cross-border value chains, containing several formal and informal institutional voids (Webb, Khoury and Hitt, 2020). Therefore, those voids are also embedded in CBVCs. The present list of connectedness voids, as a product of the Systematic Literature Review, may incorporate some of them but not all in their full spectrum or in the same way. As highlighted in the beginning, this list tends to be the beginning of a conversation rather than the final output as multiple voids here have many other variables and connections to be considered.

actors for initial successes and sustainability of initiatives over time (L117). Working and investing in them allows to gradually structure and integrate local production and supply system to other levels (L117, L211).

[4R] National and subnational policies should incorporate Cross-Border Integration & Development –especially CBVCs– strategies in their policies for tackling territorial problems in border regions (L68, L117). However, political cycles and personnel turnover at multiple government levels hinders the stability of cooperation as politicians and professionals have different thoughts (or disinterest) about cooperation (L211). As a solution, relevant institutions can play a role to keep cooperation running. In one case, during local elections, delegates of the CAN and Foreign Affairs officers talked with political candidates about the existing progresses on CBVCs and their relevance for the border areas, generating consciousness and motivating them to continuing working in similar projects (Wong Villanueva, Kidokoro and Seta, 2023). Other proposals, such as flexible cross-border agreements or regular cross-border meetings can promote new politicians to adhere to continuing CBC in their development plans (L215). Furthermore, the inclusion of minorities and indigenous groups into political life represents an opportunity to generate more political capital and better reception of CBVC initiatives that promote community development.

The entrepreneurial culture, the set of intangible resources such as values, attitudes, and practices that motivates to innovate and take risks (Ioannidou, 2021), leads businesses and producers to change their perception on productivity and cooperation (L68, L211). In terms of companies, financial incentives, sense of belonging, and knowledge on the benefits of cross-border value chains can motivate them to engage into these initiatives[13]. For producers, there are several factors that motivate them to be more productive such as higher profits, land property, or access to credit (L70). Although a structural perspective to observe precariousness and poverty is relevant to involve them into productive activities and cooperation (e.g., gradual support through knowledge and financial resources), it should be accompanied by a process of building confidence on their product and its profitability: 'they can make a living based on what they produce' (L68). In addition, encouraging good practices –through quality contests, productive equipment, or financial incentives (L215) –, involving young producers (L211) or socializing the good results of CBVCs can change locals and producers' perceptions towards cooperation and productivity, leaving behind conventional ways of thinking (L111).

[13] This is better explored in the void 12 (CV12).

CV32: No Clarity of a Joint Identity

[1M] The lack of a joint identity for CBVCs has also been considered relevant for their formation and sustainability (L1, L63, L68, L70, L88, L158, L208, L211, L215). Endogenous development requires a high stock of political, economic, technological, and cultural capital (Boisier, 2005). The last one implies the capacity to generate a socio-territorial identity (L158), that translates into a joint cross-border identity when talking about CBRs, and into a shared product-oriented identity when referring to CBVCs. Shared identity, as a representation of the territorial attachment of cross-border relationships, is embedded in a set of values, rationale, or narratives that justify the need to articulate –and in this case, motivates to cooperate around a specific product that promises endogenous local development across borders (L211) (Wong Villanueva, Kidokoro and Seta, 2023).

[2P] In multiple cross-border regions, there are strong sociocultural gaps due to the lack of common language, cultural differences, ethnic diversity, and policy priorities (L70, L211). This encourages national xenophobia dividing the 'us' with the 'others' (L70) (Wong Villanueva, Kidokoro and Seta, 2023), obstructing the building of mutual trust and formation of CBVCs. The lack of a regional common identity across borders hinders political consensus and the formulation of a common agenda as both sides of the borders operates by their own (L68).

[3T] Creating a joint identity for CBVCs refers to shaping a common narrative (historical relevance of the product, shared needs, common goals, etc.) as the axis for concatenating productive activities across the borders, serving as a means for inclusive sustainable development (L68). In many cases, common geography set similar territorial challenges and productive opportunities in both sides of the border, that facilitates a common understanding of the cross-border space (L211).

The predominance of some productive systems promotes the rise of product-oriented cultures such as 'livestock culture', 'coffee culture', or 'organic culture' that reflects similar patterns and constraints of local lifestyles and serves as cornerstone for common cross-border identity and productive policies (L68, L215). Thus, culture stimulates a feeling or sense of belonging to the product's value chain (L211). In addition, companies' dynamics across this territory eases the construction of a shared product culture, as they establish common communication codes and foster trade trust to reducing transaction costs (L1). Effective productive cooperation promotes the consolidation of initiatives by promoting a sense of identity for the group of involved stakeholders and aligning their efforts towards shared needs (L211). In more organized governance schemes such as cross-border clusters, common identity facilitates mutual understanding and cooperation promotion with other clusters within the same CBR (L211).

[4R] Product-based cultures, being shared by smallholder producers and local SMEs across borders, have the potential for developing a common territorial vision that facilitates the development

of cross-border initiatives that embed political-economic objectives (e.g., binational contests, cross-border agencies, CBVC activities) (L70, L88, L158, L215). As a product's value chain is closely related with local development and cross-border cooperation, it creates favorable conditions for promoting circular economy on the product life cycle as a component for sustainable CBI&D (L208).

Most CBRs do not only embrace different societies and cultures, but also enjoy a high rate of indigenous people sharing similar characteristics across borders (L63, L211). Cultural diversity brings the opportunity to generate new joint socio-territorial identities and more inclusive cross-border societies that can foster better relationships –achieving better negotiations and deals between local companies– and promote innovation –by developing new CBVC strategies (e.g., branding of cross-border product) (L1, L68, L158, L215). A common cross-border agenda based on joint identity can incorporate an institutional mix of actors, dialogue and decisions making spaces, and the development of a joint development vision and strategies (L211, L215). However, the lack of participation and commitment from public or private stakeholders – or even more, the construction of cross-border identities based on political objectives rather than a shared experience, put in risk the execution of joint projects (e.g., only one side of the border continuing with the project) (L215).

CV33: Low Bargaining Power

[1M] Bargaining power is a concept that has been undertaken by multiple fields related to negotiation or transactions such as game theory, value chains, or international relations. From a transaction cost approach, bargaining power is the capacity to influence in its own favor the terms and conditions of agreements or contracts and their subsequent deals (Argyres and Liebeskind, 1999). In this way, both suppliers and buyers enjoy a different position to influence pricing (Porter, 1985): Suppliers have more bargaining power when companies depend on the availability of resources and cannot change to others. In the opposite case, when buyers can find substitutes easier, they bargain better prices and volumes. These differences lead to different GVC governance models (Gereffi, Humphrey and Sturgeon, 2005).

Bargaining power is also affected by other factors such as market information, accumulation of resources and capacities, legal system and contracting, and more. Although it is interconnected to other voids, low bargaining power can be considered as one (L68, L88, L111, L158, L208, L211) because having a better position to negotiate facilitates to set a better pricing even they face uneven bargaining relationships in their GVC or instability of supply and demand (Grabs and Ponte, 2019; Ponte, Sturgeon and Dallas, 2019).

[2P] The irregular and inconsistent supply (small or seasonal production) and demand (small available markets and low prices) affect producers as they lose assets for bargaining with buyers, hampering their penetration into markets and leading to precarious living conditions (L88). In addition, market issues such as weak positioning in local and international markets or unfair competition from larger players hinder even more their capacity to negotiate and access to fair trade (L68, L88). Low bargaining power does not exactly mean a lack of a CBVC, but the difficulties to set good pricing and that the profit distribution along the VC might not be so equal or fair (L88).

Projecting this problem into the politics sphere, the lack of bargaining power of producer associations and local governments –even more if they want to venture into cross-border cooperation– leads to little influence on political decisions, financing schemes, or national policies (L208). In addition, considering bargaining with buyers within the GVC, low bargaining capacity leads to supply contracts that limit suppliers' production decision (Raskovich, 2003). In the case of the alpaca fiber market, the buyers' preference for white fiber generated contracts in which they paid more for it than for colored fiber, affecting the domestic production dynamics. This pushed local producers to a white alpaca monoculture – a situation that almost represented the extinction of colored alpacas (Michaud and Dorrego Carlón, 2018).

[3T][4R] Factors such as knowledge, associativity, and contract intermediation can increase bargaining power for producers in front of intermediaries, companies, and lead firms. Market information enables better evaluation of markets and to push for better prices (L88). In addition, associativity of producers or businesses, by creating an economy of scale, enhances representation of the CBVC initiative and therefore, increasing their influence on closing agreements, partnerships, or contracts (L211). In addition, producer associations or cooperatives have a good position to empowering communities by providing updated market information or increasing their negotiation capacity through trainings (L88, L158). Contract regulation or intermediation is another strategy to raising the bargaining power of producer associations: As the China-Laos tea CBVC shows, the mediation of the local government between the company and producers brought a fairer price and other benefits (L111).

To be 'cross-border' brings extra benefits: although a CBVC occurs at a local or subnational scale with little agglomeration of resources and capacities, the fact of cooperating across borders makes this initiative an international one, leveraging their status and gaining relative power. In other words, they 'scale-jump', achieving a better political position. Shaping cross-border agencies levels this game up, as it represents an international political entity with even more capabilities and bargaining power than a single national government.

7.10. Capacities voids

The last set refers to other intangible factors that are transversal or supplement other voids such as change capacity (CV34), associativity capacity (CV35), or knowledge transfer (CV36).

CV34: Low Change Capacity

[1M] While knowledge, governance, or intangible infrastructure embody the 'what' is needed to leverage CBVCs and make them more competitive, the 'how' is still a pending question in the present list. In relation to CBVCs, this represents a better use of existing assets (knowledge, relationships, resources, infrastructure, etc.) while overcoming threats such as cross-border externalities, value chain gaps, or business insecurity. Several terminologies, such as capacity development, upgrading plans, scaling-up strategies, business expansion models, innovation, or entrepreneurial culture refer to means to achieving this higher output with a predefined level of staff, equipment, or infrastructure, and therefore, increasing value, productivity, resilience, or competitivity (Bolger, 2000; MarketLinks, 2009; Ponte and Ewert, 2009; Reddy and Vijayachandra Reddy, 2014; Ioannidou, 2021).

These strategies embody alternatives of 'how to' reduce the complexity of transforming the knowledge acquisition into outcomes and, therefore, facilitate the change process (Otoo, Agapitova and Behrens, 2009; Brinkerhoff and Morgan, 2010). A low capacity to adapt has been reported as a CBVC void in the literature review (L68, L70, L79, L88, L111, L117, L118, L170, L180, L208, L211, L215), giving rise to ways to 'plan' the change process, or rather, to promote proactive change management.

[2P] In CBRs, adaptation to change tends to be a common capacity for entrepreneurial businesses, but more intuitive rather than planned: changing supply distributors, marketing channels, or buyers are strategies to adapt to adversities by making use of the cross-border market externalities (L180). Variations of context conditions (such as new regulation, new infrastructure, land degradation, etc.) also affect the value chain, changing and giving rise to new actors and dynamics (L68). Thus, diversification tends to be a reactive measure in front of the value chain pressures, where specialization is an alternative business strategy to keep the business afloat (L180). To this is added the aversion or little investment in productive upgrade due to a combination of lack of knowledge, capacities, financing, and motivational factors (L79).

New businesses or infant industries, characterized by basic production processes or low business capacity to handle workload (L170, L211), need more technical and financial investments to upgrade themselves and ensure quality, production volume, or their own financial stability (L111). The intersectionality of lagging conditions leads border producers and companies to live with business

insecurity, risk of precariousness, and uncertainty about the future or direction of their businesses (L180). Moreover, low levels of business planning capacities lead to a lack of long-term enterprise perspectives (e.g., resource planning or technological improvement), contributing to unsustainable business practices (e.g., monoculture farming, one-crop dependency, operations above carrying capacity, etc.), and market irregularities (e.g., unmeasured risks, mispricing, market vulnerability, etc.) (L88, L118, L208).

Fostering a more proactive change management also brings several challenges. In CBRs, companies, producers, and even subnational and local governments tend to have weak information systems, with a lack of data: farm conditions (location, quality of processes, etc.), technology foresight (available technology, processing tools, etc.), market analysis (knowledge on economic trends, investment opportunities, etc.), or public instruments (policies, legal schemes, etc.) (L208, L211). To this must be added the lack of IT systems such as online knowledge platforms (L208), sectoral statistics databases (L68), or the Implementation of Geographical or Territorial Information Systems (GIS/TIS) to monitoring land production, farm performance, logistic bottlenecks, etc. (L68) Finally, yet importantly, the lack of Research & Development (R&D) systems due to the mismatch between business needs and the limited technological development and innovation, makes difficult to challenge problems like transport & logistics, energetic needs, and supply/demand stability (L211).

[3T] As mentioned earlier, several strategies for proactive change management have been developed to be more competitive, stimulate growth not only in quantity but also quality, and improve the business and productive capacities (L68, L79, L211). Although an extensive explanation goes beyond this chapter scope, this section simplifies proactive change management in three interlinked approaches: optimization (resource planning), planning (business expansion), and innovation.

Resource planning or the optimization of production is a useful strategy to forecasting and allocating business resources and risk management. This is especially relevant for CBVCs facing supply/demand uncertainties. The core element of this strategy is the efficient use of knowledge about the dynamics, advantages, and disadvantages of the product's value chain (ROI, capital requirements, labor intensity, transportation modes, cash flow, main foreign markets, competitor products, etc.) (L88, L117) and the product itself (L111, L158): e.g., the tea value chain demands knowledge about the local tea economy, tea cultivation science, tea ecological environment or even the tea culture (L111).

Business planning can be useful for long-term productivity improvement, tech innovation, or increase commercialization (L215), facilitating proactive change through expansion strategies such as diversification, scaling up, or upstream/downstream expansion. Fragility of value chains can be tackled by moving to other VCs or developing with new product lines (L117, L118, L180, L211): in the case of the raw milk cheese production, bovine tuberculosis is a threat that can be reduced by engaging in the pasteurized cheese production (L180). Scaling up value chains by 'occupying' more profitable value

chain nodes or increasing the value of products in current nodes by innovation (L70) is a good strategy for targeting foreign markets as they weight differentiated or value-added products with better rates and prices than commodities (generic product) (L211). In addition, developing upstream or downstream production activities strives to achieving higher value in the same or other value chain (L117, L118) by adding new value chains nodes that promote new jobs and more incomes (L70).

CBVCs in Latin American CBRs cannot be based only on industrial modernization but in a comprehensive approach based on organizational, marketing, production, quality, and environmental-based innovation (L208). Different technological levels throughout CBR also represents a potential opportunity for technological upgrading (mostly from one side to the other), but also for collaborative innovation and R&D schemes (L88, L211).

Research & Development is a key component for improving efficiency of productive systems, developing new products or technologies, making more informed decisions, or even achieve a competitive advantage to better positioning the products in foreign markets (L68, L79, L88, L211). Examples could be found in the production of new varieties of agriproducts to make them more resistant, different flavor, etc. Placed-based innovation embraces a holistic perspective of innovation, grouping Social, cultural, institutional, and technological practices for improving business and productive capacity (L170, L208) or generating value differentiation in unique/exclusive international markets (L208, L211): e.g., transforming leftovers into new products, using less-energy consuming techniques, or implementing new philosophies or business practices.

[4R] Proactive change management, as an uncertainty planning exercise, carries risks and threats that should be considered. Therefore, understanding the real capacities of the CBR productive system (especially from businesses, cooperatives, and producers) is a key step for making them more competitive (L211) and productive with their current resources (L118). This could be assessed by surveys or dialogue spaces (group dynamics, collaborative sessions) to compare skills, techniques, practices (existing knowledge) and compare them with the business and productive needs (gaps in the value chain nodes) (L117, L211, L215).

Governments can have an important role for strengthening a long-term perspective on companies and creating an innovation environment in terms of knowledge management, regional planning, and Cross-Border Cooperation. The development of GIS/TIS provides information to the private sector so they can make more informed business decisions and promote better articulation of the sector (L68). Regional planning – even better if it is coordinated with the pair across the border– must include sectoral or industrial development strategies from a multidimensional approach: capacity building, organizational development, R&D, risk management, infrastructure, etc. (L117, L208, L211). In addition, specialized agencies can help in the elaboration of business and productive plans (L215).

In relation to CBC, knowledge transfer allows exchanges between companies and producers to leverage the business capacities in the region (L117, L118) encouraging join-production processes (L117), promote upstream or downstream production (L118). CBC also can promote the replication of successful business and productivity models in the region (L68, L117). Finally, yet importantly, change management should take a gradual approach to scaling up (L111): governments should foster a business environment for organic growth and endogenous development, where ideas such as local business incubators can have a good impact towards building that setup and incorporating innovations in the productive and social fabric (L68, L170, L208).

CV35: Low Associativity Capacity

[1M] The low levels of associativity capacity between producers (to shape producer association or cooperatives) and between companies (to shape clusters) have been reported as a relevant CBVC void (L68, L70, L117, L118, L208, L215). While the latter have been described previously, this section focuses on producers and their associative configurations.

[2P] The long distances between producers, the little extension of their farmlands, and their weak organization do not allow to build economies of scale, generating gaps in the value chain network within the CBR and complicating the way of providing them with support services or connecting them with upstream and downstream activities (L70, L117, L208). Low associativity capacity leads to more disperse configuration of producers, with low economy of scale, limited access to good prices, supplies, and markets, difficult access to technical & financial incentives, etc.

[3T] Formalization of producer groups into associations or cooperatives transform them into a legal person, recognizable by public and private institutions. This allows them an easier access to financial and technical incentives, formulate marketing strategies, access to foreign markets and sign contracts or trade agreements (L70, L215). Stronger cooperatives improve those benefits and provide producers with credits and services (e.g., technical training or quality, control) by themselves (L70, L117), and can reduce the number of intermediaries in the value chain, generating more benefits for its producers.

Producer associations and cooperatives facilitate cross-border articulation as clear leaderships allow faster coordination and transactions (L215). As producer agglomerations, associations have better access than individual producers to more specialized knowledge, equipment, or infrastructure, reducing production and trade costs, and getting better prices and profitability (L68). In addition, depending on each national legal framework, associations and/or cooperatives might have business characteristics, allowing them to certify their process and products, and brand their production (L117).

[4R] Increasing associativity starts by identifying small associations or potential ones (non-formalized producer groups that are motivated for greater associativity) (L70, L215), implementing methodologies and practices for horizontal articulation of smallholder producers (L68, L70) and providing them with, at least, the minimal technical, legal, tributary, financial, and organizational capacities (L70, L215). Thereby, producer organizations have a social component, where associates have a governing system (e.g., board of directors, deliberation spaces, statutes, etc.) (Österberg and Nilsson, 2009), as well as business component, where they need technical, business, and market knowledge to run the operations and provide services (Deller *et al.*, 2009).

Replication of successful cooperative models from the CBR can be a good opportunity to facilitate knowledge transfer. For example, in the Peru-Bolivia CBR, the CBVC project incorporated training sessions from the Peruvian coffee cooperative to the Bolivian coffee association in topics such as organizational and business model, allowing the latter to increase the number of members (L215). Moreover, the presence of development partners and champions facilitate knowledge transfer and the formalization process (L118, L215). However, increasing associativity requires addressing the limitations of the national law on associations and cooperatives.

CV36: Difficulty in Knowledge Transfer

[1M] Other void that has been recorded and highlighted is the difficulty in knowledge transfer (L68, L70, L88, L111, L117, L118, L158, L208, L211, L215). Although as other voids this could be considered as a very standard problem for capacity building implementations, the cross-border context bring other challenges to consider, but also benefits that can be achieved through cooperation.

[2P] In CBVC projects, multiple research institutions and public agencies carrying technological transfer projects may not achieve positive outcomes, most of them due to the lack of methodological and instrumental capacities for effective transference (L211). However, several factors are behind this problem. First, the wide knowledge gap between knowledge generators (universities, research centers, etc.) and target audience (producers, public officers, etc.) hinders transfer, as multiple times both groups have different priorities to cover (L211). This is also influenced by motivational issues, reflected in the low participation in workshops or seminars (L215) or not taking advantage of the learned knowledge for their productive activities (L211). In addition, the lack of qualified personnel to conduct the learning process is a limitation if they must visit the farmlands (L211).

In cross-border contexts, other factors such as language and cultural differences also represent an obstacle for transferring knowledge and technology (L211). Moreover, legal constraints can increase the transaction cost of cross-border knowledge transfer, making it more expensive or almost impossible,

although there are successful potential development partners at the other side (L70). Thereby, limited knowledge transfer leads to very low effectiveness of initiatives, from technical visits or installation of new equipment to development projects or long-term productive programmes. This represents a waste of resources, time, and funding while generating few positive outcomes, or even producing negative ones – affecting the credibility of CBVC initiatives.

[3T] Knowledge transfer can support the reduction of connectedness voids related to a need for improving capacities and skills by the provision of technical knowledge (e.g., learning about new equipment, technologies, productive processes, certifications, etc.), financial knowledge (e.g., inventory books, sales books, sales receipts, etc.), legal knowledge or from other relevant fields that can contribute to development (L215). Continuous learning programs are beneficial for knowledge transfer and technical support provision, even more if they are tailored to local producers' needs (L208) and their seasonal production herewith learning in the moment that they need to do it (L215). In addition, cross-border joint ventures, PPPs, and G2G partnerships bring the opportunity to explore knowledge transfer and exchange across borders (L111, L117) while reducing the cost of accessing to those technologies (L88).

Great potential exists on local and endogenous knowledge (L68) embedded in local business styles and practices (L117), indigenous knowledge of productive activities (L88), ancient wisdom (L215), native crops (L208, L215), local management styles (L215), or local customs in use of resources (L208). Validating and learning from them allow to identify how local companies have answered to common problems (L208), the differences between practices in similar realities (L215), effective ways of how communities replicate their knowledge, and mechanisms for local innovation (L215).

Cross-Border knowledge transfer is not a new concept in CBVCs, but a core element that fosters cross-border regionalism: In the Argentina-Bolivia CBR, facing the opportunities for knowledge transfer in terms of genetic improvement and exchange of experiences, the camelids producers and public officers established the 'Binational Camelids Fairs', a cross-border space to enhance the existing dynamics (L158). Thus, cross-border knowledge transfer facilitates peer-to-peer cross-learning, reducing learning curve while promoting cross-border articulation.

[4R] As public officers, professionals, and technicians should be the main responsible for the local implementation of learning processes, special programmes should target their needs for building capacities (L117). Mapping development partners can be beneficial to improve this process, especially if those programmes involve institutions with previous successful experiences on knowledge transfer (L211).

Examining knowledge transfer as an educational methodology for building capacities, it is suggested to take a comprehensive approach for addressing the cognitive objectives (Bloom *et al.*, 1956). Thereby, the learning process should consider 1) the identification of the available knowledge (local

and across borders), 2) comprehension of existing needs and installed capacities (prioritizing needs and teaching & absorption capacities), 3) programme implementation (learning spaces and learn-by-doing), 4) analysis & evaluation (successful solutions in short and medium-term), and 5) the generation of new knowledge (place-based innovation) (L117, L118, L211, L215). The transference of knowledge should be accompanied by a correct process building rapport and learning approaches in the affective and psychomotor domains, supported by tools coming from other educational or agile methodologies: e.g., Using mix learning spaces or methods such as seminars, workshops, technical visits, internships, or personalized advise (L111, L215), shaping comprehensive technological packages with minimal needs for producer's adaptation (L211), or considering practices and social emotional facilitation strategies for supporting communities (Fulton, 2021). In these operations, local knowledge and resources should have a central role for deciding new approaches, as external technologies need to be adapted first to the environmental and sociocultural conditions where the CBVC is embedded (L88, L215).

8. A Theoretical Framework for Connectedness Voids

The exploration of connectedness voids has led us to a deeper understanding of the constraints and bottlenecks that cross-border value chains experience. However, apart from the thematical classification of voids in **Table 2.7**, we have not yet proposed a model to interconnect them. To transform the connectedness canvas from an analytical tool to a theoretical framework –that means, to give an order to the existing elements within a system–, we precise to hypothesize the causal relationships between the voids (McGinnis, 2011; Ostrom, 2011).

The list of 36 connectedness voids represents the possible existence of 1260 possible causal relationships (without considering self-loops). How can we reduce the complexity while retaining the internal relationships within voids? This section aims to propose a model to comprehend the voids based on their causal relationships: what voids are more related to others, and how can we understand these relationships within a theoretical model. To achieve this, we implement a qualitative approach on qualitative data: first, to identify those causal relationships between the connectedness voids, and then clustering the resultant causal network.

First, we start identifying the relationships between voids based on literature review following the decision flow from **Figure 2.7**. We focus our analysis in finding patterns connecting each void within the compositions and sixteen sources. **Appendix 2** shows the extracts from the previous section (quotes from the written compositions) that were used to justify the causal relationships. As the sources were result of an intense SLR according to our research inquires, it was established that, if there were not contradictions, at least one citation from the literature was enough to establish causality. This

process is repeated 1260 times and results are inserted in a directed adjacency matrix of 36 variables ($A = (a_{i,j}) \epsilon R^{36\times36}$). If we identify at least one causal relationship between voids (if X→Y=TRUE), then we assign a binary number equivalent to 1 (then $a_{X,Y} = 1$). The results are expressed in a directed adjacency matrix (**Table 2.8**). that can be interpreted as a causal network or Causal Graph Model (**Figure 2.8**) –we will discuss about them in **Chapter 3**.

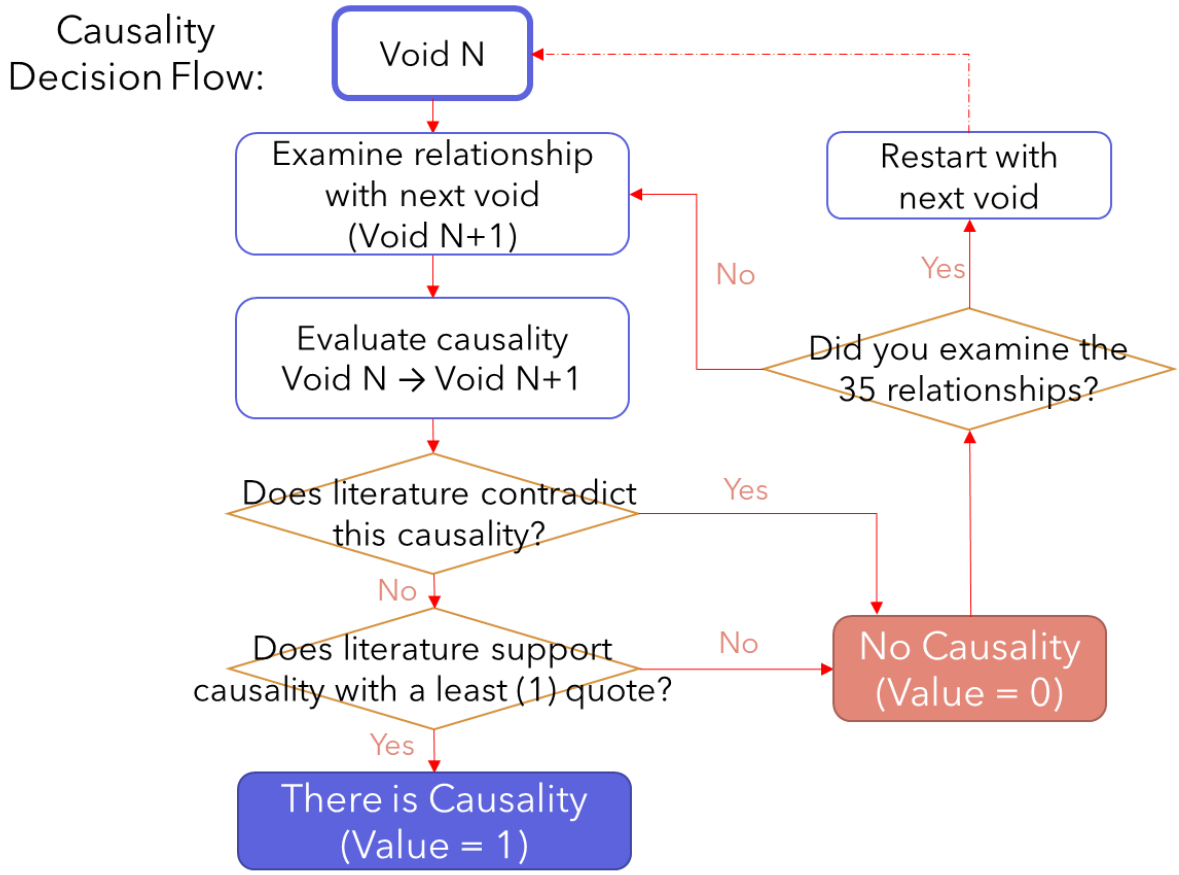


Figure 2.7. *Decision Flow to determine causal relationships between voids (Author's elaboration)*

The second step involves clustering the previous results. Clustering methods are widely implemented to identify meaningful subgroups within a dataset (Fraley, 1998). However, we should not confuse 'classification' with 'clustering': while the role of the former is predictive (shaping groups to then establish relationships between them, e.g., thematical classification such as our ten issues), the role of the latter is descriptive (discovering categories based on assessment) (Rokach and Maimon, 2005).

Thereby, the emergent model from a clustering analysis would keep academic rigor while simplifying the complexity of the existing relationships.

The causal matrix (**Table 2.8**) is analyzed using the software *R* to identify how voids are clustered according to their interrelationships (see code in **Appendix 3**). Testing several clustering methods, we finally opted for the Ward's minimum variance method as this one allows a better qualitative interpretation of the relationships between voids and clusters (and the relationship between them) better than the other methods[14]. The resulting dendrogram (**Figure 2.9**) classifies the voids in clusters and subclusters. Considering a cluster distance of 2 (named as Partition line in the Figure), we can identify eight clusters (named from A to H).

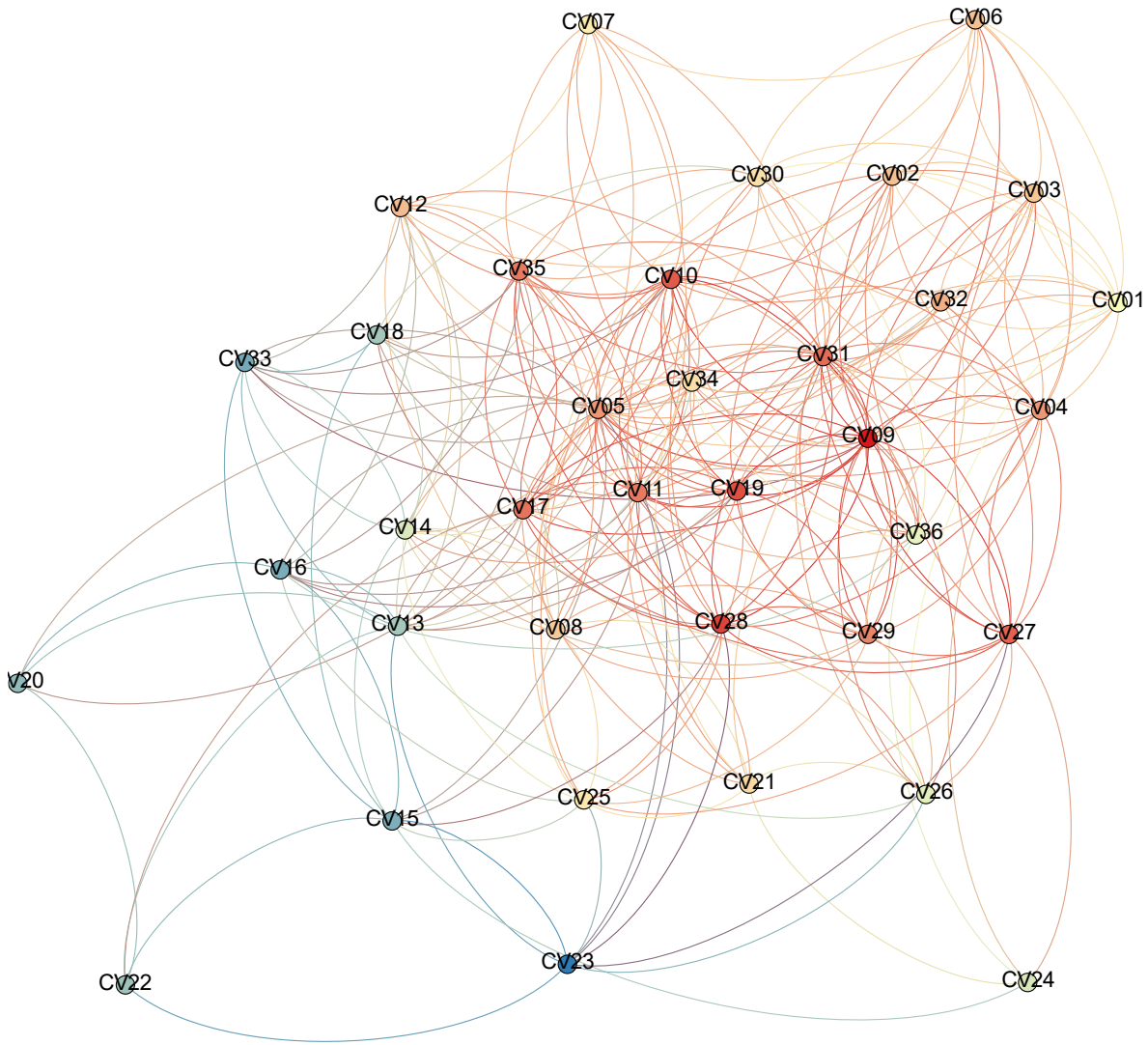
At the same time, we can understand how these clusters related by reordering and compressing the 36x36 matrix into an 8x8 matrix (**Table 2.10**). Based on the compressed matrix and the main groups of the dendrogram, it is possible to understand the how the clusters are interrelated (**Figure 2.9**). Despite most clusters have any kind of relationships, following the dendrogram agglomeration[15], **Figure 2.11** integrates the previous results and interpreted them qualitatively in a theoretical framework that represents the clusters of relationships between connectedness voids.

[14] There is no unique method for clustering, each of them with their strengths and weaknesses, and depending on the selected one, it can provide different subgroups (Zaït and Messatfa, 1997).

[15]As shown in **Table 2.9** and **Figure 2.10**, some relationships between clusters have more weight than others considered in the dendrogram. For examples, voids in cluster D have more interconnections with cluster A (16 edges) than with cluster C (3 edges). However, as we applied a Ward's minimum variance method (Murtagh and Legendre, 2014), this agglomeration hierarchy prioritizes the minimum within-cluster variance in each clustering step. Thus, C and D shapes a cluster as their distance to other clusters within the hierarchy is the minimum possible.

Table 2.8. *Directed Adjacency Matrix of Causal Relationships from the Theoretical Framework (Author's Elaboration)*

CVs	CV01	CV02	CV03	CV04	CV05	CV06	CV07	CV08	CV09	CV10	CV11	CV12	CV13	CV14	CV15	CV16	CV17	CV18	CV19	CV20	CV21	CV22	CV23	CV24	CV25	CV26	CV27	CV28	CV29	CV30	CV31	CV32	CV33	CV34	CV35	CV36	TOT
CV01	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	**6**
CV02	1	0	1	1	1	0	0	0	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**8**
CV03	1	0	0	1	1	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**8**
CV04	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	1	0	1	**10**
CV05	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	1	0	0	**11**
CV06	1	1	1	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	**9**
CV07	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	**6**
CV08	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0	**8**
CV09	0	1	1	1	1	0	0	0	0	1	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	1	1	0	1	0	1	1	0	1	**16**
CV10	0	0	1	0	1	0	1	0	1	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	**13**
CV11	0	0	0	0	1	0	0	0	0	1	0	0	1	0	1	1	0	1	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	1	1	1	**12**
CV12	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	**9**
CV13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	**3**
CV14	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	**4**
CV15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	**4**
CV16	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
CV17	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	**11**
CV18	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	**4**
CV19	1	1	0	0	1	0	1	1	1	1	1	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	1	**14**
CV20	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**
CV21	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1	0	0	**7**
CV22	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
CV23	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
CV24	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	**4**
CV25	0	0	0	0	1	0	0	1	0	1	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**7**
CV26	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	**5**
CV27	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	0	1	1	0	1	0	0	0	0	0	**12**
CV28	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	0	0	0	0	1	0	1	1	0	0	1	1	0	0	1	1	1	1	**14**
CV29	1	0	0	0	1	0	0	1	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1	0	0	1	0	1	**11**
CV30	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	**7**
CV31	1	0	1	1	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	1	1	**12**
CV32	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1	0	1	**9**
CV33	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
CV34	0	0	0	0	1	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	**7**
CV35	0	0	0	1	1	0	1	1	0	0	1	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	**11**
CV36	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**5**
TOT	**9**	**6**	**10**	**9**	**21**	**3**	**4**	**6**	**10**	**12**	**13**	**6**	**12**	**10**	**7**	**8**	**11**	**7**	**4**	**1**	**3**	**2**	**7**	**1**	**6**	**6**	**4**	**5**	**7**	**8**	**17**	**4**	**9**	**13**	**9**	**11**	**281**



*Nodes distributed in Yi-Fu Proportional configuration. Nodes are colored based on harmonic closeness centrality (+central to -central = red-yellow-blue scale)

Figure 2.8. *Causal Graph Model of the Theoretical Framework (Author's elaboration)*

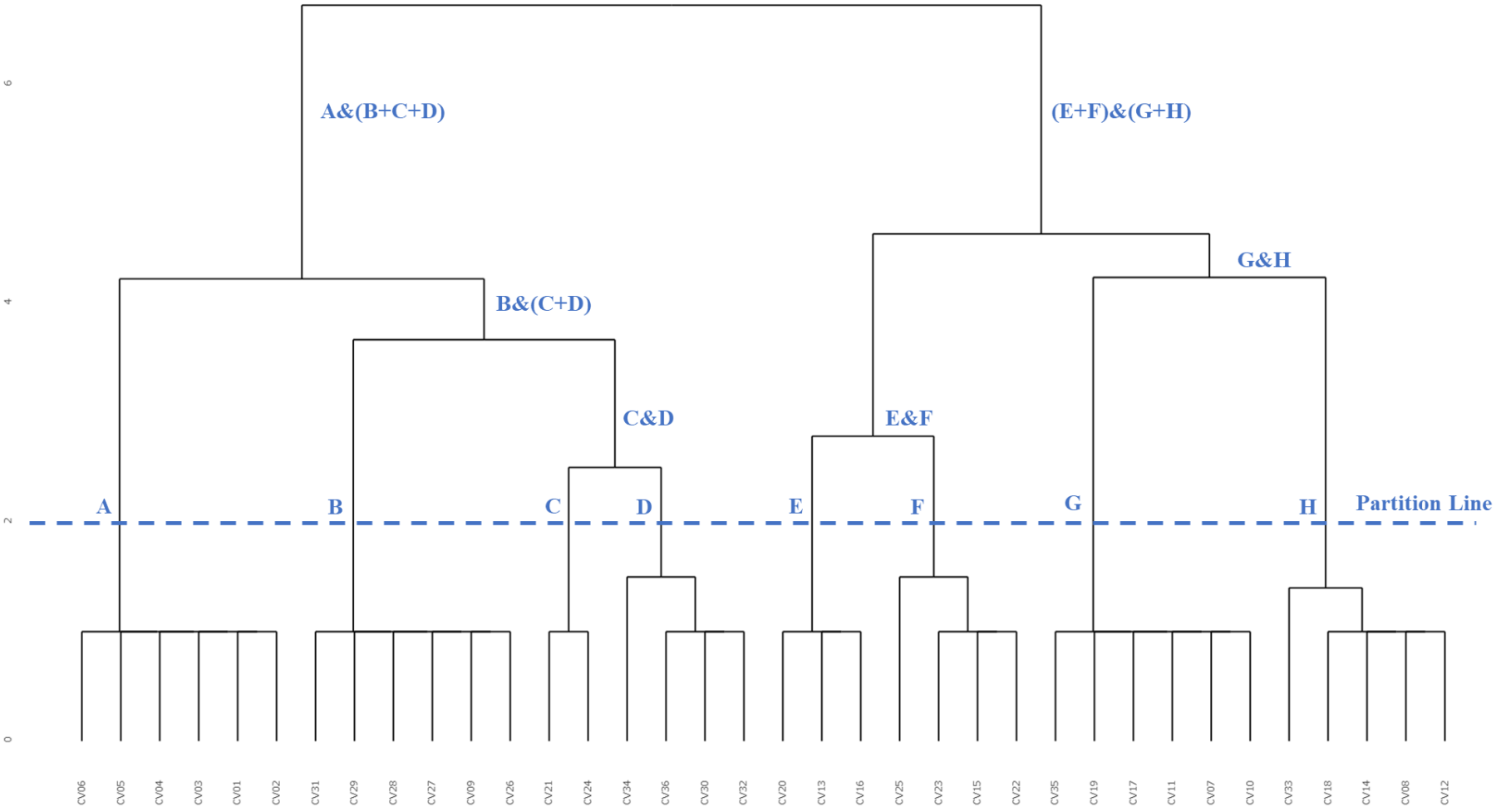


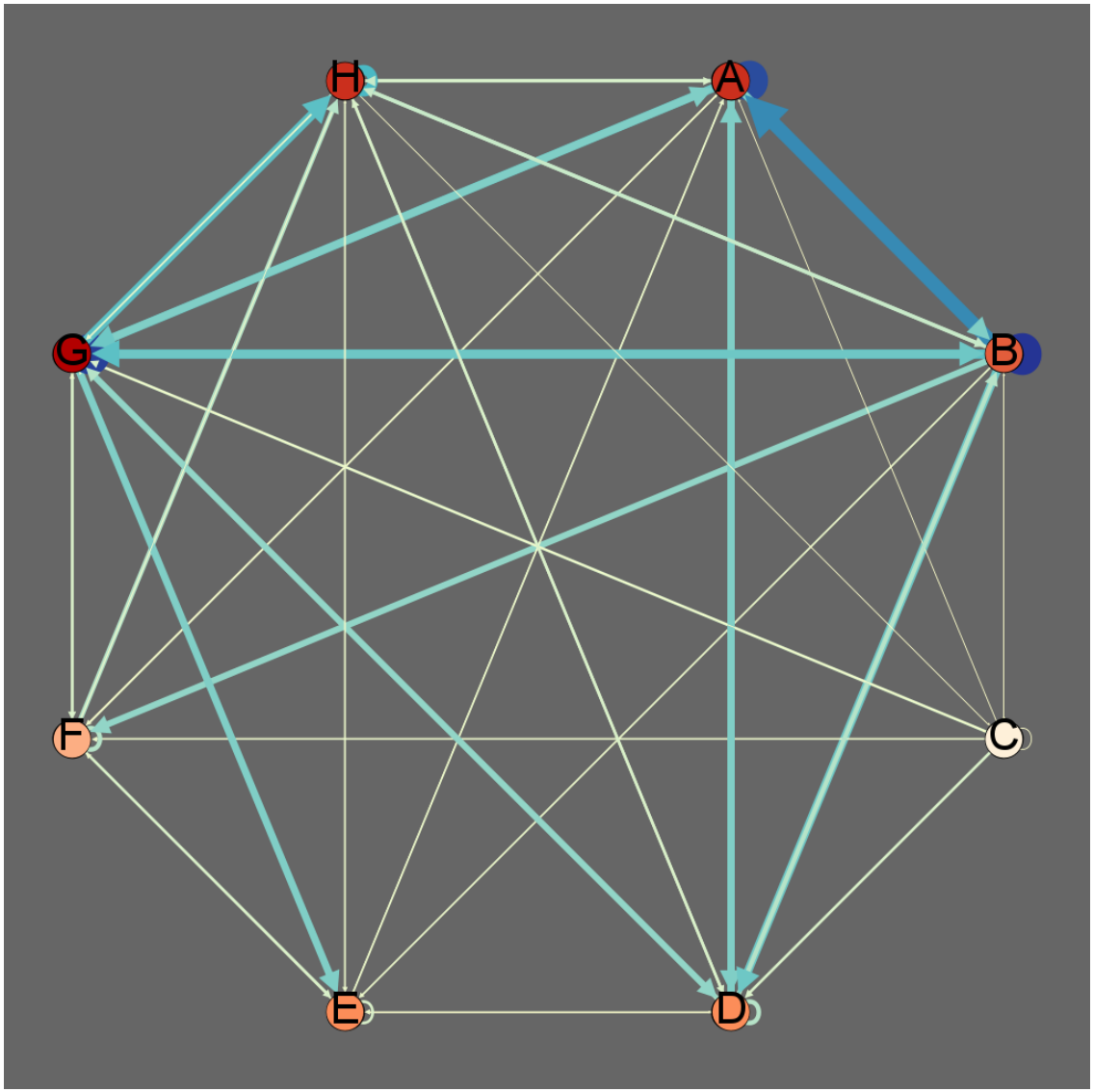
Figure 2.9. *Dendrogram (hierarchical clustering) of connectedness voids (Author's elaboration)*

Table 2.9. *Interrelationship between clusters of connectedness voids (Author's elaboration)*

	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	
A	20	8	0	8	1	2	9	4	**52**
B	15	22	1	9	2	7	10	4	**70**
C	1	1	1	3	0	2	3	0	**11**
D	8	5	0	5	2	0	5	3	**28**
E	2	0	0	1	3	2	1	1	**10**
F	1	0	0	0	3	5	2	5	**16**
G	8	9	1	7	8	3	21	10	**67**
H	3	4	1	3	2	1	2	11	**27**
	58	**49**	**4**	**36**	**21**	**22**	**53**	**38**	**281**

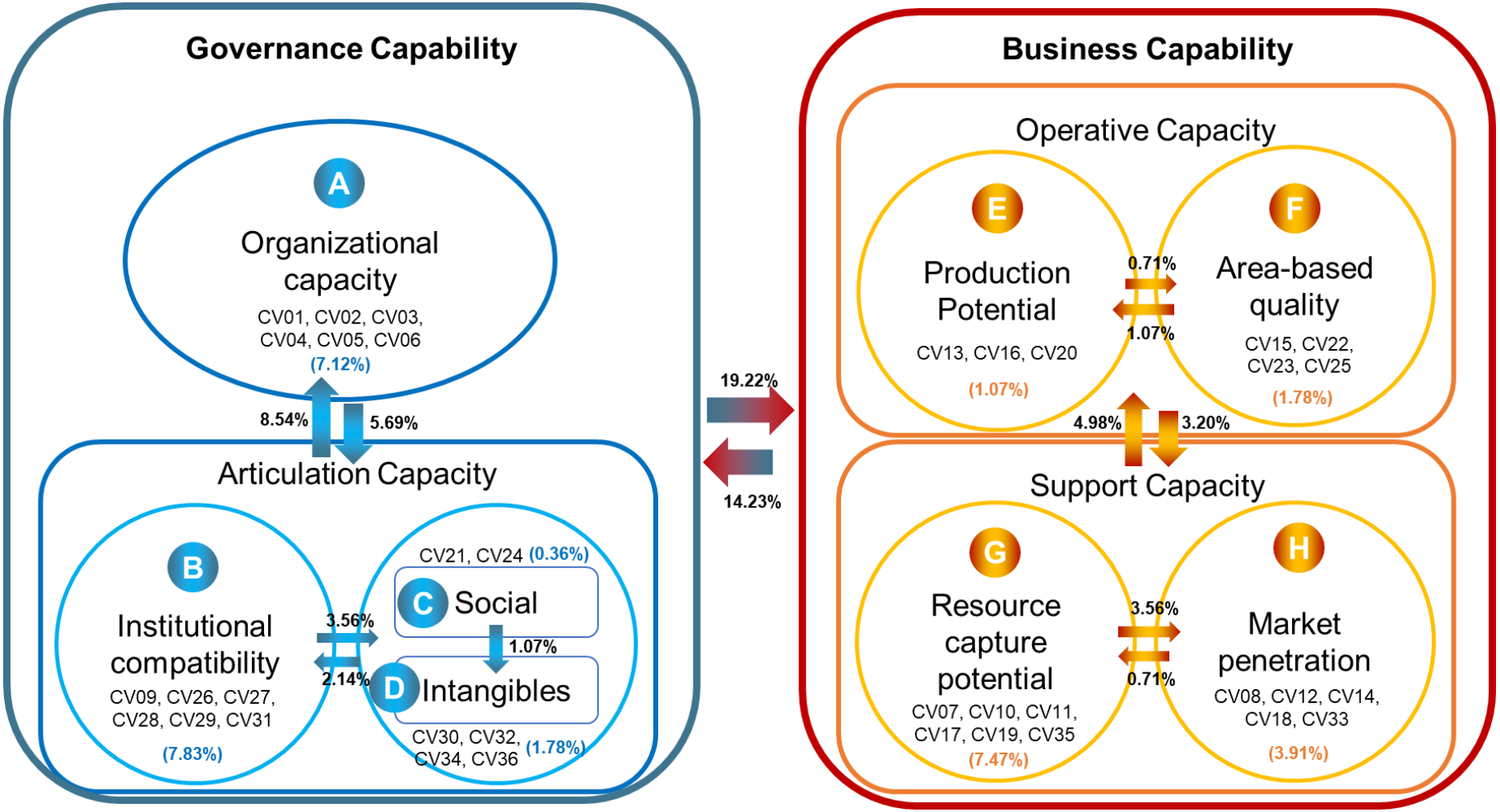
*Clusters (vertices):
-A= CV01, CV02, CV03, CV04, CV05, CV06
-B= CV09, CV26, CV27, CV28, CV29, CV31
-C= CV21, CV24
-D= CV30, CV32, CV34, CV36
-E=CV13, CV16, CV20
-F= CV15, CV22, CV23, CV25
-G= CV07, CV10, CV11, CV17, CV19, CV35
-H= CV08, CV12, CV14, CV18, CV33

** Total number of relationships: 281(100%)
-Clusters (main diagonal, self-loops): A=20(7.12%), B=22(7.83%), C=1(0.36%), D=5(1.78%), E=3(1.07%), F=5(1.78%), G=21(7.47%), H=11(3.91%) = 88(31.32%)
-To calculate the relationship between clusters, e.g., A&(B+C+D): as A→(B+C+D) = 16(5.69%) and A←(B+C+D) = 24(8.54%)
-Thus, sum of relationship between clusters: 193(68.68%)



*Intensity/Weight of edges are in blue scale (+weight = +blue), and weight of nodes in red scale (+Weight = +red).

Figure 2.10. *Interrelationship between clusters of connectedness voids (Author's elaboration)*



*Percentages out of 281 (total number of causal relationships)

Figure 2.11. *Theoretical Framework: Interrelationships of connectedness voids (Author's elaboration)*

The theoretical framework (**Figure 2.11**) allows us to classify the connectedness voids in two large groups and explore their relationships within the clusters and between them. The first group is named as **governance capability** (A, B, C, D) and is composed by four clusters, most of them related to human interrelations and their structures, codes, and values:

- **(A) Organizational capacity:** This subcluster contains voids (CV01, CV02, CV03, CV04, CV05, CV06) related to how actors related, articulate, and organize themselves and their productive activities.
- **(B+C+D) Articulation capacity:** Composed by two subgroups, relates to the social, legal, and intangible conditions to articulate between actors.
    - **(B) Institutional compatibility:** Third-level cluster (CV09, CV26, CV27, CV28, CV29, CV31) that considers the public capacities and limitations in terms of the harmonization of their agencies, instruments, and related mechanism.
    - **I Social & (D) Intangibles:** Third-level cluster that can be decomposed in other two groups related to social components (Social: CV21, CV24), or sets of intangible resources (Intangibles: CV30, CV32, CV34, CV36).

In terms of the second groups, we have the **business capability** (E, F, G, H) that is composed by the other four clusters, most of them related to production and market factors:

- **(E+F) Operation capacity:** This second-level cluster related with two subgroups and can be interpreted as the potential for quantity and quality of production.
    - **I Production potential:** Third-level cluster (CV13, CV16, CV20) that can be interpreted within an input-process-output scheme.
    - **(F) Area-based quality:** Third-level cluster (CV15, CV22, CV23, CV25) related to the contextual factors that determine quality (e.g., land, environment).
- **(G+H) Support capacity:** Second-level cluster that groups voids that can leverage production by providing knowledge, funding, market strategies, economy of scale.
    - **(G) Resource-capture potential:** Third-level cluster (CV07, CV10, CV11, CV17, CV19, CV35) oriented to the provision of technical/professional and financial resources (it includes actors that provide them).
    - **(H) Market penetration:** Third-level cluster (CV08, CV12, CV14, CV18, CV33) that groups elements that serve to connect producers to the market (e.g., intermediaries, market information, marketing channels, etc.).

From our analysis, we can observe what clusters are more closely related between them. While there are several interrelations between voids and or their clusters (**Figure 2.8** and **Figure 2.10**), we will focus on the relationships described in the dendrogram (**Figure 2.9**) and displayed them in **Figure 2.11**. Furthermore, although most of the shown clusters have bidirected causal relationships (edges going from one cluster to the other and vice versa), we will focus on the predominant relationship to interpret the theoretical framework. The most evident relationship is between the Governance capability (A+B+C+D) cluster and the Business Capability (E+F+G+H) one, where we can observe more causal relationships going from the former to the latter, implying that the governance-related voids have more impact on business/production/market voids. This aligns with the initial proposal that cross-border value chains are political-economic initiatives whose cross-border governance model over the value chain processes can improve the articulation with new markets.

Analyzing the interrelationships within Governance capability, we observe that the components of the social cluster I such as poverty, demographic decline, and gender inequity impact to the intangible cluster (D) voids namely as lack of trust, joint identity, change capacity, or knowledge transfer. This implies a minimum level of social development to improve capacities (e.g., involving youth and women in trainings to increase knowledge transfer or innovation). Simultaneously, the cluster B related to institutional compatibility or cross-border public-public articulation (how public institutions interrelate through actors, laws, policies, or regulations) have an impact on those social & intangibles voids. These joint cluster (B+C+D) named as Articulation capacity affects the Organization capacity (A) – a relationship that make sense as the lack of mutual compatibility, commitment, or minimum conditions have an impact in the foundations of any cross-border governance model (from the existence of previous cross-border relationships to the formation of cross-border institutions).

On the other side, in the Business Capability group, we can observe two main subclusters. The Support Capacity (G+H) reveals how cluster G components (voids related to what is the potential to capture resources such as knowledge and funding) have an effect in their capacity to penetrate markets (cluster H: reduce intermediaries, achieve better prices and markets, develop more bargaining power). In addition, the improvement of quality-related voids (F), such as improving standards and production processes, has an impact in the potential of production I, leading to higher volume and therefore, the operative capacity (E+F) of the CBVC. Finally, the support components have an impact in the operatives ones as the access to market and resources can increase quality and quantity of production.

This framework to understand the connectedness voids can lead us to understand the causal relationships between voids, how they interrelate with the cross-border value chain (value chain analysis), and how their dynamics are deployed in the cross-border territory (spatial analysis) are three relevant steps that need to be taken to evaluate CBVCs. However, it is needed further validation based on empirical data (this is conducted in **Chapter 6**).

9. Discussion

The present Chapter has focused on building the body of knowledge of cross-border value chains to develop an analytical framework that can initiate a discussion on how these spatial-economic configurations promote connectedness in cross-border regions, that is, the articulation of value creation processes between both sides of the borders, and their linkage with external markets by embedding their products into international trade flows. Due to the lack of a unified and well-connected literature on cross-border value chains, this chapter has intended to fill this gap by conducting a Systematic Literature Review.

As starting point, the main theoretical claims were developed –the Ontology of Scale, Neo-Institutional Theory, New Institutional Economics, and Cross-Border Governance Theory–, to build from there the main concepts that support the idea of CBVCs –Value Chain Approach, Cross-Border Territorial Development, and Institutional Voids Approach. The theoretical and conceptual framework represented the research compass to carry out the eight-step SLR. This methodological approach aimed to develop four inquires: the definition of a CBVC, its relevance, the mechanisms behind it, and the institutional voids that avoid its development.

The Systematic Literature Review cast sixteen sources related to CBVCs, between academic articles, methodological guides, policy recommendations, consultancy reports or project proposals. However, as **Table 2.5** showed, most of them were case studies (with flaws such as considering subregional level, few details on the cross-border nature, or no clarity of the main bottlenecks) and only one source with a theoretical approach (oriented to the design of CBVCs but does not map the potential bottlenecks). Thereby, our SLR reveals that, although the idea of cross-border value chains exists in several regions in the world with similar problems (**Table 2.6**), there is a lack of theoretical and methodological tools to integrate the value chain approach with cross-border territorial development. The present Chapter links both approaches by incorporating the concept of institutional voids, implying that filling these gaps is possible to articulate production with development across borders. Thus, our theoretical framework represents a comprehensive approach to cross-border value chains that identifies their definition & purpose, operating mechanisms, connectedness voids, and causal relationships that prevent initiatives to be successful, allowing not only to study CBVCs, but support their design, and predict the outcomes of those interventions.

The cross-evaluation of sources gave some insights about the CBVCs. As a spatial-economic configuration for developing cross-border regions, a CBVC can be considered as a localized phenomenon in Latin American and South Asian contexts, to develop lagging CBRs based on the

productive articulation of primary sector and basic manufacture. Thereby, a CBVC approach becomes a spatial-political development tool that builds on existing productive and trade flows across borders. However, initiatives to formalize them is more a recent trend that have been explored in the last two decades (as an alternative to other more 'developed' spatial-economic strategies such as clusters), but with few achieved projects – and even less project evaluations– in both regions. While this explanation emerges from the selected sources, new literature reviews and qualitative research are recommended to discuss these hypotheses.

Based on the Systematic Literature Review, a Cross-Border Value Chain can be defined as a concatenation of activities in which each of them adds value to a product, and whose value creation is carried out partially or totally throughout the cross-border region. As it demands the participation of governments due to the international nature of borders, a CBVC becomes a political-economic initiative with local social impact, where cross-border participants work together towards a common or complementary productive development goal. The SLR also revealed that CBVCs are relevant because they represent a path for multi-scalar regional integration, insert products in the global economy, foster cross-border sustainable development, generate value (create and capture), promote peace, and serve as innovation labs. Those goals are achieved by benefiting from border proximity and complementarity, generating economy of scale, promoting area-based development, building cross-border governance, replacing negative spillovers, and fostering cross-cutting and leapfrogging strategies. More research is required to know if current CBVCs have achieved to develop these mechanisms and fulfill those objectives.

The last outcome from the SLR was the Connectedness Canvas or list of 36 institutional/connectedness voids in cross-border value chains (summary in **Appendix 4**). This research has widely explained the concepts of the voids, the problems that they generate, the unlocked potentialities of their solutions, and the opportunities and risks behind them. Based on the writing-as-analysis technique, some learnings can be clarified to understand more the voids. Linking to our theoretical and conceptual framework, the connectedness voids represent the lack of institutions – or factors that affect institutions– that can foster the capabilities and fulfillment of people, communities, and places. Filling these voids would lead to the construction of those capacity-building institutions and therefore, a sustainable or long-term approach to local development in cross-border regions.

Identifying the connectedness voids was a good exercise to distinguish facts (e.g., high transaction cost) from the problems that generate them (e.g., irregular supply, lack of intermediaries) to bring a better comprehension of the complexity of the Pandora's box of development. In the same way, other more complex problems (e.g., strong GVC governance, regional oligopolies) does not imply to create new void categories, but to understand their impact on each void and they are amplified (e.g.,

oligopolies generate stress on demand and price dynamics, replace cooperation with competition, limit the access to logistic or manufacture services, etc.).

It is needed to highlight that many voids might not be issues that only affect cross-border regions: While some voids are clearly related to CBRs (e.g., informality of cross-border economies, illegal flows, etc.), some issues such as the lack of association capacity, gender equity, or technical knowledge can be found in these areas as much as in any other rural or lagging area of the world. However, the opportunities that cross-border regions bring to the table make a difference in how to answer those problems (e.g., copying cooperative structures or women associations from one side to another, cross-border learning, etc.).

This chapter does not only described the problematic of each void, but also their possible solutions. First, this research helped to address that the lack of a believed 'solution' (e.g., local knowledge, innovation) is not a problem, but what exactly is behind this solution (e.g., local knowledge facilitates the trial-and-error of knowledge transfer, innovation increases the pace and capacity to change) is the real target that needs to be ensured. In addition, solving one void will not generate so much impact as it is interconnected with others (e.g., improving product quality but still selling the products to middlemen). Fortunately, one solution can tackle several voids at the same time (e.g., strong cooperatives can increase scale of supply and demand, provide financial incentives, attract more partners, etc.). This interconnection between the connectedness voids forces us to think 'outside the box' and start thinking about comprehensive alternatives that integrate solutions into more cohesive responses with a multistakeholder-interdisciplinary approach.

As an analytical framework, this canvas strives to provide flexibility in assessing cross-border value chains, as each varies depending on its context, product, history, etc. Thus, practitioners and scholars can adapt the list of connectedness voids to their own situations. As a theoretical framework, it sheds light about the possible relationships between the voids based on quantitative analysis (network clustering) of qualitative data (causal relationships based on literature review). However, some questions are still to be answered: are these all the possible relationships? Are they correct? Do they reflect the cross-border reality? Thus, further research should be oriented to determine the validation of the proposed framework (conducted in **Chapter 6**).

This proposed theoretical model can also be useful to assess solution proposals and therefore, support their design process. New productive articulation initiatives to promoting economic development in cross-border regions should consider that developing local capacities is a medium- and long-term process. Thereby, beyond the spatial allocation of the investments, how they are executed has a great weight in determining the outcomes. Finally, one question is left: Where is the value within the borders? The value of the borders is always in 'the other side', in the act of crossing, cooperating, and unraveling the potentialities within them.

Chapter 3 Methodology

Chapter 3. Methodology

1. Methodological Framework

This chapter introduces and details the selected methodologies to conduct our research. As explained in **Chapter 1**, we conduct the analysis at two levels: macro-level and micro-level (**Table 3.1**). The methodologies to analyze macroregions are oriented to explore how they have behaved in terms of developing mechanisms for cross-border integration & development. It starts with a statistical analysis (**Chapter 4**) to classify these mechanisms and select the most relevant cases: the CAN and MERCOSUR. This is followed by a multidimensional comparative analysis between their macroregional cross-border systems and evaluate them in term of their effectiveness (**Chapter 5**). These analyses aim to clarify the institutional connectedness between MR-CBRs and select the most effective initiative/s that has/have been implemented for cross-border productive articulation to later test whether it/they promoted local economic development in the CBR. As a result, we selected the coffee CBVC from the INPANDES project of the CAN.

Table 3.1. *Methodological Framework (Author's elaboration)*

Methodological Framework	
Macro-level Analysis	Macroregional Statistical Analysis (Ch.4)
	Comparative Institutional Analysis (Ch.5)
Micro-level Analysis	Causal Graph Models
	Case Study & Field Research
	CBVC Analysis (Ch.6)

The micro-level analysis aims to study the cross-border microregion, how it was supported by the macroregion, and its articulation to international value chains. Two methods were used to conduct the analysis in **Chapter 6**. First, we introduce the Causal Graph Models (CGMs) as method to operationalize the theoretical framework. Second, we explain the case study methodology and the field research (methods, procedure, collected data, etc.). The CBVC analysis (**Chapter 6**) develops Q4, Q5, and Q6 by exploring the cross-border value chain, validating the theoretical model, and testing the hypothesis. This translates in the project evaluation of INPANDES in terms of its effectiveness to fill the existing connectedness voids in the coffee CBVC. Thus, this micro-level analyses aim to articulate institutional connectedness, economic connectedness, and local development through the selected case study.

2. Macroregional Statistical Analysis

This chapter focuses on identifying and comparing the position of macroregions towards their 'internal' borders by exploring the type of border and cross-border mechanisms/policies that have been promoted as part of their integration schemes. As an exploratory research, further study would be required to deepen in more theoretical and practical debates. However, the results presented here could be used as a starting point for future discussions on the meaning and role of borders within macroregions. To conduct this research, first it was decided what kind of territorial arrangements would be considered as macroregions. Since border and cross-border policies in macroregions are mostly binding legal tools, the identification of Regional Integration Agreements (RIAs) was the departure point for selecting those regions. Two datasets were selected as initial references as they present comprehensive lists of such multilateral agreements: UNU-CRIS (2021)'s Regional Integration Knowledge System (RIKS) and Börzel and Risse (2016)'s Handbook of Comparative Regionalism.

Three reasons are behind considering RIAs as starting point. First, it is recommended to select regions that have already been institutionalized or recognized by relevant actors or that have a degree of 'actorness' or 'regionness' (Lombaerde and Langenhove, 2006). Second, this kind of agreements promote governance institutions (norms, rules, procedures, entities, etc.) which influence the transformation of national order and how nation-states should perceive and use their borders (Pevehouse, 2005; Börzel and van Hüllen, 2015a) as hinges for integration and development in new territorial schemes. Finally, since most RIAs have emerged based on previous geographic-cultural constructions throughout history (Hettne, 2005), they share a similar geographical space with existing geographical or cultural macroregions (Jones and MacLeod, 2004) (e.g., OAS associates with American continent, CELAC and LAIA with Latin America, BSC or BSEC with the black sea basin).

To narrow the scope, some criteria were used to filter the final list. First, we selected RIAs signed by a minimum of three actors (no bilateral agreement was considered) and a maximum of 70 states (to avoid Ios that may represent global networks of governance like the UN or WTO) that have been in force during the last 10 years. In addition, specific sectorial organizations (banks, funds, research networks, etc.) were not considered as they may not reflect a direct impact on border policies or are already part of existing integration schemes. Finally, RIAs promoted by other RIAs (e.g., European Single Market promoted by the European Union) could be considered as different processes of region-making with different spatialities –therefore, delimiting different macroregions. However, for the sake of this research, they are considered as the 'action area' of the leading macroregion: the former could be considered as a mechanism for the latter to achieve a specific objective (e.g., the ESM as EU's

action area to leverage itself in the global economic dynamics), which depending on their future steps, may represent divergent or convergent regional projects (Kuus, 2020).

For the selected regions, their institutional purpose as well as the macroregional space were identified from a geographical, historic-cultural, and political perspective. Geographical conventions were based on the landforms and the UN's M49 standard (2021), while cultural ones were based on literature review of cultural regions (Huntington, 2000; Marston, Knox and Liverman, 2001). This information was complemented with some regional integration indicators as GDP ratio, total area and population, membership, etc. coming from their official websites and the World Bank Statistic Database (2021).

To identify the macroregional border and cross-border mechanisms, the RIAs' official websites, documents, and related research were also reviewed. Prioritizing the delimitation/separation functions of border policies, they were classified into three groups: security-related (border security programs, migration policies, etc.), economy-oriented (FTAs, custom unions, single markets, etc.) and accessibility-based (joint border-crossings, economic corridors, etc.). For the cross-border ones, it was identified what kind of cross-border intervention have been realized (projects, funding initiatives, joint legal structures, etc.) and their sectorial approach (environment, social, etc.) in the macroregions where nation-states share physical borders. The final list of macroregions can be observed in **Appendix 5**.

The statistical analysis Is not focused on measuring the quality or efficacy of those policies but on finding correlation between the macroregional properties and the presence of policies by using dummy variables: for example, if there are security-related policies in a region, a value of 1 is assigned. Otherwise, the value is 0. Further analyses were mainly focused on the macroregional cross-border mechanisms. The macroregions where most nations share physical borders were classified according to their approaches towards cross-border issues. Finally, 28 regions were compared according to their CBC mechanisms, showing the current state of macroregional interventions in CBRs. The list for references can be found in **Appendix 6**.

3. Comparative Institutional Analysis

Literature review reveals that there is not standard analytical framework to evaluate the system of macroregional cross-border mechanisms to promote CBC. Within Comparative Regionalism studies –that involve conceptual and methodological tools from political sciences, international relations, and more–, few works have focused on the interlinkages between macroregions and cross-border microregions (Söderbaum, 2005, 2017; Lombaerde, 2010). These researches present an overview of the types of MSRRs between both types of regions: complementarity (how macroregions support

microregional development and vice versa), competition and substitution (how one regionalism fills the gaps of the other or they have incompatible development models), and parallelism (although there is no strong connection between both types of regions, they share common values and/or similar territorial logic). However, these works sketch a general perspective without mentioning the mechanisms involved in those relationships and how to evaluate them. It also does not make a spatial distinction between border and cross-border spaces, a requirement to adding conceptual rigor to the analysis.

According to Koff (2008), few works have considered a comparative methodology to analyzing cross-border regionalisms, and mainly within the macroregional context of Europe (EU) and North America (NAFTA). Scott (1999) evaluated the supranational integration (logic of regional integration and CBC tools), cooperation frameworks (multilevel governance in terms of institutional framework and actors), and operation agendas and strategies (overview of involved sectors in CBC interventions). Blatter (2004) took a different approach by theoretically producing a typology of cross-border political institutions, analyzing case studies through those lenses, and inducing from them their regional cross-border institutionality and the role of cross-border spaces within the macroregions. Both works focus on generalizing cross-border regionalism based on the conditions created by the regional socioeconomic dynamics, institutional frameworks, and multilevel actors. However, due to the specific conditions of every CBR, it is an ambitious task to consider this cross-border regionalism as homogeneous throughout the macroregional space.

Based on the previous works and other analytical tools such as the Institutional Analysis Framework (Ostrom, 2010) or the rational policy analysis model (Patton, Sawicki and Clark, 2015), it is possible to draw some analytical categories that contribute to the study of macroregional top-down facilitation of bottom-up CBC processes (**Table 3.2**). The goal is to provide an overview of the conditions that those mechanisms create for shaping CBC initiatives in their macroregional space more than the type of cross-border regionalism that they promote. This research considers the macroregional cross-border mechanisms as a system because, although each instrument target CBI&D from a different perspective, many of them interact between themselves. Later works should be conducted to weight the specific impact of every mechanism.

Five analytical categories (**Table 3.2**) were selected to proceed with the evaluation. First, a general perspective of the border realities and dynamics is given to highlight the main issues with a cross-border nature. This is followed by an examination of the cross-border strategies within the macroregional integration, the supranational agencies, and legal frameworks in which they operate, and how they overlap with other cross-border initiatives from other levels. Then, the macroregional cross-border mechanisms are described and evaluated (descriptive policy analysis), paying attention to how the sectoral agendas have answered to their cross-border issues. This will give a general overview of the macroregional cross-border institutionality, its evolution, current potentialities, and further direction

to its spatial strategies. Qualitative analysis will focus on official public documents such as agreements, decisions, project reports, and previous research evaluating macroregional cross-border mechanisms. This is complemented with interviews with researchers and policymakers.

Table 3.2. *Analytical categories (Author's Elaboration)*

Analytical category	Description	Objective
Macroregional Context of CBRs	Review of the common characteristics of borders, border regions and cross-border phenomena (dynamics, synergies, shared issues, etc.).	Identify cross-border problems and opportunities
Macroregional cross-border (MRCB) approach	Explore the macroregional logic and spatiality, how cross-border strategy fit within macroregional integration, and brief historic review of its conceptualization process.	Identify role of CBC and conceptual evolution
MRCB Governance	Identify the entities, structures, and rules behind macroregional CBC strategy and the compatibility with concerning overlapping frameworks (border policies, other macroregions' strategies, bi/tri-lateral agreements, etc.).	Identify the capacities and limitations
MRCB policy system	Review of macroregional CBC mechanisms (and their relationship) in terms of their objectives, execution, expected results and performance evaluation.	Evaluate CBC interventions
MRCB Sectoral-spatial strategies	Explore how the mechanisms have approached the cross-border problems and opportunities in a sectoral perspective.	Evaluate progress and further actions

4. Causal Graph Models for Cross-Border Value Chains

A Causal Graph Model (CGM) is a Bayesian Network or Directed Acyclic Graph (DAG) in which each node represents a variable of interest (random variables), and each edge (links) represents a causal relationship between two variables, all of them associated in a set of joint probability distribution (probability of distribution) (Pearl, 1998; Nadkarni and Shenoy, 2001; Spirtes, 2005; Glymour, Zhang and Spirtes, 2019). Causal graphs have been used by scholars from multiple fields such as biology, medicine, social sciences, among others (Wright, 1921; Morgan, 2013; Gebharter and Kaiser, 2014; Shen *et al.*, 2020; Wu and Wang, 2021), including engineering design and policy analysis (Sampson, Winship and Knight, 2013; Wu and Wang, 2021). This versatility is not only due to the need to study causal inferences in multiple fields, but also to the various benefits that causal graphs embody: CGMs give an overall picture of complex systems (Hoogerwerf, 1990), provide explanatory benefits to action sequences (Pearl, 1998), grant flexibility to adapt the model to changes (Pearl, 2000), or allow the use of nonparametric variables (unweighted relationships) (Sampson, Winship and Knight, 2013).

The Implementation of CGMs In the present research roots in two main justifications: its pertinence with the nature of cross-border studies, and the benefits of CGMs over other causal analysis methods to overcome the methodological limitations of the field of study.

In first place, border and cross-border studies have been widely conducted to analyze a variety of phenomena happening in cross-border regions. According to Van Houtum (2000)'s State-of-the-art, three approaches can be highlighted, each of them with a range of theories that can be used to analyze them (**Table 3.3**): flow approaches to determine the relevance of borders (core-periphery models, location theories, gravity models, etc.), cross-border approaches to study how to overcome border effects (network approaches, transaction cost approaches), and people approaches to comprehend the 'construction' of borders and CBRs (social constructivism, spatial identity approaches, behavioral approaches).

As **Chapter 2** described, CBVCs have not been deeply explored to automatically assign a methodological process to their study. However, as our CBVC theory internalized the claims from both network and transaction cost theories (both described in **Chapter2**), as well as the present research focused on evaluating effectiveness assuming missing links in cross-border spatial networks, our theoretical proposal would be placed in Van Houtum's second category. Implementing CGMs would fit under this cross-border approach, as conducting descriptive analyses (e.g., categorical analysis, event-root cause analysis) can provide the required data to shape the CGMs (Lambert and Lambert, 2012), and prescriptive analyses (e.g., Bayesian Networks, machine learning, clustering-based heuristics) can help us to interpret them and measure their performance (Lambert and Lambert, 2012; Lepenioti *et al.*, 2020). While previous border and cross-border studies indicate the most common used methodologies, they also raise the importance of methodological innovation (Amelina *et al.*, 2012), being CGMs an interesting contribution to this field.

Table 3.3. *Main approaches for Borders and Cross-Border Studies (Van Houtum, 2000)*

Table 1. Emphases in the Studies on Borders and Border Regions

	Flow Approach	Cross-Border Cooperation Approach	People Approach
Problem Orientation	Analysis of the discontinuity in (physical) interaction flows across borders	Analysis of effective strategies to overcome borders and stimulate cross-border development and Euregionalization	Analysis of the territorially divergent constructions of social practices, spatial identity, and spatial cognition
Central Question	Do borders matter?	Borders matter! How can they be overcome?	How are borders constructed?
Theoretical Framework	-Core-periphery models -Location theories -Central places approach -Gravity models -Economic potential models	-Network approaches -Transaction costs approaches	-Social constructionism -Spatial identity approaches -Behavioral approaches -Action approaches
Assumption on Human Behavior	*Homo economicus*: Minimization of (distance) costs	*Homo cont(r)actis*: Maximization of cont(r)acts	*Homo socialis*: Human behaviors and affections are socially and spatially constructed
Assumption on Space	Space is homogeneous	Cross-border spatial networks have missing links	Space is affectively and cognitively divided
Key Terms	-Physical distance -Discontinuity -Transport costs -Economic potential -Accessibility	-Effectiveness, success -Tools, instruments -Connectivity, openness -(Dis)similarities, differences, synergy -Networks, cooperation, alliances	-Spatial cognition -Spatial perception -Spatial affection -Spatial identity -Social construction -Social practices
Choice of Method	Computational analysis	Descriptive/Prescriptive analysis	Mental/Societal discursive analysis
Methodological Characteristics	-Material -Objective -Manifest -Static	-Material/Nonmaterial -Objective/Subjective -Manifest/Latent -Static/Dynamic	-Nonmaterial -Intersubjective/Subjective -Latent -Dynamic/Evolution
Connotation of Borders	-Physical barriers -Artificial distortions of equilibrium -The penalizing barrier effect of borders is measurable	-Artificial barriers to integration -Borders are both challenges and opportunities for contact and integration	-Borders are social constructs -Borders are relevant markers of identity -Borders are demarcations of certainty
Connotation of Border Regions	-Peripheral -Socially and economically marginal areas -"Passive" space	-Peripheral -Challenged to become central -Micro-scale laboratories -"Active" space	-Border regions are political and social constructs -Juxtapositioned, overlapping zones confronting national and regional identities
Types of Distances	-Travel or transport distance -Euclidean distance	-Economic distance -Administrative distance -Social distance -Cultural distance	-Affective distance -Cognitive distance -Mental distance

In second place, several researchers consider econometric approaches for causal inference in policy analysis (Spirtes, 2005; Heckman and Vytlacil, 2007). However, studies on the limitations of econometric studies (Moosa, 2017) recognize that causality tests based on the temporal ordering of correlations are misleading and do not present a narrative explanation on the identified causal relationships. For this research, three reasons justify the use of mixed-methods approach and CGMs over other options.

First, considering the nature of our random variables (the connectedness voids), the parametrization of each of them represents a task that requires to delve in each of them with a more comprehensive literature review, identify the most appropriate attributes and select the data collection methods for each of them (e.g., measurement scales of innovation, attributes to quantify how motivated is an actor) (Smith, 2005; Kirby *et al.*, 2021; World Bank, 2023). However, as CGMs are non-parametric arrangements, they do not require extensive quantifiable variables, but only need to determine the causal relationships (e.g., actors that have got more motivated, innovate more in the coming years), which can be labeled in terms its positive or negative effect (unweighted graphs expressed in binary) (Sampson, Winship and Knight, 2013). Thereby, CGMs reduces the need of strict quantitative approaches for data collection and analysis (although they can be used in further studies), benefiting the study of CBVCs.

Second, border and cross-border studies embody some methodological challenges in terms of defining units of analysis, the (de-)contextualization of cross-border relationships, or the availability and access to data (considering in-field collection) (Mata, 1985; Da, 2002; Amelina *et al.*, 2012). While the CBVC theory determines the units of analysis under its respective theoretical claims and places the cross-border relationships within the MSRR framework, data collection is a complex process due to the limited or incompatible datasets between both sides of the border (Wong Villanueva, 2019). In addition, the geographical dispersion of actors in border areas limits the implementation of questionnaire surveys and the fulfillment of quota, where more qualitative approaches such as semi-structured interviews or focus groups can be more effective to achieve under qualitative criteria of sufficiency such as purposive or convenience sampling (Bhardwaj, 2019; Wong Villanueva, Kidokoro and Seta, 2023). CGMs overcome this quantitative limitation as causal relationships can be established based on the combination of data and qualitative causal assumptions (Pearl, 2000) –as expected for the present study.

Third, if it would be possible to collect data for quantitative analysis, as each stakeholder embodies different ideals and representations –as explained in Wong Villanueva, Kidokoro & Seta (2023) as 'Scale difference'–, their appreciation and prioritization of objectives would be different depending on the position that they hold in the system. **Chapter 6** – Section 2.2 shows that the 'project satisfaction' scoring is perceived different by the executing team officers and by the benefited producers (more than double one from the other), raising difficulties in setting which score should be more relevant

for each void. Spatial approaches also presented limitations as border areas may not have all the geographic data required to analyze the cross-border region and localities (e.g., ArcGIS Pro does not count with the small roads, pathways, or trails uphill of the studied CBR). While subject nature of data might be a constraint for quantitative analysis, subjective knowledge is an expected aspect of input information in Bayesian Networks and causal graphs (Pearl, 1985, 2000; Montibeller and Belton, 2006).

The three presented limitations could be addressed by panel groups, methodologies that study subjectivity (e.g., Q methodology), creating multiple scenarios, or plotting new maps using the field data. However, these alternatives escape from the research objectives. The implementation of causal graph models and mixed-methods approach allow us to overcome the methodological limitations of cross-border studies while targeting the research objectives, without the need to bring more study methods. In addition, the CGMs allow us to work with qualitative datasets and transform them into matrix arrangements that could later be analyzed numerically or graphically. Nevertheless, CGMs are not a panacea for studying CBVCs, as the complexity of the research is transferred to the decision process to consider if causal assumptions are sufficient for assessing the causal effects (Pearl, 2000).

5. Case Study Methodology & Field Research

This section is divided in three parts: the selection of the site, the description of the case study methodology, and the description of the field research and how the different selected methods to collect data were implemented.

5.1. Site Selection

The process of selecting the location for the case study was conducted based on its relevance for the research question and previous chapters. **Chapter 4** revealed the implementation of eight types of mechanisms that have been implemented by macroregions for CBI&D, especially in terms of promoting research, and the implementation of projects and programmes. By analyzing their implementation, **Chapter 5** has as final purpose to select the most effective ones to evaluate how the best-case scenario would allow us to validate whether this intervention promoted sustainable local development in that cross-border region and/or to what extent it did so (effectiveness). Interviews were conducted with researchers and officers from both the CAN and MERCOSUR (see IN01, IN02A, IN64 in **Appendix 7**), confirming our findings and highlighting the INPANDES project from the Andean Community as the most successful initiative that they executed.

The INPANDES project was executed between January 2016 and December 2017, with final evaluation and reporting extended until March 2018. INPANDES was divided in six interventions, most of them with more than one 'component' (e.g., the Napo River Integration Corridor had the cacao CBVC component, and the pisciculture CBVC component). Among these experiences, five were cross-border value chains (alpaca, cacao, pisciculture, two for coffee). After the interviews, we selected the coffee cross-border value chain between Peru and Bolivia as former and current officers considered that it gave the best tangible outcomes not only among the CBVCs but also from the whole INPANDES. Thus, the selection of this project aligns with the analysis of cross-border value chains (**Chapter 2**) as the coffee CBVC belongs to one of the most advance experiences from the CAN (more than 10 years designing and executing cross-border productive articulation projects), represents one of the most implemented macroregional cross-border mechanisms in the world (projects and programmes as analyzed in **Chapter 4**), and one of the best experiences for CBI&D developed in the CAN and South American macroregions (**Chapter 5**).

The184mazone cross-border value chain between the region of Puno (Perú) and department of La Paz (Bolivia) focused on the cross-border region between the Bolivian communities of Puerto San Fermin and Cocos Lanza, and the Peruvian districts of San Pedro de Putina Punco and Cocos Lanza. This INPANDES intervention was executed by the Binational Autonomous Authority of Lake Titicaca (ALT) and operated by the Provincial Municipality of Sandia (MPS) under the supervision of the INPANDES team. As strategic partner, the project collaborated with the Central of Agrarian Coffee Cooperatives of the Sandia Valleys (CECOVASA), a Peruvian cooperative founded in 1970 that represents eight grassroot cooperatives and 4850 smallholder coffee producers from Quechua and Aymara ethnicity. Apart from the meaningful social component, CECOVASA exports around 95% of its production and has 'produced' three winners from international coffee contests, consolidating a strong economic/commercialization component.

Among the main issues affecting the mentioned actors, CECOVASA production reduced in a 90% from 2014, and Bolivian producers have been historically isolated without any contact with their public institutions, being the Peruvian side its main access to goods, services, and market. The INPANDES intervention promoted several activities across borders to promote the cross-border value chain. According to the CAN officers, the best outcome was the development of 'Café Frontera' (translated as Border Coffee) and its sale to a German wholesaler during the realization of the project. Thus, this binational brand produced by CECOVASA represented the connection between the Peruvian and Bolivian producers with the coffee global value chain – representing an ideal case to be further researched. Since the project culmination in 2018, there has been only one previous research about this experience (Mesía Herrera and Pinto Melgarejo, 2022) carried out by the former team leader of INPANDES and focused on the positive impact of associativity in the CBVC. This raises the high probability of an actor-observer bias and the need to further study this experience.

5.2. Case Study Approach

We decided to conduct an explanatory case study as this methodology allows to justify cause-effect relationships by explaining how and why some event(s) happened (Yin, 2003b, 2003a). As we understand cross-border territorial development as the conditions and institutions to foster the capabilities and fulfillment of people, communities, and places (**Chapter 2**), the connectedness voids represent a sustainable or long-term approach to development. Measuring them benefits our analysis more than other indicators for value chain projects (ACDI VOCA, 2012; IFAD, 2016), although three of them will be used as complementary measures: income increase (producer/individual level), export growth (cooperative/collective level), project satisfaction (all stakeholders involved).

Our case study had a double purpose: To explore 1) the situation of the connectedness voids in the cross-border value chain and 2) the effectiveness of INPANDES project on filling the voids (promoting local development). More specifically, we wanted to measure the change in the connectedness voids ($\Delta voids$) carried by the project. Thus, we consider the following variables to examine:

- Independent Variables: INPANDES project attributes (funding, actions)
- Dependent Variables: Connectedness voids + indicators ($\Delta income, \Delta exports, Proy_{Satisfact}$)

Procedures for data collection and analysis were designed considering additional methodological approaches for the study of scales/networks/assemblages namely as Actor-Network Theory (ANT) and Assemblage Theory (AT) (Latour, 2005; DeLanda, 2016). ANT contributes conducting case studies by providing recommendations to trace actors to recreate spatial-temporal networks (e.g., the INPANDES project), consider the role of non-human actors, focus on narratives and clarification of events, or keep attention to associations (concatenation and interaction between actors in the network). By the other side, AT helps to understand how different individuals, groups, and systems come together to create the movement, and how these different elements interact and influence one another (e.g., the formation of CECOVASA cooperative, or the formulation of INPANDES). These recommendations were used to conduct the field research.

5.3. Field Research

By considering appropriated measures to conduct face-to-face interviews during the COVID-19 pandemic, the field research was conducted between February 5th and March 25th (2022) in eighteen cities and communities in Peru and Bolivia. Semi-structured interviews were conducted prioritizing the actors that participated in the project and/or the current authorities in the agencies that participated (mayors, ambassadors, general managers, etc.). Focus groups or technical visits were conducted to explore and compare different perspective of common phenomena. In addition, other primary and secondary sources (e.g., reports, statistical data, municipal plans, export data, budget reviews, etc.) were collected. These sources would serve to bring a better understanding of the project, geography of the place, cross-border dynamics, product dynamics, etc. Follow-up consultations and interviews were conducted online to complement collected data.

As a result, a total of 105 interviewees participated in 63 interviews (physical and online) and 10 focus groups/technical visits (**Appendix 7**), recording 106 hours that would be later transcribed (intelligent verbatim transcription). More than half of the participants were from Peru as they had a higher participation in executing the coffee experience. **Table 3.4** summarizes the lists of stakeholders related to the coffee CBVC. Most mapped interviewees participated in the field research except from the Bolivian local government due to difficulties accessing Apolo city. However, as it had low participation in the CBVC, the absence of this interview does not significantly impact the results. How the field study was conducted is explained in the present chapter, highlighting recommendations that I learned and applied during my Master and PhD case studies and field research.

Table 3.4. *Summary of interviewees from the coffee CBVC (Author's elaboration)*

Stakeholders in Coffee CBVC	International	Peru	Bolivia	Total
Macro-level team (CAN & EU)	8			8
Micro-level team (ALT & MPS)	7			7
National Gov. (Foreign Affairs)		5	1	6
National Gov. (Sectoral)		7	3	10
Subnational Governments		5	1	6
Provincial Governments		2	0	2
Local Governments		9	0	9
Commonwealths		1	1	2
Private Sector (Cooperatives)		7	4	11
Coffee Producers		2	12	14
Others (NGO, Academia, etc.)		2	0	2
Total	15	40	22	**77**

5.3.1. Preparation

There are several recommendations that can be taken from a regular field research such as reading previous information about the project and area, develop the research tools, set priorities in terms of topics, sites, or stakeholders, and so on. However, conducting field research in border areas raises challenges to be aware.

First, it is important to be flexible and consider the limitations from the area or context (socio-political). Due to the COVID-19 pandemic, borders were closed for two years, and there was a lot of uncertainty if they would open by the time we got to the study area. While this was not a limitation to study the coffee CBR (no border crossing there), it was an obstacle to contact other stakeholders from Bolivia (most located in La Paz). We kept a flexible itinerary and budget and fortunately (see both in **Appendix 8**), the borders opened two days before arriving to the study area – although there was still high uncertainty due to the travel restriction between Peru and Bolivia imposed by the pandemic (e.g., need of COVID-19 test). In addition, the itinerary must be adapted according to the current political, economic, social, or cultural context or events (e.g., February was Carnival month).

Second, contacting border stakeholders has its limitations due to low internet connection (difficult to have online meetings), weak antenna reception (difficult also to make calls), low use of institutional mails (and therefore low reply), and informality of several institutions and actors. Thus, the use of social media, especially WhatsApp or Facebook chat, is crucial to contact stakeholders (including public officers). Having good contacting skills and initial contacts (we discuss this later), digital versions of documents (official Presentation Letter), and good phone provider helps to reduce the obstacles (some telephone companies have better reception at border areas).

Third, travel logistics. Conducting field study between two countries means that you need to think about the 'duality of the case': bring cash in two currencies, two SIM-cards, documents in different languages, and even different plug types and voltage adapters. The altitude differences between the jungle (900 to 1300 masl) and the highlands (3800 to 4300 masl), was also considered by selecting appropriate clothes, medicines, or any other relevant supply. Should be included other tools such as digital recorder, USBs, cables, laptop, camera with GPS, presentation cards, or printed research tools (maps, questionnaires, etc.), while traveling light (almost empty luggage to storage collected docs).

Finally, we considered the 'four notebooks' recommended by ANT. As this approach highlights the relevant of data collection, it divides the field data in four categories: 1) Self-experience (own perceptions, appointments, feelings, etc.), 2) field research information (write collected data in chronological and thematical order), 3) draft notes (ideas, drafts, small compositions, explanations, etc.), and 4) self- experience as researcher (researching as means to create, modify, or reactivate relationships within the network of actors). Visual Media (photos & videos) is found in **Appendix 9**.

5.3.2. Fieldwork Trip & Itinerary

In the beginning we endeavored to study both the coffee and the alpaca CBVCs as they shared common institutions, and we divided the field research in five stages: 0) Lima (preparation), 1) Puno area, 2) Jungle area, and 3) Highlands area, 4) Closing (Puno/Lima) (**Figure 3.1**), traveling around 3000km between the eighteen visited sites. However, we did not consider the alpaca case for further study as the main partner of the alpaca intervention, the Central of Alpaca Special Services Cooperatives of Puno (CECOALP), was already disbanded and most interviews during the case study revealed that most activities did not have a good outcome – even during the execution of the project.

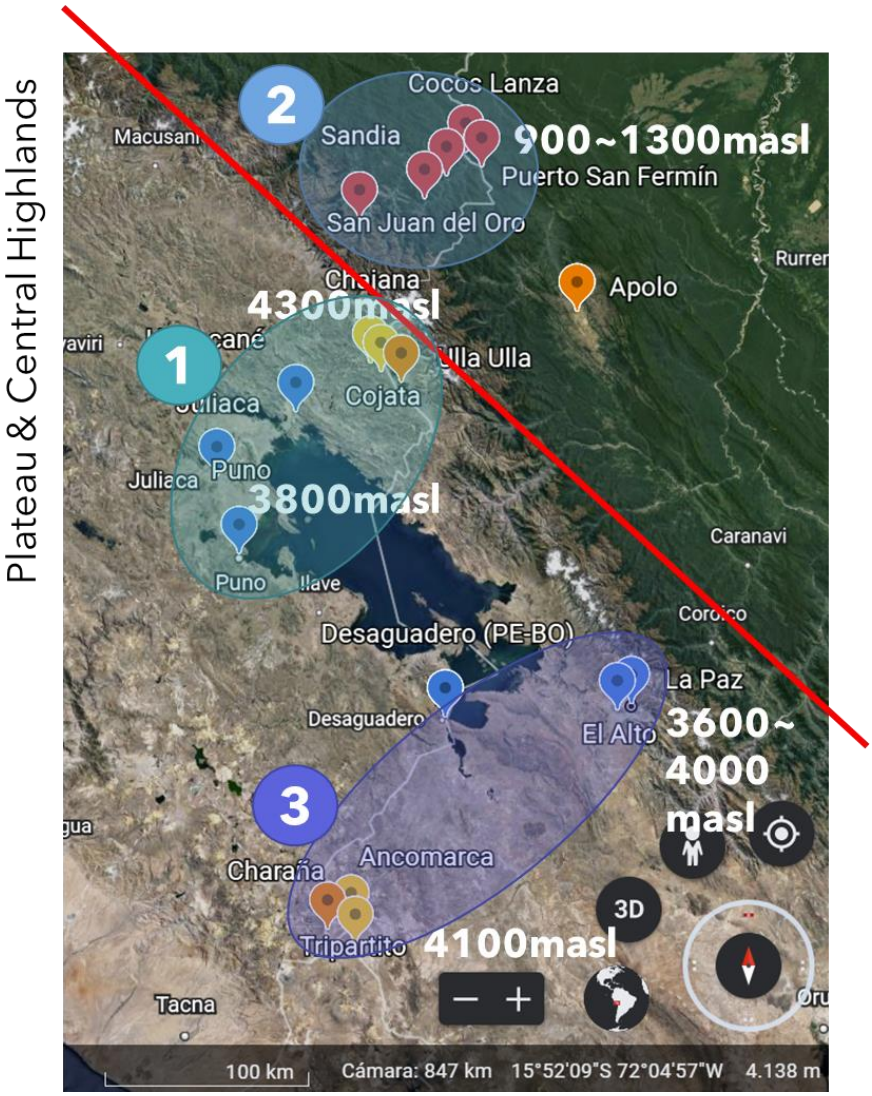


***Figure 3.1**. Visited sites during Field Research (Author's elaboration)*

5.3.3. Contacting & Arranging Meetings

As commented, **contacting interviewees** is challenging due to the connectivity of borders. Although **mailing** is an essential step at an initial point (it gives formality to the research trip), there are more efficient techniques. As a general recommendation, having all academic credentials (e.g., presentation letters, presentation cards, identity cards, etc.) raises the formality of the research independent of the contacting method or contacting means (e.g., social media, formal mail, etc.). This approach is especially effective for obtaining interviews with the 'heads' of the institutions or companies (e.g., mayors, department heads, important officers, general managers, etc.). These interviewees should be prioritized as they can provide with more information or other contacts that can provide support to the case study. In any case, making calls are more effective than social media, and the latter are more useful than e-mail. In addition, four contacting techniques are explained in this section.

First, one of the most efficient techniques is approaching **hot contacts** such as colleagues, previous interviewees, known officers in public institutions, and even friends and family members. For this research, I started contacting officers from Peruvian institutions and the CAN that I already interviewed in my Master research. In addition, commenting the research topic with family members – that commented to other relatives and friends, opened the possibility to arrange initial interviews with public officers in Puno and get to know first-hand about the city, context, case study, and other potential contacts.

Cold contacts are also essential for conducting research and tend to be the main approach when starting field research. The most common way is contacting officers or stakeholders through their websites or institutional mails. However as commented, while this can work for national agencies, it is more difficult with provincial or district entities. If there are not hot contacts nor reply to mails, a direct approach to the institution would be recommendable (knocking door and asking for someone that can help in the research). This can be inconvenient when approaching to public entities due to their bureaucratic system, but this can be negotiable.

In addition, field research in border areas faces another challenge: the probable need to restart the contact network when crossing borders. Despite of the cross-border nature of the dynamics, most actors are interrelated within the country and few key ones with the other side, and not finding/meeting them in time would lead to restart with cold contacting again. In our field research, the community of Cocos Lanza was practically isolated from Bolivian and Peruvian dynamics, so a direct approach was needed. The same happened when contacting public entities in Bolivia (there was not so much interaction with Peruvian ones).

The third method was **snowball technique** or how to get potential interviewees from hot and cold contacts. This is a relevant step to reduce efforts and arranging interviews faster. Commenting the interviewee that a common person recommended me generates rapport from the first moment. In our field research, this was the most efficient technique to approach mayors from provincial and local municipalities. Eventually, some actors are brokers in the studied network, having several contacts and even facilitating other resources from documents to travels. In our case, the SSE, a national agency in Puno that participated in INPANDES, was a relevant 'ally' for this research as it provided with contacts that were part of the project, gave access to the INPANDES implementation files, and facilitate the transport to some sites and events. Following up the established relationship with all contacts is important to further get information or provide them with the expected results from this research.

Finally, a last technique called **fishing** is recommended when conducting research in border areas. When there are specific individuals to be contacted in determined areas, a very intensive method is to go around and ask for that person to locals until finding him/her. This was helpful to find producers that live approximately one-hour walk away from the town: asking references in the town and then to people in the way can help to locate the potential interviewees.

Very close to contacting skills is the issue of **arranging meetings**: when? How? With whom? First, due to the time constraints during the field study, we should prioritize the interviewees with the least access to virtual means such as producers, elders, or stakeholders with difficult connectivity. Second, depending on that, should be decided if the meeting would be virtual or physical, although the latter is recommended as facilitates to generate rapport. In addition, factors such as the proximity of actors, cultural issues (e.g., delays), or bureaucracy should be considered when scheduling meetings. A good week and daily programming, buffer times, or contacting interviewees who are nearby for the same day can help to reduce those issues (e.g., some public institutions have several related agencies working in the same building).

There are two other recommendations that can help to arrange meetings during the field study. First, an **adaptative speech** helps to approach interviewees in a more appropriate way as they might have different interests on the research. In any case, a brief phone call should state basic information (name, institution you represent, etc.), the relevance of the research, and what is expected from the interview. Second, while conducting the field research, it is practical to have a 'headquarter' or 'office' in a site with easy connectivity to invite interviewees, do deskwork, or move easier from there. In our case, the SSE office in Puno city provided me with a space to work and come back when traveling short and long distances.

5.3.4. Semi-Structured Interviews & Focus Groups

Semis-structured interviews were the main method to collect data from the field research. Following the ANT methodology, we consider interviews as actors' perspectives or **narratives**, each of them with their own logic, concepts, values, or ideation of the context and dynamics. Thus, the focus is to let them tell their story by building rapport (subjectivity), while keeping academic rigor and reliable answers for the interview questions (objectivity). Following similar methodologies for exploring cross-border dynamics (Wong Villanueva, Kidokoro and Seta, 2022), three research tools (**Appendix 10, Appendix 11,** and **Appendix 12** respectively) were implemented during the interviews: 1) a list of institutions (to identify the cross-border relationships or potential contacts), 2) a list of referential questions (as a starting point for follow-up questions to delve in the interviews), and 3) maps for the cross-border region and subregion (to point determined dynamics, actors, movements, etc.). The complete list of interviews, audio records, and transcripts can be found in the Appendix section (**Appendix 7**, **Appendix 13**, and **Appendix 14** respectively). Some recommendations and techniques can be helpful to conduct interviews:

- **Clarify interview purpose:** Interview should start with self-presentation, showing credentials, explaining in more detail what is the research about and possible outcomes, setting expectations, ask permission to record interview, and so on.
- **Clarify questions & concepts:** Testing questions is recommendable before field research to keep them simple while helping to answer the research question. However, in some cases it is needed to give more explanation about them or specific concepts (e.g., asking for cross-border spaces might refer to a territory or a institutional space). In addition, as researchers, we need to clarify the concepts (words, quotes, and ideas) that interviewees mention. For example, several actors repeated the term of 'dedicated' or 'devoted' producers, that was further explored by coding (categorical coding), conceptualizing (constructing definitions, attributes, examples, etc.), and framing it withing existing knowledge (linking it with existing voids such as "CV31: motivation to produce").
- **Interviewer's style:** Using different interrogation styles can help to get more useful information. For example, 'faking ignorance' (asking very basic questions) helps to understand concept and ideas from their own values and thoughts, allowing to ask more complex questions. In addition, 'devil's advocate' questions (taking an opposite stand to what they think or value) can help interviewees to formulate better arguments and reveal linked ideas.
- **Detailing, interconnecting & cross-feeding:** While the previous recommendation focused on styles to delve into basic or elemental knowledge, these two techniques are related to find more detailed information. By asking more technical questions or referring to previous comments or

interviews, it is possible to build on them and get more details and specifications of specific events or dynamics.

- **Wrapping up**: Finally, it helps to summarize the main ideas from the interview and ask for validation, wrapping up, asking them for a general evaluation and recommendations, and so on. This moment is ideal for getting new contacts, datasets, or any other extra information.

We can also suggest some additional recommendations for focus groups or technical visits when several interviewees were participating simultaneously. While the introduction is like an interview, it is required to take note of the names and personal data to refer them directly if needed. A main difference with an interview is the amount of question. It is recommendable to shape the discussion around one or two questions and start letting them to shape a fluent conversation. For that, it is useful to identify the most active participants to continue participation and incentivize the rest directly to talk more. The goal is to facilitate until they can share and interact by themselves.

5.3.5. Note-Taking

Note-taking and complementarity activities are crucial steps during field research. When using the four notebooks suggested by ANT, it is recommendable to write daily learnings, new emerging questions, and so on. Constant questioning is a relevant technique to highlight phenomena that, although seem obvious, have had a deep effect on daily dynamics. For example, a question that emerged was: "why are most alpacas white?" Despite the simplicity of the question, the interviewees responded that the global alpaca market set a higher price for white fiber, which led producers to prefer white alpacas and almost drove colored alpacas to extinction. A similar question was "why do people here have really good trucks?" The response was closely linked to the presence of illegal economies such as gold mining and coca production, which generate higher profits and faster, allowing most of them to purchase better trucks.

At the end of the day, should be considered a list of to-dos for the week or next day, preparing for the rest of interviews, updating itinerary and logistics (e.g., budget review, booking transport and hotels, etc.), back-up (upload) collected data (audio records, files, photos, etc.), and classify the collected information. Keeping everything in order and writing good notes facilitate later analysis. Finally, budget issues should always be taken into account, considering that when starting a new stage of the field research, the expenses may be higher until the area is known.

5.3.6. Impact as Researcher

Lastly, the researcher's impact on cross-border networks should be taken into account. First, the researcher represents an institution (e.g.,university), having certain degree of authority in the field that can be used to access information, key people, or special events (e.g., participating in the meeting between border mayors). However, it is very important to have a good expectation setting and frame what research can do and cannot. A second 'responsibility' to consider is the role of 'researcher as storyteller': Conducting border studies, while keeping objectivity, should also transmit the stories from people that need to be heard. For example, what happened with the Bolivian communities after the INPANDES project finished. After 2018, no other institution approached those lands and cross-border trade discontinued – 'details' that were not included in the final report of the project.

This leads to the final 'responsibility' of a researcher: to impact through advocacy, direction action, or indirect action. While one of the purposes of the present research is to advocate for more appropriate cross-border value chains to target development in cross-border regions, some possibilities opened during the field research that could directly benefit the cross-border articulation. For example, after interviewing CECOVASA and ANPROCA, the largest coffee cooperatives from Puno and Bolivia, the executive managers showed interest in cooperating. That said, we organized a virtual meeting between both parts (April 26th) where they shared their interest for subregional cooperation in: increasing volume (ANPROCA selling to CECOVASA), technical visits and cooperation (sharing knowledge), joint events (binational coffee contests in Desaguadero city) or applying together to international funds.

In addition, there were positive indirect impacts from the field research. In my visit to Cocos Lanza community (March 2nd), we had a focus group with community represents, coffee producers, and one technician of CECOVASA. This meeting finished by interchanging contacts and motivations, opening the possibility for producers to sell their coffee to the cooperative again. As commented by the executive manager of CECOVASA in later conversations, the Bolivian producers visited the CECOVASA office in San Pedro de Putina Punco, and the manager himself with the technicians approach to the community by April 18th to evaluate the production and reestablish the cross-border flow of coffee. The possible reactivation of dynamics not only represents the possible impact as researcher, but also to consider that cross-border networks are 'living entities', in constant change or better said, processes of region-building and territorialization where the existence of previous assemblages and cross-border experiences are the basis for future articulations. Thus, the mere fact of studying a phenomenon can be as helpful –or even more so– than the outcomes of that study.

6. Cross-Border Value Chain (CBVC) Analysis

Based on mix-methods approaches and causal graph models, this section describes the selected methodologies for the field study and for each research question (Q4, Q5, Q6).

6.1. Objective 1: Building the Case Study's Causal Graph Model (CGM)

The process to build the causal graph model based on the case study was divided in three phases. First, there is a pre-processing stage to organize the events, classify under analytical categories, and analyze the collected data. This is followed by an analysis that evaluate the spatiotemporal dynamics per connectedness voids. Finally, by defining a 'minimal model' of causality, the causal relationships between voids are established and organized into a directed adjacency matrix (unweighted). The section concludes by sketching the matrix into a Causal Graph Model.

6.1.1. Phase 1.1: Pre-Processing Analyses

This phase begins by adapting Wong Villanueva, Kidokoro & Seta (2022)'s framework to analyze Cross-Border Integration, Cooperation, and Governance and the Fernández Jardón (2014)'s and Dilla (2017)'s methodologies to evaluate Cross-Border Value Chains (both considered in **Chapter 3** as L1 and L70 respectively). Thereby, the initial steps consist in two qualitative descriptive analyses (Lambert and Lambert, 2012): the first one oriented to analyze the cross-border region and the project INPANDES, and the second to delve into the coffee Cross-Border Value Chain of this CBR and the impact of INPANDES in the CBVC dynamics. They are followed by two additional analyses to interrelate the results from the previous steps: a value chain analysis (Porter, 1985) and mixed-methods spatial analysis (Kwan and Ding, 2008; Rucks-Ahidiana and Bierbaum, 2015). Both were selected due to the pertinence to this research: understanding the cross-border reality and the project impact along the chain (process-oriented), and throughout the territory (three levels).

Descriptive Analyses

For this case study, we conduct four descriptive analyses. The first two analyses begin addressing the bilateral relationship between Peru and Bolivia in terms of a) trade, b) institutions (legal frameworks, joint agencies, etc.), and c) geography – especially from the border area. This discussion is organized at three levels: national level, subnational level, and local (border) level. This is followed by the analysis of the 'Participatory Regional Integration in the Andean Community' Project or better known as INPANDES project (six sub-projects or interventions), orienting this discussion according to its project lifecycle (Project Management Institute, 2021): a) stakeholder analysis, b) concertation & formulation, c) project description & scope, d) implementation & management, e) evaluation & appraisal (tangible outcomes and perceived by the actors). From the six INPANDES interventions, three were executed in the Peru-Bolivia ZIF, but only one is related to this case study: "Integration, inclusion and innovation in the cross-border productive chains of coffee and South American camelids with a territorial base in the Peru-Bolivia Cross-Border Integration Zone".

Working with a cross-border value chain implies to understand with two socioeconomic phenomena that interrelate: how the product is created and gains value across the borders while earning profits that can promote local development (fixed geography at cross-border scale), how the product has shaped the global dynamics of supply and demand based on how stakeholders add value to arrive to different market niches (relational geographies without scales). Thus, the third and fourth analyses explore the Global Value Chain (GVC), and the Cross-Border Governance System (CBGS) of coffee between Peru and Bolivia at different scales.

We adapt the Gereffi & Fernandez-Stark (2016)'s analysis dimensions to study Global Value Chains, and the Wong, Kidokoro, & Seta (2022)'s dimension to study the governance system of cross-border productive dynamics. From the former study, we take how they analyze GVCs at global scale (top-down processes) to identify the main processes of the value chain as they happen in the global dynamics, the geography behind the global trade relationships, and the global governance of the product (lead firms and industry organization). Gereffi & Fernandez-Stark considers other three dimensions to analyze at local scale (bottom-up process). As our focus is to analyze the CBVCs, their methodology is mixed with the latter research, describing the existing territorial flows related to the local coffee value chain (and more important their spatial configurations), the cross-border social capital (institutions and policies), and the territorial convergence (focusing on the collective imaginaries in the cross-border region).

Value Chain Analysis (VCA)

Based on previous methodological approaches (Porter, 1985; Faße, Grote and Winter, 2009; Nang'ole, Mithöfer and Franzel, 2011), the Value Chain Analysis is conducted to analyze 1) the input-output structure (strengths and weaknesses), 2) time & space frames (of the CBVC and the project), and 3) the pricing of coffee (along the CBVC, and the project budget). Finally, we identify the most relevant voids affecting (or being affected) the processing stages.

Mixed-Methods Spatial Analysis (MMSA)

Considering the limitations on data collection & analysis for spatial data and the available methodologies (Kwan and Ding, 2008; Rucks-Ahidiana and Bierbaum, 2015), we adapt the Global Productive Network (GPN) framework (Henderson *et al.*, 2002) to map the productive and governance relationships and start with a spatial description of the three selected levels of analysis: binational, subregional, and cross-border levels based on geo-narrative analysis (interpretation of narrative materials to determine spatial configurations). This is complemented using the software *ArcGIS Pro* and running a network analysis for calculating the Origin-Destination Cost Matrix (table containing travel time and travel distances from each origin to each destination) (ESRI, 2018). As this analysis is weak in the CBR (as the software does not include trails, small roads, etc.), this analysis is refined by complementing with the times and distances collected during the field study (own notes). The purpose of this mixed-methods spatial analysis is to interpret the 5W1H or 6W question model (Wagner *et al.*, 2014) in the coffee CBVC spatial configuration: who (actors), what (product), where (space), when (time), how (productive capacities), and why (location rationale).

6.1.2. Phase 1.2: Connectedness Voids Analysis

Currently, there is not established methodology to evaluate institutional voids. Most research on this subject are descriptive analysis based on qualitative cases studies (Mair and Marti, 2009; Qiu, Xu and Bhatt, 2021; Preuss *et al.*, 2022), using different methodologies such as event chronology, institutional assessment, and more. While the set of voids represent the main institutions (or the lack of them) of the cross-border value chains, this section strives to explore how they have changed with the intervention of the project. Thus, we adapt an Outcome-Based Evaluation (OBE) methodology (Schalock, 2002) to conduct assessment based on the performance measurements and value measurements:

- Organizational performance assessment: coordination, financial stability, program data, staff turnover, etc.
- Organizational value assessment: access to services, consumer satisfaction, staff competencies, community support, etc.

The collected data, from the field study and the previous analyses, is used as main elements for the OBE assessments and categorized per connectedness void in charts (**Table 3.5**). Each of these assessments is organized as a temporal and spatial event, that later will be useful for studying causality, and the impact of the project. As a temporal event, the void chart is divided in three scenarios: before the INPANDES (~2015), during the project (2016 to early 2018), and after it (2018 to nowadays). As a spatial event, the voids chart follows the same organization as the previous Spatial Analysis. The information is processed and organized in the chart as short statements indicating if it has a positive connotation [+], a negative one [-], or could be interpreted as positive or negative depending on the situation [*][+/-]. The implemented quotes and material per void chart are referenced in **Appendix 15**.

Table 3.5. *Connectedness Void Chart (Author's elaboration)*

Void N°0X	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational			
Subregional			
Cross-Border			
Void Evaluation	**High/Avg./Low presence**	**Targeted? ___ Efficiency? ___**	**High/Avg./Low presence (↑, ≈, ↓)**

Actions at binational and subregional level refers to the events and assessments that relate to the cross-border value chain but occurred at those levels (e.g., meetings in the CAN headquarters). Thus, how events outside the CBR impacted this territory. In terms of specific institutions such as the DEVIDA or the ALT, although they are national and international actors, they are considered as subregional actors because 1) their regional office and headquarters are in the subregion (Puno and La Paz), and 2) their actions are at subregional and cross-border regional level rather than at binational level as the chancelleries, CAN, or EU.

Finally, to facilitate the later analysis of the project (Objective 3) a referential evaluation of the existence of the void is noted in terms of low, average, or high presence. In the INPANDES column, it is noted if the projected targeted the void (no, low, average, and high), and the efficiency of the intervention (low, average, and high). This qualitative evaluation is realized as referential to identify patterns within the causal graph model, but without the numerical strictness to work as a Likert scale for further analyses. The most important category for our analysis is the variation after the project

(Δvoid): if the voids "increased" "↑" (presenting more troubles), "decreased" "↓" (allowing good performance) or was kept "similar" "≈" to levels before the intervention (all these three are indicated in parenthesis). Apart from pointing the main issues that strengthen each void, some recommendations for more suitable policy making in CBVCs are noted.

6.1.3. Phase 1.3: Causal Graph Model (CGM)

In terms of determining rules for causality, there are several approaches to establish if there is a causal relationship between two variables (X: cause, Y: effect, X→Y), starting from statistical models such as the Kenny (1979)'s three conditions to measure causal effects or the Pearl (2000)'s framework that explores the 'philosophical foundations of causality' (Antonakis *et al.*, 2010). Other sets of causal rules are chosen according to their functionality, such as causal conditions used by scholars working on network graphs (Nadkarni and Shenoy, 2001; Montibeller and Belton, 2006) to practical models of causality (e.g., the Five Rules of Causation) used by practitioners (Bagian *et al.*, 2002; Charles *et al.*, 2016).

For this research, causality in the relationship between two variables is determined under five conditions (Kenny, 1979; Nadkarni and Shenoy, 2001)[16]:

- Covariation: X and Y are positively correlated (both variables increase, or both decrease).
- Temporality: X precede temporally to Y (both events have happened, not hypothetical cases).
- Spatiality: the area of X is equal or contains geographically the area of Y.
- Reasoning process: Relationships can be understand under deductive (X→Y) or abductive (X←Y) reasoning.
- Direct relationships: If X→Y can be expressed as X→Z→Y, then X→Y is indirect.

[16] Initially, Kenny's model was considered based on its simplicity and its wide use in causal studies. However, apart from covariation and temporality, the third attribute "control of third variables" represented that X and only X was the cause of Y – a dynamic that it is very complex to measure in real life (Antonakis *et al.*, 2010; Oppewal, 2010), even more in observational datasets where third variables can be mediators (Rohrer, 2018). Due to this limitation, 'reasoning process' is used as a condition for building causal graphs, as it provides more flexibility of analysis rather than 'control of third variables' (Nadkarni and Shenoy, 2001). In addition, the concepts of direct and indirect relationships are added to ensure conditional independence (Nadkarni and Shenoy, 2001). In addition, the condition of 'spatiality' – as an extension of temporality – is added to address the multilevel nature of this project, so the area of the cause is the same or contains the area where the effect happens.
In some of the determined relationships, bidirected edges or directed cycles (e.g., X→Y, Y→X) will be considered if they happened with a different temporality (Pearl, 2000; Antonakis *et al.*, 2010). In other cases, the condition of direct relationship might not be fulfilled as depending on the variable and the analyzed event, X can affect directly and indirectly Y (Rohrer, 2018). Adding more variables, splitting them, or creating variables with different temporality (e.g., replacing X with $X_{t=1}$ and $X_{t=2}$) could eliminate these discrepancies and facilitate their probabilistic assessment (Nadkarni and Shenoy, 2001). However, as our CGMs are not constructed for numerical parametrization, bidirected edges and multiple nod es can be allowed considering for further reviews that there might be a common hidden cause of the variables (X↔Y = X←Z→Y) (Pearl, 2000; Rohrer, 2018).

As we have initially considered 36 variables and therefore 36 void charts, each table is compared with the other 35 ones to find causal relationships. As self-loops are not allowed (Pearl, 2000), this process of finding causality should be executed 1260 times. When comparing one chart with another, we identify first that there is a common event or topic, and if the same actor or set of actors are participating in this[17]. After checking these preconditions, we apply the causality conditions, applying a binary notation (causal=1, non-causal=0). If two variables are connected by and edge (causality), they are called adjacent. These values are arranged in a matrix (if X→Y=TRUE, and $A = (a_{i,j}) \in R^{36\times36}$, then $a_{X,Y} = 1$). The final arrangement is called adjacency matrix (unweighted). Each relationship from the matrix (either a 1 or a 0) is explained in **Appendix 16**. Using the visualization software *Gephi*, we obtained the causal graph model based on the case study and giving a general description about it (its analysis is conducted in Objective 2).

6.2. Objective 2: Validating Theoretical Framework based on CGM Comparison

Based on the Causal Graph Models determined in Chapter 3 and the one designed in Objective 1, this section focused on validating the former from three methods. The first two are consider as predictive/prescriptive analytics methods, coming from the machine learning field. Starting with a confusion matrix, the most relevant metrics are calculated, giving relevance to the Matthews correlation coefficient (MCC), and the Fowlkes–Mallows index. These indicators are used to measure the performance of the theoretical framework.

To complement the first phase, the next ones is followed by a network clustering analysis using the visualization software Gephi to visualize the CGMs, and the programming software R to conduct the cluster analysis under the Ward Method. The interpretation of results is complemented by a direct observation of the causal relationships from Objective 1 to establish the main reason behind the divergence between the CGMs.

[17] Some of the variables considered may refer to only one actor or set of actors (e.g., CV9 refers to public sector or municipalities), but other variables are related with a higher variety of stakeholders (e.g., CV31 refers to motivation and therefore, it relates with most actors from the CBVC). As commented, this can be avoided by splitting variables, but this can lead to a great expansion of them (e.g., V9.1: technical capacities of municipalities, V9.2: business capacities of cooperative N°3, V9.AB: budget of regional agency N°5, etc.), that would complexify the case study to a point where it would become too specific and unmanageable under a qualitative approach. To reduce errors, each void analysis explains the main events and relationships that have been found. For example, in terms of CV31, four motivations were identify as the most relevant for the case study based on the qualitative data. Furthermore, all relationships (either a 1 or a 0) are noted in **Appendix 16**, so it is possible to check them and realize changes if required.

6.2.1. Phase 2.1: Confusion Matrix

A confusion matrix is a table layout usually used in machine learning to measure the performance of an algorithm or model (Visa *et al.*, 2011). A confusion matrix for two-class classification (square matrix) (**Table 3.6**) has rows that represent the actual class (case study), and columns that contains the predicted class (theoretical framework).

Table 3.6. *Confusion Matrix (Visa et al., 2011, p. 126)*

		Predicted (Theory)	
		Negative (0)	Positive (1)
Actual (Case Study)	Negative (0)	a	b
	Positive (1)	c	d

From this arrangement, the entries mean:

- a: True Negative (TN) predictions
- b: False Positive (FP) predictions
- c: False Negative (FN) predictions
- d: True Positive (TP) predictions

Taking in consideration these variables, it is possible to calculate some metrics that allow us not only to measure the accuracy of a theoretical proposal, but also its correlation and similarity of clusters (**Table 3.7**). Of special interests are the Matthews correlation coefficient (MCC) and the Fowlkes–Mallows index (FM). The MCC is considered a contingency matrix method to calculate the Pearson Correlation Coefficient and more reliable than other metrics in the confusion matrix (Chicco and Jurman, 2020; Chicco, Tötsch and Jurman, 2021). By the other side, the FM is an external evaluation method that measure the similarity between two clustering, and it is usually used to measure clustering performance (Fowlkes and Mallows, 1983; Gupta, 2022).

Table 3.7. *Confusion Matrix Metrics (Author's elaboration)*

Confusion Matrix Metrics	
Recall/ Sensitivity (TPR)	$TPR = \frac{d}{c+d}$
False Positive Rate (FPR)	$FPR = \frac{b}{a+b}$
True Negative Rate/ Specificity (TNR)	$TNR = \frac{a}{a+b}$
False Negative Rate (FNR)	$FNR = \frac{c}{c+d}$
Accuracy (ACC)	$ACC = \frac{a+d}{a+b+c+d}$
Error Rate (ERR)	$ERR = \frac{b+c}{a+b+c+d}$
Precision/ Positive Predictive Rate (PPR)	$PPR = \frac{d}{b+d}$
Matthews correlation coefficient (MCC (φ))	$\varphi = \frac{a \times d - b \times c}{\sqrt{(b+d)(c+d)(a+d)(a+c)}}$
Fowlkes–Mallows index (FM)	$FM = \sqrt{PPR \times TPR}$

6.2.2. Phase 2.2: Network-Clustering Analysis

The second phase starts by using Gephi to process the matrices and visualize the CGMs. Having both CGMs, we make an initial comparison of their statistical parameters (Graph density, network diameter, average path length, etc.). This is followed by a visual comparison of them. To support its analysis, we conduct a Ward's minimum variance method using the software R (Programming code in **Appendix 3**). The Ward method consider all clusters and the algorithm calculates the sum of the squared distances within the clusters and merges them to minimize them (Murtagh and Legendre, 2014). As every clustering method provides different arrangements (AprendeIA, 2020), this method was prioritized because the relationship between voids within each subgroup (and the relationship between them) can be interpreted qualitatively better than with the other methods. We take two approaches to analyze the clusters. First, we compare both clustering models obtained by R. Second, we introduce the data of the case study into the theoretical clusterization and evaluate how they diverge.

In these and following calculations, the divergence between the results between the theoretical framework and the coffee case study is expressed as the percentage of the relative error ($\%Error$):

$$\%Error = \frac{Case\ Study - Theoretical}{Case\ Study} \times 100\%$$

6.2.3. Phase 2.3: Direct Observation of Causalities

Connecting the two previous phases, this part presents a summary of how the case study differed from the theoretical framework, in order to understand the reason behind the divergence between both. This analysis is done considering the difference between IN-voids (X in X→Y→Z), as well as the OUT-voids (Z in X→Y→Z). Some recommendations are given to strengthen the theoretical model for further studies.

6.3. Objective 3: Instrumentalizing the CGM for Project Evaluation

This section is also divided in three phases. Considering the INPANDES project in terms of funding and interventions as the independent variables, and the connectedness voids as the dependent ones, the first phase collects the main findings from the void charts (Objective 1), to determine the impact of the project per void. The second phase builds on the former (Δvoids) and contrast the obtained results with the identified causal relationships (CGM) to bring causal explanations of how the project outcomes happened in the way they happened. Finally, the last phase focuses more on the predictive potential (What will happened if we act in this way?) and deliver some policy recommendations, raising further questions and considerations for future studies in this area.

6.3.1. Phase 3.1: Connectedness Voids for Project Evaluation

The implementation of the CGM approach to evaluate INPANDES project represent an initiative to propose a multidimensional framework that links project management performance and project success (Mir and Pinnington, 2014). From this perspective, the project is parametrized in terms of budget executed and implement actions (project attributes as independent variables), and they are contrasted with the results obtained in the connectedness void charts obtained in Objective 1 (connectedness voids as dependent variables). As the charts were obtained under an Outcome-Based Evaluation (OBE method) considering the project, effectiveness is estimated as the Δvoid ($\Delta\text{void} = void_{2022} - void_{2015}$). From this analysis, we determine to what extent the project was effective.

6.3.2. Phase 3.2: Explanatory Potential of CGMs

This phase builds on the former by determining the reasons behind the Δvoids. The CGM calculated in Objective 1 presents all the possible causal relationships that affected the project. However, not all of them affected the project activities, nor all of them had the same importance. We can find this information in the void charts, and in this way, determining what were the main voids that affected the project (indegree links). Simultaneously, contrasting the expected project objectives with the reality, we can determine what were the shortcomings (outdegree links). Using both the charts and CGMs, it would be possible to provide the causal explanations of how the project outcomes happened in the way they happened.

6.3.3. Phase 3.3: Predictive Potential of CGMs & Policy Recommendations

The last phase of this research is to extend the use of the CGM in deploying policy recommendations. Based on the project INPANDES experience and the IN-voids that affected them, we deliver some policy recommendations. These are further organized within groups or clusters and determine the main relationships between themselves, to make predictions about their hypothetical implementation. Finally, further questions and considerations are highlighted for future studies in this area.

Chapter 4 Macroregions and Their Borders Within: The State of Border and Cross-Border Policies in 100 Macroregions

Chapter 4. Macroregions and Their Borders Within: The State of Border and Cross-Border Policies in 100 Macroregions

0. Chapter Abstract

Chapter 4 starts by defining macroregions and the difference between their border and cross-border policies. It presents a worldwide overview exploring from a quantitative perspective how both types of policies have been promoted in 100 macroregions. The analysis of 689 references reveals correlations between macroregional border policies and cross-border policies, to subsequently classify the macroregions in terms of their approaches towards Cross-Border Cooperation. In addition, eight types of macroregional cross-border mechanisms (e.g., zoning tools, funding mechanisms) were identified in 28 macroregions, highlighting the initiatives from Western Europe, South America, and West Africa.

Keywords: macroregion, regional integration, regionalism, regionalization, border policies, cross-border,

1. Introduction

The end of Cold War, the 'boom' of globalization, and the fading of postwar state-driven economies generated several processes –such as the relativization of scales, regional integration, governance transfer, etc.– that leveraged the creation of regions at multiple levels in overlapping geographical spaces (Amin, 2002; Jessop, 2002; Sum, 2002). These dynamics have fostered various integration schemes based on existing territorial units, shared ethnic or cultural linkages, territorial identity, historical tradition, geographical patterns, among others (Neumann, 2003), placing territorial arrangements –called macroregions– beyond the geographical space of nation-states.

These phenomena have led to thinking of a 'borderless world' (Newman, 2006; O'Dowd, 2010) as macroregions have diminished the traditional Westphalian role of borders. However, the total elimination of borders is still a distant goal: Although there has been a significant shift in the paradigm of borders as lines or barriers towards more complex systems like locations for global and local dynamics (Iranzo and Caballero, 2020), most countries in the world still have borders that reflect preindustrial and industrial societal relations rather than being hubs of globalization processes (Kireev and Ivanov, 2015). Nonetheless, the vast development of macroregional border and cross-border

policies –starting from tariff reductions and custom unions to cross-border authorities and joint integration zones – leads us to question the role of borders as they become the internal boundaries of macroregions.

This Chapter focuses on identifying and comparing the position of macroregions towards their 'internal' borders to explore how bordering processes are affected by regional integration processes today. As macroregions have traditionally been researched through case study analysis, the present work contributes to this field by quantitatively exploring 100 macroregions and the current state of their border and cross-border mechanisms. First, the involved concepts and their interpretation are discussed to frame this research from the perspective of the macroregional geographical space and their bordering processes. Subsequently, the selection criteria for macroregions and data collection method are explained. The analysis shows an overview of how macroregions deals with their respective 'internal' borders, the relationship between border and cross-border mechanisms, and finally focuses on the latter by classifying the regions according to their implemented mechanisms for Cross-Border Cooperation. The present strives to start new discussions on the study of macroregions and borders by fostering richer interdisciplinary debates.

2. Macroregions and Their 'Internal' Borders

A 'macroregion', as a composed word, conceals more than the sum of both words since its understanding varies depending on the field of research. International relation academics have been the main contributors to this concept (**Table 4.1**) and, although efforts have been made to incorporate theoretical elements from other fields such as geography or social sciences, those definitions do not escape from the 'territorial trap' of their study field (Agnew, 1994), or at best, consider geographical space and social relations as 'meaningful contexts' that shape geopolitical dynamics (O'loughlin and Anselin, 1991; Cohen, 2014). Thereby, the reification of regions remains a problem for academics and policymakers (Tamaki, 2015; Testa, 2015).

Since macroregions vary greatly in their institutional forms, diverse theoretical approaches and interdisciplinary conversations can contribute to break with the 'spatial fetishism' and consider them as the complex porous networks between places, people and ideas that they represent (Massey, 1991; Paasi, 2003; Katzenstein, 2019). To further develop this concept, literature on macroregions was revised and expanded, focusing on the construction of the macroregional space. This perspective is crucial for the present research as it clarifies what to consider as a macroregion and to understand borders and cross-borders policies in terms of their spatialities.

Table 4.1. *Literature Review on conceptualizations of macroregions (Author's elaboration)*

Definition of macroregion	Sources (Author, Year)
Region that consists of states which have some common ethnic, linguistic, cultural, social, and historical bonds	(Cantori and Spiegel, 1970)
Region with a limited number of states linked together by a geographical relationship and by a degree of mutual interdependence	(Nye, 1971)
Loose geographical units larger than the state with some political and cultural bonds, however varied and sometimes contentious.	(Mittelman, 1996)
Grouping of nation states located in geographically bounded but proximate space. A classification of a macroregion may vary according to the purposes of that classification.	(Dunning, 2002)
Macroregions can be defined in different ways: as continents or as supranational formations of countries sharing a common political and economic project and having a certain degree of common identity	(Hettne, 2005)
Macroregions, the so-called world or international regions, are large territorial units, as opposed to nonterritorial units or subsystems. They exist between the state level and the global system level.	(Söderbaum, 2011)

2.1. Regional Integration & Macroregions

After the fall of the Berlin Wall, the formation of alliances in the political and economic realm became means to reduce the possible risks of globalization, leverage regional potentialities, become relevant actors in the new world order, among others (Munakata, 2004; Hettne, 2005; Pédussel, 2006). Regional Integration was quickly promoted among national governments in the form of Regional Integration Arrangement (RIAs) such as International Regional Organizations (IROs), Free Trade Agreements (FTAs), Custom Unions, regionalist projects, etc. (UNU-CRIS, 2021) At present, nearly all countries in the world are members (or becoming one) of one or more RIAs (Pédussel, 2006).

Although predominant in current times, this type of integration based on agreements has not been the only one. Other integration processes, such as cultural exchange, economic flows, social networks or other territorial dynamics, have also played a role in promoting regional integration and may have influenced or challenged the regional agreements (Lähteenmäki and Käkönen, 1999). While the process of creating regional organizations or institutions is known as **regionalism**, the increased economic, political, and cultural integration within a specific region has been named as **regionalization**. Both are considered as macroregional processes created in multiple ways (institutionally, symbolically, territorially, etc.), from multiple perspectives (top-down and bottom-up, formal and 'real', etc.) and by multiple actors (states, merchants, civil society, etc.) with different motives (Neumann, 2003; Munakata, 2004).

When (and when not) a macroregion comes to existence cannot be reduced to its institutionalization (Paasi, 1986; Metzger, 2013; Zimmerbauer, Riukulehto and Suutari, 2017). As regional projects, they may fail under some criteria but thrive on others (e.g., the failure of UNASUR does not represent the end of a South American regional identity or existing socioeconomic flows). Understanding macroregions as regions-in-becoming (Pred, 1984; Hettne and Söderbaum, 1998; Metzger, 2013; Kuus, 2020), allows to consider them as spatiotemporal processes of 'coming-together' (Law, 1992) or 'regional propositions' (Metzger, 2013) that are mobilized by stakeholders located inside and outside the region's boundaries.

Macroregions represent political projects –which can succeed or fail– that establish relations of sameness and otherness (inclusion/exclusion, we/others, inside/outside, etc.) (Neumann, 2003; Söderbaum, 2005; Newman, 2006; Syssner, 2006) while they are accepted, articulated or declined as they are performed through practices and interventions (Callon and Law, 2005; Callon, 2007; Metzger, 2013). Regional cohesiveness arises when a particular regional proposition is more 'stable' than others, event that occurs as it is more articulated with existing material and non-material elements (Law, 2008; Riggirozzi, 2012; Paasi and Metzger, 2017) through region-building processes –such as the intensification of socioeconomic flows, founding international organizations, signing RIAs, etc.– within the most suitable geographical space that supports their agenda.

From this perspective, we understand a **macroregion (in-the-making)** as a set of supranational processes of region-building on multiple dimensions (political, economic, social, etc.) that generates a territorial arrangement subject to a logic that actors promote within a geographical space that goes beyond the nation-states' borders and under the global system, but not subordinated to other region (Cantori and Spiegel, 1970; Nye, 1971; Mittelman, 1996; Dunning, 2002; Hettne, 2005; Söderbaum, 2011). Macroregions do not imply a physical contiguity, cultural homogeneity, or even the existence of a supranational organism, but rather to be tied up under a logic or set of narratives that give meaning to the territorial composition. These narratives or political discourses are stories or coherent sequences of events based on the historic-political context that are linked by a causal explanation and mobilized with political implications on the scalar processes of region-building (GONZÁLEZ, 2006; Shenhav, 2006).

Regionalism and regionalization are part of this set of processes, acting in different dimensions but influencing the others. While regionalism is promoted by politicians, academics, etc. acting in an ideological realm and setting an institutional space from their national and subnational capitals, regionalization is mainly developed through socioeconomic flows that transnationally connect networks of production, influencing the construction of infrastructure, local and regional planning, and so on (material realm) (Hettne and Söderbaum, 2000; Munakata, 2004; Hettne, 2005). As both processes unleash a plethora of regional dynamics, each with different geographical scopes within the territory (space of regionalism can be different from regionalization spaces (Jones and MacLeod, 2004)), the

dominant regional proposition encapsulates the spatialities that benefit it, generating a reified territory with certain degree of homogeneity (Agnew, 2013) that serves to keep the macroregional space all together (Metzger, 2013), even if there is a difference between the 'formal' and the 'real' region (Hettne and Söderbaum, 2000; Hettne, 2005). Therefore, as temporal 'solutions' for the spatial conundrum, macroregions must be 'in-the-making', changing continuously in time and space (Amin, 2002; Paasi and Metzger, 2017; Kuus, 2020).

Although evaluating 'how much region' is a macroregion is a pending research issue (Lombaerde and Langenhove, 2006), 'Regionness' (Hettne and Söderbaum, 2000) emerges as a measurement scale of regional cohesiveness or stability based on how actors have attached material foundations, symbolic components, and external recognition to a determined regional proposition, legitimizing its own capabilities to act as 'one' (e.g., increase its 'actorness' in the global arena, decide the kind of desired development, etc.) and transforming it from a passive object to active subject. Instead of perceiving macroregions just as reified units with agency (Paasi and Metzger, 2017) or a 'regional Leviathan' (Zimmerbauer, Riukulehto and Suutari, 2017), those processes of regional capability development could also be understood as 'means for' and 'goals of' the open dialogue and negotiation among state and non-state actors that lead to a governance transfer to this upper territorial order (Börzel and van Hüllen, 2015a). Thereby, it would be possible to move away from the 'spatial fetichism' or institutional reductionism' by examining macroregions as assemblages or networks of actors (national governments, private sector, civil society, etc.), material (geographies, resources, communities, etc.) and non-material elements (discourses, identities, memories, etc.) that are continuously interacting (Zimmerbauer, Riukulehto and Suutari, 2017).

In the study of macroregions, geographical scale has failed to capture the complexity of their spatialities (Agnew, 2013). Efforts have been done to define the spatial frames of contemporary region-building processes by conceptualizing the spatial logics behind their formation (Hettne, 2005; Olesen and Richardson, 2012; Hidle and Leknes, 2014; Grundel, 2021). However, from a metageographical perspective of the construction of macroregional space politic-institutional units should not be the only spatial delimitations (Lewis and Wigen, 1997; Taylor, 2001; Murphy, 2008), but also consider other spatial structures outlined from various disciplines as history, sociology, natural sciences, etc., not only to break the dependence on nation-states as standard territorial units, but to consider the powerful role of some regional constructions in understanding the world (Faludi, 2012; Paasi and Metzger, 2017).

Although a discussion on a macroregional metageography demands further examination, observing how scholars have considered these regions in their works, three types of macroregional constructions of space can be highlighted as a starting point: geographical, historic-cultural, and institutional. We explore these approaches considering their space, sub-systems, and boundaries.

From the first perspective, macroregional space is determined by its physical-geomorphological features, establishing a topographical hierarchy of space based on their landforms: while continents represent the territorial unit to delimit macroregions (e.g., Africa macroregion, Asia macroregion), their subdivisions define lower levels of regional formations (e.g., North America meso/sub-region, Andean subregion, etc.) (Marston, Knox and Liverman, 2001). The boundarying process is based on the natural limits of the different landforms or geographical conventions.

From a historic-cultural approach, macroregions or 'cultural regions' represent large-scale territorial divisions where, throughout history, communities with similar patterns in terms of ethnicity, language, religion, historical junctures, etc. established the cultural foundations of current societies (Huntington, 2000; Marston, Knox and Liverman, 2001; Hettne, 2005). As there can be controversies to define the external boundaries of these macroregions due to its multi-dimensional nature (e.g., depending on the researcher, MENA macroregion have some countries that others do not consider (Katzenstein, 2019), internal boundaries are even more diffuse as they vary depending on the specific criteria used to classify subregional formations from a geographic-cultural perspective (e.g., Centra Europe sub-region).

Finally, the institutional approach is based on a membership format where nation-states are part or not of RIAs, and where the external boundaries encapsules the sum of national territories, and the internal ones are the national borders. However, whether a regional organization can be considered macroregional or sub-regional is an ongoing academic debate. For example, while some academics consider ECOWAS as a subregion (Hook and Kearns, 1999), others differ from this opinion as it encourages macroregional integration (Söderbaum, 2017). Hamanaka (2015)'s definition of subregionalism as a subset of (macro-)regionalism (subordinated in terms of membership, institutional capacities, boundaries, etc.) sheds light on this issue: as there is no clear pattern of ECOWAS being subordinated to a larger regional organization like the AU (Hettne, 2005), it can still be considered as a macroregion that occupies the same space as the geographical-cultural subregion of West Africa.

2.2. Macroregional Border and Cross-Border Mechanisms

From a macroregional perspective, the traditional Westphalian role of borders as tools for demarcation and control starts fading as supranational arrangements as RIAs become the mobiles of nation-states' interests to achieve a better insertion in the current global political and economic arena, reduce regional asymmetries, facilitate intra-regional trade, etc. (Nye, 1971) National borders become 'sutures' that connect the region to itself and, simultaneously, blur the line between the 'safe' national space and the 'anarchical' international realm (Salter, 2012). This change does not represent the

complete annihilation of bordering and boundarying processes, but rather their redefinition within the new macroregional logic. However, the implementation of regional integration activities may differ from the legal commitments, not only because nation-states may or may not have the will and capacities to endorse the new border functionalities, but because it also depends on how those functionalities are performed in the daily border *realpolitiks* that happen at the border crossings, border communities, borderscapes, etc. (Paasi, 1999; Jones and MacLeod, 2004; Brambilla, 2015).

Due to the multiplicities of borders –as they represent a plethora of meanings, practices, spaces, associations, etc.– and the relationship among their heterogeneous components, they could be considered as 'sets of sets' of intertwined assemblages (Johnson *et al.*, 2011; Laine, 2016; Sohn, 2016). Border policies serve as both a means of maintaining national sovereignty and an integral part of the multi-scalar production of border assemblages (Laine, 2016), representing procedures, relations, mechanisms, etc. that 'do not have the same meaning from everyone' (Balibar, 2002; Sohn, 2016): borders do not only serve States, but whoever has the agency for bordering or contesting them (Johnson *et al.*, 2011). As they become internal boundaries of macroregions, studying how boundarying and bordering processes are re-negotiated contributes to examine their 'multiperspectival' social construction (Rumford, 2012; Brambilla, 2015) moving away from the state-centrism.

The role of borders within macroregions has not been deeply researched as works mainly focus on case study analysis, but not in a comprehensive way (Hettne, 2005; Bartz and Fuchs-Schündeln, 2012). There has been a lack of practical and theoretical work in the field of regionalism studies to address the evolving nature of borders. However, some recent studies (Souza, 2018; Iranzo and Caballero, 2020), have attempted to fill this gap by exploring how borders have transformed from simple physical lines to complex processes and systems that reflect and adapt to the international political-economic context. These studies have provided insights into the historical evolution of border functionalities during different waves of regionalism, but there is still a need for further exploration into the current state of bordering and boundarying process and how they are influenced by macroregional integration schemes.

Starting an exploration on these topics requires differentiating between border and cross-border mechanisms. From a geographical perspective (Kireev and Ivanov, 2015), while the former refers to a policy type that focuses on the national territory and the state capacities to ensure security and development in their own space, the later implies a new spatial form across borders, a Cross-Border Region (CBR) that compromise subnational territorial units from two or more states (Perkmann and Sum, 2002) for the sake of pursuing joint objectives in a 'common' space. In order to simplify further discussions, **macroregional border mechanisms**[18] would be related to instruments that act over the

[18] Consider macroregional border mechanisms as a multiplicity of legal tools, social practices, infrastructure, etc. that interact with the territory, communities, national border systems, etc. Although both macroregional and

national spaces by reducing the traditional role of borders for protection and delimitation (e.g., protect national markets with tariffs, border-crossings to selective access of people and goods, etc.) (Sohn, 2014; Kireev and Ivanov, 2015). In contrast, **macroregional cross-border mechanisms** would refer to Cross-Border Cooperation (CBC) instruments to achieve Integration within a cross-border space by reinforcing cross-border social capital, increasing territorial flows and enhancing territorial convergence (Kireev and Ivanov, 2015; Wong Villanueva, Kidokoro and Seta, 2022).

Conducting research on macroregional border and cross-border policies could contribute to answer questions about the contemporary meaning and role of borders in global dynamics: is the elimination of borders an indicator of regional integration? If not, what changes on borders' features or functions represent a more 'integrated' macroregion? Would that phenomenon be similar in all regions suggesting a one-for-all path or does it depend on the context? Starting this examination from the borders within macroregions represents an interesting transition of how border capabilities are moving from a state-centered international order to a non-homogeneous 'world of regions', still politically contested by nation-states, but outlining a multi-lateral global system (Katzenstein, 2019).

3. Analysis on Macroregions and Their Mechanisms

After filtering the RIAs, 100 macroregions were selected (see **Appendix 5**). **Table 4.2** summarizes their general features: 21% come from Africa, 18% from America, 16% from Europe, 11% from Asia, 9% Eurasia, 5% Oceania, and 20% represent arrangements located in two or more continents. 71% of these macroregions have partial or total geographic continuity (presence of physical borders). The remainder comes mainly from transcontinental regions and Oceania. In terms of border policy, 74% of the macroregions have at least one policy related to security, economics, or accessibility, and 44% have any kind of cross-border policy. Economic-oriented policies as FTAs and customs unions represent the most common form of border policies (48%), followed by security-related border policies (e.g., joint border security programs against terrorism and crime), which are predominant in Africa and America (44%). Accessibility-based border policies (29%) are preferred by Asian macroregions as many of them foster regionalization processes based on the promotion of economic corridors. In the case of Europe, as multiple macroregions share or are encapsuled in the same geographical space as the European Union and Schengen area, they do not count with specific border policies. Under the same logic, they mainly operate cross-border projects under INTERREG program. Europe, Africa, and America represent the three continents were most regions have any kind of cross-border initiative.

national border policies act over the space of national sovereignty, they differ as the former is based on international mutual agreement and the later depends on decisions of the national government.

Table 4.2. *General properties (average and total values) of selected macroregions (Author's elaboration)*

	Africa	America	Asia	Eurasia	Europe	Oceania	Transcont.	Total
Macroregions – MRs (total #)	21	18	11	9	16	5	20	100
Member States (Avg.)	11.8	12.5	9.8	11.6	12.1	11.0	24.8	14.3
GDP ratio (Avg.)	197.5	2576.3	1081.3	226.6	349.9	84295.9	1075379.0	219991.1
Density (Avg. hab./km2)	51.8	47.8	142.7	30.9	78.6	11.1	71.6	65.4
Foundation Year (Avg.)	1971.7	1978.6	1988.6	1994.8	1980.2	1989.6	1979.4	1980.7
MRs with Physical borders (#)	19 (90.5%)	14 (77.8%)	11 (100.0%)	7 (77.8%)	14 (87.5%)	0 (0.0%)	6 (30.0%)	71 (71.0%)
MRs with any Border Policy (#)	19 (90.5%)	15 (83.3%)	9 (81.8%)	6 (66.7%)	9 (56.3%)	5 (100.0%)	11 (55.0%)	74 (74.0%)
-MRs with Security-related BPs (#/%)	11 (52.4%)	8 (44.4%)	3 (27.3%)	3 (33.3%)	4 (25.0%)	1 (20.0%)	6 (30.0%)	36 (36.0%)
-MRs with Economy-oriented BPs (#/%)	12 (57.1%)	10 (55.6%)	5 (45.5%)	3 (33.3%)	5 (31.3%)	5 (100.0%)	8 (40.0%)	48 (48.0%)
-MRs with Accessibility-based BPs (#/%)	7 (33.3%)	8 (44.4%)	6 (54.5%)	1 (11.1%)	4 (25.0%)	0 (0.0%)	3 (15.0%)	29 (29.0%)
MRs with any Cross-Border Policy (#/%)	14 (66.7%)	11 (61.1%)	4 (36.4%)	1 (11.1%)	12 (75.0%)	0 (0.0%)	2 (10.0%)	44 (44.0%)

Table 4.3. *Correlation analysis between Macroregions, Border and Cross-Border Mechanisms (Author's elaboration)*

		Border & Cross-border mechanisms per continent							
		World	**Africa**	**America**	**Asia**	**Eurasia**	**Europe**	**Oceania**	**Transcontinental**
Macroregional indicators		**Border Mechanisms**							
Macroregional integration indicators (all MRs)	**Year**	-0.1308	-0.2026	-0.0628	-0.1680	-0.3846	-0.2398	**-0.6837**	0.1393
	GDP ratio	-0.1214	0.2286	-0.1419	0.2519	-0.2940	-0.2150	0.4082	-0.2147
	Membership	-0.0634	0.3368	-0.3295	0.3662	-0.3597	0.2506	0.2673	-0.2263
		Border Mechanisms							
MR integration indicators (MRs with borders)	**Year**	-0.1591	-0.2385	0.0640	-0.1680	-0.2244	-0.2299	-	-0.1942
	GDP ratio	-0.0322	0.2930	-0.1707	0.2519	-0.4633	-0.2576	-	-0.0128
	Membership	0.0391	0.4102	-0.4375	0.3662	-0.4967	0.2256	-	-0.3581
		Cross-Border Mechanisms							
MR integration indicators (MRs with borders)	**Year**	-0.3132	-0.1217	-0.0767	-0.1425	-0.3073	**-0.8246**	-	0.2685
	GDP ratio	-0.0538	0.2601	-0.0913	-0.3008	-0.1008	-0.0713	-	-0.2051
	Membership	-0.0379	0.2430	-0.1133	-0.2051	-0.1247	0.0115	-	0.4060
		Cross-Border Mechanisms							
Border mechanisms (MRs with borders)	**All Border Mechanisms**	0.3691	0.3942	**0.6294**	0.1932	**0.7303**	0.1776	-	-0.4889
	Security-related BP	0.3338	**0.6363**	**0.5852**	0.0449	**0.4714**	-0.0625	-	-0.4472
	Economy-oriented BP	0.0270	-0.3254	-0.0856	0.0669	**0.6455**	0.1564	-	-0.4472
	Accessibility-based BP	0.3558	**0.4544**	**0.7417**	0.2276	-0.1667	0.2658	-	-0.2000

Considering some indicators to evaluate regional integration in terms of the regional actors (number of member states), structural factors of economic and geographical proximity (ratio between the highest and lowest GDP, presence of physical borders), and institutionalization (oldest year of foundation) (Lombaerde and Langenhove, 2006), linear correlation analysis (**Table 4.3**) was carried out to observe the relationships among macroregions and the presence of border and cross-border policies. Regarding border policies, there are not strong correlations with the selected indicators at worldwide level, but there are slight variations among continents. The presence of physical borders intensifies the found correlations (positive and negatively respectively), nevertheless they are still low. In the case of cross-border ones, there is a low negative correlation with the year indicator, revealing that older macroregions around that world (with an emphasis on Europe) tend to generate more cross-border projects and institutions.

The relationship between policies is more encouraging. There is a positive correlation between cross-border and border policies, especially when considering all border policies. In terms of security policies, strong correlations are found in America and Africa, followed by Eurasia. A possible explanation comes from the institutional space created by the joint security programs: as they require the participation of multiple actors (including national, subnational, and local authorities), these multistakeholder meetings become into points of interaction where trust and 'sameness' are generated. This transforms the institutional space in an opportunity to explore commonalities outside security issues, increasing the complexity of cross-border relations (Wong Villanueva, Kidokoro and Seta, 2023) and serving as the basis for future bilateral and macroregional initiatives. A similar case would be with accessibility border policies since the construction of economic corridors or joint border-crossings have a direct Impact on cross-border spatiality and dynamize relationships across borders that can lead to future institutionalization initiatives (Wong Villanueva, Kidokoro and Seta, 2022). However, more detailed studies are required to assert that security and accessibility border policies are pre-conditions for cross-border policies.

4. An Overview of Macroregional Cross-Border Mechanisms

Macroregional cross-border mechanisms or policies are the clearest way to observe how bordering and boundarying processes change to reflect new territorialities. The analysis of the dataset gives insights on possible classifications of macroregions according to their position regarding CBC (**Table 4.4**). The 71 macroregions were divided in four groups, and while one indicator cannot explain their behavior, a combination of them (number of members, GDP ratio, regional density, and foundation year) offers a comprehensive perspective.

Table 4.4. Classification of macroregions according to their position towards cross-border mechanisms (Author's elaboration)

	Non-engaged	Cooperative	Supportive	Interventionist	Total
Macroregions – MR (total #)	29	7	7	28	71
Member States (Avg.)	13.0	15.1	24.3	10.7	13.4
GDP ratio (Avg.)	441.9	286.4	1491.8	135.2	397.9
Density (Avg. hab./km2)	75.6	64.6	81.3	65.9	71.2
Foundation Year (Avg.)	1987.4	1993.1	1965.3	1972.0	1979.7
MRs with Security BP (#/%)	8 (27.6%)	2 (28.6%)	1 (14.3%)	18 (64.3%)	29 (40.8%)
MRs with Economy BP (#/%)	16 (55.2%)	0 (0.0%)	2 (28.6%)	14 (50.0%)	32 (45.1%)
MRs with Accessibility BP (#/%)	6 (20.7%)	1 (14.3%)	3 (42.9%)	15 (53.6%)	25 (35.2%)
Policy Ratio (Total Policies /MRs)	1.034	0.429	0.857	1.679	1.211

Non-engaged macroregions: These regions are characterized by not having traces of cross-border policies or by having initiatives that are in an embryonic stage. Many of them (55.2%) are under RIAs focused on economic issues (e.g., CEFTA, APTA, RIIF). Although they share physical borders, some regions are partially disconnected, their borders are extensive and inhabited, or some sections of those macroregions are spatially overlap by other regions with better cross-border policies, so nations develop their strategies under the latter (such as CNT, AP, CAFTA-DR). Based on their foundation year, although they are not the newest, they date back to the latter half of the 80s, which represents less time to develop cross-border policies. Being the second highest GDP ratio in the classification, it can indicate that low economic proximity among nation-states can contribute to not developing CBC.

Cooperative macroregions: Although these regions have not developed their own cross-border policies, they cooperate under the CBC frameworks of other macroregions. The seven cases are in Europe and their surroundings (as CEI, SEECP, BSPC, UFM) and their GDP ratio is relatively low (around 286), showing a better degree of economic proximity. As they appeared in the 90s, the European Union had a greater influence in their border and cross-border policies. Thereby, more than generating their cross-border initiatives, they have supported INTERREG projects. Most of these macroregional organizations, when their member states approached to the EU model through the European Neighborhood Policy (ENP), started considering it as a strategic partner within the same space, generating interregional dialogues, accessing EU funding schemes, etc. However, the spatial overlap has generated problems in determining the specific functions within interregional cooperation. As example, the Adriatic and Ionian Initiative (AII) explains that under the EU Strategy for the Adriatic and Ionian Region (EUSAIR), the delimitation of responsibilities among both macroregions was quite blurry (AII, 2021).

Supportive macroregions: These macroregions are continental and subcontinental arrangements that, although they have not developed their own projects and policies to foster CBC, they have supported other macroregions to fulfill this goal. They could be considered as old regions (from the 60s) with vast geographical extension in America (OAS, LAIA, CELAC and SELA), Asia (CAREC and MGC) and Europe (CoE), which explains their high GDP ratio (around 1500) and large number of member states. They work mainly in providing technical support (all of them have conducted research on CBC), legal assistant (CELAC and CoE have developed 'standard' legal frameworks for CBC cooperation) and financing cross-border projects and policies from other macroregions that are subordinated in their geographical space. Their vast territory might be one of the main obstacles to establishing more complex cross-border mechanisms as there are multiple interests from different nations. However, their 'continental' perspective gives them authority and resources to support other regions.

Interventionist macroregions: These regions contemplate a wide range of CBC mechanisms, from shaping cross-border networks to designing specific cross-border zones with legal authorities. They are mainly located in Africa (as AU, COMESA, IGAD, LGA), America (as CAN, MERCOSUR, SICA) and Europe (EU, BENELUX, NORDEN), have the lowest GDP ratio (135) and the minimum amount of member states, which can be an indicator of higher regional integration compared to the three previous categories. Most of them started in the 70s, having time to develop more and better border policies (more than 50% in all types of border policies). There is a predominance of security-related and accessibility-based border policies, supporting the correlation analysis from **Table 4.3**.

Having described these categories, **Table 4.5** explores the 28 interventionist macroregions (see **Appendix 6**). The table does not look to establish a ranking in terms of quantity or quality but the existence of CBC mechanisms, supporting it with some examples and relevant information about them.

Table 4.5. *The State of Cross-Border Cooperation Mechanisms in Macroregions (Author's elaboration)*

N	Macroregion	Foundation Year	Institutional Purpose	Macroregional space			Macro-Regional Cross-Border Policy Mechanisms									
				Geographical	Historic-Cultura	Political	Approach	Research/ Workshops	Projects	Programme	Spatial Plan/ Zoning	Legal structure	Directive body	Framework (Legal, Plan)	Funding	Export Model
1	EU	1951	Multipurpose (economic union)	Europe	European	Pan-Europeanism	Multidimensional	X	X	X	X	X		X	X	X
2	UEMOA	1962	Multipurpose (economic union)	West Africa	African French heritage		Multidimensional	X	X	X			X	PAR	X	
3	CAN	1969	Multipurpose	Andes	Andean civilizations		Multidimensional	X	X		X		X	X		IND
4	MERCOSUR	1985	Multipurpose	South America	Southern Cone		Multidimensional	X	X	X			X	X	PAR	
5	BENELUX	1944	Multipurpose	Western Europe			Multidimensional	X	X	X		X		X		
6	CIS	1991	Multipurpose	Easter Europe & Asia (North, Central, West)	Post-Soviet		Multidimensional	X	X	X				X	X	
7	ECOWAS	1975	Multipurpose	West Africa	African (West African)		Multidimensional	X	X	X				X	X	
8	USMCA	1994	Trade (FTA)	North America			Environment, Economic	X	X		IND	IND	PAR		X	
9	SICA	1951	Multipurpose (idea towards economic union)	Central America	Latin-American (Central-American)		Multidimensional	X	X	X	PAR	X				
10	AU	1963	Multipurpose (idea towards economic union)	Africa	African	Pan-Africanism	Multidimensional	X	IND	X		X		X		
11	SADC	1975	Multipurpose	Africa (South, Central, East)	African (Sub-Saharan)		Multidimensional	X	X	X	X			PAR		
12	NORDEN	1952	Multipurpose (inter-parliament)	Northern Europe	Nordics		Multidimensional	X	X	X		X				
13	IGAD	1986	Economy	East Africa	African (East African)		Multidimensional	X	X	X	PAR		PAR			
14	V4	1991	Multipurpose	Eastern Europe	Visegrad Pact		Multidimensional	X	X						X	
15	MRC	1995	Environment	Mekong River Basin			Environment	X	X	X						
16	LGA	1970	Multipurpose	West Sahel			Multidimensional	X	X			X				
17	OTCA	1978	Environment	Amazon Basin			Environment, Social	X	X		PAR					
18	ASEAN	1959	Multipurpose	South-Eastern Asia		ASEAN Way's values	Environment, Economic	IND	IND	IND	IND	IND				
19	UNASUR	2000	Multipurpose	South America	Latin American (South-American)		Multidimensional	X	PAR	PAR						
20	ECCAS	1983	Multipurpose (idea towards economic union)	Central & Eastern Africa	African (Sub-Saharan)		Environment, Economic	X	X							
21	CEMAC	1919	Economy (idea towards economic union)	Central Africa	African French heritage		CB Trade	X	X							
22	COMESA	1981	Economy, Trade (FTA)	Africa (North, Central, East, South)	African		CB Trade	X	X							
23	EAC	1919	Multipurpose	East & Central Africa	African (Sub-Saharan)		CB Trade	X	X							
24	CEN-SAD	1998	Trade (idea towards FTA)	Sahel & Sahara Desert			Environment	X	X							
25	MRU	1971	Multipurpose (idea towards customs union)	Mano River Basin			Multidimensional	X	X							
26	CE	1958	Multipurpose	West Africa	African French heritage		Environment, Economic	X	PAR							
27	PROSUR	2019	Multipurpose	South America	Latin American (South-American)	Right-wing Ideology	Multidimensional	X	PAR							
28	CEPGL	1976	Multipurpose	African Great Lakes Basin	Chwezi civilization		Multidimensional	X	PAR							

**PAR=partially, IND=Indirect

At first glance, it is possible to observe multiple African macroregions mainly located in West Africa (ECOWAS, UEMOA, MRU, CE) followed by South American initiatives (CAN, MERCOSUR, UNASUR, PROSUR, OTCA). All macroregions have conducted CBC research or workshops, however, regions with fewer projects tend to subcontract them or receive help through interregional cooperation (mainly from the EU).

In macroregions that have developed only projects, it is possible to observe some cross-border components in the activities of their macroregional strategies (as in the CEPGL's Director Scheme and the PROSUR's roadmap), that their cross-border projects build on their border security programs (as ECCAS or MRU) or that they focus in specific priority areas as environment or cross-border local trade (e.g., CEMAC's Annual cross-border fair, COMESA Cross-Border Initiative and EAC's informal cross-border trade project for women and SMEs).

Cross-border programs –as sets of projects or multi-dimensional agendas executed in multiple CBRs– can build on local development projects around economic corridors. Two examples are the UNASUR's Integration Territorial Program on the IIRSA highways and the cross-border special economic zones (CBSEZ) in the economic corridors of the Greater Mekong Subregion (considering the GMS as a regionalization process that occurs within the ASEAN space). Other programs take into consideration socio-environmental issues as the OTCA's program to protect indigenous people's territories (PIACI), the MRC's Integrated Water Resources Management, the IGAD's Karamoja ecological zone or the SADC's Transfrontier Conservation Areas (TFCA) Program. There are also programs that have a more spatial approach, focusing on the 'cross-border' aspect and incorporating multiple sectorial activities (education, health, economic chains, etc.) such as the ECOWAS' Cross-Border Cooperation Support Program (PRACT), the MERCOSUR's Open Borders Program, the UEMOA's Local Cross-Border Cooperation Program (PCTL) or the EU's INTERREG (that can be considered as a set of programs and legal instruments).

Although projects and programs are the most common intervention mechanisms, other tools such as spatial planning or zoning have contributed to promoting CBC. Some of these cross-border zones, such as the Maquiladoras on the US-Mex border or the already explained CBSEZ in ASEAN, have emerged from collateral regionalization processes outside the main objectives of the RIAs. Others in contrast, emerged from macroregional binding agreements to standardize the 'scope' of border areas. Examples of this type are the CAN's Cross-Border Integration Zones or the EU's delimitation based on NUTS 3 standards. Others are consequence of the delimitation of a specific space for cross-border programs or entities (e.g., SICA's Trifinio region, OTCA's PIACI, SADC's TFCA).

Another option is the creation of legal bodies and/or subregional/cross-border organizations. In the case of the former, the European Union have developed a legal tool known as the European Grouping of Territorial Cooperation (EGTC) to facilitate the creation of CBC entities. This instrument

has been implemented by the Nordic Council to consolidate its Kvarken Council, a cross-border legal body that has operated for the last 50 years. On the other hand, the Benelux Union, although it is completely under the EU's geographical space, decided to create three possible forms of cross-border agencies from the lightest to the most comprehensive: 1) administrative agreements, 2) common body, or 3) the Benelux Grouping of Territorial Cooperation (GBCTs). In the case of the latter, while subregional organizations can be created directly by supranational organisms (e.g., the Trinational Commission of Trifinio Plan by SICA or the EU's four 'Macro Regional Strategies'), others arose from macroregional dynamics: GMS, BIMP-EAGA and IMT-GT in ASEAN and the Council of Atlantic Premiers (CAP) or Pacific Northwest Economic Region (PNWER) in USMCA space.

An alternative path to legal bodies is the existence of macroregional governing entities that promote CBC from above. This strategy has been executed in macroregions like the CAN with its High-Level Task Force for Cross-Border Integration and Development (GANIDF), the MERCOSUR with the Ad Hoc Group on Cross-Border Integration (GAHIF) and the UEMOA with the Council of Territorial Collectivities (CCT).

Three last instruments can be highlighted. The first one is the implementation of frameworks, which can be based on legal documents (such as the AU's Niamey Convention, the MERCOSUR's Agreement on Linked Border Localities or the CIS' Conventions on Interregional and Cross-Border Cooperation) or can have a more operational approach, drawing strategic objectives or courses of actions for Cross-Border Integration in policy documents (such as the UEMOA's Community Spatial Planning Policy or the SADC's cross-border pillar in its Regional Indicative Strategic Development Plan). The second instrument refers to funding mechanisms: While many macroregions finance their cross-border operations through international cooperation, some of them create investment bodies such as the Visegrád Group with its Visegrád Fund, the EU with the European Regional Development Fund (ERDF) and ECOWAS with its ECOWAS Cross-Border Fund. Finally, the last identified mechanism belongs solely to the European Union and represent how this macroregion exports its CBC model to other regions, not only in terms of research, technical support, or funds (that other regions also do), but with a view to integrating with adjacent territories through the European Neighborhood Policy (ENP).

5. Discussion

What is the role and meaning of borders in regional integration? Are they at the heart or at the periphery of macroregional building processes? Although these questions demand more-in-depth discussions, this research contributes from a theoretical and practical perspective by exploring macroregional border and cross-border policies as components of the complex assemblage of bordering and boundarying processes that interact with/in the on-going construction of macroregions. First, we

discussed how interdisciplinary studies would benefit from considering macroregions as supranational regions in-the-making and exploring their spatialities from a metageographical perspective. This spatial approach led to look border policies away from the borderlines and to bring them as institutions acting over the national spaces, while cross-border policies work on the cross-border spaces. Under these interpretations, 100 macroregions were identified. Considering some indicators of regional integration and their border and cross-border mechanisms, this study focuses on the latter. Some results and limitations can be highlighted as they could lead to further deliberations.

In the first part of the analysis, no strong correlations were found between the selected regional integration indicators and the policies. Considering more indicators (independently and integrated) and a measure of quality for those policies would give more to discuss. Nevertheless, analyzing both type of policies, there was a positive correlation between cross-border mechanisms and all border policies together, but mainly with security-related and accessibility-based ones. Causation analysis based on mixed methods can contribute to unveil this query. The second part of the analysis focused on classifying macroregions in terms of their cross-border policies, and then exploring these mechanisms in the different macroregional constructions. Four types of macroregions were identified (non-engaged, cooperative, supportive and interventionist), not only having common approaches towards cross-border issues, but also common features (number of members, GDP ratio, foundation year, etc.). More in-depth analyses on these groups are recommended to observe which of these characteristics (or a combination of them) influence more in how macroregions decide their cross-border approaches or if there are other factors (institutional, historical, geographical, etc.) that are more important in those decisions.

Focusing on the interventionist macroregions, eight types of CBC mechanisms were explored (for future discussions, we will consider projects & programmes in the same category). While regions like USMCA and ASEAN do not target cross-border issues directly, they foster the conditions in which regionalization processes fill the institutional gaps. In contrast, regions like CAN, ECOWAS and other formations take a greater participation in promoting CBC. EU shows a broader set of instruments that have been evolving over decades and have influenced cross-border policies in many macroregions, but this does not imply or recommend a global linear script of policy convergence or ideal maturity of CBC policies (Börzel and van Hüllen, 2015a) as they should serve to the final objectives of their own macroregional integration schemes and to the sustainable development of their own CBRs. A more comprehensive study on these CBC mechanisms may contribute to generate precise instruments that are adjusted to their realities and stage of integration and development.

Based on this research, three lines of discussion can be opened to expand the study of macroregions and their borders within: their relationship with regional integration, region-building processes, and space. To begin with, rather than pointing out the difficulties of measuring regional integration, it is relevant to consider it as a non-homogeneous process throughout the territory: Some

countries and parts of them may be more integrated with each other than with others within the same integration scheme. The spatial component of regional integration can contribute not only to observing which areas integrate more, in what dimension (economic, social, etc.) and why it occurs in this way, but it also can help to explore the performativity of border and cross-border policies: Although border policies can be enforced in legal documents or official plans, their implementation faces the multiplicity of regional propositions carried out by a variety of actors working on the same geographical space. Since the concept of 'regionness' may help to explore the emergence, development, and relationship of macroregions, a parallel concept like 'borderness' is relevant to start parametrizing the complexity of border assemblages and measuring their relationship with macroregional processes in the different dimensions (institutional, economic, social, etc.) where they interact.

The second line aims to unveil the multiple processes of region-building beyond the regionalism-regionalization duality and the 'formal' paths of integration. As an example, the current process of macroregion construction through social media and protest movements led not by institutions but by the social sphere, reinforces the idea of a bottom-up phenomenon that arises as a claim of common national problematics that are not attended –or even more, that are generated by public institutions. Cases all over the world like the current protests in Latin America or the Arab Spring in Middle East (Monier, 2014; Castro Riaño, 2020), could be considered as bottom-up regionalisms, where digital activism across national borders has supported contestatory networked social movements, having the potential effect of influencing change in the political system (Castells, 2015) and therefore, regional integration under common values. However, working within a virtual and geographical space, this phenomenon differs from the conventional spaces of regionalism (Amin, 2002; Jones and MacLeod, 2004), suggesting that it does not correspond to a sub-process of traditional regionalism, but to a process by itself with its own impact on macroregions and national borders.

Finally, this research outlines the relationship between borders and macroregional space. Considering the institutional approach of macroregional space over others would be a natural recognition of the 'stabilization' of regional projects that reflect not only legal constructions through the negotiation of actors' interests, but also geographical and cultural constructions throughout the history. However, we should not limit macroregions to their institutional arrangements as they may fail but remain strong from other perspectives. The macroregions of this century are not only institutionally created, geographically defined, or culturally represented, but a mixture of them. Nevertheless, states continue to be the main territorial units that define these regions, placing new 'orders' above or below them. Looking at how nations relate to each other and what motivates them to be more involved in some macroregions than others –which may also compete in the same geographical space– can provide insights into how the traditional role and meaning of borders are changing.

Chapter 5 Targeting Development from Above: A Comparative Study of Macroregional Cross-Border Systems in South America

Chapter 5. Targeting Development from Above: A Comparative Study of Macroregional Cross-Border Systems in South America

0. Chapter Abstract

Chapter 5 focuses on analyzing how macroregions in South America target cross-border development by comparing the macroregional cross-border systems of the Andean Community (CAN) and MERCOSUR. An analytical framework was developed to facilitate a descriptive analysis using 448 primary and secondary sources. A comparative analysis identifies the commonalities, implementation processes, and best practices that can contribute to other macroregions. Results indicate that both policy systems have not been very effective, but cross-learning can promote their improvement. Special attention deserves the CAN projects, highlighting those targeting cross-border productive articulation.

Keywords: macroregions, cross-border policies, Andean Community, CAN, MERCOSUR, comparative policy analysis

1. Introduction

Cross-border policy literature has been closely related with regional integration research (Koff, 2008). Despite being politically constructed from a supranational perspective, the processes of (macro) region-making are 'held together' through regional dynamics operating at sub- and micro-level. This is especially relevant in Cross-Border Regions (CBRs) as these areas represent key nodes for physical interactions, interconnections of productive value chains, opportunities to reducing of conflicts, and as appropriate locations for deploying Regional Public Goods (Estevadeordal, Frantz and Nguyen, 2003; Oddone *et al.*, 2009, pp. 16, 21; Estevadeordal and Goodman, 2017). Thus, regional integration does not mean the beginning of a borderless world, but the rescaling of the borders and their dynamics to make them more visible (Oddone *et al.*, 2009, p. 63).

Macroregional arrangements do not represent just a process of governance transfer to supranational entities (Börzel and van Hüllen, 2015a), but also a process that promotes decentralization from the nation-states' traditional apparatus and mechanisms to plan, manage, and control the territory (Börzel and van Hüllen, 2015a). This represents an opportunity to bring a better redistribution of governance capacities at multiple levels that can lead to a democratization of border communities as

they start owning the decision-making mechanisms and resources to generate their own development (Oddone, 2008). Thereby, macroregional and microregional processes intertwine, generating possibilities of complementarity and confrontation as both can operate within the same cross-border space (Söderbaum, 2017). These inter-scalar relationships may affect positive or negatively the results of Cross-Border Cooperation (CBC) and impact on Cross-Border Integration (CBI) (Wong Villanueva, Kidokoro and Seta, 2022), leading to consider the repercussion of multi-scalar governance in cross-border local dynamics.

As cross-border studies have been conducted to evaluate the success of CBC strategies at subnational and local level, there has been a need to evaluate the impact of macroregional cross-border mechanisms as facilitators (or inhibitors) of those dynamics. Research on European experiences show how CBC intensified within the policy framework brought by the European Union's macroregional integration (Medve-Bálint, 2008). However, the study of 'top-down facilitation of bottom-up CBC processes' has not been so fruitful outside Europe although other supranational organizations around the world have had similar experiences (as explained in **Chapter 1** and **Chapter 4**). Studying macroregional policies in South America could be enriching as they focus on developing countries, possess similar mechanisms to encourage CBC, and could contribute for a non-Eurocentric perspective of cross-border studies.

This chapter focuses on comparing the macroregional cross-border systems in South America by studying the cases of CAN and MERCOSUR. First, the literature review examines previous research and related analytical tools that can help to explore macroregional cross-border mechanisms. Then, an analytical framework is constructed to allow a descriptive analysis of each case. This is followed by a comparative analysis between both macroregions and the identification of commonalities, the differences within their executions, and the good practices or alternatives that can contribute to other regions. Thereby, the present strives to deliver an overview of how macroregions target cross-border development, the potentialities that they create, and the obstacles that they face in their path for stronger inter-scalar linkages.

2. Macroregional Border and Cross-Border Mechanisms

Following previous discussions on border mechanisms/policies (**Chapter 4**), they are considered not only as political tools embodied in procedures, mechanisms, legal frameworks, etc., but also as components in the multi-scalar production and renegotiation of boundarying and bordering processes. Considering them within macroregions and contrasting them from a spatial perspective, they can be classified as macroregional border and cross-border policies.

Macroregional border mechanisms tackle the traditional role of border as 'protectors' of the nation-state and its sovereignty, reconfiguring all national spaces in a macroregional one. Within macroregions, borders are internal boundaries were their conventional functions of protection and delimitation are discouraged and replaced by strategies that strives to facilitate crossing, eliminate externalities and barriers, and work as one integrated system. Thereby, their impact exceeds the border space although they are related to bordering processes. In addition, for this classification, although many of those policy mechanisms do not have the word 'border' in their names or were not designed to address them specifically, they have a direct or indirect impact on them and in their role within a macroregional space. Accordingly, macroregional border mechanisms/policies can be classified in four types: security-related, economy-oriented, accessibility-based, and social-aiming policies.

The security-related policies (border security programmes, migration policies, etc.) focus on protecting the macroregional space from the border externalities (such as human trafficking, smuggling, cross-border terrorism, etc.) as they can affect any part of the joint territory. Economy-oriented policies (FTAs, custom unions, single markets, etc.) strives to reducing the role of borders as economic barriers to not only facilitate the trade of goods and services but also to construct a seamless economic bloc and enhance the productive function of lagging spaces within macroregions. Accessibility-based policies (joint border-crossings, economic corridors, etc.) stand for reducing the physical barriers that slowdown flows of people, goods, and services between countries through the construction of infrastructure (for transport connectivity, energy connectivity, etc.) or transport logistics systems. Social-aiming policies (regional citizenship, multilingualism, etc.) relate to the socio-cultural components of borders, bringing concepts of migratory governance and regional citizenship (rights and benefits for people) to reducing the division between 'us' and the 'others' throughout the macroregional territory.

Macroregional cross-border (MRCB) mechanisms diverge from the former as these ones focus on the cross-border space and not directly to the macroregional one. These are considered as instruments to facilitate Cross-Border Cooperation and in this way, achieve cross-border integration and development (CBI&D) within a cross-border space by reinforcing cross-border social capital, increasing territorial flows, and enhancing territorial convergence (Wong Villanueva, Kidokoro and Seta, 2022). These mechanisms to promote CBC are based on the dynamics between communities, actors, resources, and territories next to the borders, and how they generate immediate opportunities and threats in a micro-scale.

CBC interventions cover a wide range of sectors as the problems coming from the borders, such as the incompatibility of legal frameworks, or the constraints that appear from being a border territory (e.g., reduced capacities and dependance to national capitals in decision-making) meet the possibilities that are opened because of the proximity to the other country. Thereby, problems such as the lack of local capacities to disaster risk reduction could be covered with cross-border mitigation mechanisms.

Cross-border air pollution could be controlled with joint spatial planning. Lagging territories find an opportunity through cross-border productive chains or joint tourism projects in the economic field, but also by benefiting from common public services in education, health, sanitation, etc.

CBC requires to acknowledge a space where to intervene. However, the question of 'what are the boundaries of Cross-Border Regions?' is still a pending academic discussion. Although some progresses have been realized towards answering it (Medeiros, 2020), the scope of cross-border spaces is still defined by political motivations and reasonings coming frequently from national spheres. In addition, it should be highlighted the crossover between macroregional border and cross-border policies within this space as some strategies from the former such as joint security programmes or development corridors do have an immediate but indirect impact on local dynamics. Whether this impact is positive or negative depends on complementarity measures that incorporate microscale considerations (e.g., border cities programme in economic corridors).

Both type of macroregional mechanisms are instruments for top-down facilitation of bottom-up CBC processes. These tools can be considered as a way of interacting between different scalar regions: not only macroregions can support or delay CBR development, but also microscale arrangements have an impact on macroregional constructions (e.g., how conflicts on borders can avoid further regional integration). Although multiple discussions have emerged on the ontology of scale (**Chapter 2**), for the sake of this research, considering them as levels can contribute to further understanding of the Multi-Scalar Regional Relationships (MSRR), focusing the analysis on the macroregional cross-border mechanisms (unidirectional impact of macroregions in CBRs).

3. Multi-Scalar Regional Relationships (MSRR) and Regional Experiences

Although CBC cannot be constructed just from a top-down approach, it certainly has been implemented by multiple macroregions to facilitate cross-border local dynamics. As the role of borders changes within a macroregional logic, there are potential benefits that can be highlighted. First, due to their supranational nature, their decisions must be accepted by all the country members, reducing the possibility of legal obstacles, and opening the possibility for generating development standards for border regions and promoting a more homogeneous development across borders and between different border sections. Second, depending on the political will, macroregional institutions can orientate more resources (financial, technical, institutional, etc.) to cross-border initiatives and leverage local capacities from both sides of the border. Third, as they set an institutional environment that promotes CBC, local, subnational, and even national governments might change their own legal frameworks to have a better access to their benefits, generating a 'political momentum' that encourage further strategies from above.

Based on the previous analysis of macroregions, **Table 4.5** identified eight mechanisms that are implemented to promote CBC such as research initiatives or workshops, projects & programmes, cross-border zoning, legal structures, macroregional institutions, policy frameworks, funding opportunities and mechanisms to export current working models. The European Union is not only the experience that have implemented more of these mechanisms and for a longer period, but also the one that have attracted more scholars. It is undeniable the (western) eurocentrism in cross-border studies (Wilson and Donnan, 2012), even more in macroregional cross-border studies, where multiple researchers and policymakers consider the EU example as a desired goal for cross-border institutionality (Dahou, 2004; AEBR, 2010).

Although supranational entities may have adopted similar mechanisms and cooperate with the EU to improve them, leading to belief that policymaking is on a convergence path towards a 'global (western) script' to close the governance gaps, regional experiences have shown the decoupling from these standards to answer the needs coming from their own contexts (Börzel and van Hüllen, 2015b). The institutionalization of EU mechanisms for CBC has been constructed based on their own meanings, regional values, border dynamics and negotiations throughout decades. As example, it took around 30 years to develop legal instruments such as the European Grouping of Territorial Cooperation (EGTC) to facilitate the creation of cross-border legal structures (AEBR, 2010, p. 58). Thereby, policy mobility (also called policy transfer) to other regions –with their own particularities, values, institutions, dynamics, etc.– is a challenging task as what to transfer, how, and when are questions that matters to avoid counterproductive effects (Cochrane and Ward, 2012; Evans, 2017).

Apart from the challenges of policy mobility, Cross-Border Cooperation is still a strategy in improvement, even in the European Union. Perkmann (2003) and Koff (2008) indicate that cross-border strategies have not always generated the expected outcomes in Europe, and even less in regions like Latin America where the lack of cross-border programmes and weak institutionality affect the efficacy of CBC projects. Cross-border cooperation or the development of cross-border governance models cannot be considered as a panacea for solving cross-border problems, but as an operating system that can increase the chances of success (Gualini, 2003; Young, 2017; Wong Villanueva, Kidokoro and Seta, 2022). Thus, exploring regional experiences outside EU and identifying their best-case practices and mechanisms can favor their own development and even more, south-north cooperation.

Studying macroregional cross-border mechanisms from South America can be a good starting point to expand this field of study. **Table 4.5** also shows that among the top 5, the Andean Community (CAN) and the Southern Common Market (MERCOSUR) from South America have developed several mechanisms to promote CBC. Under a perspective of Comparative Regionalism and moving away from EU-centric script, taking these cases can contribute to a constructive dialogue as they share multiple similarities in their historical paths, they share dynamics within the same continent, and there is

availability of multiple primary and secondary sources. The learnings can contribute to cross-fertilization of experiences and bring recommendations to other macroregions to revalue their policies towards cross-border spaces.

4. Macroregional Cross-Border Mechanisms in South America: CAN and MERCOSUR

In South America, the Andean Community (CAN) and the Southern Common Market (MERCOSUR) are the two most important existing macroregional arrangements related to CBI&D. Although other supranational organizations overlap those territories, the South American Union (UNASUR) has lost momentum due to political issues among the countries, and the Forum for the Progress and Development of South America (PROSUR) has started few years ago to perceive a meaningful progress. The CAN and MERCOSUR do not share common nations: while the former is composed by Ecuador, Colombia, Peru, and Bolivia, the latter is composed by Brazil, Argentina, Uruguay, Paraguay, and Venezuela (currently suspended)[19]. CAN members are associated states of MERCOSUR and vice versa (except for Venezuela).

4.1. Macroregional Context of Cross-Border Regions

The construction of borders in South America started at the beginning of the 19th century with the independence movements and the rising of the new nation-states, whose territories emerged based on the previous colonial jurisdictions through subdivisions (like the Viceroyalty of Rio de la Plata becoming Argentina, Paraguay, and Uruguay) or unifications (such as Brazil). Successive military conflicts and agreements originated several delimitation processes between the nations that set the borderlines to their (almost) current location by the first half of the 20th century (Benedetti, 2014).

Conflicts between the CAN members to protect their territorial claims started few years after their independence wars (1810-1824), with disputes like the Peruvian Intervention in Bolivia (1828) or the Gran Colombia-Peru War (1828-1829). They continued even in the middle of their own internal conflicts and civil wars, until the late 20th century with the Cenepa War (1995) between Peru and Ecuador.

[19] As MERCOSUR countries do not share land borders with Venezuela and due to its suspended condition, this country is not considered for the present research.

A similar scenario happened with the MERCOSUR members starting with the Cisplatine War (1825-1828) between the United Provinces of Rio de la Plata (Argentina) and the Brazilian Empire, one year after Brazilian independence. The last conflict between those countries was the War of the Triple Alliance (1864-1870) between Paraguay and the Triple Alliance (Argentina, Brazil, and Uruguay), when the former lost up to 69% of its population and Brazil set the conditions to become the political and economic hegemon in South America (Doratioto, 2002). Borders continued changing, but now through diplomatic mechanisms such as the Argentina-Brazil legal disputes of 1895. These events established the international borders within both macroregions, with a difference of 100 years between MERCOSUR and CAN (**Figure 5.1**).

Figure 5.1. *The political Division of CAN and MERCOSUR (Politizados.com, 2020)*

Border demilitarization gave way to the imposition of control mechanisms at the borders to restrict flows (Oddone *et al.*, 2009, p. 64) following the Westphalian approach of consolidating national sovereignties based on the stabilization of the borderlines and their imaginaries as physical, political, social, cultural, and economic barriers (Paasi, 1996; Wong Villanueva, Kidokoro and Seta, 2023). The consolidation of national borders was carried out in the 20th century through three instruments: regions, crossings, and checkpoints (Benedetti, 2014). Under each national planning system, the selection of border districts, border zones, border regions, etc. had the function to ensure the peripheries and their resources under possible conflicts. Border crossings were selected to allow flows between countries, some of them allowing just specific types of flows (e.g., river traffic flows, transhumance movements, tourism corridors, etc.). Border checkpoints concentrated different national agencies to control those flows (e.g., custom services, migration, phytosanitary agencies, etc.).

Table 5.1 and **Table 5.2** provides more information about the geographical context. The CAN has 4788 km of borderlines within its territory, involving Ecuador's land borders entirely. Peru has a strategic position within the macroregion as it is the only one that shares borders with the rest of CAN countries and almost 60% of their borders participate in the regional interactions. MERCOSUR counts with 6261km of 'internal boundaries', where Argentina and Brazil have a dominant position as they share common borderlines and surround Paraguay and Uruguay. Uruguay's borders are entirely part of MERCOSUR intra-dynamics and 80% of Paraguay's frontiers are also involved. Those borders are delimitated by boundary markers, rivers, or landforms.

In addition, there is one trilateral border in the CAN where, although only the Peruvian town of Tres Fronteras is in the tripoint, its subsistence depends on the dynamics across the Putumayo River (that delimitates the border among the countries) with Puerto El Carmen de Putumayo (Ecuador) upstream and Puerto Leguízamo (Colombia) downstream. MERCOSUR counts with two trilateral borders. The most famous one is the Triple Frontier between Ciudad del Este (Paraguay); Puerto Iguazú (Argentina) and Foz do Iguaçu (Brazil) because of the touristic relevance of the Iguaçu Falls (Iguaçu River). The other tripoint locates between Monte Caseros, Barra de Quarai, and Bella Unión (Argentina, Brazil, and Uruguay), and it is delimitated by the Uruguay River and Cuareim River. The two latter countries are still in dispute because of the Brazilian island located between both rivers.

Table 5.1. *Borders and Border Crossings in CAN and MERCOSUR (based on (Benedetti, 2014))*

Borders	Length (km)	Main Border Crossings (#)	Length/crossings (km)
Bolivia – Peru	1047	7	150
Colombia – Ecuador	586	2	293
Colombia – Peru	1626	2	813
Ecuador – Peru	1529	9	170
CAN	**4788**	**20**	**239**
Argentina – Brazil	1132	15	75
Argentina – Paraguay	1699	8	212
Argentina – Uruguay	887	3	296
Brazil – Paraguay	1365	3	455
Brazil – Uruguay	1178	6	196
MERCOSUR	**6261**	**35**	**179**

Table 5.2. *Percentage of national borderlines within CAN and MERCOSUR (based on (Benedetti, 2014))*

CAN	Borders within MR (km)	*International borderlines (km)	% Over Total
Bolivia	1047	7777	13.5%
Colombia	2212	6342	34.9%
Ecuador	2115	2115	100.0%
Peru	4202	7073	59.4%
MERCOSUR	**Borders within MR (km)**	***International borderlines (km)**	**% Over Total**
Argentina	3718	9768	38.1%
Brazil	3675	16885	21.8%
Paraguay	3064	3814	80.3%
Uruguay	2065	2065	100.0%

*Borderlines consider only land borders

As the initial blueprint of current borderlines were the colonial delimitations, national borders have been drawn over indigenous tribes' living spaces, imposing different national interests on ethnic identities such as the Aymará between Peru, Chile, and Bolivia, the Waorani tribe located in the Ecuador-Peru Amazon, or the more than twenty indigenous tribes living in the Gran Chaco plain shared by Argentina, Brazil, Paraguay, and Bolivia (Pan American Health Organization, 2011; Dilla Alfonso, Cabezas and Figueroa, 2022). The consolidation of sovereignty within national spaces mainly had a negative impact on the tribes within the borderlands, as the socioeconomic and political expansion led to their enslavement and population decline (Wong Villanueva, 2019). The national 'colonization' of border areas was accompanied with the establishment of their own national jurisdictions with different managerial capacities at subnational (e.g., Brazilian States, Uruguayan Departments, Argentinian Provinces, etc.) and local level (e.g., Ecuadorian Cantons and Parishes, Peruvian Districts and Town centers, Colombian Municipalities and Communes, etc.). In these conceptualizations, the borders were adopted to support the territorial development within the national schemes by exercising preferentially a protective function (AEBR, 2010; SELA, 2012).

The regionalization of borderlands –or establishment of border regions– was based on delimiting a distance from the border to the interior of the national territory – with different conceptualization in each country. Within this process, the concept of borders –defined by public entities– started moving from just being a line or limit (legal entity) to a zone or area (socioeconomic entity), and then to a shared-action space (cross-border entity) (SELA, 2012). However, this has been more a recent story than a traditional policy as **Table 5.3** shows. Their perspective towards planning and securing borders led to different border region configurations with different levels of border institutionality, where Peru and Brazil showed greater degree of specialization compared with the countries their own macroregions.

Between the CAN members, although their national constitutions mention about border regions, it is through laws that they expand that definition, most of them issued by 2011. Among them, Peruvian border institutionality could be considered the most complex as several concepts and legal instruments crystalized in policy tools targeting development at different border scales and critical issues. Among these countries, there is not consensus on the length, denomination, and even more, on the issues that should be carried at borders. Between the MERCOSUR countries, border regions still have a strong security component. Although first laws started with Argentina and Brazil (1944 and 1979), it is by 1990s that both countries give relevance to border development, and only Brazil has a border region policy. Paraguay and Uruguay do not have that approach (no constitutional mention, very simple laws, no development emphasis, etc.) and consider border regions smaller due to their geographic size (20-50km compared with 150km from Argentina and Brazil).

Table 5.3. *National Policies and Agencies oriented to Border Integration and Development (Author's elaboration)*

CAN	Border region denomination	Oldest Border Zone Law	Main legal instruments	Policy/Plan Instruments	Institutions	Length
Bolivia	Border security zone	2011	Political Constitution of the Plurinational State (art. 262), **Border Development and Security Law (Law 100, 2011)**	No policy	Council for Border Development and Security (2011), Agency for the Development of Macroregions and Border Zones (ADEMAF, 2011)	50km
Colombia	Border zone, border integration zone, Special Border Intervention Zones	1995	Political Constitution of Colombia 1991, Law of Borders (Law 2135, 2021), **Border Zones Law (Law 191, 1995)**, Decree 1030 (2014) [replacing Decree 569 (2001)], zoning decrees [Decree 1814 (1995), Decree 2036 (1995), Decree 930 (1996)]	Borders for Prosperity Plan (2014) (plan but not policy)	Intersectoral Commission for Border Development and Integration (2014), Directorate for Development and Border Integration (DIDIF, 2016)	municipalities, townships, departments
Ecuador	Border strip/zone	2018	Constitution of the Republic of Ecuador 2008, **Organic Law of Border Development (ROS 243, 2018)**	Policy of Defense, Security, and Development of the Northern border (2018) (partial policy)	National Intersectoral Committee for Border Development (2018)	40km
Peru	Border area, border zone, border region, border macroregion, border integration zone, and critical border areas	2011	Political Constitution of Peru of 1993, **Framework Law for Border Development, and Integration (Law N° 29778, 2011)**, Supreme Decree 019-2018-RE, Supreme Decree 005-2018-RE	National Policy of Border Development and Integration (2018)	National System for Border Development and Integration (SINADIF, 2011) & its National Council (CONADIF, 2011), Directorate of Border Development and Integration (DDF, 2011)	50km, districts, departments, national macroregions
MERCOSUR	**Border region denomination**	**Oldest Border Zone Law**	**Main Legal instruments**	**Policy Instrument**	**Institutions**	**Length**
Argentina	Border Security Zones, Border Zone for Development	1944	Border Security Zones (Decree 253/2018), Decree 1648/2007 [modifying Decree 887/1994, Law 18.575 (1970), **Decree Law 15.385 (1944)**]	No policy	Secretariat of Borders, National commission for border security zones (2017)	150km
Brazil	Border Strip	1979	Constitution of the Federative Republic of Brazil 1988, Decree 9.961 (2019), Decree 9.810 (2019), Decree 85.064 (1980), **Law 6.634 'Border Strip' (1979)**, Decree 8.903 (2016)	National Policy for Regional Development – PNDR (2019) [including border policy], Border Strip Development Promotion Programme – PDFF (2005, ~1990) [replaced by PNDR], Integrated Border Protection Programme – PPIF (2016)	Permanent Commission for the Development and Integration of the Border Strip – CDIF (2019, 2010), Executive Committee of the Chamber of National Integration and Regional Development Policies (2019)	150km
Paraguay	Border security zone	2005	**Law 2.5342/05 (2005)**	No policy	-	50km
Uruguay	Border zone	2018	Law 19677 (2018)**, National Border Plan (2022)**	No policy	General Directorate of the Area for Border, Border and Maritime Affairs (2014), National Border Commission (2022)	20km

Table 5.4. Territorial Dynamics in the Cross-Border Regions of CAN and MERCOSUR (Author's elaboration)

	Territorial Synergies (Cross-border flows that nourish the CBR)	Shared Issues (Common problems in both border sides)	Common Externalities (Negative cross-border spillovers)
CAN	**Indigenous population dynamics:** Andean-Aymara cross-border spaces (PE-BO-CH), Waroni and other tribes in EC-PE Amazon, the eleven ethnic families in EC-CO CBR. **Cultural linkages:** Multiple ethnic heritages and traditions in Amazon CBRs, Pre-Inca cultures across borders (e.g., Tiawanaku culture between PE-BO), the Incan Empire and Spanish colony (both in all Andean region) set common identities, lifestyles, etc. **Blood kinships & Daily-life dynamics:** High intensity of social relationships, kindship and ethnic linkages between local population, tribes, etc. (e.g., doble residency to work, non-monetary exchange of goods in PE-CO Amazon CBR, joint festivities in PE-BO, religious ceremonies in EC-CO, etc.). **Paradiplomacy:** cooperation between subnational and local governments have existed but it has not been sustainable over time. **Cross-border networks:** organizations across borders to help migrants (Ecuadorian orgs receiving Venezuelan and Colombian migrants in EC-CO border). Madre de Dios – Pando Consortium (supported by USAID) to finance CBR projects (orgs related to environmental conservation). **Use of common resources:** PE-BO CBR dynamics around Titicaca Lake, Amazon Forest, etc. Environmental CBR such as the 'Bosques de Paz' Transboundary Biosphere Reserve between PE-EC (first cross-border reserve in South America). **Economic complementarity:** Complementarity of services in CBRs such as technical/professional services, retail commerce, restaurants, etc. Dynamism in river transportation.	**Geographic accessibility:** long border extension and difficult access due to Andean (PE-EC, EC-CO, PE-BO) and Amazon geography (all borders), CBRs' sections divided by waterbodies (Titicaca Lake, Putumayo River). **Urban and regional characteristics:** Between 70-80% of border population is urban (30-40% in border districts). High presence of ethnic groups (indigenous tribes, afro/ Caribbean heritage, etc.). Presence of cross-border urban complexes (e.g., Huaquillas – Aguas Verdes – Zarumilla (EC-PE-PE), Desaguadero-Desaguadero (PE-BO), etc.). **Socioeconomic conditions:** Socioeconomic gap compared with national centers, lack of access to basic services (water, sanitation, health, education, energy, technical/professional education, etc.) mainly in rural border areas. Little connection with global networks (value chains, international forums, etc.). High environmental value in CBRs. Flood/Drought risks affect agriculture production.	**Economic imbalances:** Price differentiation, and legal divergence promote pendular economy and imbalances across borders (e.g., Tulcan-EC and Ipiales-CO dynamics before and after dollarization, cross-border illegal labor movement). **Socioenvironmental problems:** Cross-border illegal mining in Andean and Amazon regions (e.g., Ecuadorian miners in Cordillera del Condor, Peru), illegal logging (e.g., logging mafias extracting from Ecuadorian forests to Colombia), wildlife trafficking (e.g., from Peru to Bolivia). **Security & Illegal Flows:** Peru, Colombia, and Bolivia are worldwide top producers of cocaine, moving large flows of illegal chemical supplies and drugs across borders to EC, AR, BR and VE. Drug networks relate to other illegal flows: arms trafficking, human trafficking, etc., increasing criminality in CBRs (e.g., 88% of Ecuadorian homicides happened in Colombian side). Illegal flows are moved through river and throughout the jungle.
MERCOSUR	**Indigenous population dynamics:** twenty indigenous tribes living in the Gran Chaco plain (AR-BR-PA-BO), but little indigenous populations in CBRs (extinct or reduced such as the Charrua ethnicity between AR-BR-UR). **Cultural linkages:** CBRs within the Gaucho culture region. European colonial legacy based on rural cattle work (common traditions, literature, clothing, economies, etc.). Jesuit reductions (catholic indigenous settlements) across Triple Frontier (AR-BR-PA). **Blood kinships & Daily-life dynamics:** High intensity of social relationships and kindship between local populations (e.g., doble residency, twin cities dynamics, Brazilian health centers attending border populations, increase trade between Brazilian descent, etc.). **Paradiplomacy:** subnational and local cooperation have been more dynamic with network initiatives like MERCOCIUDADES and AMFIM, and cross-border alliances. **Cross-border networks:** Joint projects between public subnational/local entities, joint research (e.g., BR-AR-UR biotechnology center), university-university cooperation in +24 border cities through Border Bilingual Intercultural School, exchange of professors, students, promoting joint research/technical assistance to municipalities, etc. **Use of common resources:** Strong economic dynamics in Triple Frontier due to Iguazu Falls. Energy production in the binational Itaipú Dam (BR-PA). Joint environmental reserves between Argentina and Brazil (Iguazú/Iguaçu National Parks). **Economic complementarity:** Brazilians from Matto Grosso and Parana (BR) use competitive advantages (low costs, deregulation, permissiveness, etc.) from Alto Parana (PA) to leverage their local economy and connect with global chains. Other dynamics such as border retail markets, tourism, river transport, etc.	**Geographic accessibility:** CBRs are in plains (Gaucho pampas (AR-UR-BR) and Gran Chaco plain (AR-PA-BR)) and highlands (Misiones plateau (AR-BR), showing moderate access, but long extension of borders. CBRs divided by waterbodies (Parana River, Uruguay River, Pilcomayo River, etc.) with flood risks. **Urban and regional characteristics:** High border urbanization (70-90%). Mix of very high urban centers with very unpopulated rural areas. Presence of multiple cross-border urban complexes (Triple Frontier (AR-PA-BR), Chuy-Chui (BR-UR), Barracao – Bernardo Irigoyen (AR-BR), Monte Caseros-Barra de Quarai -Bella Unión (AR-BR-UR), etc.). **Socioeconomic conditions**: Unbalanced development levels across borders (HDI: AR>BR>UR>PA). Rural areas still have difficulties with access to basic services. CBR economy is based on agriculture, agroindustry, and services. High environmental value in CBRs. Flood/Drought risks affect energy/agriculture production, and river transport.	**Economic imbalances:** The construction of tax-free zones, price differentiation, and legal divergence foster smuggling and promote pendular economy and uneven development across borders (e.g., case of Ciudad del Este Paraguay in Triple Frontier of Iguaçu). 'Chicken smuggling' to Paraguay (70% of national consumption comes illegally from Argentina). **Socioenvironmental problems:** Agro-industrial problems such as the 'Brasiguayans' soy agriculture (Brazilian descent farmers in Paraguayan border putting at risk local ones) and rice agriculture (in Uruguayan border), and the Paper factories' issue in Uruguay River (Argentinian environmental concerns on two Uruguayan pulp mill projects). Wildlife trafficking (e.g., traffic from Brazil and Paraguay to Uruguay). **Security & Illegal Flows:** Paraguay is considered as the 'smuggling hub' of the region and worldwide top producer of weed (PA and UR move weed to AR and BR). Argentina and Brazil are cocaine 'platform countries', moving it to other MERCOSUR countries and the world. Illegal flows (mainly through rivers) increase cross-border criminality (e.g., cross-border gangs in border cities).

As these processes, identities, legal schemes, and spatialities intersected across the borders during 19th and 20th century, South American cross-border regions emerged as spaces of overlapping territorialities (Agnew and Oslender, 2010). Due to their geographical location, many of the border towns have lower population and weaker economies than regional centers (AEBR, 2010), giving few incentives (low demand levels, not proper conditions, etc.) to invest on them (SELA, 2013). The poor subnational and local capacities and the constrained accessibility to regional and national centers also influenced in their weak institutionality (SELA, 2012). The long extension of the borderlines, the lack of official border crossings and checkpoints (**Table 5.1**), the weak infrastructure at the borders (AEBR, 2010), and the different legal regimes in every side of the borderline (**Table 5.3**) generated several spillovers across the borders, shaping cross-border dynamics and phenomena (Wong Villanueva, 2019) such as territorial synergies, shared issues, and common externalities (**Table 5.4**).

In South America, cross-border collaboration happens more informal than formal (AEBR, 2010). Considering a Southern Latin America cross-border regionalism (Rhi-Sausi and Oddone, 2013) has been a proposal to differentiate with the Northern Latin American dynamics: while the latter struggles more with border security issues, the former has a more stable scenario to focus on development issues. However, although CAN and MERCOSUR present similar dynamics within their long and unpopulated borders (economic complementarity or competition, high presence of illegal and dangerous flows, irregular patterns of urbanization, different dynamics in 'wet' and 'dry' border regions, multiple sociocultural linkages, high environmental-value CBRs, etc.), their own historical developments, geography, economic potential, and so on, have determined different kind of cross-border relationships and issues.

The difficulty of Andean-Amazon geography (average-low agriculture potential, cumbersome access, distance to the national centers, etc.), the presence of indigenous tribes, and limited subnational governmental capacities (centralist governments with national presence in terms of securitization), have generated conditions in the CAN cross-border regions to hold dynamics based on rural-ethnic identities, resource-extraction activities, and socioeconomic disconnection with the capitals. By the other side, MERCOSUR presented an easier geography where the countries incentivized cattle-based economies and set specific economic and regional patterns to strengthen national interest at the borders (border tax-free zones, agriculture frontiers, urban concentration, etc.). In addition, stronger subnational capacities (especially in Argentina and Brazil as federal nations) opened the opportunity to shape partnerships at local and subnational levels. This promoted cross-border dynamics based on agroindustry-related activities, stronger subnational networks, and asymmetric economic relations across borders.

4.2. Macroregional Cross-Border Approach

The numbers behind the regions reveal clear differences in terms of area, population, and GDP (**Table 5.5**). Three times bigger in terms of area and GDP, more than twice the population, and a GDP per capita 1.4 times greater, MERCOSUR is comparable bigger than the CAN. One remarkable difference is the ratio between the highest national GDP and lowest one in every macroregion (GDP ratio in table). MERCOSUR ratio is six times bigger, reflecting big economic disparities between them. However, both have relative low densities (22-30 habitants/km2).

Table 5.5. *The CAN and MERCOSUR in numbers (Author's elaboration)*

	Area (km2)	Population (million habs)	Density (habs/km2)	GDP (milliards $)	GDP capita ($/habs)	GDP ratio*
CAN	3'781'920	111.7	29.54	698.8	6253.9	7.9
MERCOSUR	11'879'142	266.5	22.43	2379.4	8928.5	48.2

*GDP ratio: max GDP / min GDP; milliards: 10^9

The CAN or MERCOSUR, as macroregions-in-the-making (**Chapter 4**), can be considered as a set of supranational multi-dimensional processes that gives meaning to their spatialities, including to their CBRs, and what role they might play within their own macroregional logic.

The Andean Community's spatiality is a geographical and historic-cultural construction based on the geography of the Andes and precolonial civilizations. This mountain chain, the longest in the world, is in the western side of South America, and encompasses the CAN countries, Chile, Venezuela, and Argentina (Chile and Venezuela were members until 1976 and 2006 respectively). Despite the multiple geographic or bioclimatic regions, the Andes mountains have a particular relevance as they witnessed the appearance of several cultures and civilizations in Ecuador, Peru, Bolivia, Southwest Colombia, Northeast Argentina, and North Chile. Among them, the Incan Empire during 15th and 16th Century represented the zenith of the Andean civilizations before the Spanish colonization. Although the CAN geopolitical space is smaller than its geographic and cultural spatialities, they have been important for its macroregional identity and sectoral agendas.

The Southern Common Market's spatiality has different origins than the CAN, although is also based on geographical and historic-cultural constructions. MERCOSUR, the macroregional arrangement in the eastern side of South America, expands the conceptualization of the 'Southern Cone'. This geographic subregion originally covers Argentina, Uruguay, and Chile. The proximity to the

Pacific Ocean and climate conditions intensified the European colonization, leading to the formation of the 'gaucho culture', that had an especial role redefining the Southern Cone identity (including Paraguay and the South of Brazil). Evidence from this phenomenon was the Brazil and Argentina's attempt in 1987 (supported by Uruguay) to instrumentalized this cultural asset by moving towards a common currency, the Gaucho, as part of a regional economic integration (Neagle, 1987). Thereby, although geographical and cultural spatialities were smaller compared to the MERCOSUR geopolitical space, they were used as an initial imaginary to cooperate.

In relation to their institutional construction, regional integration in South America is mainly related to territorial development, international trade, and infrastructure (transport connectivity, and economic/productive integration) (Rhi-Sausi and Oddone, 2013). Thereby, institutional macroregions are political umbrellas to support pending issues between the countries. Although the integration processes accelerated by the 80s with the demilitarization, the comeback of democracy, and the turn towards integration to solve the socioeconomic crises (Oddone *et al.*, 2009, p. 59; Rascovan, 2009), both macroregions had different motivations towards CBI&D.

The Andean Community, as a regional arrangement, can be tracked from the Cartagena Agreement (1969). The bloc emerged as a subregional protectionist initiative in response to the unsuccessful integration attempt of LAFTA, mainly focusing on economic and trade integration from the beginning, but also considered other components such as inequality reduction, social integration, integrated development, and more (Carrillo Roa and Santana, 2012). Thereby, 'borders' were only mentioned as part of the transport connectivity and trade facilitation regional strategies (Art. 86) (Pacto Andino, 1969). In 1979, the creation of the Andean Parliament, Court of Justice, and Andean Council of Foreign Ministers (CAMRE) brought further institutionalization and a turn towards democracy, human rights, social justice, etc.

In 1987, two decades after the Cartagena Agreement, the countries modified it with the Quito Protocol, which included a broader concept of integration (economic, social, cultural, development, etc.). This agreement considered Cross-Border Integration as a socioeconomic mechanism (Art. 3) to promote an integral development of border regions and incorporate them to the national and regional economies (Art. 70) (Pacto Andino, 1987).

In 1989, the Cartagena Agreement Board (JUNAC), the maximum organ, proposed further CBI in the 'Strategic Design for the Orientation of the Andean Group' document, with the objective to raising border development levels, productivity capacity, and strengthening union between the countries (Cumbre de Presidentes Andinos, 1990, p. 25). To achieve those goals, it was promoted a three-steps plan based on research, binational projects and planning, cross-border productivity programmes, and legal harmonization. This progress, coupled with the binational initiatives that the countries were carrying between them (e.g., the Bolivian-Peruvian Border Integration Support Programme),

incentivized the JUNAC to cooperate with the Inter-American Development Bank (IADB) that provided technical and financial support.

Under the 'Programming of Border Development and Integration Activities between the Andean Region Countries' initiative, JUNAC and IADB conducted research on the main CBRs between 1989 and 1990 (Oliveros, 2002a; Arciniegas Serna, 2018).Those were carried under the same methodology to have a common perspective of the cross-border problematic, define a regional development strategy for CBRs, and elaborate action plans that promote communitarian initiatives (Oliveros, 2002a). The resulting guidelines for a macroregional cross-border policy (including analysis, strategies, and action plans) were collected and presented to the Andean Presidential Council in 1990, in the 'Strategy and Policies for Integration and Border Development of the Andean Group Member Countries' document (Arciniegas Serna, 2018). However, due to the lack of clarity on how to finance cross-border projects, the slowdown of the integration process, and the not-concluded border tensions (e.g., Peru-Ecuador 1995 war), this initiative did not progress (Oliveros, 2002a; Arciniegas Serna, 2018).

With the renewed peace, the integration process accelerated through the Trujillo Protocol (1996) that gave birth to the Andean Community (CAN) and its institutionality, embodied in the Andean Integration System (SAI) and its executive organ, the CAN General Secretary (SGCAN, ex-JUNAC) (Comunidad Andina, 1996). The integration agenda considered not only physical connectivity, economic and trade cooperation, but also the relevance of social and environmental cooperation as those were sensitive political issues among the countries (Arciniegas Serna, 2018). The cross-border agenda was retaken by 1997, with the realization of cross-border events in the Peru-Ecuador border cities to symbolically strengthen peace binationally and trust on the multilateral Andean system. In addition, the SGCAN improved its technical team for cross-border policy and started working with the foreign ministries, with a common understanding on the relevance of bilaterality as a territorial cohesion factor (Arciniegas Serna, 2018).

In 1999, the CAMRE approved the 'Decision 459' or 'Community Policy for Border Integration and Development', a framework policy that set the principles for macroregional CBI based on regional peace, mutual benefit, economic complementarity, and socioeconomic development in the Cross-Border Integration Zones (ZIFs). To increasing the quality of life of border populations, legal harmonization, and dialogue mechanisms, this policy created the High-Level Task Force for Border Integration and Development (GANIDF). This agency, coordinated by the CAMRE and supported by the SGCAN (technical partner), binational mechanisms, and the Andean Regional Consultative Group (conformed by IADB and CAF), was responsible of the macroregional institutionality and to coordinate and propose plans and programmes (Comunidad Andina, 1999; SELA, 2013).

In the beginning, GANIDF prioritized two issues: to clarify the concept and approach of the cross-border integration zones, and the role of border-crossings in the regional and local dynamics. In

2001, both initiatives crystallized in the 'Decision 501' for the 'Cross-Border Integration Zones (ZIF)' and the 'Decision 502' for the 'Binational Border Service Centers (CEBAFs)'. The former policy established the ZIFs to generate the conditions for sustainable development and achieve CBI in five dimensions: social (focus on basic needs and cultural identity), economic (improve border productivity and markets), environmental (preserving nature), institutional (incentivize public-private partnerships), and accessibility (free transit).

To achieve those goals, Decision 501 promoted the bilateral elaboration of plans and projects within the ZIFs, the establishment of the Bank of Border Integration & Development Projects (BPIF) supported by IADB and CAF, and the elaboration of ZIFs with third-party countries (Comunidad Andina, 2001a). Decision 502 set the CEBAFs to ensure the integrated control of cross-border flows and eliminate obstacles for cross-border mobility (e.g., reduce customs procedures, homologate business hours, etc.) (Comunidad Andina, 2001b). This last decision would be considered more as a macroregional border mechanism than a cross-border one.

The establishment of the ZIFs started immediately using preestablished binational frameworks (e.g., Peru-Ecuador Binational Plan). However, their progress to date is debatable (evaluation in 5.4). Even though, as a legal umbrella, it promoted other binding initiatives such as 'Decision 541: Andean Health Plan on Borders (PASAFRO)' (2003) that established guidelines to prioritize health problems in CBRs, promote binational health services networks, and elaborate binational plans and projects for cross-border health cooperation (Comunidad Andina, 2003a).

The same year, the Andean Presidential Council agreed in the Declaration of Quirama 'to establish the structures of a new stage in the integration process that deepens the multidimensional nature of the Andean Community', selecting six development axis and considering Cross-Border Integration and Development as one of them (Consejo Presidencial Andino, 2003). This document not only encourage the GANIDF to generate the 'Comprehensive Cross-Border Integration and Development Plan' (not yet developed), but also to promote the ZIFs and projects with third countries and within the macroregional framework of UNASUR's 'Initiative for the Integration of the Regional Infrastructure of South America' (IIRSA). Years later, the same compromise towards a cross-border agenda would be reaffirmed in the GANIDF's Santa Cruz Action Plan (2009) and in the CAN's Strategic Agenda (2010) (GANIDF, 2009; Comunidad Andina, 2010a). However, in 2013, GANIDF was displaced by bilateral mechanisms promoted by the national governments (Presidential meetings), and next year with the Decision 797 (2014), GANIDF was not considered anymore within the CAN's institutionality (Comunidad Andina, 2014a).

The progress on macroregional legal frameworks did not translate exactly into projects although by 2007, there were some prioritized projects included in the BPIF. The change of paradigm towards a more practical perspective of CBI (more projects instead of plans and legislation), a macroregional

perspective to facilitate a bottom-up approach (increase involvement of local actors), and the access to technical and financial sources through international cooperation, started generating the first cross-border projects (Wong Villanueva, 2019) and prioritizing them in the BPIF.

In 2008, CAN subscribed a collaboration agreement with EU called 'Project to Support Economic and Social Cohesion in the Andean Community' or CESCAN I. Four cross-border projects were considered, with a total investment of 2.9M euros (58% covered by EU, the rest with local investment) and a benefit for 251,000 inhabitants (Comunidad Andina, 2011a). The success was followed by CESCAN II in 2011, with four new cross-border projects that received a total investment of 2.7M euros until their completion by 2014 (Comunidad Andina, 2012a).

In parallel, the Spanish Agency for International Cooperation (AECID) also collaborated with the CAN by developing the Andean Regional Programme (PRA). This included cross-border projects to support PASAFRO, social development initiatives within the ZIFs, socio-productive and tourism projects, and institutional strengthening (AECID and Comunidad Andina, 2006), receiving a financing of USD 6.7M for the 2006-2011 period and proposing a second delivery for 2012-2014 period with projects oriented to cross-border productivity (AECID and Comunidad Andina, 2006; Comunidad Andina, 2015). By 2010, the CAN-EU cooperation worked on other programme called the 'Action with Civil Society for Andean Integration' or SOCICAN, that developed 64 initiatives with 250 social organizations with a total investment of 4.6M euros (88% covered by EU, the rest from the CAN) (Comunidad Andina, 2010b, 2011c) and developing some initiatives for cross-border development.

By 2015, the CAN and EU collaborated in one last programme named 'Participatory Regional Integration in the Andean Community' – INPANDES (signed in 2010) that focus on socio-economic cohesion in the ZIFs, impacting over 160,000 border people through six binational interventions for the value of 6.1M euros (85.7% covered by EU, the rest by local sources) (Comunidad Andina, 2018b). The projects finished by the end of 2018, almost four years later, strengthening the local networks, focusing on cross-border productivity capacities, and developing three mechanisms to further collaboration: the Andean Platform for Cross-Border Cooperation, the Andean Platform for Community Tourism Development, and the Andean Platform of Innovative Regions (Comunidad Andina, 2018b).

Thereby, the CAN has achieved to materialize its legal framework and execute multiple projects within the last decade by capturing a considerable amount of funds (small-scale donations) from international cooperation to overcome the political difficulties that it has faced. However, with the end of GANIDF and the cooperation projects, this process of macroregional integration from the borders has slowed down.

The **Southern Common Market** started with the closer approach between Argentina and Brazil in the 1980 decade. With the comeback of democracy (1983 and 1985 respectively), the regional economic crisis, and persistent trade protectionism, both countries signed 24 bilateral cooperation

protocols between 1984 and 1989 to increase international trade and reorientate their economic policies (Rascovan, 2009). Among them, the Declaration of Foz de Iguazú (1985) represented a milestone for that cooperation and the cornerstone of the future MERCOSUR. This agreement created the 'High Level Mixed Commission for Integration between Argentina and Brazil' and promoted cooperation in sectors such as trade, transport, energy, science, and more, but without mention of borders outside customs issues (Presidencia de la República de Argentina and Presidencia de la República Federativa de Brasil, 1985). In 1989, the idea of bilateral integration was replaced by the objective of shaping a common market, that was reflected in the Act of Buenos Aires (1990) (Presidencia de la República de Argentina and Presidencia de la República Federativa de Brasil, 1990).

Paraguay and Uruguay were also attracted to the idea of a common market, and in 1991 the four countries signed the Treaty of Asunción, giving rise to the Southern Common Market or MERCOSUR. This regional initiative was mainly oriented to trade and economic development by transport infrastructure, trade liberalization, elimination of tariff and non-tariff barriers, implement a common external tariff, and more (MERCOSUR, 1991). This initial formation did not include any social issue (apart from a short mention about social justice), and its unique role as economic-trade region differentiated it from other regional blocs (Carrillo Roa and Santana, 2012). Therefore, borders and border development were not considered originally.

In the following years, the integration dynamics among the countries set the need to reinforce MERCOSUR as a customs union to construct a common market, giving relevance to a stronger institutionality, and elevating it to a political platform with not only economic, but also social characteristics (AEBR, 2010; Carrillo Roa and Santana, 2012). Thereby, with the Ouro Preto Protocol (1994), MERCOSUR established its institutional structure composed by six organs, being the Common Market Council (CMC) the highest-level agency (MERCOSUR, 1994). Among those bodies, the Economic-Social Consultative Forum (FCES) was the body in charge of promoting social and economic cohesion and articulating with civil society. However, this initial approach for social issues did not contemplate cross-border topics.

Cross-Border Integration was not part of the macroregional agenda –although it was part of the bilateral ones– until the late 1990s. Nevertheless, in the Asunción Summit of 1995, the integration process inspired eleven local governments to strengthen their linkages and promote horizontal cooperation in six thematic agendas (Oddone, 2008, p. 77; MERCOCIUDADES, 2018). The MERCOSUR city network, or better known as MERCOCIUDADES, was not initially composed by border cities (apart from Asunción) but it included subnational governments with border regions such as Curitiba (Paraná), Porto Alegre (Rio Grande do Sul), and Florianópolis (Santa Catarina). Since its creation, MERCOCIUDADES has grown to a total of 361 cities in ten South American countries and cooperating through 22 technical units –including a Border Integration Thematic Unit (UTIF) created

in 2015 (MERCOCIUDADES, 2015). Other initiative, the 'Association of Municipalities of Integrated Borders of MERCOSUR' or AMFIM (2003), was also bottom-up constructed by border municipalities within the South-Central Corrientes and Northeast Entre Rios microregion, but did not have continuity (MERCOCIUDADES, 2007; Oddone, 2012).

Since the end of 20th century, there were some progresses in terms of macroregional cross-border institutionality. In 1998, MERCOSUR approved the Socio-labor Declaration that included a commitment to establish common norms and procedures to facilitate the cross-border flow of workers in border regions (Art. 4) (MERCOSUR, 1998). The following year, the Decision 'MERCOSUR/CMC/DEC N°17/99' or 'Border Neighborhood Transit (TVF) Agreement' gave the border populations the right to get a TVF card and cross to the adjoining border area more easily (MERCOSUR, 1999a). Brazil promoted further negotiations to achieve free movement on border areas, however, they did not accomplish that goal (Oddone *et al.*, 2009, p. 66). As a result of these negotiations, the CMC approved the Decision 'MERCOSUR/CMC/DEC. Nº 05/02' in 2002, creating the 'Ad Hoc Group on Border Integration (GAHIF)'.

GAHIF was created to generate instruments that promote integration between border communities and increase their quality of life in a multisectoral perspective (health, education, labor, etc.) as CBI represents 'one of the most relevant and emblematic aspects of the integration process' (MERCOSUR, 2002). In the following years, GAHIF worked on some laws and projects such as the 'MERCOSUR Border Statute' (that would become in a Citizen Statute), the 'Linked Border Communities (LFV)' (MERCOSUR/IX GAHIF/DI Nº 01/05 proposed in 2005) or the 'Border Integration in MERCOSUR' project (PIFM), but with mixed results (Oddone *et al.*, 2009; SELA, 2013). Some project initiatives were supported by other MERCOSUR bodies such as the MERCOSUR Educative Sector and its Border Intercultural Bilingual Schools Programme (PEIBF) since 2005 (MERCOSUR, 2005b). This programme was executed by the Border Schools Working Group (GTEF) under the Meeting of Ministers of Education (RME) (MERCOSUR, 2022).

In 2004, the 'Consultative Forum of Municipalities, Federated States, Provinces and Departments of MERCOSUR (FCCR)' was created through the Decision 'MERCOSUR/CMC/DEC Nº 41/04 and installed three years later in 2007. Although it did not include cross-border topics in its agenda, it represented the linkage between the formal structure of MERCOSUR with the subregional initiative of MERCOCIUDADES, recognizing them as relevant actors for integration (Perezlindo, 2015; MERCOCIUDADES, 2016). By 2007, the FCCR, in cooperation with the MERCOCIUDADES Permanent Technical Secretary, promoted the 'Working Group on Border Integration (GTIF)' (FCCR, 2007b, 2007a). The GTIF started activities in 2008, organizing cross-border workshops and events to discuss about the problematic in CBRs and sectoral CBC such as the Formosa Border Meeting (GTIF, 2008).

In 2008 the 'MERCOSUR Border Integration Project (PIFM)' was proposed under the AECID's MERCOSUR Subregional Programme (PSM) and with technical support from Italian international cooperation organisms such as the Center for International Policy Studies (CesPI) and the Interregional Observatory for Development Cooperation (OICS) (CeSPI, OICS and MERCOCIUDADES, 2009). The PIFM was oriented to define strategies to designing and managing CBI policies by identifying the problems in CBRs and consulting local governments for solution proposals (Rhi-Sausi and Oddone, 2010). This research project gave priority to five sectoral action lines for CBI: border local development, institutional strengthening, environment, gender, and productive integration (GTIF, 2009). The PIFM strived to identify a set of pilot projects for CBRs, increase participation of civil society, and organize workshops as meeting spaces for concertation, decision-making, and evaluation (AECID, 2009). In the next years, this project continued to being supported with technical and financial resources from AECID under the name 'Cross-Border Governance: strengthening capacities in local and departmental governments in MERCOSUR' (FCCR, 2010).

The Municipality of Canelones (Uruguay), as the Executive Secretary of MERCOCIUDADES and the Municipalities Committee Coordinator of FCCR, was in charge not only of executing the PIFM, but also of generating partnerships with regional stakeholders (as SEBRAE or CAF) and international cooperation agencies (AECID, CesPI, OICS) (MERCOCIUDADES, 2009). The Memorandum of association between Canelones (as MERCOCIUDADES Executive Secretary) with CesPi and OICS also allowed it to cooperate under the 'Open Borders' Project. This project was executed through discussion forums (I Forum of Cross-Border Cooperation Argentina – Brazil – Paraguay) and cultural cross-border cooperation between twin cities (conduct analysis, shape associations, generate cultural events, spaces, and initiatives) (Oddone *et al.*, 2009).

While MERCOSUR institutionality was articulating with the subregional network of MERCOCIUDADES through the FCCR and GTIF, this mechanism was also interacting with the recently created FOCEM. Established in 2004 and regulated in 2005, the MERCOSUR Structural Convergence Fund or FOCEM was created as a redistribution mechanism (Brazil and Argentina as contributors and Paraguay and Uruguay as main beneficiaries) to overcome regional asymmetries in four action lines or programmes: structural convergence, competitivity, social, and institutional strengthening (MERCOSUR, 2005a). Since 2007, only three of the 49 projects financed by FOCEM can be considered as cross-border. However, many others were executed in border regions or oriented to border development, but unilaterally (**Table 5.21**).

Under the cohesion social programme of FOCEM, Uruguayan Ministry of Social Development (MIDES) applied with the 'Border Social Economy' Project in 2007. This project was oriented to strengthen microregional markets in Uruguayan border communities (neighboring Argentina and Brazil) and identify possibilities for productive complementarity (FOCEM, 2007b). In addition, this

initiative was part of the 'Social and Solidarity Economy for Regional Integration (ESSIR)' Project of the MERCOSUR Social Institute (ISM) to promote local economic dynamics in border regions and the creation of Centers for the Promotion of the Social and Solidarity Economy (CPESS) (Saguier and Brent, 2015, p. 145).

The ESSIR project was under the ISM's Strategic Social Action Plan (PEAS) and approved by the Meeting of Ministers and Authorities of Social Development of MERCOSUR (RMADS), becoming an instrument of macroregional socioeconomic integration and inter-articulation within different agencies inside MERCOSUR (Instituto Social del Mercosur, 2009). A second phase of the project was intended to include other MERCOSUR border regions, but they did not apply to FOCEM (Saguier and Brent, 2015, p. 145).

Other initiative under FOCEM was the MERCOSUR Productive Integration Programme (PIPM) established in 2008 and focused on strengthening SME's productivity complementarity. This mechanism considered border integration as a sectoral cooperation initiative for productivity integration (MERCOSUR, 2008). However, no border or cross-border project has been registered under this category. Meanwhile, the Specialized Meeting on Cooperative (RECM), as the MERCOSUR body to promote social economy cooperativism, established a cooperation with AECID to design strategies and map projects to developing the cooperatives in CBRs and consolidate RECM's role in these areas (RECM, 2005, 2010).

The ISM, as a technical and research agency of MERCOSUR, was created by the RMADS in 2007 to consolidate social development within the integration process. Apart from the ESSIR project, they have developed several research on border regions and cross-border dynamics –such as the research project about the concept of MERCOSUR Border Citizen (Instituto Social del Mercosur, 2018a) financed by FOCEM (2017-2018)– and developed alliances with international cooperation agencies. Since 2018, those efforts have translated into cross-border projects such as 'Cross-Border Cooperation in Health issues' project with EUROsociAL+ (EU cooperation), and the 'Youth and Borders' project with UNFPA-LAC (UN cooperation) (Instituto Social del Mercosur, 2022b).

In the recent years, other progresses on cross-border institutionality have been achieved based on previous projects. Although the GAHIF was eliminated from MERCOSUR institutionality by 2012 (MERCOSUR, 2012), other mechanisms were developed as the 'Working Subgroup – SGT N° 18: Border Integration' under the Common Market Group (GMC) in 2015 (MERCOSUR, 2015b, 2016b). This agency was in charge of coordinating –with the foreign ministries, the FCCR/GTIF and other entities– the promotion of CBI from a multisectoral perspective: health, education, urban design, indigenous populations, productive integration, and more.

The SGT18 retook pending projects from GAHIF such as the Linked Border Communities (LFV) agreement (approved in 2019 but not ratified yet) (MERCOSUR, 2019) and supported the

MERCOSUR Citizen Statute (published in 2021) (MERCOSUR, 2021a), that although can be considered as a macroregional border policy, it has special considerations for cross-border spaces (e.g., facilitate flow of goods for border communities). The SGT18 has been developed other projects and events, even during the COVID-19 pandemic such as the 'Human security and the rights of adolescents and young people at the border' project (MERCOSUR, 2020b), the Trinational Cross-Border Committee between Argentina, Brazil and Uruguay, and the Border Citizen Booklet (as an extension of the Statute).

Table 5.6. *Evolution of the Macroregional Cross-Border Institutionality in CAN (Author's elaboration)*

Stage	Year	Event	Type of CB mechanism	Conceptualization of cross-border institutionality
1st Phase (1969-1998) Emergence	1969	Cartagena Agreement	-	Borders for transport connectivity (infrastructure, customs)
	1987	Quito Protocol	-	CBI as socioeconomic mechanism to promote integral regional development
	1989	'Strategic Design for the Orientation of the Andean Group' report	Research	Recommendations for shaping cross-border strategies
	1989-1990	'Programming of Border Development and Integration Activities between the Andean Region Countries' initiative	Research	Proposal of guidelines for macroregional cross-border policy (regional analysis, strategies, projects)
	1996	Foundation of the Andean Community (Trujillo Protocol)	-	CBI as comprehensive mechanisms for national and macroregional development
2nd Phase (1999-2005) Structuration	1999	Decision 459: Community Policy for Border Integration and Development	Policy	Macroregional policy framework for cross-border integration and development
	1999-2014	High-Level Task Force for Border Integration and Development (GANIDF)	Body	Executive agency for cross-border institutionality
	2001	Decision 501: Cross-Border Integration Zones (ZIF)	Policy / Zoning	Zoning strategy for cross-border integration. Establishment of the CAN Bank of CB projects.
	2003	Decision 541: Andean Health Plan on Borders (PASAFRO)	Policy	Cross-border health analysis, strategies, and networks
	2003	Declaration of Quirama	-	Cross-Border Integration and Development as one of the six macroregional integration axis
3rd Phase (2006-now) Mobilization	2006-2015	Andean Regional Programme (AECID cooperation)	Programme / Projects	CAN-AECID cooperation to develop cross-border projects
	2008-2010	CESCAN I (EU cooperation)	Programme / Projects	CAN-EU cooperation to develop cross-border projects (four)
	2008-2010	SOCICAN (EU cooperation)	Programme / Projects	CAN-EU cooperation to develop social projects (some with cross-border components)
	2009	Santa Cruz Action Plan	Plan	GANIDF's ten-year action plan to promote the ZIFs and projects within them
	2010	Andean Strategic Agenda	-	Cross-Border Development as one of the CAN's twelve priorities
	2010-2014	CESCAN II (EU cooperation)	Programme / Projects	CAN-EU cooperation to develop cross-border projects (four)
	2015-2018	INPANDES (EU cooperation)	Programme / Projects	CAN-EU cooperation to develop cross-border projects (six) and institutional platforms (three)

Table 5.7. *Evolution of the Macroregional Cross-Border Institutionality in MERCOSUR (Author's elaboration)*

Stage	Year	Event	Type of CB mechanism	Conceptualization of cross-border institutionality
1st Phase (1985-2001) Emergence	1985	Declaration of Foz de Iguazú	-	No mention
	1991	Foundation of MERCOSUR (Treaty of Asunción)	-	No mention (apart from customs/infrastructure)
	1994	Ouro Preto Protocol	-	No mention (emphasis on social component of integration)
	1995	MERCOCIUDADES (Asunción Summit)	-	No mention (bottom-up MERCOSUR city network)
	1998	Socio-labor Declaration	-	Commitment to facilitate cross-border flow of workers
	1999	Border Neighborhood Transit (TVF) Agreement	Policy	Cross-border mobility for workers in cross-border communities
2nd Phase (2002-2014) Structuration	2002-2012	Ad Hoc Group on Border Integration (GAHIF)	Body	Executive agency for cross-border institutionality (policy proposals)
	2004/ 2007-2019	Consultative Forum of Municipalities, Federated States, Provinces and Departments of MERCOSUR (FCCR)	Body (partial)	Linking MERCOSUR with MERCIUDADES in topics such as cross-border integration
	2005	Border Intercultural Bilingual Schools Programme (PEIBF)	Programme	Education programme for CBRs
	2007-2019	Working Group on Border Integration (GTIF)	Body	FCCR body to exercise cross-border projects
	2007-2011	FOCEM Projects	Projects / Fund (partial)	Uni- and multi-lateral projects (with border or cross-border components)
	2007	Border Social Economy Project (ESSIR)	Project	ISM's project for cross-border local productivity integration
	2008-2009	'Open Borders' Project	Project (partial)	Involvement of MERCOCIUDADES/FCCR with CesPI-OICS' cross-border project
	2008-2009	MERCOSUR Border Integration Project (PIFM)	Research	FCCR- AECID-CesPI-OICS cooperation for CB analysis, strategy design, project proposals
	2012-2014	'Cross-Border Governance in MERCOSUR' Project	Project	Continuation of the PIFM focusing on strengthening capacities in local and departmental governments
3rd Phase (2015-now) Mobilization	2015	Working Subgroup SGT N°18 – Border Integration	Body	Agency to coordinate cross-border institutionality with other MERCOSUR agencies
	2017-2021	ISM research projects	Programme / projects / research	Execution of cross-border projects (research, projects, alliances, etc.) as part of social integration process
	2019	Linked Border Communities (LFV)	Policy / Zoning (partial)	Cross-Border strategies within twin cities
	2021	MERCOSUR Citizen Statute	Policy (partial)	Special considerations for cross-border communities (mobility, trade, etc.)

Table 5.6 and **Table 5.7** summarize the evolution of cross-border institutionality in both macroregions and divide them in three phases. The phase of emergence describes how cross-border components begin to be part of the macroregional integration process (inclusion of official documents, first initiatives, etc.). The phase of structuration represents the appearance of several mechanisms (policies, agencies, projects, etc.) to pursue the cross-border agenda. In both cases, it is possible to observe a slowdown of that process at the end of this stage. The third phase can be considered as a revitalization of the process, expressed through projects and further mechanisms to consolidate cross-border mechanisms, although the CAN process has deaccelerated in the last years.

The CAN showed from the beginning that its integration was a multidimensional process, considering CBI&D as a complementary strategy to achieve territorial cohesion. In the structuration phase, the CAN centralized the cross-border institutionality through the GANIDF, policy frameworks, and spatial planning tools, setting them under the premise of 'bilateral action with communitarian support'. However, during this phase there was no tangibility of cross-border initiatives due to several constraints (budget availability, project design, etc.). It was not until the third phase that, with help of international entities, the CAN started executing the first cross-border programmes and projects.

The MERCOSUR had a different construction. As it started as a process for economic integration, it gradually incorporated complementary dimensions. At the end of the first phase, few mentions about CBI were included in their conversations, and they were mainly oriented to economic issues (cross-border workers). It is from 2002 that different bodies related directly (GAHIF and GTIF) or indirectly (FCCR, FOCEM, ISM, and RECM) started to appear and shape an internal network of institutions that cooperate to execute cross-border projects, exploring CBC from the economic field and from the social dimension. However, this process also slow-downed by 2010 (influenced by the inactivity of GAHIF). The third phase, the dynamization of the process, was driven by the SGT18 in the policy field, and by the ISM through research projects in cross-border regions.

Based on this comparison, both CAN and MERCOSUR have had an active role in cross-border integration and cooperation, under their own institutional frameworks and constraints. However, both had different conceptualizations. The CAN conceived the cross-border process first as a complementary socio-economic mechanism that gradually became a relevant dimension of the macroregional integration. The MERCOSUR considered cross-border integration first as part of the economic integration, and then approached it as a component of the social integration to reduce regional asymmetries. In both cases, it was needed two to three decades to the formulation of the first mechanisms, going through several upside downs moments until its stabilization in the last decade. This shows the progressive evolution of the approaches and how the meaning of the borders and cross-border dynamics are defined and redefined.

4.3. Macroregional Cross-Border Governance

The previous section sketched the macroregional bodies that exercised a role within the institutionalization of a cross-border agenda: while the CAN has a more centralized structure, MERCOSUR works with a network of agencies that complement themselves. However, they overlap with other institutional frameworks and actors at regional, binational, and national level in the same cross-border space. Exploring the can give an idea of the capacities and limitations within both governance models.

4.3.1. South American Macroregions

Considering the American continent and Latin American region, CAN and MERCOSUR countries have been embedded by macroregions such as the Organization of American States (OAS), Latin American Integration Association (LAIA), and the Community of Latin American and Caribbean States (CELAC). In South American region, the CAN countries and Brazil are members of the Amazon Cooperation Treaty Organization (OTCA). However, both macroregions were part of the South American Union (UNASUR), and recently both shared a similar geographic space with the Forum for the Progress and Development of South America (PROSUR) but with exemptions (Bolivia and Uruguay).

Among these macroregions, LAIA, CELAC and UNASUR have established a certain kind of relationship with the CAN and MERCOSUR in terms of cross-border development. However, those relationships have been indirect more than binding cooperation for CBI. In 2002, the LAIA conducted a descriptive study about the geography of borders, regional corridor initiatives, and cross-border spaces (binational and trinational), considering CAN and MERCOSUR as the main integration schemes in South America (ALADI, 2002). Apart from this research, no further association existed between these macroregions in cross-border issues.

In addition, under the LAIA's regional progresses towards economic integration, the CAN and MERCOSUR signed their Economic Complementarity Agreement in 2004 to shape a joint Free Trade Area (Comunidad Andina, 2004). Although this agreement does not have any cross-border consideration, its preparation influenced the CAN to promote the establishment of ZIFs with third countries, especially with the MERCOSUR ones (Ramírez, 2008). By its own side, CELAC established a cooperation with EU through the INNOVACT platform and its mechanisms for territorial cohesion such as the EU-CELAC collaboration on CBC (EULAC-CBC). The study targeted cross-border productive value chains in all CAN's ZIFs and the MERCOSUR's cross-border region between Argentina, Paraguay, and Brazil (EU-CELAC Cooperation, 2022).

The case is different under the UNASUR as this macroregion was constructed under the ideal of unifying South America and incorporated the CAN and MERCOSUR as subregional projects by both sides of the region. In 2000, the UNASUR proposed its transport connectivity strategy under the Initiative for the Integration of the Regional Infrastructure of South America (IIRSA), leading to the identification of 531 integration projects in nine development axes (COSIPLAN, 2011). This initiative, supported by the CAF and the IADB, was mainly oriented to regional infrastructure and considered the border areas surrounding the border crossings projects, giving partial support to binational CBI initiatives (Guariglia, 2014).

It was not until 2011 that UNASUR considered tools for territorial planning within the IIRSA strategy. The Territorial Integration Programme (PTI) was designed as a cross-border territorial planning mechanism to exercise complementary actions around the regional infrastructure projects (Estrada, 2018). However, due to the deacceleration of the UNASUR integration process, no further cross-border project was consolidated. Thereby, although the UNASUR integrated the macroregional accessibility-based border policies of the region, no meaningful progress had on the cross-border ones, apart from the CAN's motivation to align the ZIFs with the IIRSA reflected in the Declaration of Quirama (2003).

4.3.2. Regional and International Development Partners

Although no macroregion in South America had an impact on the cross-border institutionality of CAN and MERCOSUR, the Inter-American Development Bank (IADB) and the 'Andean Development Corporation – Development Bank of Latin America' (CAF) influenced their activities through financial and technical support. As regional development partners, they interacted with both institutions in their path of developing their cross-border strategies. While the MERCOSUR mainly interacted with CAF to receive financial support for some projects, the IADB and CAF have had a relevant role supporting the CAN since 1989. Both banks, as part of the Andean Regional Consultative Group, were responsible to support the GANIDF by conducting the pre-investment studies and prioritizing the cross-border projects for the BPIF.

Within the IIRSA strategy, the IADB, CAF and FONPLATA (Río de la Plata Basin Financial Development Fund) integrated the UNASUR's Technical Coordination Committee (CCT), agency in charge of giving financial and technical support to support countries' national and binational interventions in border crossings and cross-border spaces. Between 2011-2013, the CCT supported thirteen cross-border projects. Most of them were research projects and development plan proposals that considered some of the CBRs from both macroregions. Although some of those projects followed

tasks included in the ZIFs, there was not explicit cooperation between the CCT and the CAN or MERCOSUR (BID-INTAL, 2014).

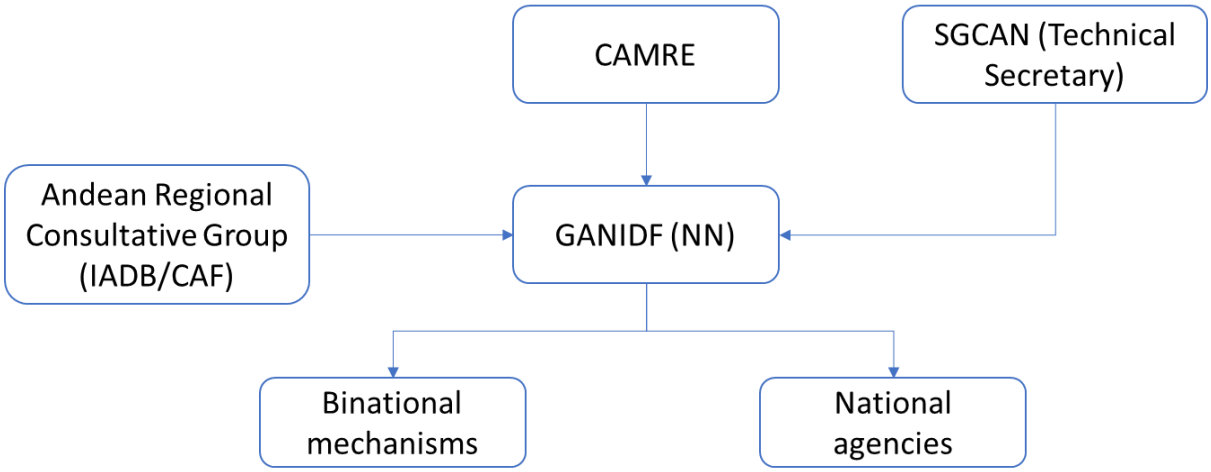
In addition, the CAF independently supported border and cross-border development by establishing in 2000 the border crossing programme under the IIRSA strategy, and the Border Development and Integration Support Programme (PADIF) in 2007. Although the focus of PADIF was on physical integration to articulate border areas and improve border crossings logistics, it supported binational projects to promote access to services, increase quality of life and human development (water and sanitation, rural development including health, education, culture, etc.) and responsible shared use and conservation of natural resources.

To support this initiative, in 2008 the CAF created the Border Cooperation and Integration Fund (COPIF) to finance three types of actions: projects for medium- and long-term sustainable development, sectoral projects within binational dynamics and Neighborhood Commissions, and initiatives within regional integration processes (UNASUR, CAN, MERCOSUR, etc.). Between 2008-2014, COPIF financed 57 regional integrations in Latin America, providing a total of $7.4M, with a budget cap of $0.5M per project. Most of those projects were diagnoses, pre-feasibility studies, plan proposals, policy recommendations, and small-scale interventions (Arciniegas Serna, 2009; BID-INTAL, 2014; CAF, 2014).

Among the international development partners, the European Union and AECID have been the most influential for both macroregions. Both promoted and financed several cooperation programmes considering cross-border ones too. With the 'Decision 601: Integrated Social Development Plan (PIDS)' and the 'Decision 727: Support for Subregional Technical Cooperation Programmes' approved in 2004 and 2008 respectively, the CAN countersigned the international cooperation agreements with EU and AECID. Thereby, EU supported most of the cross-border projects executed by the CAN through the programmes CESCAN I and II, SOCICAN and INPANDES. By the other side, AECID supported the Andean Regional Programme, considering cross-border projects within PASAFRO and the ZIFs. MERCOSUR received a broad support of AECID since 2008 with the execution of PIFM and the alliance with RECM to consolidate social economy cooperativism in CBRs. The European Commission supported MERCOSUR from 2017 through the EUROsociAL+ programme to promote cross-border health.

4.3.3. Macroregional Cross-Border Institutions

As mentioned in the previous section, the CAN's cross-border institutional structure (**Figure 5.2**) is very centralized, starting by the Andean Council of Foreign Affairs (CAMRE) as the highest legal and decision body in charge of formulating and executing the regional foreign policy. The High-Level Task Force for Border Integration and Development (GANIDF) is the main responsible to coordinate and propose cross-border policies, plans and programmes. This agency is supported by the CAN General Secretary (SGCAN) as technical secretary, the Andean Regional Consultative Group (IADB and CAF) and the binational mechanisms.



NN: inactive agency

Figure 5.2. *Institutional Structure of CAN for CBI&D (Author's elaboration)*

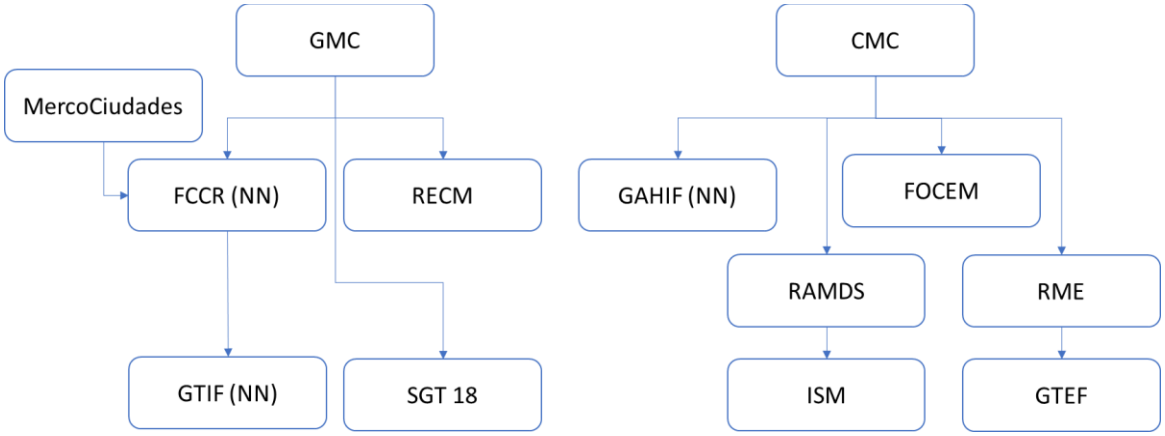
The MERCOSUR's cross-border institutional structure (**Figure 5.3**) is more branched, showing multiple agencies that have certain cross-border component in their activities, plans, meetings, etc. – although in some cases, they have not been executed. Due to its complexity, the SGT18 explored and mapped the involved agencies by 2020, to have clarity of the current sectoral priorities, legal frameworks, and progresses (MERCOSUR, 2020a).

AGENCIES AND FORUMS ACCORD. GMC N° 59/15	CMC												GMC								FCCR		CCM		FCES
MAIN FORUMS	FCCP	RMA		RME			RMIS				RMS		SGT1	SGT5		SGT11			RECM		FCCR		CT2		FCES
SPECIFIC THEMATIC FORUMS	FCCP	RMA	CMA (*)	RME	CRC-EB	GTEF	RMIS	GTE-DEL	FEM	FET	RMS	CCR	CCR/ CIVH	SGT1	SGT5	CFF	SGT11	COVIG-SAL	SCO-CONTS	RECM	CESS	FCCR (*)	GTIF (*)	CT2	SCT-COF	FCES (*)
Sanitation							○		●								●	●	○					●	●	
Health											●	●	○				○	●								
Education				●	○																					
Culture				○		○																				
Indigenous populations and multiethnic communities (*)																										
Work																				●						
Migration									●																	
Transport							○		●						●	○										
Energy																										
Infraestructure														○											●	
Urban & Rural Development																										
Economic Development																										
Cooperation											○	●														
Productive Integration																										
Security							○	●																		
Environment																										
Turism																								●	●	

***Figure 5.3**. Institutional Structure of MERCOSUR for CBI&D (extended version) (MERCOSUR, 2020a)*

Among those agencies, some of them have had a bigger repercussion on cross-border issues (**Figure 5.4**), mainly operating under two decision-making agencies: the Common Market Group (GMC) and the Common Market Council (CMC). Under them, the different agencies have had different roles to support the macroregional cross-border agenda. The Ad Hoc Group on Border Integration (GAHIF) from 2002 to 2012, and later the Working Subgroup SGT18 (from 2015) have been in charge of designing the macroregional cross-border policies and the generation of new mechanisms to promote them. The Structural Convergence Fund (FOCEM) allocated financing to projects in general but some of them were located in border areas or with cross-border components.

In terms of the execution of those policies, the Consultative Forum of Municipalities, Federated States, Provinces and Departments of MERCOSUR (FCCR), as agency to articulate MERCOSUR with MERCOCIUDADES, created the Working Group on Border Integration (GTIF) to promote discussions and projects about cross-border issues. In the education sector, the Border Schools Working Group (GTEF) executed bilingual programmes across borders. Finally, the Specialized Meeting on Cooperative (RECM) executed projects for cross-border articulation of cooperatives (economic integration), and the MERCOSUR Social Institute (ISM) have led the research and project initiatives for cross-border areas in the recent years (social integration).



NN: inactive agency

Figure 5.4. *Institutional Structure of MERCOSUR for CBI&D (simplified version) (Author's elaboration)*

To further extend the previous discussions and move from the centralized – networked differentiation, both have tried to articulate other mechanisms from subnational or local level: while the CAN does this process through the GANIDF, MERCOSUR connects with MERCOCIUDADES through the FCCR. As subnational governments in MERCOSUR have stronger capacities, they interact with other cross-border agencies (ISM, GTEF, etc.) to pursue specific sectoral agendas, while this option is not so visible with GANIDF.

4.3.4. Binational Cross-Border Mechanisms

In South America, the establishment of bilateral mechanisms has been subject of the historical contingency between countries. However, one institutional space that is common between the CAN and MERCOSUR countries are the Cross-Border Integration Committees (CIFs). The first committee was established in 1979 between Ciudad del Este (Paraguay) y Foz de Iguazú (Brazil) to facilitate international trade. In the second half of the 80s, the committees spread between MERCOSUR countries as mechanisms to solve and orientate higher decision levels to the cross-border problems and needs, and later they were replicated in the CAN.

The CIFs are composed by delegations from both subnational and local governments with representation of the national governments and discuss topics that are related to the border regions (the committees as decision takers), or that have national competence (the committees as advisers) (BID-INTAL, 1989; Wong Villanueva, 2019). Although at the beginning they just considered issues related

to border flows, they evolved to consider other issues such as natural disaster, emergency coordination, and more. This was more evident between the CAN countries that assimilated this mechanism in the 90s, establishing CIFs with a broader agenda including topics such as environmental issues, project management, cross-border health, etc. (SELA, 2013) However, this mechanism has limitations: As mainly decision-making or consultative bodies, technical and financial capacities were out of the scope of the CIFs, depending on local, subnational, and even national technical teams. Furthermore, as they depend on the political will of local governments, many of them have not had meetings recently or are inactive, disconnecting the voices and needs from border populations from upper levels.

In the Andean Community, there are multiple binational mechanisms that have been developed at different decision levels and sectors (**Table 5.8**). The Binational Presidential and Cabinet Meetings are the highest-level meetings (presidential and ministerial) and appeared in the 2010s (except from Peru-Ecuador that started earlier). Since then, they have been happening annually, working multisectoral discussion spaces until COVID-19 pandemic outbreak forced a pause on this mechanism. At subnational level, the Neighborhood Commissions are responsible of promoting binational integration, focusing on cross-border policies. They were established by the national governments in the 90s, except from Bolivia and Peru that do not have a subnational agency. In addition, there are six CIFs or local committees at cross-border local level in almost all borders (except from Colombia-Ecuador border). However, multiple bilateral subnational and local bodies have been inactive or progressing slowly since their establishment.

In terms of the bilateral tools, the ZIFs were approved between 2000 and 2002 through reversal or verbal notes (Comunidad Andina, 2003b), one year after the Decision 501 as these areas were selected based on previous bilateral works (or overlapping existing zoning plans as the Peru-Ecuador CBR). However, the elaboration of cross-border plans took more than a decade (or still in progress) after the ZIFs were established. The lack of existence of a CAN fund led the countries to create their own binational funds, however, they have not been so effective mechanisms.

In the Southern Common Market, among the binational mechanisms for cooperating across borders, the countries have adopted the mixed commissions (or administrative commissions), the CIFs, and the Linked Border Communities (LFVs) (Briceño Monzón, 2015). **Table 5.9** reveals that bilateral relations are not as homogeneous as in the CAN, with more variations between them. The highest mechanisms are at ministerial level and appeared before the 90s, and they have not occurred annually in all relations (or even inactive for more than a decade). At bilateral subnational level, all mechanisms are different and with different nature, mixing between agencies established by the national spheres, and forums that started as bottom-up concertation spaces created by the subnational governments (in three of the five bilateral relations). These forums and committees appeared to fill the governance gaps at highest level and to take advantage of the MERCOSUR subnational capacities.

A particular mechanism among all bilateral relations is the presence of mixed commissions based on geographic body (river, lagoon, bridge, etc.), leading to a contextualized sectoral agenda. At local level, the CIFs have been the most used mechanisms (except from the Brazil-Paraguay relations), with a total of 21 committees in MERCOSUR, including the first trinational CIF that was established within the work of the SGT18.

In terms of bilateral tools, the LFVs represent a zoning tool for shaping cross-border local relations. Although it has been promoted by the MERCOSUR, its establishment has not been fully executed, as has been the case of the Argentinian borders with Uruguay or Paraguay. The Brazil-Uruguay cross-border plan (2016) is the only one already established and was developed based on a list of statements (intentions and goals) rather than economic-geographic approach as in the ZIFs. However, the bilateral relationships between both countries shows a higher maturity level compared with the others in relation to cross-border development.

Table 5.8. *Bilateral mechanisms oriented to CBI&D between CAN countries (Author's elaboration)*

Bilateral mechanisms	Bolivia – Peru	Ecuador – Colombia	Ecuador – Peru	Colombia – Peru
Agencies				
National level	- Binational Presidential & Cabinet Meeting (five meetings between 2015 and 2019)	- Binational Presidential & Cabinet Meeting (nine meetings between 2012 and 2020)	- Binational Presidential & Cabinet Meeting (thirteen between 2007 and 2019)	- Binational Presidential & Cabinet Meeting (five between 2014 and 2019)
Subnational level	- Binational Technical Group for the ZIF Peru-Bolivia (GTB ZIF) (no legal body)	- Colombo-Ecuadorian Neighborhood and Integration Commission (1989) - Binational Technical Committees of the Neighborhood Commission	- Peruvian-Ecuadorian Neighborhood Commission (1998) - Binational Development Plan for the Peru – Ecuador Border Region (PBDRF) (1998) (legal body) - Five Binational Technical Committees of the Neighborhood Commission - Two Working Groups	- Peruvian – Colombian Neighborhood and Integration Commission (1994) (eleven meetings until 2015) - Binational Commission for the ZIF (CBZIF) (2014) - Three Binational Technical Committees (CTB)
Geographic-oriented	- Binational Working Group for the implementation of CEBAF Desaguadero (GTB-CEBAF) - Binational Autonomous Authority of Lake Titicaca (ALT)	-	- Permanent Binational Commission of the Zarumilla Canal - Binational Commission for the Integrated Management of the Water resources of the Zarumilla River	-
Local level	- Two CIFs (altiplanic, 260mazonian)	-	- Three CIFs (Tumbes – El Oro, Piura – Loja, and Cajamarca – Zamora Chinchipe)	- Local Management Committee of the Peru-Colombia Binational Commission
Tools				
Zoning	- ZIF Peru-Bolivia (2003)	- ZIFEC (2002)	- ZIF Peru – Ecuador (2000) (based on PBDRF area)	- ZIF Peru-Colombia (CBZIF) (2002)
Plan	- Peru-Bolivia Integrated Action Plan (PAIPB) (2000) - Integration Plan for the Development of the Amazonian Sector of the ZIF Peru-Bolivia (2018)	- Binational Border Integration Plan Ecuador-Colombia 2014-2022 (PBIFEC)	- PBDRF (1998)	- Development Plan of the CBZIF (2014)
Fund	-	- Border Development Fund or Development and Social Reparation Fund (2012)	- Binational Fund for Peace and Development (1998)	- CBZIF Development Fund (2015, first donation in 2019)

Table 5.9. *Bilateral and Trilateral mechanisms oriented to CBI&D between MERCOSUR countries (Author's elaboration)*

Bilat. Mech.	Argentina – Brazil	Argentina – Paraguay	Argentina – Uruguay	Brazil – Paraguay	Brazil – Uruguay	Trilateral
Agencies						
National level	- High Level Mixed Commission for Integration (1990) - Permanent Working Group of Protocol 23: Border Regional Group (under 1986 Agreement)	- Binational Meeting of Ministers (two meetings in 2013 and 2017)	- Bilateral Commission for Argentine-Uruguayan Commercial Affairs - Integration Commission Argentina Uruguay (CIAU) (ministerial level)	-	- General Coordination Commission (CFC) (ministerial level, last meeting in 2005) - High-Level Group for the New Border Cooperation and Development Agenda (GAN) (ten meetings between 2002 and 2016) - Four working groups of the GAN	
Subnational level	- Permanent Forum of Governors of CRECENEA LITORAL / CODESUL - Eleven Thematic Integration Groups of the Forum	- Binational Meeting of Governors of the Common Border (two meetings in 2013 and 2017) - (NN) Permanent Working Group for the Binational Regional Border Development Programme (1997-2007) (inactive, established under the 1989 Agreement) - Mixed Argentine-Paraguayan Infrastructure Technical Group (for border crossings)	- Cooperation Commission for the Development of Border Zones (CODEFRO)	-	- (NN) Commission for the Joint Development of Border Areas (until 2002) - Binational Border Committee of Mayors and Prefects (binational forum since 2003)	
Geographic-oriented	- Mixed Commission of the Santo Tomé – Sao Borja Bridge (COMAB)	- Mixed Administrative Commission of the Paraná River (COMIP) - Binational Administrative Commission of the Lower Pilcomayo River Basin - Yacyretá Binational Entity (EBY)	- Administrative Commission of the Río de la Plata (CARP) - Administrative Commission of the Uruguay River (CARU) - Joint Technical Commission of the Maritime Front (CTMFM) - Mixed Technical Commission of Salto Grande (CTMSG)	- Mixed Commission Paraguay-Brazil (for the construction of Paraguay River bridge) - Itaipu Binational (binational company)	- Uruguayan-Brazilian Joint Commission for the Development of the Cuareim River Basin (CRC) - Uruguayan – Brazilian Joint Commission for the Development of the Merín Lagoon Basin (CLM)	- (AR-BO-PA) Trinational Commission for the Development of the Pilcomayo River Basin
Local level	- Three CIFs (Bernardo de Irigoyen – Dionisio Cerqueira / Barracao, Paso de los Libres – Uruguayana, Puerto Iguazú – Foz de Iguazú)	- Seven CIFs (Clorinda – Puerto Falcon, Formosa – Alberdi, Itatí – Itá Corá, Ituzaingó – Ayolas, La Paz – Pozo Hondo, Posadas – Encarnación, Puerto Bermejo – Pilar)	- Five CIFs (Fray Bentos – Puerto Unzué / Gualeguaychu; Paysandú – Colón, Salto – Concordia, Bella Union – Monte Caseros, Carmelo – Tigre)	-	- Five CIFs (Quaraí/Barra do Quaraí – Bela União/Artigas, Santa Vitória do Palmar/Chuí – Chuy, Santana do Livramento – Rivera, Aceguá – Aceguá, Jaguarão – Rio Branco)	- (AR-BR-UR) Trinational CIF (Monte Caseros – Barra do Quaraí – Bella Unión) (2019) (first trinational committee)
Tools						
Zoning	- LFV (approved AR 2009 and BR 2016)	-	-	- LFV (2017)	- LFV (2003)	-
Plan	-	- (NN) Binational Regional Border Development Programme (1997-2007) (replaced by the POCT) - Territorial Connectivity Optimization Programme (POCT) (issued in 2010, prefeasibility)	-	-	- Integrated Border Plan (2016) - Binational Development Plan for the Laguna Merín Basin (issued in 2021)	- Strategic Plan for the AR-BR-UR Triple Border (issued in 2017, started in 2019) - Pilcomayo River Basin Master Plan (PMCRP-A) (2008)
Fund	-	-	-	-	-	-

4.3.5. The Macroregional Cross-Border Governance

The articulation above, under and within the macroregional institutions towards a cross-border agenda has been originated based on the bilateral relations and the own national interests towards regional integration. Going beyond the dichotomy that one system is better than the other (centralized vs. networked, top-down vs. bottom-up, etc.), both structures have been shaped to challenge their own regional challenges based on their opportunities and context (economic, politic, social, etc.).

Among the South American macroregions, most of them did not interact with both CAN and MERCOSUR in terms of cross-border issues, but the UNASUR served as a structural axis to coordinate cross-border initiatives around the IIRSA strategy. This was more evident in the CAN by aligning its cross-border policy towards those economic corridors. The regional and international partners had an important role for both macroregions as financial and technical supporters. In the CAN, they also worked as consultative bodies influencing in the decision-making of the cross-border agenda. While the relationship with MERCOSUR depended on its sectoral targets (economic integration, social integration, spatial integration, etc.), with the CAN was more direct. The GANIDF could centralize the cooperation towards the already constructed mechanisms and allocated cooperation funds to multisectoral projects. This was also a product of the lack of a common fund to finance those type of projects, mechanism that was available in MERCOSUR.

Although deeper studies are required to analyze the relationships between the formation of bilateral mechanisms within their context and comprehend the influence of the CAN and MERCOSUR in those binational policies (and vice versa), it is possible to identify some patterns in both scenarios.

First, the CAN adopted a more top-down structure to promoting CBI, that was possible due to the fluent participation of the national governments (benefited by their centralist nature) in shaping those instruments. However, this has been also a struggle as there are not so many mechanisms at local level (six CIFs), and capacities at subnational and local level are limited. This is different in the MERCOSUR, where stronger capacities of subnational governments (mainly in Argentina and Brazil as federal nations), a bigger number of local mechanisms (21 CIFs), and already established city networks (e.g., MERCOCIUDADES, AMFIM, etc.), have set a more important emphasis on how to legitimate those mechanisms through binational or multilateral mechanisms such as majors' forums and committees. This contrasts with the governance gaps at (bi)national level, where most mechanisms are inactive or based on specific project or sectoral agendas that are not permanent or influenced by the persistent protectionism and economic-oriented foreign policy.

Second, there was a certain homogenization and complementation between the CAN's cross-border institutionality, the binational mechanisms (**Table 5.9**), and national agencies and tools (**Table 5.3**). The Andean Decisions were based on existing bilateral initiatives, but then the countries orientated

their foreign policy to reinforce the ZIFs, shaping subnational mechanisms, their own national agencies, and promoting more comprehensive border region laws. In the MERCOSUR, the homogenization is not so evident but there is a different kind of complementarity. The networked structure allowed to interact in sectoral agendas and approach particular sections of the borders, strategy that has facilitated the execution of projects. The LFV was built over the spatiality and already installed capacities in some CIFs and border crossings and strengthen the local muscles to promote cross-border local cooperation. This is beneficial as great part of binational cooperation in MERCOSUR is based on Paradiplomacy (gen02). However, the LFV strategy has not been fully implemented yet and the CIFs still have several points to improve.

Third, macroregional structures have not only complement binational relations in terms of policies but also capacities and funding. The lack of subnational and local capacities and the absence of a common fund in the CAN lead the countries to establish their own binational budgets, although this has been a slow process with resistance of the national public investment systems (SNIPs) (sa11). However, the CAN supported this process by collecting funding from international cooperation and providing technical support. By its own side, MERCOSUR supported cross-border initiatives through the FOCEM and other specialized MERCOSUR agencies.

Finally, although, bilateral relations in both macroregions have not been homogeneous, this has not always been a setback. At first glance, this could be considered as negative because it breaks with the idea of a communitarian homogeneous development in all CBRs. However, in the execution of both macroregions this has been a benefit: good binational relationships as in Peru-Ecuador and Brazil-Uruguay have promoted policies and tools that were later copied by other bilateral relations (as the binational plans, funds, or Neighborhood Commissions in CAN) or elevated as a macroregional mechanism (as the TVF or Citizen Statute in MERCOSUR). In contrast, Peru-Bolivia and Brazil-Paraguay relations show multiple improvement areas as they lack mechanisms that have been implemented in other relations.

To summarize how they have shaped themselves within their own governance complexity, it is needed to highlight the clear difference between both macroregions: while the CAN adapted its institutional structure to promote a cross-border agenda, MERCOSUR adapted a cross-border agenda to its organizational structure. With their own advantages and disadvantages, both organizations have faced limitations in pursuing their objectives.

4.4. Macroregional Cross-Border System

As **Chapter 4** reveals, there are eight types of MRCB mechanisms: research & workshops, projects & programmes, policy frameworks & plans, spatial planning & zoning, legal cross-border structures, executive agency, collective fund, and export models. This section analyzes the mechanisms implemented in the CAN and MERCOSUR (**Table 5.10**) based on their execution and effectiveness towards facilitating CBI&D in their CBRs. Although every mechanism should have its own evaluation method and criteria, this research represents an initial exploration for each category and how they have interacted among themselves.

Table 5.10. *Macroregional Cross-Border Systems in CAN and MERCOSUR (Author's elaboration)*

	CAN	MERCOSUR
Research & Workshops	- Programming of Border Development and Integration Activities between the Andean Region Countries (1989)	- MERCOSUR Border Integration Project (PIFM) (2008-2009) - MERCOSUR Border Citizen (2017-2018) - Youth and Borders in MERCOSUR (2019-2021) - Cross-Border Cooperation in Health issues (2020-2021)
Projects & Programmes	- PRA-AECID (2006-2014) - CESCAN I (2008-2010) - CESCAN II (2010-2014) - INPANDES (2015-2018)	- Border Intercultural Bilingual Schools Programme (PEIBF) (2005-2016) - FOCEM Projects (2007-now) - Social and Solidarity Economy for Regional Integration (ESSIR) (2008-2009) - MERCOSUR-AECID cooperation (2010-2014)
Policy Frameworks & Plans	- Decision 459: Community Policy for Border Integration and Development (1999) - Decision 501: Cros-Border Integration Zones (ZIF) (2001) - Decision 541: Andean Health Plan on Borders (PASAFRO) (2003) - Santa Cruz Action Plan (2009-2019)	- Border Neighborhood Transit (TVF) (1999) - Linked Border Communities (LFV) (2019) - MERCOSUR Border Statute / Citizen Statute (2021)
Spatial Planning & Zoning	- ZIF Peru – Bolivia (2003) - ZIF Ecuador – Colombia (ZIFEC) (2002) - ZIF Peru – Ecuador (2000) - ZIF Peru – Colombia (CBZIF) (2002)	- LFV Brazil – Uruguay (2003) - LFV Argentina – Brazil (2016) - LFV Brazil – Paraguay (2017) - LFV Argentina – Paraguay (none) - LFV Argentina – Uruguay (none)
Legal CB structures	-	-
Executive agency	- High-Level Task Force for Border Integration and Development (GANIDF) (1999-2014)	- Ad Hoc Group on Border Integration (GAHIF) (2002-2012) - Working Group on Border Integration (FCCR/GTIF) (2007-2019) - Working Subgroup – SGT N° 18: Border Integration (SGT18) (2015)
Collective fund	- (Partial) Decision 621&708: Fund for Rural Development and Agricultural Productivity in the CAN (productive investment in ZIFs)	- MERCOSUR Structural Convergence Fund (FOCEM) (2004)
Export model	- (Partial) Quirama Declaration (2003) and Peru & Colombia's ZIFs	- (Partial) TVF system with Bolivia, Chile, and French Guiana

4.4.1. Research & Workshops: CAN

In the CAN, the Programming of Border Development and Integration Activities between the Andean Region Countries (1989) was a relevant study to determine the future macroregional policies. This study, executed by JUNAC with financial and technical support from IADB between 1990 and 1991, had the objective to define a regional strategy for CBI&D and elaborate action plans with the most relevant communitarian and national initiatives (Oliveros, 2002b). The study focused on the most dynamic points of the five CBRs regions (including Venezuela) from a binational and participatory approach. The final strategies focused on restructuring the territorial organization, diversification of international trade and productive activities, the improvement of public services and environmental conditions, adequate institutionality for cross-border management and policy compatibilization (Otálvora, 2003).

The concept of ZIFs took relevance from the beginning as an Ideal mechanism to promote further integration, anchoring other concepts such as the idea of hinge cities, binational metropolitan systems, bipolar nodes, and more. The report defined the geographical scope of the ZIFs as 'urban centers and their respective areas of influence with greater neighborhood articulation and border coexistence, trying to establish or maintain equivalence in economic and administrative activities and functions between neighboring centers' (Urdaneta, 2005)). In this area, 'the States have to make the political, legal, administrative and operative adjustments to share responsibilities with their peer to exercise control and regulation of common cross-border processes' (Otálvora, 2003).

The result was the identification of 45 projects within the ZIFs. However, this did not translate into actions due to the several conflicts of interests between national actors (e.g., the Peru-Ecuador War), the opposition of local actors (critique on the lack of their participation in the planning process), the slowdown of the regional integration process (delay in signing the proposal-documents) and the lack of clarity in the financial mechanisms for the projects (Oliveros, 2002b, 2002a; Otálvora, 2003; Urdaneta, 2005; Arciniegas Serna, 2018). However, the idea of border development as national objective and bilateral implication, and the concept of the ZIFs as mechanisms to reorder those cross-border territorial dynamics did not faint and reborn by 1997 as new political waves allow to retake the dialogue (Oliveros, 2002b; Arciniegas Serna, 2018). Other research focused on some sectoral agendas as the 'Health: bridge for peace and integration' project that was realized by ORAS-CONHU (the Andean Health Organization) and the CAF to support PASAFRO (ORAS-CONHU, 2010).

4.4.2. Research & Workshops: MERCOSUR

One of the first research projects in MERCOSUR was organized by the Working Group on Border Integration (GTIF). In cooperation with AECID, the GTIF (under the direction of the Municipality of Canelones, Uruguay) launched the MERCOSUR Border Integration Project (PIFM) by 2008. As previously mentioned, the PIFM was oriented to consult local authorities, assess cross-border problems, and define strategies for CBI and policies with a multisectoral approach. Thereby, the project tried to foster cross-border strategies, projects, and networks. After its culmination in 2009, the project submitted a research report and workshops (FCCR and AECID, 2009), showing the need to strengthening capacities for project formulation and management, promoting subnational networks, and the opportunity brought by the border twin cities for CBC. The obtained results induced the FCCR to apply again to the AECID fund with the MERCOSUR Cross-Border Governance project (FCCR, 2010; AECID-Uruguay, 2013), but this continuation did not embrace all issues explored in the PIFM.

Under the idea of a more 'Social MERCOSUR' to emphasize the social dimension of the integration process, many institutes and agencies were created such as the MERCOSUR Social Institute (ISM). As border populations have had a special consideration from the countries' Social Development Ministries, the ISM took this issue by promoting research and designing social projects and policies (Ferraro, 2013). This agency has developed (or developing) three research projects: the 'MERCOSUR Border Citizen' project, the 'Cross-Border Cooperation in Health issues' project (cooperation with EUROsociAL+), and the 'Youth and Borders' project (cooperation with UNFPA-LAC).

The Border Citizen research studied the social reality of borders, identities, and citizenship rights in six CBRs, focusing on border twin cities between the four countries. This study, conducted between 2017 and 2018, was financed by FOCEM and focused on the social protection and social rights asymmetries across the borders and how the distance to the urban centers and capitals affects their population (Instituto Social del Mercosur, 2018b). This research did not only analyze social assistance issues, but extended its scope towards education, nutrition, money transfer, maternity, health, and more. The final production was three reports synthetizing a set of border social policies (Instituto Social del Mercosur, 2018a). Although the results did not translate into a 'Border Statute' (as it was expected to be developed by GAHIF), some of the recommendations were included in the MERCOSUR Citizen Statute (2021).

In 2018, the ISM and UNFPA-LAC signed a cooperation agreement that will lead to start the 'Youth and Borders in MERCOSUR: How to grow in the border?' research in 2019. This study was an assessment of the youth population in border regions to identify the challenges that they face and what strategies could help in that life phase (Instituto Social del Mercosur, 2022a). Focusing on the border twin cities, the research explored the socioeconomic profile of border youth population (2020),

proposed a methodological tool to analyze social policies (2020), and evaluated the impact of the COVID-19 pandemic on this population (2021) (Instituto Social del Mercosur, 2022a). As the COVID-19 outbreak started during the realization of the research, the researchers could consider its impact on CBRs and youth to elaborate policy recommendations. As it is an ongoing research, it is not possible to evaluate its impact yet.

The 'Cross-Border Cooperation in Health issues' research was approved in February 2020 by EUROsociAL+ with the purpose of facilitating the mobility of patients across the borders through the improvement of health protocols and policies, shared emergency management, efficiency of health services, and more (Instituto Social del Mercosur, 2021b). This work, aligned with the MERCOSUR's Strategic Social Action Plan (PEAS), intends to help SGT11 (Health) and SGT18 (Border Integration) to promote new social policies. The COVID-19 pandemic exposed several of the health problems at the borders, not only in terms of the restriction of cross-border mobility of patients, but also to collect data for conducting the research. In October 2021, ISM and EUROsociAL+ delivered the final product, identifying 20 barriers in MERCOSUR borders and a set of good experiences from EU related to CBC in health and proposing a health cooperation protocol (Instituto Social del Mercosur, 2021a).

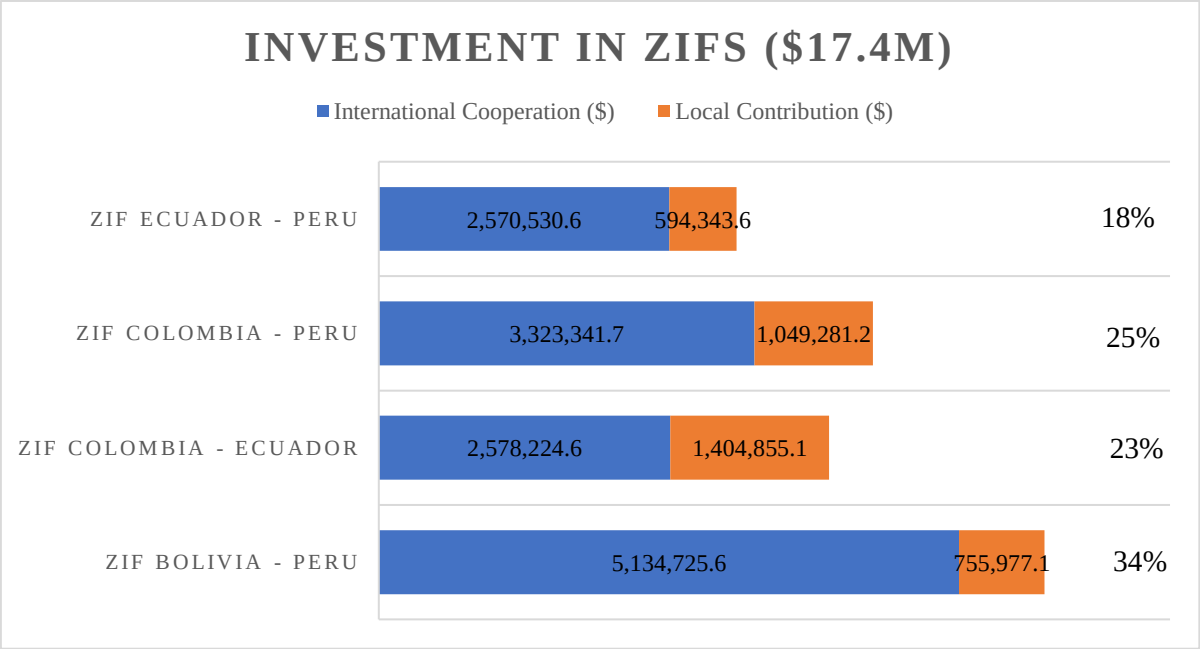
In relation of macroregional cross-border research, the ISM has represented one of the most active MERCOSUR entities in promoting the cross-border agenda within their social dimension. However, most of the initiatives started since 2017 and are still in execution, not allowing an evaluation of their impact. One point to considerate is that these researches particularly targeted the border twin cities. Even since the PIFM in 2008, this cross-border space was considered as their unit to analyzing and orientating policies.

4.4.3. Projects & Programmes: CAN

In the Andean Community, although several projects were designed for the ZIFs, many of them did not exactly have cross-border components or focused on solving cross-border issues. The GANIDF, supported by the multilateral banks, created the BPIF to evaluate and prioritize project proposals, facilitating their access to funding. By 2003, a total of 64 projects were collected: 22 for ZIF Peru-Bolivia (34.3%), 33 for ZIF Peru-Ecuador (51.6%), two for ZIF Colombia-Ecuador (3.1%), six for ZIF Colombia-Venezuela (9.4%), and one for PASAFRO. However, under the BPIF evaluation criteria, many of them did not qualify (Oliveros, 2003).

Due to the issues that the ZIFs faced, most of the cross-border projects executed were promoted by the CAN in cooperation with EU and AECID. During the 2009-2019 period, 21 cross-border projects were executed with a budget of $17.4M (around three quarters of financing came from international

cooperation). According to **Figure 5.5**, the most benefited ZIF was the Peru-Bolivia one, followed by Peru-Colombia. Between 65% to almost 90% of the investment was covered by international funding in every ZIF.



Investment in ZIFs	Int. Coop. ($)	Local Contrib. ($)	Total budget ($)
ZIF Bolivia – Peru	5,134,725.6 (87%)	755,977.1 (13%)	5,890,702.7
ZIF Colombia – Ecuador	2,578,224.6 (65%)	1,404,855.1 (35%)	3,983,079.7
ZIF Colombia – Peru	3,323,341.7 (76%)	1,049,281.2 (24%)	4,372,622.9
ZIF Ecuador – Peru	2,570,530.6 (81%)	594,343.6 (19%)	3,164,874.2
Total	13,606,822.5 (78%)	3,804,457.0 (22%)	17,411,279.5

Figure 5.5. *Investment in ZIFs (based on (Nieto Vinueza, 2021))*

Table 5.11. Summary of cross-border projects executed in CAN (Author's elaboration)

Project	ZIF	Sector	Int. Coop. Fund (€)	Local Contrib. (€)	Total budget (€)
Andean Regional Programme (PRA) – Phase 1 (CAN-AECID) 2006-2011					
Llama breeding in high Andean communities of Lake Titicaca	BO – PE	Productive	-	-	-
Solid Waste Management in Catamayo – Chira	EC – PE	Waste	-	-	-
Management of the biological corridor Quitasol – El Ángel	CO – EC	Conservation, productive	-	-	-
Binational wetland management for food security and conservation	CO – PE	Conservation, nutrition	-	-	-
		AECID (78.0%)	**980,697**	**276,425**	**1,257,121**
Andean Regional Programme (PRA) – Phase 2 (CAN-AECID) 2012-2014					
Support for the development of the cross-border coffee production chain	BO – PE	Productive	-	-	-
Improvement of the quality of organic aroma cacao in the border region	CO – PE	Productive	-	-	-
Strengthening of the Water Administration Boards for human consumption and protection of binational water sources	CO – EC	Water, governance	-	-	-
		AECID (46.5%)	**245,174**	**282,768**	**527,942**
CESCAN I (CAN-EU) 2008-2010					
Comprehensive Solid Waste Environmental Management Project in the Binational City of Desaguadero	BO – PE	Waste	425,300	164,700	590,000
Binational Health Network in Zumba – San Ignacio	EC – PE	Health, governance	424,700	174,900	599,600
Comprehensive Waste Management Model in Ipiales – Tulcán	CO – EC	Waste	425,000	662,851	1,087,851
Telemedicine network in the Putumayo River basin	CO – PE	Health, governance	425,000	207,653	632,653
		EU (58.4%)	**1,700,000**	**1,210,104**	**2,910,104**
CESCAN II (CAN-EU) 2010-2014					
Utilization of riverbanks in the circumlacustrine ring of Lake Titicaca	BO – PE	Water, productive	500,000	125,000	625,000
Practical models of fish production for human consumption and ornamental use	CO – PE	Productive, nutrition	500,000	222,553	722,553
Programme for the improvement of sanitary and environmental conditions on the Pacific, Andean, and Amazonian borders	CO – EC	Waste, water	500,000	200,000	700,000
Bilingual intercultural education in contexts of cultural diversity	EC – PE	Education, cultural	500,000	138,632	638,632
		EU (74.5%)	**2,000,000**	**686,185**	**2,686,185**
INPANDES (CAN-EU) 2015-2018					
Development of innovations for Food and Nutrition Security: The case of the native potato and the PBZIF	BO – PE	Productive, nutrition	499,500	55,500	555,000
Use of the waters of the Lake Titicaca basin to provide drinking water in a context of climate change	BO – PE	Water, climate change	1,385,677	153,964	1,539,641
Integration, inclusion and innovation in cross-border coffee and camelid production chains	BO – PE	Productive	800,000	100,000	900,000
Development and urban integration of neighboring border towns	EC – PE	Planning, productive	766,742	85,194	851,936
Design and implementation of a Border Territorial Development Model to improve environmental and living conditions in the Upper Carchi River Basin	CO – EC	Water, conservation	620,000	230,000	850,000
Integration, inclusion, and innovation in the Napo – Amazonas cross-border productive corridor	CO – PE/ EC – PE	Productive	1,200,000	250,000	1,450,000
		EU (85.8%)	**5,271,919**	**874,658**	**6,146,577**
TOTAL					
		International Cooperation (75.4%)	**10,197,790**	**3,330,139**	**13,527,929**

Table 5.11 summarizes the 21 cross-border projects that were executed with the financial and technical resources of international cooperation (7 projects with AECID, and 14 projects with EU). Among them, the ZIF Peru-Bolivia had 7 projects (33.3%), the ZIF Colombia-Ecuador had 5 projects (23.8%), the ZIF Peru-Ecuador had 4.5 projects (21.4%), and the ZIF Colombia-Peru had 4.5 projects (21.4%). In addition, while the project budget coming from international cooperation was under 500,000 euros for almost all cases (small projects), INPANDES was the exemption and the programme that most invested in cross-border projects. Also, most of the projects targeted productive chain initiatives, and social issues such as health, education, culture, etc.

In addition, there has been an evolution between the first generation of cross-border projects (CESCAN I and PRA phase 1) and the last one (INPANDES), not only in terms of budgeting, but also complexity, approach, and impact. The biggest step-up could be found in the EU-financed projects. The **CESCAN I** was a hybrid project under the EU's Regional multiannual indicative program for Latin America (PIPR-AL) –EU budget for Latin America–, and the Integrated Social Development Plan (PIDS) –which had three agreed projects that were not executed.

As the BPIF projects were not financed, taking the EU funding and the PIDS ideas, four projects were selected for CESCAN I. The main objective for this set of initiatives was to create an Andean agenda for economic & social cohesion (PE68). These projects had a one-sector approach agenda (waste management or health networks), involving mainly the participation of subnational and local sectoral agencies and without so much involvement of the border communities. This programme contributed with better public services to 252K inhabitants (Comunidad Andina, 2011b). However, as Venezuela left the CAN, CESCAN I budget was reduced in a 25%, generating financial issues, delays, and so on. Furthermore, as soon as CESCAN I started, they needed to start with CESCAN II the next year (PE68).

CESCAN II represented the second phase of CESCAN I, despite it had not finished yet. The PIDS was left aside, there were no more funds for CBI projects, so they chose from the BPIF. The main difference with CESCAN I was that, while those projects were selected, CESCAN II was realized under a competitive fund process (PE68). CESCAN II, with slightly more budget per project, offered interventions considering multisectoral approaches (water and productive, productive and nutrition) and articulating with local communities. In this phase, it is possible to observe the development of bottom-up business plans, the execution of construction works by the own beneficiaries, the development of binational management models while one local municipality assumes the role of executor/manager, and other dynamics that reflect the ownership of the projects by the involved stakeholders. This programme contributed with productive integration, better use of resources, and cultural exchange to 11K inhabitants (Comunidad Andina, 2012b).

Due to the CAN reengineering, the desire for a SOCICAN II, and the available EU budget for economic & social cohesion, **INPANDES** was born (SOCICAN and INPANDES are explained in more

detailed in **Chapter 6**, Section 2.2.2.). INPANDES had a more flexible budget allocation per project (from €0.5M to €1.4M), allowing to allocate it depending on the project demands. These projects were also multisectoral but with a strong focus on cross-border value chains (productive and nutrition, productive and planning), with a bigger variety of products that also allowed the transference of experiences from one ZIF to another. INPANDES reflected the construction of social inclusion and cohesion by owning their own mechanisms for development from a cross-border perspective.

The INPANDES projects targeted local needs by strengthening local productive capacities (infrastructure, innovation, diversification, value-adding, etc.), cross-border touristic routes, promoting the development of cross-border planning, management, and auditing models, and the creation of cross-border platforms and associations to discuss. In addition, EU installed institutional platforms in every ZIF to incentive the development of initiatives from a bilateral perspective. With 80% of budget execution, the project was considered successful, although more metrics would be needed to determine it. This programme contributed with productive integration, better access to common public goods, and improvement of multilevel institutionality, beneficiating 160k inhabitants (Comunidad Andina, 2018b).

To execute those projects, GANIDF established 'delegation' or 'grant' agreements with the beneficiary institution (local municipalities, associations, etc.) and appointed one of them as main responsible to manage the cooperation resources, elaborate reports, etc. (SELA, 2013). In other words, as the legal person of a cross-border entity was not possible due to the legal limitations, one of the cooperation actors assumed informally those functions. However, those types of interactions could only be bilateral, facing some challenges in projects such as the Napo productive corridor that had three countries. Lastly, the final evaluation of the projects was carried by the international partners rather than local, national, or bilateral agencies. Therefore, this rises the need of creating new mechanisms such as cross-border legal entities, better evaluation mechanisms and metrics, and policies to facilitate project implementation and feedback processes.

4.4.4. Projects & Programmes: MERCOSUR

In the MERCOSUR case, cross-border projects have been executed in a lower volume, most with their own resources and by different executor agencies. **Table 5.12** summarizes the main executed projects where MERCOSUR have had participation as executive agency, consultative body, or funding source. This set of projects has a great variety in terms of sectors, executive agency, budget, timeline, and type of intervention. This shows more a tendency of taking sectoral agendas into the border regions rather than pursuing a cross-border agenda with a multisectoral perspective.

Table 5.12. *Summary of cross-border projects executed in MERCOSUR (Author's elaboration)*

Project	Ex. Agency [Period]	CBR	Sector	Funding source ($)	Local Contrib. ($)	Total budget ($)
Own national funding 2005-2016						
Border Intercultural Bilingual Schools Programme (PEIBF)	GTEF [2005-2016]	BR – AR/ BR – UR/ BR – PA	Education, cultural	-	-	-
FOCEM 2007-now						
Aphthous-Fever Free MERCOSUR Action Programme (PAMA)	CMA [2007-2014]	ALL	Food safety	13,888,598	2,916,012	16,804,610
Social and Solidarity Economy for Regional Integration (ESSIR): Social Border Economy (ESS)	ISM/MIDES [2008-2009]	ALL / UR	Productive	1,323,757	388,548	1,712,304
Uruguay-Brazil 500W transmission line	UTE [2010-2016]	UR-BR	Energy	82,628,210	44,225,293	126,853,503
Integrated Sanitation System in Aceguá – Aceguá	CORSAN/ OSE [2013-now]	UR-BR	Waste, water	5,719,708	3,494,246	9,213,954
FOCEM (67.0%)				**103,560,273**	**51,024,099**	**154,584,372**
MERCOSUR – AECID 2010-2014						
Promotion of Cooperative Movements in MERCOSUR	RECM [2010-2013]	ALL	Productive	550,675	251,454	802,129
'Cross-Border Governance in MERCOSUR' Project	FCCR [2012-2014]	ALL	Network	505,066	319,711	824,777
AECID (64.9%)				**1,055,742**	**571,165**	**1,626,907**
TOTAL						
Non-national Funding (67.0%)				**104,616,014**	**51,595,264**	**156,211,278**

For the execution of projects, almost all external investment came from FOCEM (99%), followed by AECID. The Uruguay-Brazil transmission line represents the 79.8% of the total FOCEM budget ($82.6M of $103.6M investment). In addition, FOCEM projects do not have a similar budget amount although the minimum is more than $1M. This is different from AECID's financed projects whose contribution per project is around $0.5M. Thereby, FOCEM represents a funding source with more versatility.

These seven projects provide several insights of how cross-border issues are pursued in MERCOSUR. The Border Intercultural Bilingual Schools Programme (PEIBF) has been one of the oldest programmes in execution since 2005. It started as a binational experience between Argentina and Brazil's national governments since 2003 to promote the relevance of Spanish-Portuguese bilingual education (Bueno, 2019). The pilot projects were conducted in border schools of both countries, attracting Paraguay and Uruguay by 2008, moment when the PEIBF was formally added as a MERCOSUR's educational programme under the Border Schools Working Group (GTEF) (Müller de Oliveira and Morello, 2019).

By 2016, the PEIBF included 24 schools located in border twin cities and financed with public budgeting according to the national laws. The programme strived to promoting language and cultural diversity through school partnerships, joint research and planning, and exchange of teachers (Mazzei, 2016). Due to the fragility of language policies in Brazil, political context, and low relevance of regional social integration, the national budget was cut in 2016 (Müller de Oliveira and Morello, 2019). However, the experience has been taken by educational institutes, subnational and local governments, promoting bilingual education with their own financial resources (Mazzei, 2016; Lima, 2020).

Among the FOCEM portfolio, the Uruguay-Brazil 500W transmission line and the Integrated Sanitation System in Aceguá – Aceguá were two infrastructure projects between Uruguay and Brazil financed by the fund. While both represented an investment in facilities rather than capacities, the Aphthous-Fever Free MERCOSUR Action Programme (PAMA) was a regional programme (MERCOSUR countries and Bolivia) to eradicate aphthous fever, a foot and mouth disease that affect cattle and other livestock animals.

As this disease affects food quality and safety and undermines the access to external markets, PAMA strived for cross-border collaboration between national agencies, laboratories, private sector, and other related stakeholders through binational and trinational cross-border projects to strengthening action at border crossings, vaccination campaigns in border regions, and improving diagnostic mechanisms (FOCEM, 2007a). Although, the project had good results (Paraguay and Bolivia designated as Aphthous-fever free, better infrastructure, capacity building, etc.), management of recommendations was less than 15% (Fernández-Guillén, 2007; EFSUR, 2012).

The Social and Solidarity Economy for Regional Integration (ESSIR) programme could be considered as the most ambitious cross-border initiative under the concept of Social and Solidarity Economy. Proposed in 2007 by the ISM under the RMADS, the ESSIR was conceived as a multisectoral programme to develop cross-border local capacities through entrepreneurship training, promoting associativity, productive integration of cross-border value chains, productive infrastructure, and access to microcredits (Saguier and Brent, 2015). Six border twin cities were selected for this project, but in an initial stage, the project was only implemented in Uruguay with FOCEM financing (Saguier and Brent, 2015).

This Uruguayan project, renamed as Social Border Economy (ESS), was conducted between 2008 and 2009, generating 800 productive projects in Uruguayan borders, and the improvement in labor conditions. However, the lack of an ex-ante assessment to evaluate the territorial capacities (entrepreneurship feasibility), the absence of a good follow-up process, the breakup of multiple of initiatives into smaller units, and the traditional border trade barriers undermined the results of the project (Moreno, Rojo and Genta, 2009; Saguier and Brent, 2015; MERCOSUR, 2017c). At the end, the project did not scale up into a multilateral scope and the initiative continued within Uruguay.

Among the AECID projects in MERCOSUR, two of them had cross-border components. The first one, the FCCR's 'Cross-Border Governance in MERCOSUR' Project, was the continuation of the PIFM through a more 'tangible' intervention. Based on the research results, the governance project focused on a virtual platform to facilitate capacity building to designing and managing cross-border projects, and a network of border twin cities to exchange experiences (FCCR, 2011). Although progress was done towards those objectives, by the date, both initiatives are in disuse.

Based on the ESSIR experience, the RECM's 'Promotion of Cooperative Movements in MERCOSUR' (2010) was planned as a strategy to strengthen cooperatives and social-economic inclusion within the region under the concept of 'Social and Solidarity Economy'. In this project, productive complementarity in border areas was linked with the articulation of bilateral actions between border cooperatives, targeting to design at least one cross-border project (RECM, 2010). Although some binational proposals were discussed such as the Entre Rios (Argentina) – Salto (Uruguay) Touristic train (RECM, 2011), even by 2017, the RCEM had not mapped possible cross-border cooperative projects (RECM, 2017).

As there has been sectoral agendas with cross-border components, many agencies did not contemplate how to operate projects of this nature. While the projects that succeed were mainly infrastructure ones, complexity increased when there was a higher need for articulating with cross-border local dynamics. The PAMA, as an interinstitutional programme, partially achieved the expected goals, but projects such as ESSIR or AECID-financed interventions that required more articulation could not even overcome the unilateral perspective.

The lack of a previous analysis of the cross-border context, the involvement of national governments in local issues (determining even the projects to execute locally or apply to FOCEM), and the resistance for articulating across borders affected the development of the projects. One exception was the PEIBF, that was constructed bottom-up, supported by national budgeting, and advised technically by MERCOSUR. However, this project was also sensitive to the political context.

While some proposals did not occur as expected, failed in achieved results, or had implementation challenges, the presence of multiple MERCOSUR agencies (FOCEM, GTEF, CMA, ISM, RECM, and FCCR) pursuing their own sectoral agendas in cross-border regions had its benefits as the struggles in one case did not directly affect the implementation in the other. Thereby, the lack of progress of one agency could be compensated by the progress of the other. However, inter-agency collaboration was the exemption more than the rule, strategy that could have benefited in how to operate across the borders.

4.4.5. Policy Frameworks & Plans: CAN

Among the CAN's policies, Decision 459, 501 and 541 are relevant to discuss. The 'Decision 459: Community Policy for Border Integration and Development' was the product of the CAN's efforts carried in a good political moment (this chapter, **Section 4.2**). This policy reaffirmed the concept of bilateral action to strengthen the idea of every country's autonomy, set the guidelines and objectives of macroregional CBI, established the GANIDF as the executive agency to promote the cross-border agenda, and determined the ZIFs as strategies to achieve them (Comunidad Andina, 1999). Although this document represents a first macroregional step to facilitate CBC and gives flexibility to interpret it within the bilateral relations, considering the ZIF as the main strategy to articulate those relationships (most of the Decision articles frame CBI within the ZIFs) might be an example of 'putting all eggs in one basket' as concentrating all efforts into one mechanism increases the risks of failure. In addition, the difference between the countries' political administration, decentralization degree, and maturity of their border policy represented clear obstacles to execute projects (Comunidad Andina, 2002a).

While the framework policy considers the ZIFs as the main communitarian strategy, Decision 501 represents a necessary measure to its implementation. In the same line as the previous decision, it emphasizes the idea of bilateral action with communitarian support and the multisectoral nature of CBI, letting national governments to decide the geographical scope, elaborate the needed plans and projects, and decide financial mechanisms (Comunidad Andina, 2001a). To support those decision-making processes, the SGCAN reaffirmed its role as technical partner and created the Bank of Integration and Border Development Projects (BPIF) as an information system to support investment decisions (Comunidad Andina, 2002a).

In terms of the geographical scope, the ZIFs or Cross-Border Integration Zones did not exactly match the border dynamics scope or coexistence area as mentioned in the original documents, but a space decided by the central governments, that in some cases, would represent even half of a country (this discussion is continued in the next planning section). In addition, as Art.14 claims, the ZIF should be a legal jurisdiction that facilitates border development, but by that moment (or even twenty years after), the national agencies and border policies did not promote that engagement. As Bolivian ADEMAF is more related to border security, **Table 5.3** shows that only Peru and Colombia have their own border development policies. Both consider some legal benefits to those specific areas, but there are differences between both countries and the geographic scope is smaller compared with the ZIFs' ones.

For the elaboration of plans and projects, the countries did not request technical support to the CAN but opted to get it from the CAF through the COPIF. In this process, the CAN worked as a broker to facilitate access to the banks' financial and technical resources (SELA, 2013). Most of the ZIFs were

determined by political decisions rather than analytical ones and officialized one year later in 2002. The only case where a study was developed under all the Decision 501's stipulations was the ZIF Táchira – Norte Santander between Venezuela and Colombia. This concluded in 2005 and was approved next year before Venezuela left the CAN (Arciniegas Serna, 2018). The rest of plans that have been formulated (or still in progress as the Peru-Bolivia ZIF plan) were mainly designed with bilateral capacities or supported by the multilateral banks, distancing from the Decision 501. In the practice, these capacities for binational planning could not address the CBR problems due to their multisectoral complexity and could not take advantage of the opportunities brought by the ZIFs (SNDP and PBDRF, 2019).

The BPIF was mainly active from 2001 to 2004 under the SGCAN with funding of the IADB and CAF (those three bodies were the only members of the BPIF Committee). In this 'experimental phase', the BPIF worked to match the supply and demand of resources for CBI projects, facing difficulties in identifying profitable projects for the multilateral banks to invest, resistance from the SNIPs to adapt their disbursement mechanisms, and delay from multiple public agencies at different government levels that submitted projects with few cross-border elements (more oriented to their own national regional plans).

As there was low cooperation between the BPIF with bilateral or national mechanisms in the decision-making process and low quality of the national proposals, just a little amount of money ($62,000) was oriented from the IADB and CAF to some pre-investment project studies and policy design, but not for the execution of the ZIF's cross-border projects (SELA, 2013). However, the BPIF represented a clear step on determining in a concrete perspective what kind of projects has a cross-border component and the technical requirements that need to be achieved (Instituto Social del Mercosur, 2021c). Among the 80 BPIF projects, 13 were prioritized and 9 were selected to be funded under the CAN-EU cooperation: four for CESCAN I, and five for CESCAN II (but only four were executed) (PE68).

As this policy faced a funding barrier, the idea of a common fund to finance the ZIFs appeared between the governments. However, the IADB and CAF clarified that it was not needed such a mechanism and that both banks could finance the projects if there were mature enough and profitable (SELA, 2013). Without collaboration of the SNIPs and the profit-oriented motivations of the banks, most of the projects did not progress until the implementation of COPIF (CAF's solidarity fund to financing project studies and plan designs with limited resources) or the international cooperation with EU and AECID.

The success of the ZIFs was highly impacted by the nature of the relations that shaped the cross-border mechanisms: the GANIDF, the Consultative Group and binational mechanisms did not work together, discussions on cross-border spaces were mainly at high-governmental level, and decisions on

territoriality were taken by national foreign affairs agendas. Thereby, the ZIFs, more than plans designed under a territorial approach for cross-border regions (targeting real cross-border dynamics, participatory planning, consensus between local actors, etc.), were bilateral subnational plans based on political and economic interests (supply and demand evaluation, interests of the development banks, nationalist motivations within regional integration, etc.).

In addition, the lack of mechanisms to evaluate and prioritize projects based on their impact to CBI&D and the absence of meetings between the SGCAN with national and binational mechanisms to do it – although they were mentioned in Art. 15. Of Decision 501–, repercussed in the selection of priority projects (SELA, 2013). Therefore, Decision 459 and 501 were not strong enough to counter the individual conducts or national interests, facing difficulties to leverage spontaneous integration within the ZIFs from a top-down perspective (BID-INTAL, 2012). Even more, the development of every ZIF was closely related to the maturity of the bilateral relations (Oddone *et al.*, 2009), showing great progress in some cases (e.g., Peru-Ecuador ZIF) and still pending tasks in others (e.g., Peru-Bolivia ZIF). Despite both Decisions represented huge steps towards a macroregional policy to facilitate bottom-up initiatives, they did not translate into tangible results as the same principles that were implemented to help their execution (bilaterality, autonomy of decision, and communitarian support) undermined or failed to boost the process, generating asymmetric development within and between ZIFs.

The Decision 541: Andean Health Plan on Borders (PASAFRO) was enacted in 2003 over the previous decisions, with a clear thematic purpose. Although PASAFRO could achieve several progresses from the beginning (elaboration of guidelines, agreements to articulate with national technical teams, etc.), its main challenge was its relationship with the ZIFs and how to align them with health interventions as previous studies did not consider sociocultural characteristics, health information of ethnic populations, network of health services, etc. (Comunidad Andina, 2006) To progress on this sectoral strategy, those studies were developed at cross-border local level (not ZIF scope) in collaboration with the ORAS-CONHU (Health agency within the CAN).

By last, in 2009 the GANIDF's elaborated the 'Santa Cruz Action Plan', representing a reflection of the first ten years of implementing the Andean cross-border agenda and what would be the actions for the next ten years to go (GANIDF, 2009). Four action lines were determined: institutionality, planning & projects, border crossings, and financing. Most of the recommendations drew on the obstacles previously mentioned: increase multilevel participation, review the scope of the ZIFs, strengthen technical capacities in the GANIDF and governments, adjust the SNIPs to allow cross-border projects, and explore new financing alternatives. Although some progresses were achieved to solve those issues, the motivations on promoting cross-border operations from a communitarian perspective gradually decayed and were replaced by the bilateral President & Cabinet meetings.

4.4.6. Policy Frameworks & Plans: MERCOSUR

The MERCOSUR policies related to CBI&D started within the trade and economic integration processes. In 1999, the Border Neighborhood Transit (TVF) Agreement was signed to allow border legal residents living in localities near the borderline to cross it faster and easier. It depended on the States to determine bilaterally the geographic area where border population could use that credential, and to establish the limit period that they could be in the other side. The agreement was going to be implemented through digital systems to provide the TVF card, facilitate border crossing of residents, and eliminate restrictions for trade of good and services oriented to border areas or from border population (SELA, 2013). However, due to the economic situation of the countries in that moment, it was not possible to establish a more comprehensive legal framework. However, to the date, it has not been fully Implemented within all the bilateral relations (OIM, 2016; Polícia Federal, 2017).

With the creation of GAHIF in 2002, this agency focused on the elaboration of two macroregional cross-border policies: the MERCOSUR Border Statute and the Linked Border Communities (LFV). This Border Statute was supposed to be a framework policy to provide the border local actors (especially from the border twin cities) a certain degree of autonomy to decide on their own jurisdiction and facilitate lifestyle at the borders (SELA, 2013). A precedent for this policy was the 'Complementary Adjustment of the Border Legal Statute' between Brazil and Uruguay (1997), document that, despite it was oriented to border delimitation and cross-border accessibility, also incentivized CBC in urban planning, public services, environment, and more (Art. 8) (República Federativa de Brasil and República Oriental de Uruguay, 1997). However, the MERCOSUR Border Statute did not progress as there was conflict between the countries' foreign policies (Ferraro, 2013). The idea of a Border Statute was replaced by a Citizen Statute in 2010, changing its cross-border nature to a macroregional one (MERCOSUR, 2010).

Despite the paralyzation of GAHIF, the Citizen Statute continued to be in the agenda of other MERCOSUR agencies as the MERCOSUR Institutional Affairs Group or the Specialized Migration Forum, where the countries followed the previous discussions within the deliberations about migration processes (Ferraro, 2013). The creation of SGT18 promoted better debates on border populations for the Statute as this agency worked as a forum to discuss and coordinate its implementation (MERCOSUR, 2017a, 2021b). In March 2021, the MERCOSUR Citizen Statute was published, representing a macroregional social-aiming policy as it groups a set of rights and benefits (based on previous agreements) for the MERCOSUR citizens in ten thematic areas (MERCOSUR, 2021a). However, the border integration section focuses more on the Integrated Control Checkpoints and barely mentions the TVF and LFV agreements, without bringing any new contribution to the MERCOSUR cross-border

integration. As this has been recently published, it is still in the process of adoption and implementation of the country members.

After the creation of GAHIF, due to the difficulties to approve the Border Statute and the Brazilian motivation to improve cross-border mobility, the LFV represented a more feasible option that could be achieved (SELA, 2013). In 2005, the GAHIF proposed the LFV to improve the quality of life of border populations by giving them economic benefits, easing transit, employment regime and access to public services (health, education, etc.). The LFV expanded the approach of the TVF to facilitate border crossing of goods, people, and services (the TVF card is still relevant for the provision of those benefits) but considering a bigger spectrum of needs, including joint urban planning. From the social aspect, as the countries had an asymmetric provision of public services, the LFV promoted shared used based on the principles of gratuity and reciprocity (SELA, 2013). However, it does not bring clarity of the institutional arrangements necessary to exercise this agreement in every LFV other than expanding the functions of the agencies currently working there.

The LFV had a clearer geographic u"It: 'he border twin cities. Therefore, the benefit of this policy was oriented to the urban populations in the border regions that were bilaterally designated by the countries as twin cities. Although the concept of LFVs existed previously (Brazil and Uruguay signed a similar agreement in 2003) and Brazil and Argentina started adapting this in 2005, the bilateral and regional efforts slow downed. Argentina and Brazil approved the LFVs in 2016, and Brazil and Paraguay in 2017, more than ten years after the first attempts. It was not until 2015 when the SGT18 retook this project and submitted it in 2019. Although the final version was approved, it has not been ratified and the LFVs have not been institutionalized in all MERCOSUR's CBRs.

The cross-border policies in MERCOSUR have had a slow development since their formulation and have not achieved yet a smooth implementation due to the resistance coming from some bilateral relations. The two main policies, the LFV and Border Statute were based on previous bilateral agreements (policies from Brazil-Uruguay relation) with the purpose of bringing the same (or better) benefits to all the Southern Cone's CBRs. However, the GAHIF's proposals did not overcome the project phase, but continued to be part of other MERCOSUR agencies' agendas. Thereby, instead of dropping those projects, they mutated and progressed in different terms until the SGT18 could support them directly in the last years. As both policies have recently appeared and have not been ratified yet, and although it is not possible to evaluate their success, they represent a milestone for macroregional CBI&D in MERCOSUR.

4.4.7. Spatial Planning & Zoning: CAN

Within the CAN territory, four ZIFs were established through bilateral discussions. According to the 'Decision 534: CAN's Nomenclature of Territorial Units for Statistics (NUTE ANDINA)', the territory is divided in five levels (from country level to local one), homogenizing the different political levels of the four countries (Comunidad Andina, 2002b). The ZIFs considered in their space even NUTE1 instead of NUTE3 or NUTE4 that refers to local (**Table 5.13**). This section analyzes the ZIFs based on the official documents comprehending their plans and projects.

Table 5.13. *Nomenclature of Territorial Units for Statistics of the CAN (Comunidad Andina, 2002b)*

	NUTE 0	NUTE 1	NUTE 2	NUTE 3	NUTE 4	Total
Bolivia	Country (1)	Region (3)	Department (9)	Province (112)	Municipality (314)	439
Colombia	Country (1)	Region (7)	Department (33)	Cluster (336)	Municipality (1105)	1482
Ecuador	Country (1)	Region (4)	Province (22)	Canton (216)	Parish (990)	1233
Peru	Country (1)	Region (11)	Department (25)	Province (194)	District (1828)	2059
Total	4	25	89	858	4237	5213

ZIF Peru – Ecuador (2000)

The ZIF Peru-Ecuador (**Figure 5.6**) is the oldest one as it adopted the geographical scope of the Binational Development Plan for the Peru – Ecuador Border Region (1998). With a territorial extension of 420'656km2 and 5.2M habitants, it is composed by 8 provinces, 71 cantons, and 365 parishes from Ecuador (Provinces of El Oro, Loja, Zamora Chinchipe, Morona Santiago, Pastaza, Orellana, Napo, and Sucumbíos) and 5 Departments, 37 provinces, and 134 districts from Peru (Departments of Tumbes, Piura, Cajamarca, Amazonas, and Loreto). As the ZIF contains the regional capitals, urban centers and conurbations, the demography is predominantly urban, but counting just the border districts, urban population is less than 30% (Dammert Guardia *et al.*, 2017). In environmental terms, 80% of the territory are forests, including 31 protected areas, and 10 cross-border watersheds (PBDRF, 2021).

In the last twenty years, 864 projects have been development in this area: 189 co-financed by international cooperation (74 binational projects and 115 national projects) for $2'381.6M (8% from

IC), and 675 project (local interventions) co-financed by the Binational Fund for $91.9M (39.6% from the Fund) (PBDRF, 2019). Based on this data, 8.6% of the projects would be considered binational. Among the most relevant binational projects (**Table 5.14**), four of the fourteen projects are corridor infrastructure projects in a subnational scope, orienting more than 52% of the total amount of financial resources (PBDRF, 2019). Two of them are cross-border watershed projects, and six could be considered as projects in cross-border local areas (four of them were financed under the CAN-EU cooperation). The ZIF, which was well-funded at the outset as part of the peace agreement, now faces a shortage of resources as no new funds have been received and the binational entity has been unable to secure additional funding (PE69).

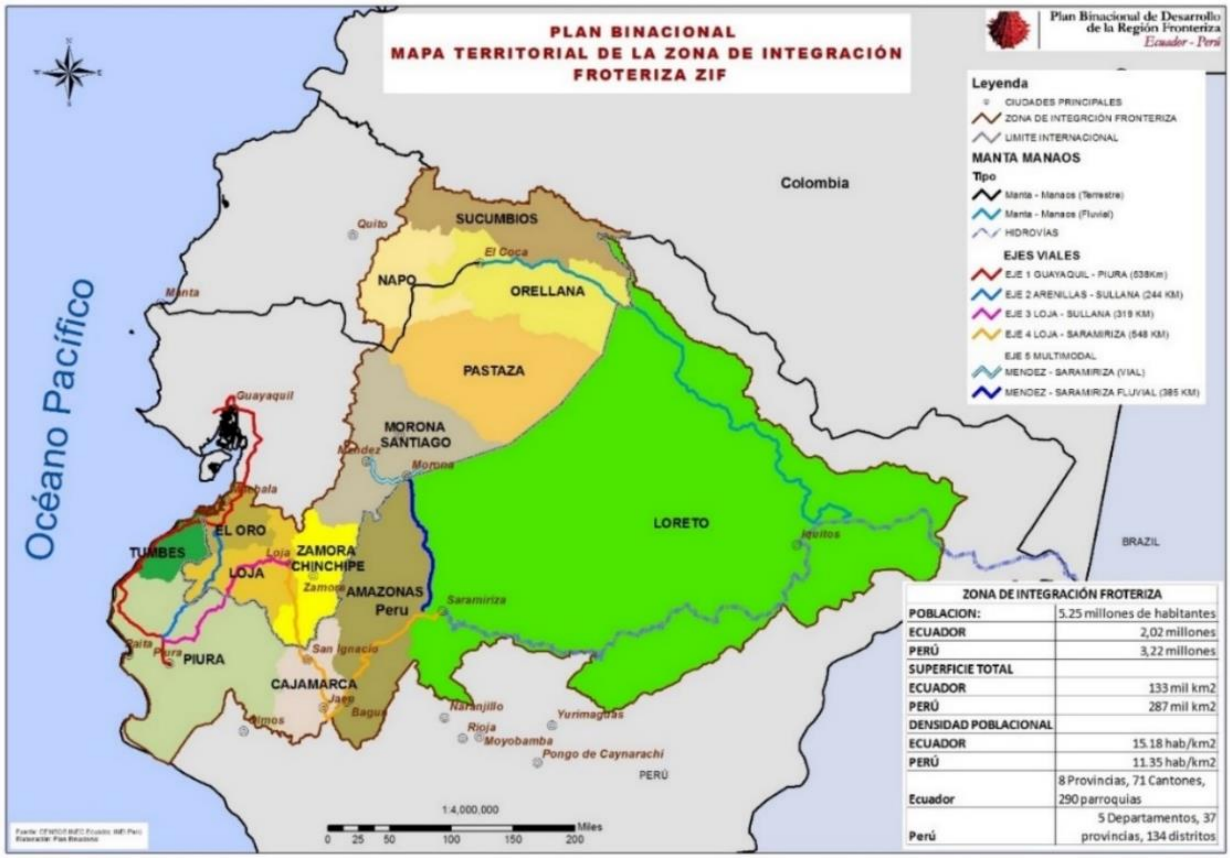


Figure 5.6. *ZIF Ecuador – Peru (PBDRF, 2021)*

Table 5.14. *Main Binational Projects in ZIF EC-PE between 1998-2019 (based on (PBDRF, 2019))*

Binational Projects	Theme	Scope	Main funding
Corridor N°1: Piura -Guayaquil	Accessibility	subnational	EU
Corridor N°2: Sullana – Arenillas	Accessibility	subnational	-
Corridor N°3: Loja – Sullana	Accessibility	subnational	Japan
Corridor N°4: Loja – Saramiriza	Accessibility	subnational	USAID, Brazil
Catamayo – Chira Binational Integrated Watershed Management (solid waste management)	institutional, water, productive, environmental	watershed	**PRA-1**
Programme to Fight Poverty in the ZIF (rural development)	Productive, social	**cross-border**	Italian Cooperation
Socio-Sanitary Cooperation Programme (micro-networks)	Health	**cross-border**	-
Binational Health Network between Zumba – San Ignacio	Health	**cross-border**	**CESCAN I**
Binational Peace and Conservation Project in the Cordillera del Cóndor (joint protected area)	Environment	watershed	OIMT, CI
Comprehensive Binational Border Peru / Ecuador Project EC-PE 001	Social, infrastructure	border	Luxemburg
Intercultural Education Project in Contexts of Cultural and Linguistic Diversity between San Ignacio – Zamora Chinchipe	Educational, Cultural	**cross-border**	**CESCAN II**
Development and urban integration of neighboring border towns of Ecuador and Peru	institutional, productive	**cross-border**	**INPANDES**
Integration, inclusion, and innovation in the Napo – Amazonas cross-border productive corridor	Productive	**cross-border**	**INPANDES**
'Between Friends' Youth Dialogue Project	Social	**cross-border**	Germany, Canada, France

Summarizing, the ZIF Peru-Ecuador did not exactly focus in cross-border projects as only 0.7% of the total can be considered within that denomination. Half of the cross-border local projects were financed within the CAN-EU cooperation (CESCAN I, CESCAN II, INPANDES), showing that even though they were not the priority of the governments, the CAN promoted that agenda within the ZIF.

ZIF Peru – Colombia (CBZIF) (2002)

The ZIF Peru-Colombia, adopted in 2002, has an extension of 266,657km2 with 0.7M habitants (84% from Peru), involving partially the Peruvian Department of Loreto, and the Colombian Departments of Amazonas and Putumayo. Population in ZIF is urban (68%) although this number is reduced at the border districts (around 40%) (González López, 2005; Dammert Guardia *et al.*, 2017). As a predominantly Amazon area, the geography is ruled by two main watersheds (Putumayo and Amazonas), isolating the human settlements, and limiting the access of public services. To target those problems, both countries established four Geo-Economic Units (UGE) and inside them, seven Development and Integration Nucleus (NDI) (CAF and PEDICP, 2013), encompassing an area of 113,156km2 with a population (predominantly indigenous) of 107,192 habitants (68% from Colombia).

These NDIs are border towns or cities close to the borders that have (or will have) a complementary function in the territorial system.

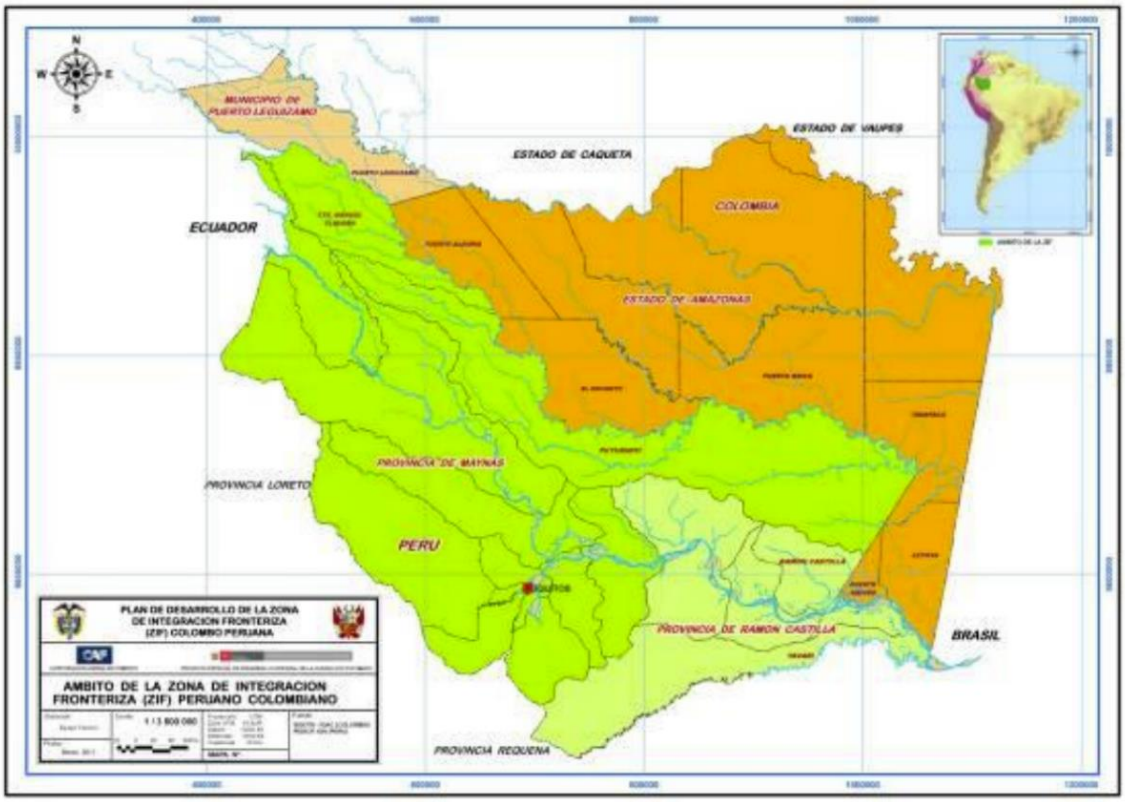


Figure 5.7. *ZIF Colombia – Peru (CAF and PEDICP, 2013)*

Mapa Nº 8. Unidades Geoeconómicas (UGE) y Núcleos de Desarrollo e Integración (NDI)

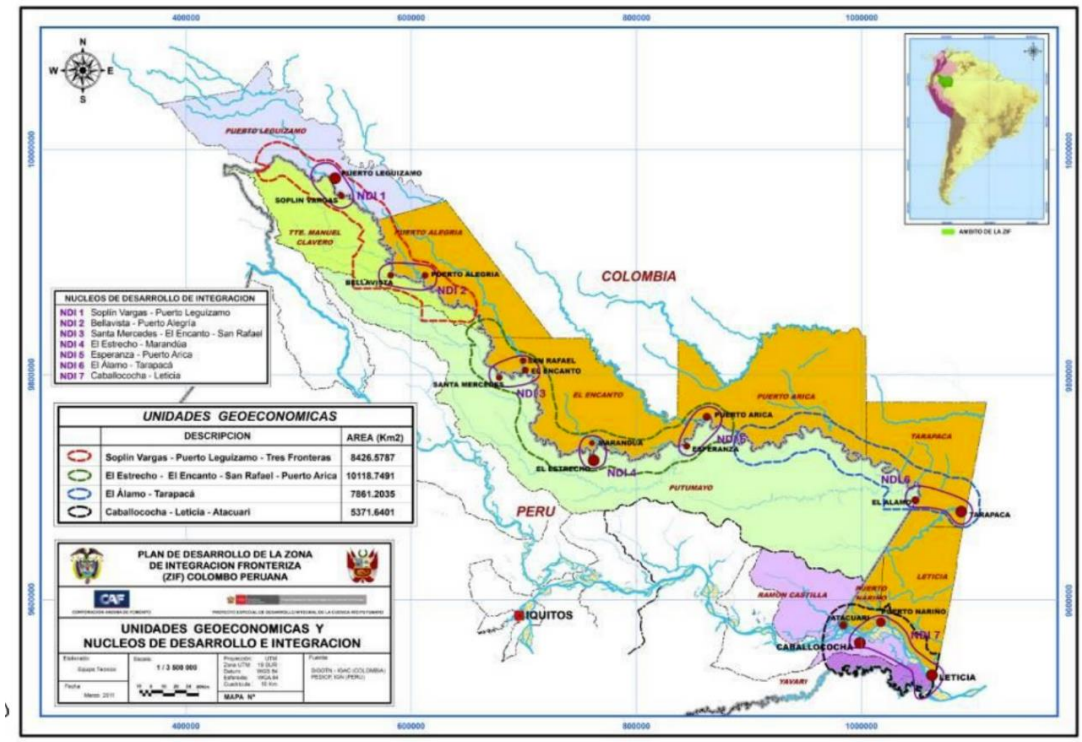


Figure 5.8. *UGEs and NDIs in ZIF Colombia – Peru (CAF and PEDICP, 2013)*

Table 5.15. *Binational cross-border projects executed in ZIF PE-CO between 2000-2020 (Torres, 2018)*

Binational Projects	Theme	Scope	Main funding
Comprehensive Fishing Management in Putumayo River	Productive, water	cross-border	FAO
Forest Management in Putumayo River Watershed	environment	cross-border	CAF
Binational wetland management for food security and conservation	Conservation, nutrition	cross-border	**PRA-1**
Strengthening local capacities for organic cacao production in the ZIF	Productive	cross-border	**PRA-2**
Telemedicine network in the Putumayo River basin	Health, governance	Cross-border	**CESCAN I**
Pisciculture Production Models in the ZIF	Productive	UGE4 (CB)	**CESCAN II**
Integration, inclusion, and innovation in the Napo – Amazonas cross-border productive corridor	Productive	Cross-border	**INPANDES**
Binational Value Chain of native aroma cacao in the Peruvian-Colombian Amazonian Trapeze (started 2020)	Productive	Cross-border	IADB

As **Figure 5.7** and **Figure 5.8** show, the UGEs' geographic scope represents a more adequate scale for a CBR than the ZIF. Thereby, a development plan based on the UGEs was elaborated in 2013 and approved in 2014. This plan considered 14 cross-border projects for sanitation, productive chains, nutrition, agroindustry, environment, and energy (CAF and PEDICP, 2013). To finance the projects, the CBZIF Development Fund was established in 2015, but the first donation arrived in 2019. These delays made that just few projects have been implemented since the ZIF started. Between the main bilateral cross-border projects executed since the ZIF started (**Table 5.15**), most of them were executed with non-refundable funds, where the CAN supported five of eight within its cooperation with EU and AECID.

Compared with other ZIFs, the CBZIF plan was more accurate as it specified intermediate and local spatial units. The UGEs and NDIs represented innovative tools to focus development, but they still can be improved. Analyzing the demography, ND1 and ND7 have high density population compared with the rest of NDIs. Both are located at the extreme sides of the ZIF, where cross-border dynamics are more trilateral than bilateral as both countries share common border with Ecuador and Brazil respectively. This would lead to a more complex analysis of the flexibility of the ZIFs (especially NDIs) to consider what to do with third countries or areas overlapping other ZIFs.

ZIF Ecuador – Colombia (ZIFEC) (2002)

The ZIF Ecuador-Colombia (**Figure 5.9**) was approved in 2002, shaping a cross-border region of 100,055km2. Although the geographical scope of ZIFEC changed by increasing and later reducing the number of involved subnational entities (Jaramillo, 2009), the last plan included four Ecuadorian Provinces (Carchi, Esmeralda, Imbabura, and Sucumbíos) and two Colombian Departments (Nariño and Putumayo) (Senplades, DNP and PFP, 2014). The ZIF has a total population of 3.29M habitants (61% from Colombia), where 1.27M of the Colombians (38% from ZIFEC population) live in the Ecuadorian side. In addition, it has an indigenous population of 260,000 people (10%) (González Rodríguez, 2018). Geographically, this territory is divided in Pacific area, Andean area, and Amazon area, allocating 25%, 60% and 15% of the population respectively.

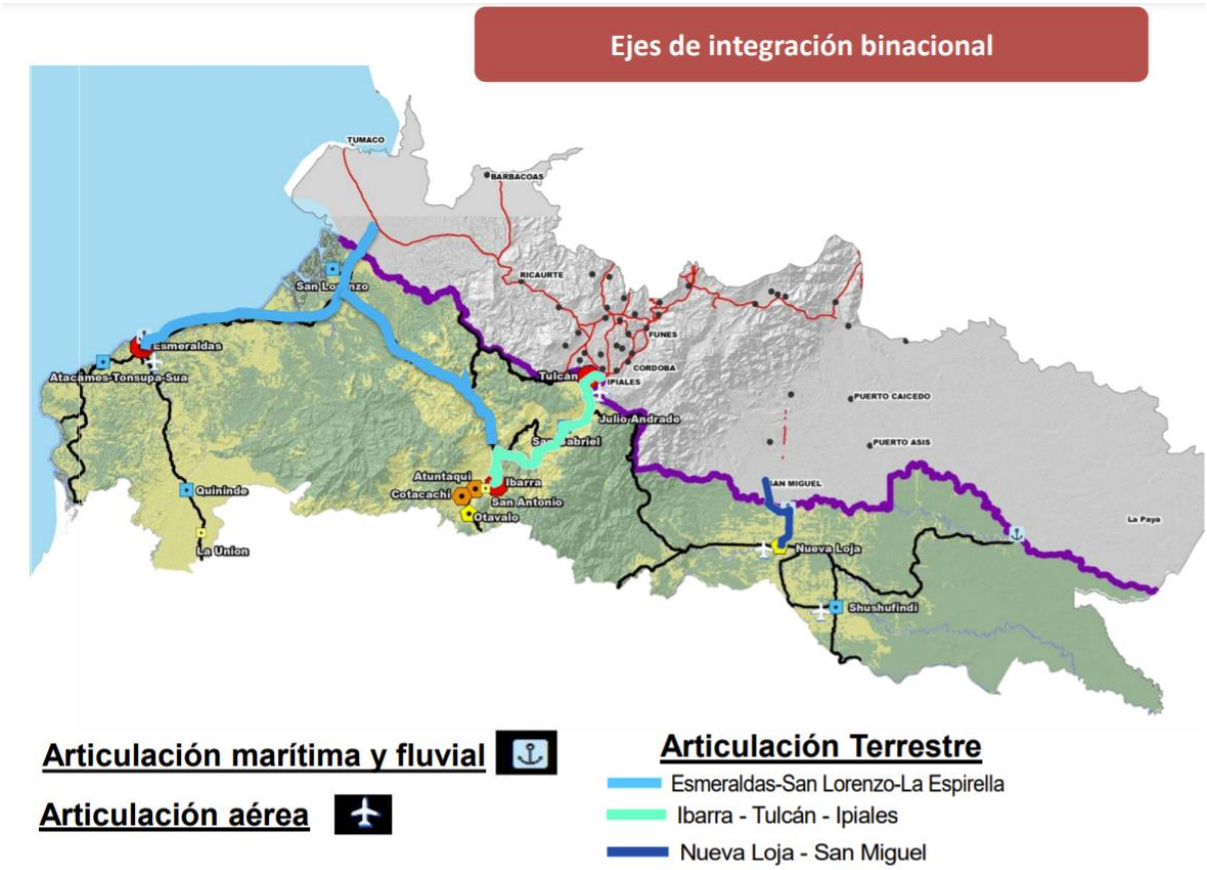


***Figure 5.9**. ZIF Colombia – Ecuador (based on (SNDP and PFP, 2014))*

In 2013, the governments merged their binational development motivations in the 'ZIFEC Binational Plan 2014-2022' (Senplades, DNP and PFP, 2014), developing strategies in five axes: equity, security, productive complementarity, connectivity infrastructure, and environmental sustainability. This plan shows the main binational policies and goals, but it does not present a list of projects nor the budget that will be allocated to achieve it. The plan contains a review of the previous national budget allocations to their ZIF sides, showing that most of the investment was oriented to connectivity infrastructure. The plan was updated in 2017, and apart from connecting the binational policies with the SDGs, it showed a list of projects (planned, in execution and executed), where most of them were unilaterally designed (Senplades, DNP and PFP, 2017).

To support the ZIF and its plans, both countries created the Border Development Fund or Development and Social Reparation Fund in 2012. However, the first projects were approved seven years later in 2019: The Binational ZIFEC Sport Games, the Binational Indigenous Games, the Binational Cultural Meeting (activities related to dance, cuisine, music, etc.), the strengthening of productive capacity and the construction of two bridges (Cancillería de Colombia, 2019). Due to the COVID-19 outbreak, the resources from this fund were reoriented to cover the needs of the ZIF generated by the pandemic (Encuentro Presidencial y IX Gabinete Binacional, 2020).

From this perspective, the ZIFEC has been bilaterally designed from the perspective of policies and plans, but mostly unilaterally executed through their project design, although the 2019 projects represented an improvement towards a bilateral cross-border agenda. Conversely, the ZIFEC binational plan did not contemplate concrete cross-border projects and the binational fund has had multiple obstacles to start operating.

ZIF Peru – Bolivia (2003)

The ZIF Peru-Bolivia (**Figure 5.10**) is the largest and most populated ZIF with an extension of 905,226km2 (almost equivalent to the area of Bolivia) with a population of 8.6M habitants (Meza, 2005). This territory contains 5 departments from Peru (Arequipa, Cusco, Madre de Dios, Puno, and Tacna) and 5 department from Bolivia (La Paz, Oruro, Potosí, Beni, and Pando), representing almost all Peruvian southern region and half of Bolivia (including the capital city). As this scope was very extensive, a 'shrunken ZIF' was designed considering only border departments to focus the first binational initiatives and later connect with the whole ZIF space. The ZIF geography is divided in two types of terrain: Andean and Amazon.

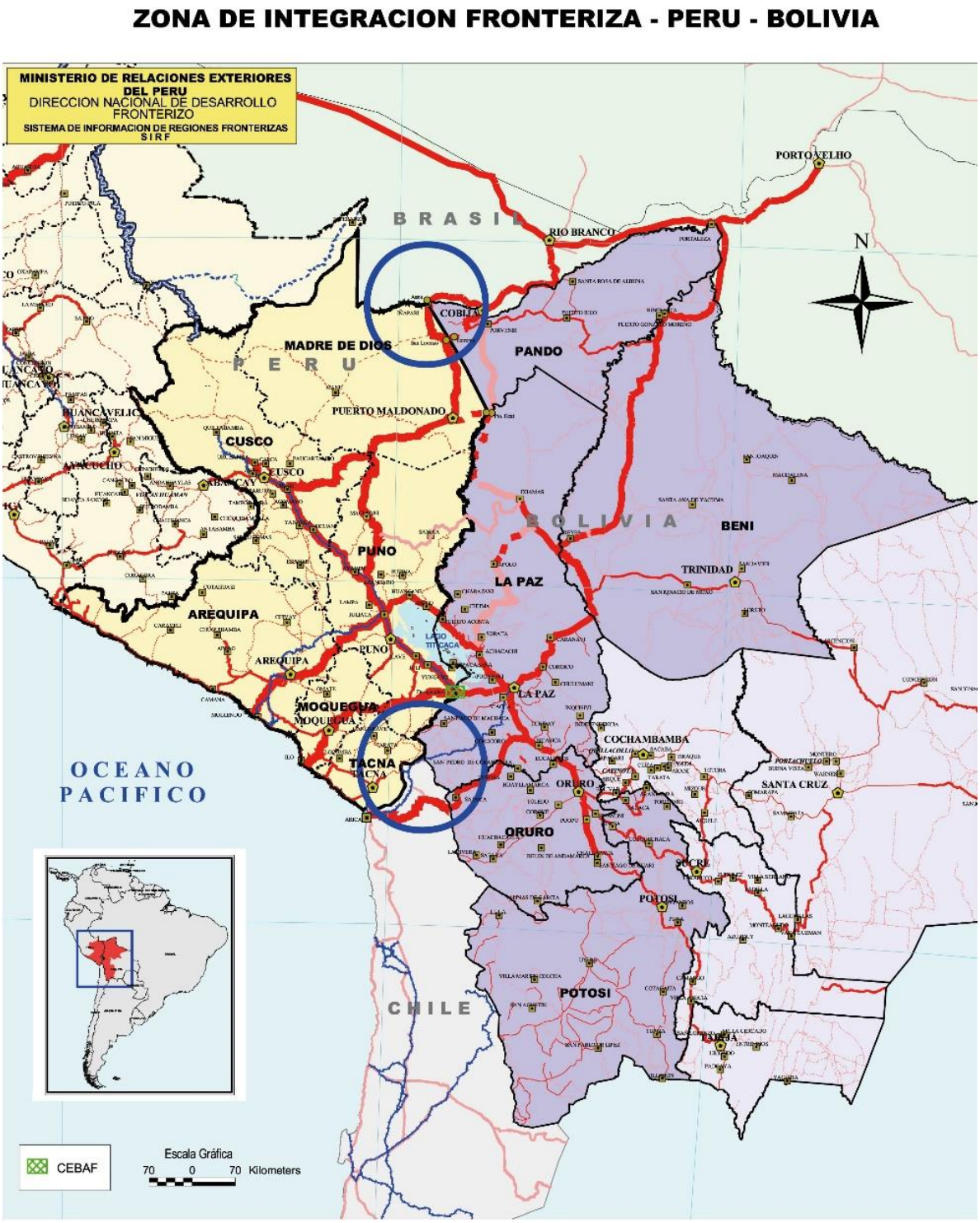


Figure 5.10. ZIF Bolivia – Peru (Meza, 2014)

The progress within the ZIF implementation was very inequal. By 2012, while Peru identified 106 projects, Bolivia did not accomplish this goal (Pareja Yáñez, 2012). The GTB ZIF, the technical group in charge, only had two meetings and the Amazon CIF had three by 2018, showing a vast discontinuity of institutional spaces (Wong Villanueva, 2019). This was reflected in the lack of a clear institutionality, a plan, and concrete projects. However, with the beginning of the Presidential and Cabinet Meetings, this progress accelerated. In 2018, the CAF elaborated the 'Integration Plan for the Development of the Amazonian Sector of the ZIF-PB'. Nevertheless, by 2019, there were still workshops to formulate local priorities and foster 'bottom-up' initiatives (CAF, 2019). In addition, no binational funding mechanism has been determined yet (investment should be executed by own public budgets).

Although some binational projects have been executed or are in execution (e.g., Titicaca – Desaguadero – Poopó – Salar de Coipasa IWRM System), they have been the exemption more than the rule. As part of the CAN-AECID cooperation, two cross-border productive projects were financed and executed. Within the CAN-UE cooperation, five cross-border local projects were implemented in sectors as water management, public services, and productive value chains.

The Andean ZIFs

From a subregional perspective, the ZIFs have been reaching their economic and development goals as bilateral trade in those jurisdictions has increased since their implementation (Moreno and Sancho, 2017). However, from a cross-border perspective, the four ZIFs have had an inequal progress between and within them as they have been mainly determined by the bilateral relations and capacities. Nevertheless, there has been progress to fill the bilateral governance gaps with new agencies, funds, and plans. The ZIF projects were mainly selected to respond national interests at subnational and border level, and not exactly with a cross-border nature. This issue was worsened with the low influence of local agencies and institutions within the decision-making processes (even in mechanisms as the CIFs).

Based on their territoriality, the ZIFs could be considered more as subregions or bilateral subnational regions, rather than cross-border microregions. In the ZIFs, the border is not an actor of the territorial dynamics (BID-INTAL, 2012) but a barrier or line that should be overcome from the central governments. Among the ZIF plans, the Peru-Colombia decision for choosing a closer geographic space with the UGEs and NDIs is a practice that should be replicated in other contexts as it brings the zoning practice to more reasonable units to operate. Even the Peru-Bolivia 'shrunken ZIF' represents a large territory based on the political administrative levels and not on the cross-border interactions or border lifestyle.

Other relevant challenges have been how to design cross-border projects by their own national technical teams (without so much bilateral coordination), and how to finance those initiatives while having the limitations of the SNIPs. Those issues led to the lack of cross-border components inside the projects and the execution of few of them. At the end, most of the cross-border projects were supported financially and technically by the CAN's international cooperation. In addition, the plans do not contemplate what happens in the areas overlapping with other ZIFs or countries outside the CAN, where cross-border dynamics may be more trilateral than bilateral.

4.4.8. Spatial Planning & Zoning: MERCOSUR

In the MERCOSUR, progress towards zoning cross-border dynamics has been achieved with the Linked Border Communities (LFV) Agreement. This document presents the 43 border twin cities that were bilaterally designated in the five borders (**Figure 5.11**). From the list of considered border twin cities, twelve are in the Brazil-Paraguay Border (27.9%), ten in Argentina-Paraguay border (23.2%), ten in Brazil-Argentina (23.2%), seven in Brazil-Uruguay (16.2%), and four in Argentina-Uruguay (9.3%).

Considering both dry and wet borders of MERCOSUR, the LFVs are urban dense zones surrounded by rural areas. Not all border towns are included in the LFV list, leaving some low-density towns outside the strategy or also high-density cities such as Asunción that is not considered in the cross-border dynamics with Clorinda (AP2). In addition, not all towns in LFVs are geographically contiguous: some of them are divided by a distance between 30km to 80km (e.g., BP5, BU7, AP4, etc.). Examining the linked towns, not all of them have a similar geographical extension or population, showing patterns of dependency or one-way cross-border flows (e.g., AP3, AP4). Lastly, some LFVs consider multiple towns and the possible dynamics between them (e.g., BU7), but in other parts, those relationships are divided and overlapped to reduce the number of stakeholders involved for CBC (e.g., BP9&BP10, AP4&AP5).

In the two trinational borders, LFVs continued to be allocated bilaterally, so instead of coordinating trilateral CBRs, three bilateral LFVs were coordinated. In the case of the Triple Border (BA1, BP12, AP10), not all Paraguayan border towns are considered in Argentina-Paraguay's LFV – due to geographical proximity, although all border towns could be considered as one conurbation divided by rivers.

Figure 5.11. *Linked Border Communities (border twin cities) in MERCOSUR (Author's elaboration)*

LFVs in Argentina – Brazil (2016)

The Argentina – Brazil border is composed by the Argentinian Provinces of Corrientes and Misiones, and the Brazilian States of Parana, Santa Catarina, and Rio Grande do Sul. The biggest Linked Border Community is in the Argentina-Brazil-Paraguay tri-border (AB1) and is followed by the cross-border town of Paso de los Libres – Uruguaiana (AB7). Most of the LFVs are divided by rivers (nine of ten), and four of them do not have a bridge to connect them. This LFV agreement, although it was approved by Argentina in 2009, was ratified by Brazil and set up in 2016.

Table 5.16. *LFVs in Argentina – Brazil Border (Author's elaboration)*

Cod.	Argentina	Pop.	Connection/ Division	Pop.	Brazil
AB1	Puerto Iguazú	45,000	Tancredo Neves Int. Bridge (Iguazu River)	256,088	Foz do Iguaçu
AB2	Comandante Andresito	11,482	Cmdt. Andresito Int. Bridge (San Antonio River+38km)	18,526	Capanema
AB3	Bernardo de Irigoyen	10,889	Dry border	14,811 9,735	Dionísio Cerqueira/ Barracão
AB4	Alba Posse	481	Uruguay River (no bridge)	2,542	Porto Mauá
AB5	San Javier	8500	Uruguay River (no bridge)	10,558	Porto Xavier
AB6	Santo Tomé	23,299	Integration Bridge (Uruguay River+10km)	61,671	São Borja
AB7	Alvear	7,917	Uruguay River (no bridge)	38,159	Itaqui
AB8	Paso de los Libres	43,251	BR-AR International Bridge (Uruguay River)	125,435	Uruguaiana
AB9	Monte Caseros	23,470	Uruguay River, Quaraí River & Uruguay (no bridge, 10-18km)	4,012	Barra do Quaraí
AB10	San Antonio	3,665	SA-SA Border Crossing (San Antonio River)	18,893	Santo Antônio do Sudoeste
Total	**10 cities/towns**	**177,954**	**1 dry, 9 wet (5 bridges)**	**560,430**	**11 cities/towns**

*Population data is referential based on Argentina 2010 Census and Brazil 2010 Census

In terms of population, most of the LFVs are unbalanced, being Brazilian towns even five times bigger than Argentinians (AB1, AB4, AB7). There is an average distance of 80km between LFVs, except for the Santa Catarina section (between AB4 and AB5) where there are not cross-border communities registered as most of that zone could be considered as rural area (Brazil) or protected one (Argentina). However, some cross-border communities located in other sections are not considered such as Panambí – Porto Vera Cruz, El Soberbio – Tirandentes do Sul, or Garruchos – Garruchos, as they have relative low population.

In addition, the LFV between Bernando de Irigoyen, Dionísio Cerqueira, and Barracão (AB3) does not exactly reflects the cross-border institutional progress that has happened in this area: the

Intermunicipal Consortium of the Border also includes the Brazilian municipality of Bom Jesus do Sul, articulating the four towns in cross-border dynamics to develop this microregion (Angnes *et al.*, 2013).

LFVs in Argentina – Paraguay (none)

The Argentina – Paraguay border is composed by the Argentinian Provinces of Salta, Formosa, Chaco, Corrientes and Misiones, and the Paraguayan Departments of Boquerón, Presidente Hayes, Itá, Ñeembucú, Misiones, Itapúa, and Alto Paraná. The biggest Linked Border Community is in the tri-border Argentina-Brazil-Paraguay (AP1) and is followed by the cross-border towns of Posadas – Encarnación (AP1) and Formosa – Alberdi (AP3). All LFVs are between wet borders, seven of ten do not count with a physical connection. This border represents the most unconnected among the MERCOSUR borders. No LFV agreement has been closed by the moment between both countries.

Table 5.17. *LFVs in Argentina – Paraguay Border (Author's elaboration)*

Cod.	Argentina	Pop.	Connection/ Division	Pop.	Paraguay
AP1	Posadas	275,028	San Roque González de Santa Cruz Bridge (Paraná River)	93,497	Encarnación
AP2	Clorinda	52,837	San Ignacio de Loyola Bridge (Pilcomayo River)	4,105 5,980	Puerto Falcón / Nanawa
AP3	Formosa	222,226	Paraguay River (no bridge)	9,588	Alberdi
AP4	Puerto Bermejo	1,503	Paraguay River (no bdg.,22km)	32,810	Pilar
AP5	Ituzaingó	19,575	Paraná River (no bridge, 33km)	20,135	Ayolas
AP6	Itatí	6,562	Paraná River (no bridge, 8km)	4,000	Itá Cora
AP7	Puerto Rico	17,491	Paraná River (no bridge)	1,200	Puerto Triunfo
AP8	Misión La Paz	620	Misión La Paz Int. Bridge (Pilcomayo River)	1,593	Pozo Hondo
AP9	General Mansilla/ Puerto Colonia Cano	2802	Bermejo River & Paraguay River (40km, no bridge)	32,810	Pilar
AP10	Puerto Iguazú	45,000	Paraná River & Brazil (no bridge, 6km)	104,677	Presidente Franco
Total	**11 cities/towns**	**643,644**	**10 wet (3 bridges)**	**277,585**	**10 cities/towns**

*Population data is referential based on Argentina 2010 Census and Paraguay 2012 Census

Although Argentinian border towns could be considered with more population, the distribution of LFVs is irregular: some of them have a bigger population by the Argentinian side (AP3, AP7), and others by the Paraguayan one (AP4, AP9). In both cases, the proportion ratio is between 11 to 23 times bigger, showing a high unbalance. The first section of this border (Salta and North of Formosa) is

composed mostly by rural areas (Gran Chaco Plain), and despite there are not urban centers, there are multiple indigenous populations living across the borders.

Most LFVs are in the section between Asunción and Foz de Iguaçu, and the distance between them is irregular oscillating from 70km to 150km. However, some cross-border communities are not considered as LFVs such as Eldorado – Carlos Antonio López, or Montercarlo – San Jose. This second example would not be considered as a town-town linkage but a town-rural linkage, representing the nearest access to public services for Paraguayan border population in that area. Other observation is the absence of Asunción as part of the cross-border dynamics with Clorinda (AP2).

LFVs in Argentina – Uruguay (none)

The Argentina – Uruguay border is composed by the Argentinian Provinces of Corrientes and Entre Rios, and Uruguayan Departments of Artigas, Salto, Paysandú, Río Negro, Soriano, and Colonia. The biggest Linked Border Community is the Concordia – Salto cross-border town (AU2), followed by Colón – Paysandú (AU3). All the four LFVs are between wet borders and two of them count with bridge connection. No LFV agreement has been closed by the moment between both countries.

Table 5.18. *LFVs in Argentina – Uruguay Border (Author's elaboration)*

Cod.	Argentina	Pop.	Connection/ Division	Pop.	Uruguay
AU1	Monte Caseros	23,470	Uruguay River (no bridge)	18,406	Bella Unión
AU2	Concordia	152,282	Salto Grande Int. Bridge (Uruguay River, 10km)	131,231	Salto
AU3	Colón	29,835	Paysandú-Colon Int. Bridge (Uruguay River, 7km)	119,429	Paysandú
AU4	Gualeguaychú	81,569	Uruguay River (no bdg., 19km)	24,406	Fray Bentos
Total	**4 cities/towns**	**287,156**	**4 wet (2 bridges)**	**293,472**	**4 cities/towns**

*Population data is referential based on Argentina 2010 Census and Uruguay 2011 Census

Although in total population both Argentinian and Uruguayan population are balanced, Paysandú – Colón cross-border community has four times more Uruguayan inhabitants, and in Gualeguaychú – Fray Bentos there are three times more Argentinians. There is an average distance of 100km between LFVs. As the shortest border in MERCOSUR and with vast plains, there are more urban centers in both sides, but not all of them are considered as LFVs. The Argentinian border cities of San José and Concepción del Uruguay are frequently associated with Colón – Paysandú (AU3), but not considered in the Agreement. In addition, how the rest of border towns interact within the system (e.g., Nueva Palmira, Carmelo, Nueva Escocia, Federación, etc.) is not exactly considered as the LFV

model does not attempt to be a comprehensive strategy for all CBRs but to strengthen cross-border dynamics in defined sections/points.

LFVs in Brazil – Paraguay (2017)

The Brazil – Paraguay border is composed by the Brazilian States of Mato Grosso do Sul and Paraná, and the Paraguayan Departments of Alto Paraguay, Concepción, Amambay, Canindeyú, and Alto Paraná. The biggest Linked Border Community is in the tri-border Argentina-Brazil-Paraguay (BP12) and is followed by the cross-border town of Ponta Porã – Pedro Juan Caballero (BP4). Half of the LFVs are located in dry borders, and among the wet ones, only two have a bridge connection. The LFV Agreement between both counties started operating in 2017, being their only cross-border mechanism at local level (there are no CIFs).

Table 5.19. *LFVs in Brazil – Paraguay Border (Author's elaboration)*

Cod.	Brazil	Pop.	Connection/ Division	Pop.	Paraguay
BP1	Porto Murtinho	15,372	Paraguay River (no bridge, 67km)	16,159	Puerto Carmelo Peralta/ San Lázaro
BP2	Caracol	5,398	Paraguay River (no bridge, 36km)	753	San Carlos del Apa
BP3	Bela Vista	23,181	Paraguay Avenue Bridge (Apa River)	16,413	Bella Vista Norte
BP4	Ponta Porã	77,872	Dry border	122,190	Pedro Juan Caballero
BP5	Aral Moreira	10,251	Dry border, Roadways (58km,69km)	122,190 18,864	Capitán Bado/ Pedro Juan Caballero
BP6	Coronel Sapucaia	14,064	Dry border	18,864	Capitán Bado
BP7	Paranhos	12,350	Dry border	8,591	Ypejhú
BP8	Sete Quedas	10,780	Dry border (21km)	9,892	Corpus Christi
BP9	Japorã	7,731	Dry border (32km)	35,493	Salto del Guairá
BP10	Mundo Novo/ Guaíra	17,043 30,704	Dry border (23km) & Paraná River (no bridge)	35,493	Salto del Guairá
BP11	Santa Helena	23,413	Paraná River & Itaipú Lake (no bridge)	10,000	Puerto Indio
BP12	Foz do Iguaçu	256,088	Friendship International Bridge (Paraná River)	80,319 304,282 104,677	Hernandarias/ Ciudad del Este/ Presidente Franco
Total	**13 cities/towns**	**504,247**	**6 dry, 6 wet (2 bridges)**	**727,633**	**13 cities/towns**

*Population data is referential based on Brazil 2010 Census and Paraguay 2012 Census

With the highest number of LFVs, there is not defined pattern of density relationship as in some cases there is more population in the Brazilian side (BP2, BP11), but also in the Paraguayan one (BP5, BP9, BP12). However, there are more inhabitants by the side of Paraguay. The first section of the border (from the triborder between Bolivia, Paraguay, and Brazil to the crossing between Paraguay River and Apa River) is part of the Gran Chaco Plain and although it has few LFVs, there are indigenous tribes with cross-border dynamics. The distance between LFV is in the range of 50 km to 100 km. What is particular in this area is the overlap of LFV spaces, as the dynamics between Pedro Juan Caballero and Capitán Bado (BP4, BP5, BP6), and Salto del Guairá (BP9, BP10) with their Brazilian counterparts. In this border, other cross-border communities have not been considered such as the linkages between Porto Mendes – Puerto Adela.

LFVs in Brazil – Uruguay (2003)

The Brazil – Uruguay border is composed by the Brazilian State of Rio Grande do Sul, and the Uruguayan Departments of Artigas, Rivera, Cerro Largo, Treinta y Tres, and Rocha. The biggest Linked Border Community is the cross-border town of Santana do Livramento – Rivera (BU3). Four of the seven LFVs are between dry borders, and the rest are interconnected with bridges, being the most connected among the MERCOSUR borders. The Brazil – Uruguay LFV Agreement was operational since 2003, being also the oldest in MERCOSUR.

Table 5.20. *LFVs in Brazil – Uruguay Border (Author's elaboration)*

Cod.	Brazil	Pop.	Connection/ Division	Pop.	Uruguay
BU1	Barra do Quaraí	4,012	Bella Unión Int. Bridge (Quaraí River, 3km)	18,406	Bella Unión
BU2	Quaraí	23,021	Concordia Int. Bridge (Quaraí River)	40,658	Artigas
BU3	Santana do Livramento	82,464	Dry border	78,900	Rivera
BU4	Aceguá	4,394	Dry border	1,511	Aceguá
BU5	Colônia Nova	-	Dry border (49km)	2,331	Isidoro Noblía
BU6	Jaguarão	27,931	Barón de Mauá Bridge (Yaguaron River)	14,604	Río Branco
BU7	Chuí/ Barra do Chuí/ Santa Vitória do Palmar/ Balneario do Hermenegildo	5,917 700 30,990 7,011	Dry border (0km-47km)	10,457 370 977 510 598	Chuy/ Barra del Chuy/ Dieciocho de Julio/ La Coronilla / San Luis al medio
Total	**10 cities/towns**	**186,440**	**4 dry, 3 wet (3 bridges)**	**169,322**	**11 cities/towns**

*Population data is referential based on Brazil 2010 Census and Uruguay 2011 Census

This border has in total, a similar proportion of Brazilian and Uruguayan population, although some cities might be bigger by the Brazilian side (BU6, BU7), or the other (BU1, BU2). The LFVs represent the biggest concentration of urban population in the border, and the territories between them is composed by rural areas with low density. In other words, it is very difficult to have any other LFV configuration in the present border. The distance between LFVs is in the range of 100km to 180km, being the border with the longest separation between each unit. What is particular of this case is BU7 that represents a network of cross-border towns (four from Brazil and five from Uruguay). In this urban-rural system, there is an average distance of 23km between the communities.

The Mercosurean LFVs

The Linked Border Communities represents a cross-border strategy oriented to promote local development from a bilateral perspective. This works by giving special rights and benefits to border populations considered within the Agreement. With a focus on cross-border mobility of people, goods, and services, this agreement expands those benefits in other sectors such as health, education, planning, disaster risk management, etc. However, this means that sectoral strategies should be designed and financed by themselves with their own resources (technical and financial). As the promotion of LFVs lays on the national governments (Art. 5), they can create other mechanisms to support. However, this leaves cross-border development in the hands of bilateral relations of national governments, perpetuating the business-as-usual model with some CBRs more developed than others. Thereby, the idea of a cross-border development promoted from a macroregional perspective fails by not balancing a more homogeneous development within its space.

As a zoning policy, the LFV agreement represents a milestone with the recognition of border town cities as the geographical unit for cross-border cooperation, as it has been promoted in previous research, projects, and policies. However, as there is not clear nomenclature of what is the specific jurisdiction of a border locality or community; although it brings flexibility to local and subnational governments to determine it, in the practice it has translated to an urban unit. In addition, the criteria to define which cross-border arrangements can be considered as LFVs or not is unclear and multiple combinations (especially small towns or rural areas), have been left out of scope. In addition, the urban perspective leaves out of consideration other dynamics that occur across the borders, as the indigenous populations that still interact in those regions.

Other consideration is the overlap of LFVs within the same border or because they happen in the triborder areas. In the first case, it is unclear why LFVs overlap between themselves (as in Brazil-Paraguay or Argetina-Paraguay) instead of considering a cross-border system of towns (as in Brazil-Uruguay). In the second case, although the official agreement opens the possibility of trilateral

configurations (Art. 3), those have not been considered, creating complex arrangements in triborder zones. This reflects the need of new territorial strategies to articulate the LFVs, promote urban-rural dynamics, and connect those regions with subregional and macroregional networks.

4.4.9. Executive Agency: CAN

As already mentioned in **Section 4.3**, the GANIDF had a central role as institutional space for dialogue and coordination, promoting the cross-border agenda with high-level agencies, and exercising functions of policymaker, negotiator, relationships broker, and auditor. Although from the beginning it showed dynamism (35 meetings between 1999 and 2014 (SELA, 2013)), and the Santa Cruz Action Plan represented clear steps to further expanding its leading position, it gradually started fading. Adding to the previous discussions, it is possible to highlight its main successes and setbacks.

Considering their positive contribution, the GANIDF could generate a cross-border approach despite the limitations of the national systems, creating several methodological tools: integrating civil society to governance systems, binational management models, binational social participation mechanisms, socio-economic cohesion, strengthening regional relations, the bank of cross-border projects, and financing some of them (Instituto Social del Mercosur, 2021c). One interesting example that mix those components is its cross-border intervention scheme for planning and financing (**Figure 5.12**). As the main target was to develop binational projects, but the investment and technical agencies from the countries do not contemplate cross-border legal structures, the concept was to exercise those functions from the border inwards. In other words, they coordinated their unilateral operations based on a common plan.

Among its setbacks, the GANIDF lost its role as promoter of the macroregional cross-border agenda and was displaced since 2013 by the Binational Presidential & Cabinet Meetings as the countries wanted to continue the cross-border operations from a bilateral, but not communitarian way. Although the bilateral appropriation of the macroregional mechanisms could be considered as a success, as those were not properly implemented, it brought difficulties to coordinate with other government levels. The slowdown in the last decade has carried some governments (especially Peru) to express their motivations to retake the cross-border agenda from a communitarian perspective (Instituto Social del Mercosur, 2021c). Reducing multilevel political risk represents a considerable challenge but can have positive impact on improving technical and financial capacities.

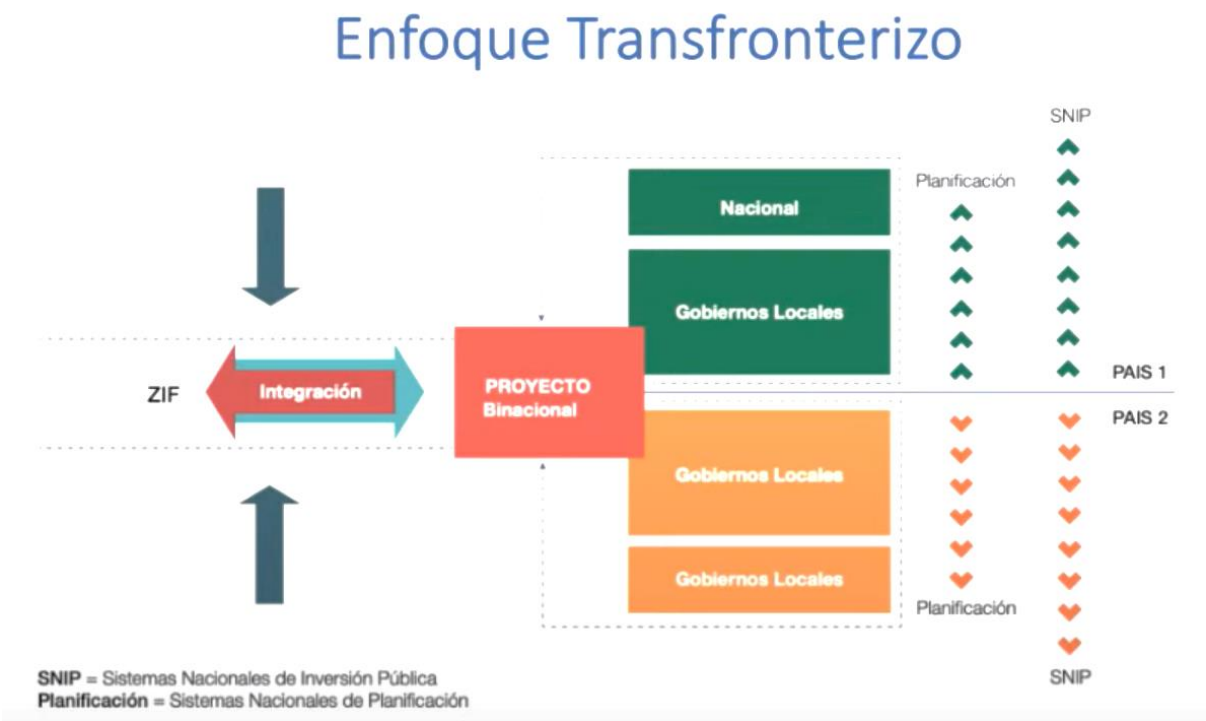


Figure 5.12. *CAN's cross-border approach for planning and financing (Nieto Vinueza, 2021)*

4.4.10. Executive Agency: MERCOSUR

In the MERCOSUR, as the cross-border institutionality was disperse but networked, the cross-border issues were integrated in several agencies as a small part of their agenda. Among those we can find the RECM considering cross-border components in their cooperative strategies, the RME shaping a team for cross-border education, or the ISM promoting cross-border research. Other bodies were primarily oriented to promote cross-border strategies and projects such as the GAHIF, FCCR/GTIF and SGT18.

The Ad Hoc Group on Border Integration (GAHIF) was the first agency to promote a cross-border agenda through the design of policies and the promotion of projects. From its creation in 2002, it promoted research to defining action lines that can be helpful to create and manage cross-border public policies, but the decision-making bodies (GMC, CMC) did not adopt any significant decision on the subject (SELA, 2012). However, some of those initiatives were taken bilaterally between some countries (Ferraro, 2013). By 2005, GAHIF did not have so many meetings and the few that did happen, did not have a relevant success. In those meetings, there was only participation of the national governments without consideration of the subnational and local representatives (Oddone *et al.*, 2009). Apart from the LFV and Border Citizen Statute, they were working on other issues such as cross-border health cooperation, and special import customs regimes (this last one was approved) (Oddone *et al.*,

2009). From 2005, the GAHIF did not registered any activity except from some attempts in 2011 that did not prosper (Ferraro, 2013). In 2012, this agency was removed from the MERCOSUR's institutionality.

In contrast to GAHIF that was designed as a top-down agency, the Working Group on Border Integration (GTIF) was born under the FCCR, body that was created to connect MERCOSUR with MERCOCIUDADES. The FCCR worked like the EU's Committee of the Regions by linking the macroregional process to the subnational ones, and strengthening their capacities through cross-border assessments, consultative mechanisms with subnational and local governments, and promoting the reduction of regional asymmetries through productive integration, social inclusion, and more (SELA, 2012). However, it did not have as much influence as its homonymous body. From its constitution in 2004, the FCCR faced problems to operationalize its activities due to the lack of a team until 2007. That year, the FCCR had its first meeting showing motivation for cross-border integration from the beginning (FCCR, 2007b). The operationalization problems of the FCCR did not conclude by 2007 and continued due to the institutional unbalance between countries (institutional peers with different capacities) (Oddone *et al.*, 2009).

In 2008, the GTIF was created to articulate the local demands from the CBRs and was composed by local and subnational representatives, the Pro Tempore Coordination, and Permanent Technical Secretariat of MERCOCIUDADES (FCCR, 2007a) (This organ was different from the MERCOCIUDADES' Border Integration Thematic Unit). Its first project, the PIFM, represented the most relevant activity of the GTIF and how macroregional institutionality could promote local and subnational agendas. The continuation, the MERCOSUR Cross-Border Governance Project (2012-2014), built on those results to promote a better articulation and capacities of border twin cities. However, neither the cross-border projects, nor the network of border twin cities were successful as there are not register or documentation about them. In other words, the institutional arrangement had problems to materialize CBC.

The GTIF's activities decayed, but in 2015 the CMC did some efforts to reactivate it by incentivizing CBC through a new cross-border territorial unit: the Mercoregions (MERCOSUR, 2015a; Avaredo and Arzamendia, 2020). The Mercoregions took a very similar concept to the LFVs – facilitate CBC in border localities to improve the quality of public services. They were going to be established by the national governments with participation of the respective subnational jurisdictions, replicating a similar top-down zoning like the CAN but in areas closer to the border. Although the discussions of what exactly is a Mercoregion were included in FCCR's meetings until 2016, they were dropped by the next year (MERCOSUR, 2016a).

Between 2007 and 2012, the FCCR did not produce any recommendation to the GMC and in the next two years, it had an effectiveness near 30%, becoming an agency with very low influence.

Gradually, the local interests started fading and the subnational ones were replaced by national guidelines and motivations (Borges Junqueira and Loss de Araujo, 2021). After the creation of the SGT18, the FCCR showed interests in articulating with the SGT18 and orientating a joint initiative to analyze the demands of the CIFs and border regions, but it failed (MERCOSUR, 2017b). Although meetings continued until 2017 (49 meetings in total since 2007), the process stagnated and by 2019, it was not considered anymore in the MERCOSUR's institutionality as a permanent agency but as a conference-under-demand (national governments considered an overlap between SGT18's topics and the FCCR) (Olliveira Pessoa and Silveira de Souza, 2021). Despite the culmination of activities, the FCCR represented how the local dimension could be incorporated in the MERCOSUR, but also how States may displace those interests within a macroregional approach.

In 2015, the SGT18 was created under the GMC as a high-level consultative forum to lead the MERCOSUR's cross-border agenda from a multisectoral approach and promote inter-agency collaboration. Since its first meeting in 2016, the SGT18 has organized eleven meetings (MERCOSUR, 2021b; Olliveira Pessoa and Silveira de Souza, 2021). Apart from the LFV and Citizen Statute, the SGT18 has promoted the creation of the trinational CIF in 2019, the Border Citizen Booklet, the 'MERCOSUR dialogues with its borders' project, among others. Due to the COVID-19 pandemic, the delegations of the SGT18 agreed to cooperate with the SGT11 Health. However, they did not have results even by May 2021 (MERCOSUR, 2021b). This was a relative slow process compared with the ISM's proposal submitted by the first semester of 2020 (one year before) to the Health Ministers Meeting for shared pre-hospital hostels between border twin cities (MERCOSUR, 2020a; Olliveira Pessoa and Silveira de Souza, 2021).

In 2019, the SGT18 retook the idea of a Border Citizen Booklet to complement the current MERCOSUR Citizen Statute, the LFV agreement, and current cross-border legal framework and sectoral activities. By 2020, the SGT mapped the MERCOSUR's cross-border institutional structure as there was no conglomerated data about what every agency was doing on CBI&D (**Figure 5.3**) and proposed the Booklet as a set of rights and benefits for the border population (MERCOSUR, 2020a). Although the document is still in revision, this represents the materialization and evolution of the GAHIF's MERCOSUR Border Statute that stagnated fifteen years ago.

The difficulties In formulating the Border Dialogue project and strategies towards COVID-19 pandemic reveals the SGT18's struggles to formulate projects. In addition, the non-consideration of some sectoral agendas (such as the indigenous one), the lack of participation of subnational governments and other cross-border actors (SGT18 as top-down agency), the absence of a cross-border agenda with the MERCOSUR's neighboring countries, and the challenges to articulate the cross-border strategies from other MERCOSUR agencies are some improvement points that should be reviewed to not follow the same path as GAHIF (Olliveira Pessoa and Silveira de Souza, 2021).

Although those are the main macroregional agencies, there are multiple cross-border bodies within MERCOSUR and outside it, where the subnational governments have approached to CBI&D through Paradiplomacy to promoting CBC bilaterally or multilaterally. Networks and associations such as MERCOCIUDADES, AMFIM and the Intermunicipal Consortium of the Border (Argentina-Brazil at local level), binational mechanisms such as the Binational Border Committee of Mayors and Prefects (association of Brazilian local governments with the association of Uruguayan subnational governments) and the Permanent Forum of Governors of CRECENEA LITORAL / CODESUL (Argentina-Brazil at subnational level), or even the Cross-Border Committees are still outside the MERCOSUR institutionality and agenda. This represents a lost opportunity to leverage the current CBC dynamics across MERCOSUR borders, where in practice, are mostly informal or not well structured (AEBR, 2010).

4.4.11. Collective Fund: CAN & MERCOSUR

In 2005, through the Decision 621, the CAN established the 'Fund for Rural Development and Agricultural Productivity in the Andean Community' (Comunidad Andina, 2005). Although at the beginning it did not include cross-border projects, this was later updated with Decision 708 in 2008 to consider productive projects within the ZIFs (Comunidad Andina, 2008). However, there is no register that the countries used this mechanism for cross-border interventions. With the CAN reengineering, the idea of a macroregional fund was replaced by binational funds with different performances depending on the progress of their bilateral relations –as explained in the ZIF section.

Unlike CAN, the MERCOSUR did establish a funding mechanism that supported cross-border projects although it was not the focus. The MERCOSUR Structural Convergence Fund, known as FOCEM, was created in 2004 and regulated next year. This fund was a redistribution mechanism based on the idea of macroregional solidarity to reduce regional asymmetries (including border areas): Brazil and Argentina would be the main contributors (donating 70% and 27% respectively), while Paraguay and Uruguay the main receptors (receiving 48% and 32% respectively). The contributions started in 2006, accumulating annually a total amount of $100M. With the entry of Venezuela, from 2012 to 2015, the amount increased to &127M.

As of May 2021, during these fifteen years in operation, the member countries have submitted to FOCEM a total of 53 projects, of which 49 were approved and have been executed (or still execution). The FOCEM covered $1,000M of the $1,548M investment for those projects (64.5%) (FOCEM, 2021), financing four types of programmes: infrastructure (90.40%), competitivity (5.48%), social cohesion (3.98%), and institutional strengthen (0.13%). By the moment, 22 projects have finished (44.5%), 12 already concluded activities (24.5%), and 15 are in execution (30.6%).

Table 5.21. *Summary of projects financed by FOCEM (based on (FOCEM, 2016))*

Sectors	Total of Projects	Border Dev.	CBI&D	Description
Infrastructure	**26**	**15**	**2**	
Energy	3	0	1	- Uruguay-Brazil 500W transmission line (UR-BR)
Sanitation	4	1	1	- Aceguá-Aceguá Integrated Sanitation System (UR-BR) - Enlargement of Ponta Porã Sanitation System (BR)
Highways	17	12	0	- Main binational corridors, and connections with border populations (PR, UR)
Railways	2	2	0	- Rehabilitation of railways connecting border regions (UR)
Competitivity	**10**	**1**	**1**	
Health	1	0	0	-
Productive	6	0	0	-
Tourism	1	1	0	- Dev. of Iguazú-Misiones Integrated Touristic Route (UR)
Food quality	2	0	1	- 'Aphthous-Fever Free MERCOSUR' Action Programme (multi)
Social cohesion	**9**	**4**	**0**	
Housing	2	1	0	- 'MERCOSUR Roga' Housing project (PA)
Education	2	0	0	-
Social development	3	3	0	- Extreme Poverty & Habitat Emergency Interventions (UR) - Capacity Building for Informal Waste Management (UR) - Border Social Economy (UR)
Human rights	2	0	0	-
Institutional	**4**	**0**	**0**	
Institutional	4	0	0	-
Total	**49**	**20**	**3**	

What has the contribution of FOCEM been in border and cross-border development? Based on the executed projects (**Table 5.21**), 46 of 49 projects were executed unilaterally, and only three of them were bilateral and multilateral. However, 20 projects (40.8%) were conducted in border regions, most of them (12 projects) were highways that connect with the main economic corridors or road sections connecting border communities. Among the three projects (6.1%) in cross-border regions, one of them is a binational power transmission line, the other an integrated sanitation system between twin cities, and the last one a regional programme (set of bi- and trinational projects) to eliminate aphthous fever from livestock in border regions.

The cross-border projects were oriented to solve cross-border issues (aphthous fever or sanitation) or take advantage of cross-border opportunities (energy). However, they exactly did not involve participation of local communities: two were infrastructure projects (private sector) and the other an interinstitutional collaboration to increase livestock quality (public sector). We can perceive projects with a more social component in the Uruguayan initiatives related with tourism or social development. Although those projects were thought within a cross-border perspective (e.g., the Jesuit route, border local productivity), they were executed just by one side of the border, reflecting the difficulties to promote that kind of projects through FOCEM.

Within MERCOSUR, FOCEM represents the main funding mechanism to operationalize integration and reduce regional asymmetries. However, what kind of asymmetries is priority is determined by the national governments and selected under a sectoral perspective rather than a geographical one. Therefore, national technical capacity in every sector limits the type of projects. As most of its projects were oriented to infrastructure, this fund could be considered more effective in terms of macro- and sub- regional integration rather than cross-border one, as the few CBC projects do not enhance fully the potential of the cross-border dynamics. However, how every infrastructure project benefits regional integration has not been weighted as no ex-post evaluation criteria has been implemented.

The low number of cross-border projects and the nature of them (infrastructure or interinstitutional cooperation) would be consequence of the low technical capacity and political predisposition to formulate more complex projects based on cross-border local dynamics. However, it should be considered that, since 2016, the promotion of initiatives by FOCEM have stagnated due to the regional political climate (the exit of Venezuela, the right-wing movements, COVID-19 pandemic, etc.) (Oliveira Cruz, 2021), affecting the production of new projects.

In terms of low-budget investments (not registered in its platform), the FOCEM has cooperated with other agencies such as ISM to promote cross-border research and focusing on territorial units that can be considered as cross-border regions. Although this has not been translated into high-budget investments as it depends on the national interests, the FOCEM represents an opportunity to fund cross-border projects from a macroregional approach without the dependence of external sources. This is beneficial as, how **Table 5.11** indicates, international cooperation's budget cap (around $0.5M) limits the type of interventions in the CAN, while FOCEM has the potential to promote initiatives with a bigger scope and degree of complexity (from $1M to +$80M).

4.4.12. Export Model: CAN & MERCOSUR

For this last strategy, the CAN partially applied it by incentivizing the members to establish the ZIFs with their neighbor countries. This experience led to the establishment of the ZIF Táchira – Norte Santander between Venezuela and Colombia (although it was designed when Venezuela was in the CAN), and the ZIF Peru-Brazil. Apart from the first case that has a cross-border scope (considering priority areas within two subnational divisions between Colombia and Venezuela), the other has the same flaws as already established ZIFs.

As a bilateral mechanism, the ZIFs have not incorporated exactly how to consider trilateral dynamics within their scheme. The idea of a trinational ZIF has been contemplated more in an academic

perspective (Grisales, 2005; Meza, 2005; Ramírez, 2005; Wong Villanueva, Kidokoro and Seta, 2022), considering regions such as the triple amazon border between Ecuador-Peru-Colombia, the Triple Frontier between Peru-Colombia-Brazil, the territoriality of the Aymara tribes between Chile-Peru-Bolivia, or the cross-border dynamics of the MAP Initiative between Peru, Brazil, and Bolivia. However, as the bilateral execution of the ZIFs has faced several difficulties, a trilateral one would represent a challenge that should be approach from a gradually institutional approach in a long-term horizon (Wong Villanueva, 2019).

In the case of MERCOSUR, there has not been a large replication of macroregional cross-border mechanisms. Some initiatives were carried under the Decision MERCOSUR/CMC/DEC. Nº 19/99, extending the TVF system to Bolivia and Chile (MERCOSUR, 1999b). Although Argentina has ratified this agreement with both countries (with Chile in 2009 and with Bolivia in 2015) (OIM, 2016), Paraguay has not made progress with Bolivia. By its own side, Brazil has established the TVF system with the French Guiana and Bolivia for specific border cities (Polícia Federal, 2017).

4.4.13. Overview of Macroregional Cross-Border Mechanisms

This analysis of mechanisms does show the main success and limitations that both macroregions have achieved in terms of promoting cross-border integration and development. **Table 5.22** and **Table 5.23** summarize this discussion based on their design, performance, and results.

Table 5.22. *Evolution of the Macroregional Cross-Border Mechanisms in the CAN (Author's elaboration)*

	CAN's MRCB mechanisms	Achievements	Setbacks
Rsrc. & WS.	- Programming of Border Development and Integration Activities between the Andean Region Countries (1989)	- Elaboration of the ZIF concept and possible spatialities and projects for bilateral operations in cross-border regions.	- Difficulties coming from the political context, struggles to achieve multilevel/binational consensus, and lack of financial mechanisms.
Projects & Progrm.	- PRA-AECID (2006-2014) - CESCAN I (2008-2010) - CESCAN II (2010-2014) - INPANDES (2015-2018)	- Clarity on the cross-border dimension within the projects. - Execution of projects with multisectoral approach. - Projects constructed and implemented from a bottom-up approach.	- High dependency to International Cooperation in terms of financial and technical resources. - Executed projects were low budget interventions (limited resources). - Execution of a small number of projects.
Policy Frameworks & Plans	- Decision 459: Community Policy for Border Integration and Development (1999) - Decision 501: Cros-Border Integration Zones (ZIF) (2001) - Decision 541: Andean Health Plan on Borders (PASAFRO) (2003) - Santa Cruz Action Plan (2009-2019)	- Framework policy to approach CBI&D in the region. - ZIF were constructed on previous/existing bilateral dynamics. - Multisectoral concept of CBI&D. - Additional mechanism to support ZIF execution (BPIF). - Fast process of design and approval. - Cross-border policy with a sectoral approach. - Articulation with health-related international organizations and national technical teams. - Promotion of local interventions (not the whole ZIF scale). - Action plan based on the strengths, weaknesses, and learnings from ten years of executing the macroregional cross-border mechanism.	- The strategy is primarily linked with the concept of ZIFs (high risk). - The ZIF policy did not delimitate the geographical scope of CBRs. - Lack of financial mechanisms to support its implementation. - Difficulties dealing with national governments' territorial interests. - Slow implementation after decay of initial momentum. - Lack of data and research on cross-border health issues. - Difficulties articulating with ZIF strategy. - Gradually decay of GANIDF's importance and its displacement (by bilateral meetings) affected the plan implementation.
Spatial Planning & Zoning	- ZIF Peru – Bolivia (2003) - ZIF Ecuador – Colombia (ZIFEC) (2002) - ZIF Peru – Ecuador (2000) - ZIF Peru – Colombia (CBZIF) (2002)	- Clear nomenclature of spatial units. - ZIF model promoted bilaterally subregional economic growth. - Promoted the bilateral development of plans, fund, entities to support ZIF development. - The ZIF model has been in operation for 20 years, being the scheme for even new plans and projects within it.	- ZIF's spatial scope is more subregional rather than cross-border local. - ZIF Planning flaws (e.g., no consideration of overlaps). - The ZIF delimitation has not been constant and varied multiple times. - Unbalanced progress depending on the bilateral relations and capacities. - Low effectiveness of own national and bilateral capacities to promote cross-border interventions within the ZIFs. - Low ratio of projects properly considered as cross-border. Most significant ones were supported by International Cooperation.
Exectv. Agency	- High-Level Task Force for Border Integration and Development (GANIDF) (1999-2014)	- Central role in generating cross-border policies, strategies, and tools, articulating stakeholders vertically and horizontally, capturing funding and technical support from international cooperation, and promoting concrete cross-border interventions.	- Not strong enough to deal with the central governments' interests. - Displaced by bilateral mechanisms (removed in 2014).
Col. Fund	- (Partial) Decision 621&708: Fund for Rural Development and Agricultural Productivity in the CAN (productive investment in ZIFs)	- Fund to incentivize productive projects in cross-border regions.	- Low incidence on developing cross-border productive initiatives.
Exp. Model	- (Partial) Quirama Declaration (2003) and Peru & Colombia's ZIFs	- Extension of ZIF model to Venezuela, and Brazil.	- Replication of the ZIF problems. - No configuration for overlap between ZIFs.

Table 5.23. *Evolution of the Macroregional Cross-Border Mechanisms in the MERCOSUR (Author's elaboration)*

	MERCOSUR's MRCB mechanisms	Achievements	Setbacks
Research & Workshops	- MERCOSUR Border Integration Project (PIFM) (2008-2009) - MERCOSUR Border Citizen (2017-2018) - Youth and Borders in MERCOSUR (2019-2021) - Cross-Border Cooperation in Health issues (2020-2021)	- Study on cross-border population and specific social groups. - Analysis of barriers and design of policy proposals for cross-border integration (in terms of rights and interventions). - Focus CBC on sectoral approaches (e.g., social inclusion, health, etc.). - Consolidation of border twin cities as spatial unit for CBI&D.	- Difficulties in translating research into macroregional policies. - Follow-up projects did not consolidate in long-term. - Some research projects are still in execution (difficult to measure impact).
Projects & Progrm.	- Border Intercultural Bilingual Schools Programme (PEIBF) (2005-2016) - FOCEM Projects (2007-now) - Social and Solidarity Economy for Regional Integration (ESSIR) (2008-2009) - MERCOSUR-AECID coop. (2010-2014)	- Executed with own technical and financial resources. - Cross-border projects have been explored within the MERCOSUR agencies' sectoral agendas. - Wide variety of projects in terms of project duration, involved stakeholders, geographical scope, etc. - Budget flexibility allowing different kind of projects.	- Technical expertise was relatively low to pursue complex articulation with cross-border dynamics. - The budget was mainly oriented to infrastructure works. - Almost no experience in bottom-up CBC promoted by the macroregional agencies (PEIBF started bilaterally).
Policy Frame. & Plans	- Border Neighborhood Transit (TVF) (1999) - Linked Border Communities (LFV) (2019) - MERCOSUR Border Statute / Citizen Statute (2021)	- Use of ID cards to facilitate cross-border mobility and access. - LFVs as cross-border local units to promote CBC. - LFV constructed on previous/existing bilateral dynamics. - It consolidates on the progress made on border twin cities. - Multisectoral approach for CBI&D. - Framework policy that specify rights and benefits of all MERCOSUR citizens with special consideration in border populations.	- Limited to mobility of people and restricted time and zone. - Not fully implemented. - Highly dependent on the progress of bilateral discussions. - Not validated by all bilateral systems. - No clarity in the involved institutionality. - Recently approved after a long period of stagnation, not ratified yet. - No concretization of MERCOSUR Border Citizen (booklet in progress). - Recently developed after a long period of stagnation, not validated yet.
Spatial Plan. & Zoning	- LFV Brazil – Uruguay (2003) - LFV Argentina – Brazil (2016) - LFV Brazil – Paraguay (2017) - LFV Argentina – Paraguay (none) - LFV Argentina – Uruguay (none)	- Spatial unit based on border twin cities (traditional policy unit, close to local scope, already existing cross-border dynamics). - Clarity on the LFVs that are involved in the policy. - Direct benefit on border population based on rights and facilitate cross-border interventions by governments.	- Spatial unit is more urban, not accurate in its extension, and does not consider existing cross-border dynamics (urban-rural, current associations, systems of border towns, etc.). - Implementation within LFVs depends on own local resources. - Unbalanced progress depending on the bilateral relations and capacities. - Approved recently and executed projects under MERCOSUR agencies have not been fully immersed within these spatial units.
Executive agency	- Ad Hoc Group on Border Integration (GAHIF) (2002-2012) - Working Group on Border Integration (FCCR/GTIF) (2007-2019) - Working Subgroup – SGT N° 18: Border Integration (SGT18) (2015)	- Started working on cross-border policies and strategies. - Articulating agency between MERCOSUR and MERCOCIUDADES (linking macro- and subnational/local levels). - Continued and materialized GAHIF's work. - Promotion of new cross-border policies, strategies, projects, institutional spaces, and more.	- Not strong enough to deal with the central governments' interests (removed in 2012) - Low effectiveness in developing concrete activities. - Variable motivation/participation of subnational/local governments. - Not strong against national governments' interests (removed in 2019). - Constrained by the same limitations and improvement points as GAHIF.
Col. Fund	- MERCOSUR Structural Convergence Fund (FOCEM) (2004)	- Flexibility to invest in different kind of projects. - Consideration of projects targeting cross-border problems.	- Strong influence of national governments to determine the projects. - Small incidence on bi-/multi-lateral projects. - FOCEM supported projects with unclear cross-border nature.
Exp. Model	- (Partial) TVF system with Bolivia, Chile, and French Guiana	- Extension of TVF system to Bolivia, Chile, and French Guiana.	- Limited to cross-border mobility of people.

Both macroregions have shown different paths (that could even be considered as complementary) in how to institutionalize their cross-border agenda through projects, policies, availability of resources, and more. Although the CAN achieved a better execution of cross-border projects than MERCOSUR, both did not achieve scalability of projects and sectoral strategies. Both had complications in translating their CBI goals into concrete results, facing similar barriers: difficulties to achieve a 'supranational' condition to overcome the national governments and bilateral variability, struggles to generate a strong connection with other government levels or related stakeholders and include them into the decision-making processes, low or lack of technical capacities to analyze and determine suitable policies and projects for cross-border spaces, and limited financing sources and evaluation mechanisms to allocate investment properly.

These institutional flaws led to weak macroregional agencies that are sensitive to political waves, a coordination gap between legal evolution and effectiveness of local implementation (Hurtado Bautista and Aponte Motta, 2017; Dilla Alfonso and Breton Winkler, 2018), and deacceleration of the regional integration process from the borders. To be more specific, based on the present analysis and **Table 5.22** and **Table 5.23**, it is possible to highlight that in the case of the CAN, most initiatives have already stopped or did not have the expected impact. Even though, the cross-border projects are worth to be further examined as implementing 21 initiatives is a big achievement and detailed analysis on them have not been executed yet. In the case of MERCOSUR, while the first mechanisms implemented (before 2015) did not have the expected outcomes, the recent initiatives promise further cross-border cooperation, but it is difficult to estimate their impact as some of them have been recently implemented (e.g., LFV since 2019 but with low progress due to COVID-19 pandemic). Although the MRCB mechanisms portray a low impact from an overall point of view, the persistence of macroregional cross-border ideals, mechanisms, and agencies for more than 20 years represents an achievement that should be valued and more carefully explained.

4.5. Macroregional Cross-Border Sectoral Agendas

This section focuses on the sectoral approaches that the projects have target rather than in the sectoral considerations that are indicated in the policies previously mentioned. This is followed by a summary of the challenges that are still pending and the further actions that are needed to be done in cross-border regions.

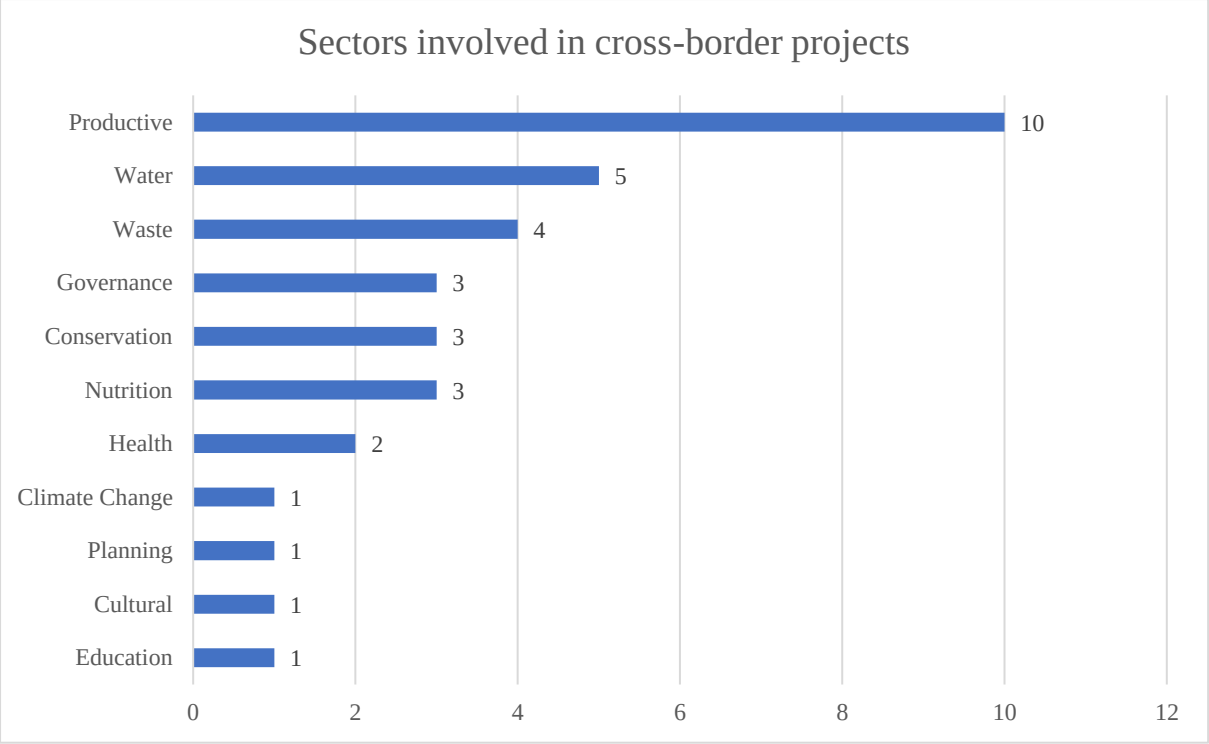


Figure 5.13. *Sectors involved in cross-border interventions in CAN (Author's elaboration)*

In the Andean Community, 21 cross-border projects were executed between 2008 and 2019 in cooperation with EU and AECID. As **Table 5.11** shows, many of them had a multisectoral nature, considering topics such as economic development with nutrition, or environmental conservation and water availability, and more. **Figure 5.13** shows how almost half of the projects have focus in cross-border productive chains, followed by water issues and waste management. All ZIFs had productive projects, especially the ZIF Peru-Bolivia.

Among the executed projects (**Table 5.11**), it is possible to observe the evolution of the approaches. While in CESCAN I many of the projects were oriented to waste management and health networks, INPANDES reflected more elaborated projects with multisectoral nature, focusing on cross-border productive chains (four of six projects). In addition, the last set of projects showed different strategies to support them. For the productive projects, not only technical assistance was provided, but also access to credits, workshops on food security, and connecting associations with culinary fairs.

The provision of cross-border projects with multiple sectoral components was benefited by the exchange of experiences between them. In the execution of INPANDES, it was possible to rescue good case practices achieved in one ZIF (project: cross-border coffee and camelid production chains in Peru-Bolivia ZIF) and translate them to another project in other context (project: Development and urban integration of neighboring border towns in Peru-Ecuador ZIF) (Comunidad Andina, 2018b). Although this is a little example, it brings an idea of how sectoral specialization on cross-border projects can be

relevant for solving similar problems in CBRs. PASAFRO, as a macroregional policy for health projects, is a sample of how sectoral strategies are possible but need to be designed and implemented more accurately.

To conclude this analysis, we need to answer an important question: 'Have the CAN's cross-border projects targeted urban and regional problems?' As **Table 5.4** shows, the Andean CBRs are characterized by multiple common issues. Based on **Table 5.11**, 13 projects targeted environmental issues (water, water, conservation, climate change), 10 projects focused on economic issues (productive chains, tourism), 7 projects in social issues (education, cultural, health, nutrition), and 4 projects in institutional ones (governance, planning). This shows a good distribution on a multisectoral agenda, and although there is still a lot of work on the Andean CBRs (related to indigenous tribes, access to technology, gender empowerment, etc.), the executed projects have focused on current cross-border local needs and sectors that should be deepened in the future.

However, the CAN faces a problem of scalability due to the political, technical, and financial limitations. The sectoral progress was possible due to the expertise and resources coming from international cooperation and how local communities by themselves promoted integration to tackle their problems. Thereby, the experiences in cross-border local development of the CAN, under an effective multi-scalar governance model, can be relevant to extending good practices to other CBRs.

In MERCOSUR, with a lower number of cross-border interventions since 2005 (**Table 5.12**), most of the projects are uni-sectoral, showing a slight preference for shaping productive chains and strengthening networks between border twin cities (involving public and private sector). From a sectoral perspective, topics such as environment, planning, or urban development. Are not even considered, showing a mismatch between the current actions and the cross-border needs. However, in a research level, other themes such as health, social inclusion (young and gender population at borders), and human rights have been considered, expanding the possibilities of a more comprehensive social agenda in the future (**Figure 5.14**).

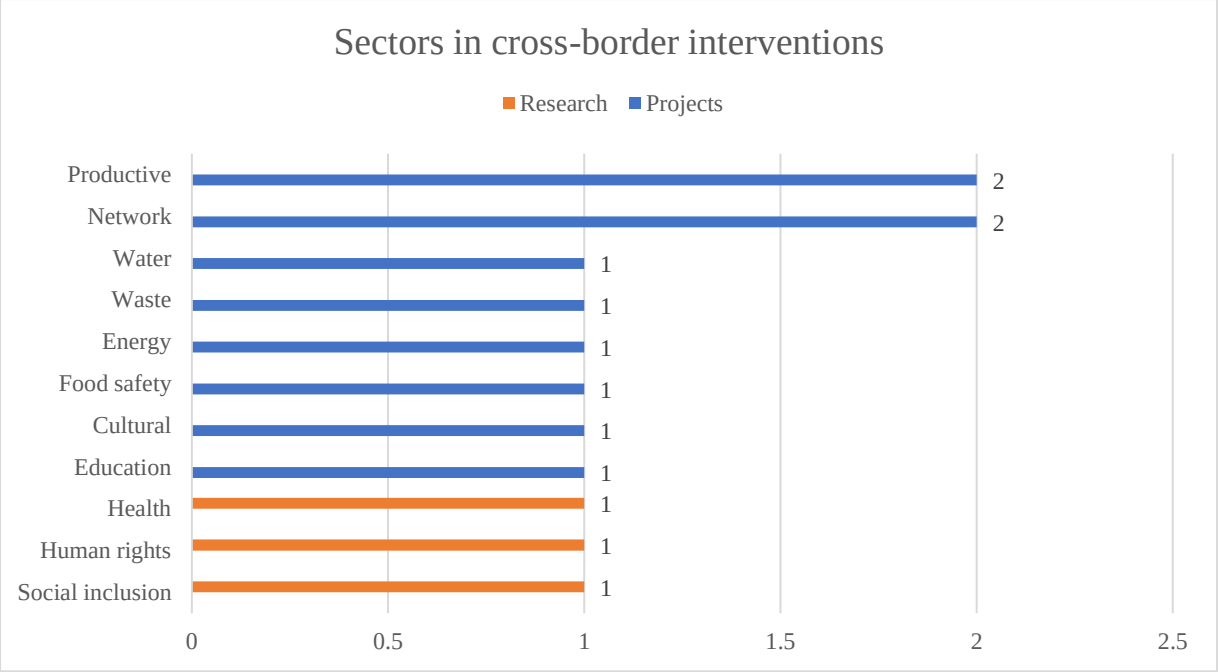


Figure 5.14. *Sectors involved in cross-border interventions in MERCOSUR (Author's elaboration)*

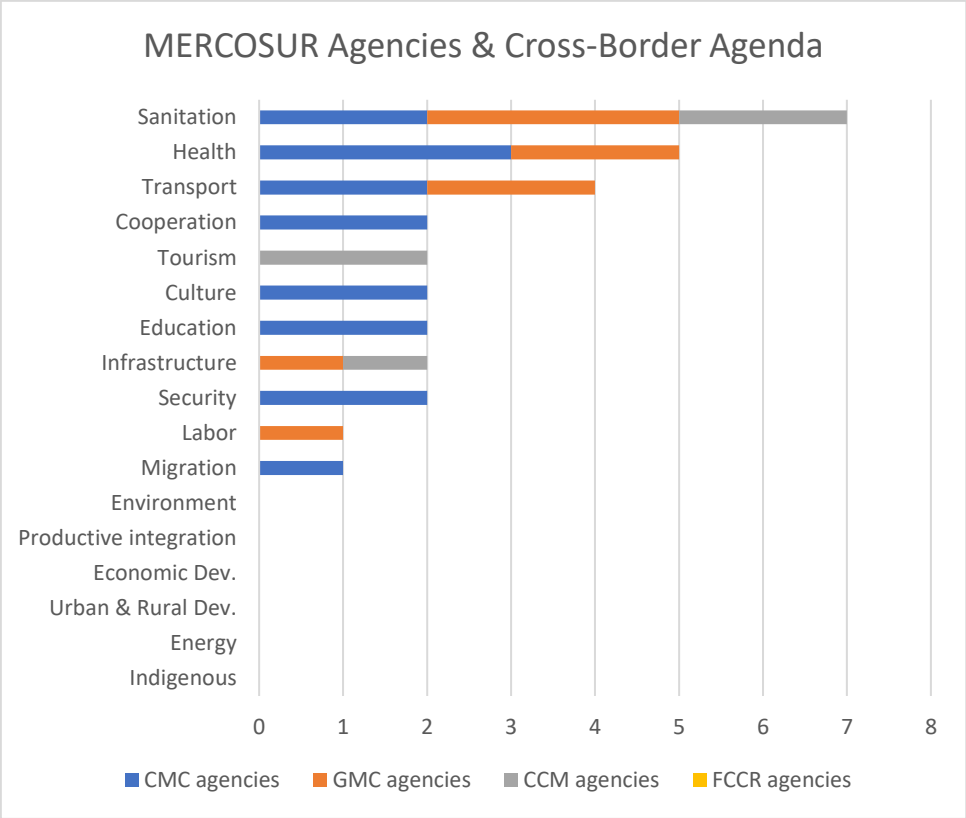


Figure 5.15. *Sectors involved in MERCOSUR agencies' cross-border agendas (Author's elaboration)*

Despite the little number of projects, as **Figure 5.15** shows, MERCOSUR has several sectoral agencies with repercussion on cross-border issues. However, as mentioned above, the degree of intervention in CBRs is very different: while some agencies have materialized CBI&D through projects, others only consider it in official documents or possible initiatives. Overlapping **Figure 5.14** and **Figure 5.15**, it is possible to observe a mismatch between the executing bodies and implemented projects: if they would be promoting interventions in their cross-border areas, there would be a higher number of projects starting for sanitation and health ones. In addition, 6 of the 17 areas do not have any institutional representation, almost matching with the sectors that do not have any project initiative at all.

One of the reasons for the low number of projects is because the nature of every agency is different, and not all of them seek to generate projects but policy recommendations, research, or legal frameworks. In other cases, some bodies direct their actions to the current bilateral operations between public agencies, without direct impact on border communities. At present, most of the 'cross-border' multisectoral actions focus on integrated border checkpoints (more related to trade and transport), health technical cooperation (due to COVID-19 pandemic) and finding future action lines for bilingual education without Brazil (MERCOSUR, 2020a).

Evaluating the sectoral approach of MERCOSUR's cross-border policies, while the Border Citizen Booklet represent a human right initiative, it mainly validates the already approved multilateral agreements. The TVF brings benefits for multisectoral cross-border mobility (labor, education, transport, and trade), but it would only have a great potential under a better implementation of the LFV. This last policy may have a greater impact in sectors that have not been considered in current projects and agencies, but its implementation is tied to the current bilateral capacities at subnational and local governments.

In MERCOSUR, rather than talking about an integrated cross-border agenda, it is better to consider several sectoral agendas, mostly unconnected, with some border-related components. Although MERCOSUR has a more tangible territorial unit for cross-border interventions (border twin cities), the disposition of policies to those areas instead of projects is not enough to help local and subnational governments to overcome their territorial challenges (as **Table 5.4** indicates). Political struggles, low technical capacities, and institutional coordination are problems that prevent the access to funding, to the current CBC dynamics, and to more concrete interventions.

Observing both regional organizations, although their performance and priority sectors have been different in terms of materializing interventions, it is possible to observe some similarities: the relevance on cross-border productive projects (ten projects in CAN and two in MERCOSUR), the need to articulate networks and promote governance (three projects in CAN and two in MERCOSUR), environmental projects focus on sanitation (local infrastructure projects), and the benefits that cross-border health cooperation can bring, even more nowadays in the context of the COVID-19 pandemic

(CAN's PASAFRO and multiple health-related agencies in MERCOSUR). However, there is still work to be done, especially in border populations with the most critical social demands, raising questions about whether the prioritized sectors obey a cross-border agenda or not.

5. Comparative Analysis

The previous descriptive analysis presents a synthetized overview of the cross-border regional context in both macroregions, the strategical envisioning and institutional structure to target cross-border integration and development, and the main mechanisms and sectors where their actions have focused on (**Figure 5.16**). This section focuses on the fourth category (MRCB policy system) to identify the commonalities between the macroregional cross-border mechanisms by contrasting their execution and highlighting the good practices or alternatives.

Summary of Results of Comparative Analysis

The analysis and comparison of both macroregions was executed based on 448 references (websites, official documents, agreements, reports, previous studies, etc.).

	Both	CAN	MERCOSUR
Context of CBRs	Low sub. gov capacities, long borders, CBC more informal	Rural/Ethnic heritage, resource-extraction, little connectivity	Subnational networks, agroindustry, high border asymmetry
Approach	3 stages, but not linear evolution	Cross-Border Integration as a dimension of macroregional integration	Cross-Border Integration as a component of MR social integration
Governance	Trade-off between strategies & structure	Adapt institutional structure to promote a CB agenda	Adapt CB agenda to the institutional structure
Policy System	Complementary tools rather than similar	Interventions modeling a Region-State (direct)	Interventions modeling an enabler (indirect)
Sectoral Strategies	Productive, networks, Health, environment	Multisectoral projects (few initiatives)	Some sectors involved (few projects & research)

Figure 5.16. *Summary of Results of Institutional Comparative Analysis (Author's elaboration)*

The execution of **research and workshops** in both macroregions highlights two main types of investigations. The first one is oriented to explore their cross-border regions, understanding their context, cross-border dynamics, problems across borders, the main needs of border populations, and identifying similarities and differences within the different geographic areas. Based on this exploration and generalization on the cross-border regionalism process within the region, those responsible sketch policy initiatives and project proposals. Example of this case is CAN's Programme of Activities of 1989 and MERCOSUR's PIFM in 2008. A common tendency within this research type is the formulation or reinforcement of spatial units that can help policymaking: in the case of the CAN, the 1989 investigation led to consider the ZIFs as the space for CBI&D and the MERCOSUR's work emphasized the idea of border twin cities (the foundation for the LFV policy).

Based on the general exploration of needs, the second type of research focuses on a sectoral agenda and how this can be applied in every (or specific) CBRs. These researches make a deeper diagnosis on the sector status, involved stakeholders, networks, mechanisms, and policy recommendations or initiatives that should be executed. In the CAN, this type of work was realized by ORAS-CONHU and the CAF to support PASAFRO under the 'Health: bridge for peace and integration' project. However, the most extensive sectoral research works were executed by the ISM (Social agency within the MERCOSUR), focusing on sectors such as human rights (border citizenship), social inclusion (border youth and women), and health. This type of research brings the opportunity to benefit the cross-border strategies with the expertise of sectoral agencies and articulate the cross-border approach within the sectoral agendas. From a macroregional perspective, the idea of promoting sectoral platforms (as EU did through INPANDES), could be beneficial to articulating related stakeholders (especially academia), delving into lines of research that are more appropriate to cross-border context, piloting experimental projects or initiatives, and more.

Either the first or second type of research, most of them execute a multi-level diagnostic. However, subsequently, local, and subnational governments are not frequently considered in the decision-making processes. This case was more evident in the selection of geographical areas for the formation of the ZIFs. In addition, in both macroregions, they were mainly supported technically and financially by multilateral banks or international cooperation. As research projects are the anteroom for further initiatives and bigger investments, the dependence to external funding increases risk on decision-making as these cooperative bodies could influence the next steps. This is the case of the Andean Regional Consultative Group with GANIDF, that promoted positive initiatives (e.g., feasibility studies under the BPIF) but also setbacks (e.g., oppose to the creation of a communitarian fund for CBC projects).

The exploration of cross-border regions was the basis for conceiving a common spatial unit for the macroregions. However, rather than a deeper analysis on those cross-border territorialities or how

to articulate development strategies within them, they were selected based on political decisions. The MERCOSUR showed better efforts by choosing a local spatial unit. However, as identified in the previous section, some incompatibilities, or flaws among the LFV policy reflect that this decision was not based on data analysis, but interests. In both cases, as motivations fluctuate depending on the countries' support to a common agenda, there was a gap of ten years to translate research into zoning policies (ZIFs from 1989 to 2001, and LFVs from 2008 in 2019), reflecting that it is a politically sensitive process and that the use and replication of those units within bilateral relations help to settle them in a communitarian way.

A last type of research, that has been mainly conducted by researchers, is the analysis of binational and macroregional cross-border mechanisms (as the present work). This is particularly relevant as many of the current macroregional policies in both regions started not from scratch but imitating the innovative tools or practices implemented by the most successful bilateral relations. The Binational Development Plan and Binational Fund between Ecuador-Peru were later replicated in other CAN borders. The TVF and MERCOSUR Citizen Statute were based on bilateral tools between Brazil and Uruguay and taken to a macroregional level. Learning from their implementation and performance can be even more useful than importing policies from other macroregions, since some of the existing experiences have already built suitable capacities to cope with the contextual problems.

Based on the CAN and MERCOSUR cases, the development of MRCB **projects and programmes** faces mainly three limitations –governance, technical, and financial– and three challenges –the 'cross-border nature', articulation with local actors, and scalability. Starting with the operability barriers, the governance issues are related with the lack of bilateral mechanisms at different levels (especially at local level), and the difficulty to reduce the involvement of national agencies in the formulation of cross-border projects. Although both cases have the CIFs as bilateral local mechanisms, this have work as consensus spaces rather than joint planning units, leaving that responsibility to local or subnational municipalities with limited resources. As the technical capacities and human resource with know-how in project design is scarce, national governments finish exercising this role.

This is related with the second barrier, technical limitations: although there is a marked difference of capacities between national, subnational, and local governments to formulate investment projects, even at the top level could be shortcomings such as the capacity gap between Peru and Bolivia in the elaboration of project proposals for the ZIF-PB. In front of this issue, the macroregional agencies could exercise a supportive role to facilitate this limitation. This was more evident in the CAN, that could overcome this barrier by establishing partnerships with AECID and EU, allowing policy transfer and execute projects that could be considered as cross-border. However, this reflects a more direct intervention to facilitate cross-border local projects rather than installing capacities to bodies that could replicate or promote new experiences later.

The last barrier Is related with the financial limitations to execute cross-border projects. This limitation was present in both macroregions but in different ways. In the case of CAN, there was resistance from the SNIPs and legal frameworks to adapt their disbursement mechanisms and promote cross-border projects. To face this issue, the CAN promoted a cross-border financing scheme from the borders inwards. As local, subnational, and other agencies would prefer not to invest their own resources on this type of projects, governments created bilateral funds to facilitate the investment (three funds in four bilateral schemes). However, their performance has been questionable as the funds are subject to the ZIF model's advantages and flaws. In front of those limitations, financing coming from international cooperation (facilitated by the CAN) was useful for the realization of projects since 2006. In the case of MERCOSUR, the creation of a collective fund to reduce asymmetries represented a great progress as it overcame the financial struggles that were found in CAN. However, the cross-border projects had to compete with other projects to get resources, which were mainly assigned to transport infrastructure works.

Overcoming these limitations is relevant to face the three challenges. The first one is related to what can be considered as a proper cross-border project or programme, referring to its contribution towards cross-border integration (reinforcing cross-border social capital, increasing territorial flows, and enhancing territorial convergence) and development (solve shared issues, and common externalities). To this challenge comes the need to acknowledge who should be responsible of designing cross-border projects and executing them.

What would be the most appropriate level to coordinate activities based on both cases? The CAN represents an example of promoting CBI&D from a macroregional level, being partially effective in moving away from national interests and facilitate cross-border bottom-up processes. However, this approach faced issues related to scalability. Moving to a national level, cooperation depends not only on the bilateral relations and capacities, but also on the vertical articulation within their own national systems. Considering the leading role of national agencies (and the 10-year relatively short lifespan of the existing national CBI&D teams), the difference of horizontal and vertical capacities between countries (and the problem to connect with local networks), and the distance from national agencies to the cross-border realities, an approach from national level would lead to a lack of articulation with local actors– as happened in the ZIFs.

This panorama leads to allocate technical and financial capacities to subnational and local levels, especially bilateral ones, to promote the design and execution of projects. The CAN experience reveals the benefits of this last strategy as the operationalization of cross-border projects through international cooperation required the creation of informal cross-border legal structures where one municipality or joint committee took the role to oversee those administrative functions.

Ensuring the cross-border nature not only depends on the correct institutions but a proper impact evaluation of projects. Although FOCEM did not have considerations to evaluate cross-border projects, the CAN established through Decision 501 yearly evaluations of the ZIFs and their plans, programmes, and projects. However, this was not implemented. Despite of this setback, the BPIF, supported by the multilateral banks, represented a technical mechanism that could evaluate ex-ante which projects could be considered as cross-border and which not, leading to the prioritization of projects according to their impact. Meanwhile, ex-post evaluation was mainly carried by the EU and AECID, although there is not available information about the involved indicators (apart from budget execution and impacted population).

These experiences reveal that orientating initiatives to the cross-border reality of every microregion requires ex-ante and ex-post impact evaluation that should be articulated with a previous exploration of multiple models for cross-border sustainable development and sectoral agendas. This should lead to the prioritization of projects according to their impact on the local context, the border region or subregion, or for the macroregional context (as Regional Public Goods). In other words, to acknowledge the impact of projects at different scales.

The articulation with local actors represents the second challenge for the execution of interventions. Here it is possible to highlight the MERCOSUR's efforts articulating with MERCOCIUDADES through the FCCR and deepening the cross-border agenda with the GTIF. Thereby, the FCCR/GTIF represented a multilateral subnational mechanism that could articulate with local initiatives, bilateral agencies, and local/subnational networks. Despite of the implementation issues, the articulation with local actors did not start by shaping new multilateral or bilateral bodies, but identifying, linking, and supporting the existing grassroot organizations or Paradiplomacy initiatives. While in MERCOSUR this was more possible considering the networks operating between public institutions at local/subnational levels, the indigenous populations and organizations across borders could represent an opportunity for the CAN. Thereby, articulation should not only target governmental entities but also non-public ones to get a more precise perspective of cross-border local social dynamics.

Finally, scalability (third challenge) represents a consequence of the previous limitations and challenges: scaling up the number of projects depends on the access to technical and financial resources and their correct installation within bi/multilateral local agencies and their interconnection with upper levels. However, this is more a process rather than a shock therapy: the natural evolution of capacities and institutions allows them to adapt to their political and geographical context, and work based on their experiences. Therefore, macroregional organizations have a role to promote the reduction of these barriers and support this change. Nevertheless, supporting other levels is a challenging task as they (e.g., the CBI&D agencies from CAN and MERCOSUR) also face fluctuations that do not allow them to generate their own capacities.

The design of **policy frameworks and plans** is tightly linked with their function: policies for what? For whom? Where should them be applied? Therefore, the conversation on the spatiality of CBRs translates into the question to considering the most accurate space for cross-border policies. Based on both cases, a cross-border region for policymaking could be consider as a 'Space of Interventions' or a 'Space of Rights'. The former describes the traditional function of policies to achieve CBI&D by reducing the limitations of the most relevant cross-border actors and facilitating CBC through direct actions. Examples from this type can be found in the ZIF and LFV policies (Art. VII and Art. VIII) that contained several measures to support public agencies and promote joint urban planning, multisectoral coordination, and develop joint activities.

The latter describes policies that directly benefit the border populations by bringing to legality the cross-border dynamics that can increase their quality of life. Therefore, the cross-border approach is instrumentalized to mitigating the problems that are part of their border reality: most of time these benefits are based on the concept of solidarity and that communities divided by borders remain part of one whole cross-border society. A very good example is brought by the LFV agreement (Art. II to Art. VI) or the MERCOSUR Citizen Statute (Axis N°2 and the incoming Border Citizen Booklet) that give benefits to the border citizens in terms of cross-border mobility, labor, and access to services. This approach could be considered as a passive action –instead of being an active action like the interventions, and although it does not require a direct investment, it surely demands to recalibrate the public service budgets (hospitals, schools, etc.).

The spatiality of policies would differ not only on the type of policy, but also on the sectoral approach: while strategies for productive chains connect rural productive areas or productive enclaves with logistic centers, strategies for cross-border health connect health centers, defining zones with different geographical scope. Although designing policies considering such a multiplicity of territorialities would be complex and non-practical for policymakers, it might be helpful for practitioners, raising the importance of policy diversification.

Policy diversification not only means differentiated territorialities to properly execute strategies, but also to reduce the possible risk of 'putting all eggs in one basket'. Although the idea of a framework policy helps to conceive other tools under its umbrella, it should present a set of options that could mitigate the risk of systemic flaw. In the CAN, the Decision 459 articulated most of the strategies to the ZIF policy (three Articles of four), and later PASAFRO also connected with the ZIF model. Despite it interconnects actions under the ZIFs (allowing interoperability), the setbacks of this strategy affected the whole macroregional cross-border strategy. In the case of MERCOSUR, the LVF policy was an evolution of the TVF, and the Citizen Statute grouped them with other measures. This gradual evolution of policies from MERCOSUR is an approach that can be useful to mitigate risk and promote policy diversification.

A second question is related with implementation: How to execute cross-border policies? The Andean principle of 'Bilateral Action, Communitarian Support' represents how nations should target CBI&D under their own legal frameworks but being supported and monitored by regional organizations. In theory, macroregional planning should promote a 'plan of plans', articulating the bi-/trilateral cooperation and exercising a different role according to the governance level. However, instead of discussing about governance models, an important task is to identify what has worked in the practice and how macroregions have facilitated this process. In the CAN, the idea of being supported or audited by the GANIDF and SGCAN was not fully implemented as the national governments accepted technical support if funding came with it. In South America, the CAF's COPIF financed 57 interventions, doubling the number of projects from both macroregions together and in less time. Thereby, 'Communitarian Support' conceals some conditionalities to give authority –in the practice– to the macroregional bodies.

The idea of a macroregion exercising a 'plan of plans' does not mean a holistic approach of planning that, although could be considered desirable, its implementation implies several challenges. It embodies an opportunity to correct flaws from bilateral operations by highlighting the best-case practices, connecting practitioners through networks to share their experiences, collecting feedback from infield operations, propose policy changes, and more. The Andean experience gives some insights with the ZIF Táchira – Norte Santander, that due to its more manageable scope (focus on subnational and local spaces rather than subregions) it was highlighted by researchers as a good experience for cross-border planning. The transfer of practices was evident in INPANDES as the experience on generating coffee productive chains in Peru-Bolivia border was a reference for generating a similar coffee project in the Peru-Ecuador border. In addition, the creation of regional platforms within this programme facilitated knowledge exchange, bringing an innovative approach of bilateral technical mechanisms to articulate local offices to upper levels. This concept of 'plan of plans' could be replicated for other mechanisms, considering schemes such as 'network of networks' (as the case of MERCOCIUDADES) that can help to interconnect multiple experiences at local level and reduce the gaps between bilateral operations through horizontal learning.

A last aspect to considering Is the clarity and flexibility In cross-border policymaking: Being too flexible (soft law) generate policies that allow multiple interpretations and are susceptible to political changes or bilateral unbalances. Being too rigid (hard law) would demand more political capital and probably would not pass from the discussion table if binding regulations exercise many legal obligations. However, the latter has more coercive power to oppose national interests. As macroregional Decisions are part of the international law system, the trade-off for flexibility has its pros and cons. The ZIFs had a very broad scope as this policy did not establish what could be consider as cross-border space, and as it was defined later bilaterally, it included even regional capitals far from the borders. On the other side, the list of twin cities in the LFV agreement was very rigid as only the ones written them

would be benefited by this regulation, leaving others that also have cross-border dynamics out of the law benefits. A deeper study on this issue would bring a better understanding of what is negotiable and the impact of those decisions.

A closer view to **spatial planning and zoning** reveals how cross-border space has been conceptualized by macroregions. In both cases, CBRs could be considered as spatial approximations for targeted development: areas where is possible to promote multisectoral interventions or rights. Both ZIFs and LFVs are zoning strategies under the idea of a standardized unit for exercising control over the territory; one-size-fits-all political divisions created or validated from a high-level governance level. Although macroregionally established microregions represents a governance transfer from national governments to upper and lower levels, it also conceals the idea of macroregions 'behaving like nations' by promoting regional integration processes for new territorialities. While zoning in Westphalian system served to plan, control and ensure sovereignty, zoning in this relativization of scale strives to exercise similar functions to correct the asymmetries found in the interface between sovereign regimes (as in MERCOSUR) or to achieve multidimensional territorial cohesion (as in the CAN).

In addition, the idea of multidimensionality or multisectorality is embedded in cross-border spatial planning for better or worse: one scheme to order all sectoral strategies, incorporating all type of measures for all border geographies. As this is clearly affected by bilateral executions, macroregional zoning differs from national zoning but both have common flaws, leading to exploring new practices for planning CBRs.

The case study of CAN and MERCOSUR also reveals the need of multilateral and multi-scalar articulation. The Andean ZIFs represented more a subregional space, showing the need of spatial units closer to the borders. The Mercosurean LFVs are very local and urban, considering the need of new territorialities to incorporate other cross-border dynamics and how to link their development with bilateral, subregional or macroregional dynamics. Thereby, selecting intermediate zones between subregions and cross-border localities could help to sketch better strategies. A case to highlight would be the ZIF Peru-Colombia (ZIF as subregional scope) that defined Development and Integration Nucleus (NDI as local scope) that were interconnected with the ZIF through the Geo-Economic Units (UGE as intermediate scope) considering dynamics that are not merely urban. A similar option to the UGEs is in the Brazil-Uruguay border with the Chuí-Chuy network of towns that shapes a cross-border system of localities (BU7 as intermediate scope). Despite of demanding more coordination, having these alternatives could give practitioners more flexibility to act and interconnect with new stakeholders.

Finally, spatial plans in multilateral scales demands compatibility not only with national, subnational, and local plans and legal frameworks, but also between them, considering schemes beyond bilaterality (trilateral/multilateral). From a legal perspective, bilateral confirmation of the communitarian policies set obligations which States are bound to exercise: as those international

agreements are ratified by the Parliaments, national laws start considering this model within their schemes. However, this could be a challenging process as happened in the LFV ratification process. Conversely, this was relatively easy between Andean countries as they validated ZIF model through reversal or verbal notes, taking approximately a year.

From a zoning perspective, this was more challenging as most of binational ZIF plans were two subnational plans sticked together without the cross-border nature previously mentioned. In the MERCOSUR, most of the LFVs have not included a plan by the moment. The only plan post-LFVs was designed between Brazil and Uruguay (Argentina-Paraguay plan is still in process) and has a broader approach that considers the whole border fringe rather than just the LFVs. Further efforts should be oriented to design and make compatible spatial plans without falling in the repetition of unilateral schemes, where previous recommendations on the cross-border nature could give insights to this issue.

Moving from bilateral schemes to tri- or multi- ones, is challenging at legal and planning level. The overlap of ZIFs and LFVs in trilateral sections demands to consider the three territories for joint action in the Napo River (EC-CO-PE), the Triple Frontier (AR-BR-PA), or the crossing between Uruguay River and Cuareim River (AR-BR-UR). Although trilateral approaches could be considered more complex, some initiatives such as the Trinational CIF in the last triborder point shows the feasibility of exploring these schemes and should be further studied. Otherwise, the replication of models with other countries outside the macroregions would fall in the same flaws as the ZIF Peru-Brazil that overlaps other two ZIFs. A last compatibility issue relies on connecting sectoral plans with the cross-border spatialities and other countries' tools, increasing the relevance of multilevel governance, smaller spatial units, flexibility, and periodical evaluation.

Discussing on an **executive agency**(ies) to leading the macroregional cross-border strategy is a question about what the most accurate governance model could be according to the context and approach towards CBRs: Which would be more suitable, a centralized or a branched model? Or even more, not having any institution? Although the last question would require other comparisons, the CAN and MERCOSUR show the pros and cons of the first two models.

The centralized model of GANIDF (supported by SGCAN and the Consultative Group) gave it the capacity to be a broker of relationships between the national governments with other levels or actors. This facilitated to getting support from international cooperation and capture €10M in non-refundable funds. In addition, it was also appointed to be a technical advisor for bilateral schemes and audit the progress on the ZIFs, gaining know-how about cross-border integration and development. However, the slowing down of the integration process and the loss of relevance because of the Presidential Meetings, lead this model to its end. This shows that having only one agency, although it gives authority and capacity to promote a cross-border agenda, it also represents a high risk to continuing the macroregional strategy.

In contrast, MERCOSUR, with its branched and networked model, had multiple agencies from where to target cross-border initiatives. This surely helped to preserve the cross-border goals even if some agencies decayed or disappeared as the knowledge or human capital moved to other agencies and continued their work from other approach. In addition, as it was part of the sectoral agendas, these incorporated cross-border elements. However, they did not act coordinately and even more, it was needed an exploration (executed by SGT18) to identify which agencies had any kind of activity or progress related to CBI&D. Furthermore, as they did not have strong relationships, accumulating and sharing know-how was difficult, showing a low cross-border nature in several of their projects.

Rather than questioning which model would be better, it is more relevant to highlight their adaptive capacity to execute activities or to mold their own institutionality. In the CAN activities, the cross-border financing scheme allowed to work under the national legal frameworks. However, as many other flaws prevented the good execution of projects in the ZIFs, the Santa Cruz Action plan represented an adaptive plan to improve their performance based on the successes and setbacks of the first ten years. Another example of adaptive institutionality is in the MERCOSUR, that created several agencies for cross-border policymaking after the previous ones failed but building on the previous advances (e.g., the SGT18 finalizing the LFV and supporting the MERCOSUR Citizen Statute that started with the GAHIF) and improving based on them (e.g., designing the Border Citizen Booklet to expand the Statute). In addition, to adapt their strategies with the cross-border local dynamics, it created the FCCR and the Trinational CIF. This teaches the relevance of not betting on stiff roles and changing to get a better position to target institutional goals.

The adaptive capacity, from a broader perspective, could be understood as progressive institutionality: moving from the nation-states' model to the macroregional one involves a governance transfer process that could be supported by intermediate mechanisms at different levels. While in CAN there are bilateral mechanisms at presidential and ZIF level, the MERCOSUR embedded multilateral subnational networks, landform-oriented bilateral agencies, and the CIFs. The multilevel gaps should be addressed not in terms of agencies but in terms of functions to complement the articulation of existing offices, not replacing them. However, an initial movement towards bilateral or tri-/multilateral schemes (mainly at local and subregional level) is recommended as it would facilitate institutional transition and balance particular interests.

Thus, filling the multilevel/multilateral gaps should be oriented to empower cross-border (local) governance models (Wong Villanueva, Kidokoro and Seta, 2023): fostering agencies to articulating actors, facilitating decision-making (forums for knowledge socialization, institutional spaces for discussion and deliberation, consensus mechanisms), increasing technical and financial capacities, monitoring and feedback processes, and more. While multiple discussion and consensus agencies exists at local level such as the CIFs or forums –which should be evaluated for whether they articulate the

interests of border populations–, there is a gap of technical agencies to materialize projects. The proposal of cross-border local legal structures, although they were not legally applied in both macroregions, could help to construct this progressive institutional model. Learning from other regions such as the Benelux Union and its three-tiered model for legal transition can promote the evolution of existing informal structures to more robust bodies with own resources and capacities to scale up the number of projects (**Chapter 4**).

The idea of an executive agency crystalizes into one question: what should be the role of macroregional organizations vis-à-vis other agencies or stakeholders? The MERCOSUR answer this question by taking a more indirect or supportive approach: creating the FOCEM to finance bilateral initiatives, creating the PEIBF to support an existing project, promoting the LFVs to work on the traditional spatial unit of border twin communities, etc. In this way, MERCOSUR took a role as an enabler of initiatives. This contrasts with the CAN model, that was more direct and interventionist: developing first communitarian policies to orientate bilateral action, capturing external funding when the bilateral investment schemes failed, promoting projects as 'they should be' when the ZIFs had setbacks, etc. Thereby, the CAN behaved like a nation-state as much as it was possible under international law. Whether one model is more beneficial for certain contexts or not would demand a deeper analysis of both cases and explore the experiences in other regions. Both organizations accomplished several functions as articulation and concertation, technical and financial support, and more, but instead of setting a recipe of how they should act towards every government level, it is more convenient to be flexible and adapt.

One last issue about institutions is their sensitivity to political changes. National, subnational, and local elections in all countries have an impact on bilateralism and multilateralism. This impact could be negative, slowing down or hindering the regional integration or CBI processes and discussions, but also could be positive, accelerating and boosting them. The idea of this political waves with peaks (most countries in favor) and troughs (the opposite) represents the high political risk of the integration process but also it is very natural and common so institutions should embed mechanisms to mitigate it. As it involves different government levels, political waves are also scaled, and they require different strategies. The macroregional and local level should be a priority to (re)build the principle of supraterritoriality and, from there, facilitate cross-border bottom-up process.

From a macroregional level, it is important to highlight that constructing a cross-border approach is not a linear process: while the CAN started executing research and then policies, some projects started while plans were still in the making or not even in consideration. By its side, MERCOSUR was characterized for having projects from the beginning, followed by research, then projects again, and later continued with policies and zones. The non-linear process, political waves, and dependency to national governments' interests make macroregional institutions very vulnerable to those

changes. In MERCOSUR, after GAHIF slowed down, it passed around half a decade until SGT18 started moving and encouraged the completion of the LFV and Statute in a window of 3-4 years. The GANIDF also took advantage of the countries' motivation towards integration, and they approved Decision 459, 501, 502 and 503 and created the ZIFs in a span of 5 years, but later the movement stagnated.

As these variations cannot be predicted, it demands macroregional organizations to progress as much as possible during peaks, and to prepare multilevel capacities for the troughs: supporting networks and bi-/multilateral mechanisms, promoting the development of technical knowledge, creating transition plans, moving resources (human and financial) from one agency to another, leveraging technical peers, etc. Those multilevel improvements would not only help to work on cross-border strategies during harsh conditions but facilitate to achieve more during the wave peaks. The incorporation of development partners (as it happened in CAN with IADB and CAF) represents an opportunity to support this process because, while politicians come and go, these institutions stay longer. For both macroregions, shaping their own permanent technical offices and not only concertation agencies (such as GANIDF and SGT18), can help to deal with these changes and reduce the presented risks.

As local and subnational governments (especially their CBI&D teams) have the most direct contact with border reality, they have a higher responsibility in promoting a cross-border agenda. However, they are very vulnerable to changes from all levels above: the central government, national policies, legal frameworks, financing mechanisms, or even regional governors and local majors. Although cross-border structures could help, they need the support at least from local governments. Thereby, there is a need to mitigate the risk through transition plans and other mechanisms. For example, CAN officers, in collaboration with the national foreign ministries, met with local mayoral candidates to explain them the benefits of CBC and make them sign pledges to ensure the continuity of the achieved progresses if they were elected (Wong Villanueva, 2019). Other strategies such as the involvement of non-public actor (local businesses, academia, indigenous organizations, etc.) could be an advantage as, although public officers change according to periodical elections, professionals and interested local actors tend to stay longer time in their organizations or companies, opening the possibility for long-term planning.

A macroregional **Collective Fund** represents an interesting opportunity to bring investment to border areas that, traditionally, have been considered unstable or with high risk to invest since different –and even incompatible– systems (legal, tributary, corporative, economic, etc.) converge in them (SELA, 2013). FOCEM reveals some benefits and obstacles that should be considered for this type of mechanism. Among the main successes was its budget flexibility: while CAN interventions were limited by a budget cap and regulatory conditions set by international cooperation, the nature of

MERCOSUR projects was more flexible in terms of scope, sectors, type of interventions, and involved actors. This offers maneuverability to practitioners and public managers to developing a great variety of projects.

Also, an own macroregional fund reduces the dependency to external bodies and can set conditions to national al local governments to access the financial resources such as making mandatory to receive technical support, ensuring cross-border nature, setting a local scope, presenting a cross-border proto-structure, etc. This demands to have a more structured evaluation criteria and process, where practices such as the Andean BPIF to evaluating and prioritizing projects can be a good contribution. However, raising the bar should be accompanied with the empowerment of technical capacities for developing cross-border projects at local level, where ideas such as sharing networks, special workshops and courses, technical tours, internships, and others can help to leverage those capacities.

Although the concept of FOCEM as a solidarity fund to reduce asymmetries was innovative, most investment was oriented to infrastructure and a little to cross-border interventions, raising the important of having a special separate fund. The best example from other regions comes from EU and its INTERREG policy, that has a separated budget (€10BN) under the European Regional Development Fund (ERDF) to finance its three programmes (European Commission, 2021, 2022). The fund has its own regulation and selection process to determine if the projects follow any of the policy objectives and other standards. In addition, this fund is not only opened to public agencies but also private sector, NGOs, academia, and other organizations.

Although the budget size would be less in CAN and MERCOSUR, initial successes could allow a fund increase as happened in EU, growing ten times in 25 years. In a first instance, would be recommended that only subnational and local actors involved in cross-border cooperation could apply to this fund to reduce the traditional dependence from national resources and motivations. Thereby, higher government levels would have a supporter role rather than executers.

Finally, the **export model**, more than a special tool, is a strategy of a macro-region to extend the existing mechanisms to its neighbors, taking its own CBI process from its internal boundaries to its external borders. While the most elaborated model in the world would be the European Neighborhood Policy (ENP) –as it establishes progressive plans to articulate the EU's neighbors, the CAN and MERCOSUR also extended their policies to other countries, whether it was through bilateral agreements (Peru-Brazil ZIF) or nation-macroregion agreements (TVF system with Bolivia and Chile).

As previously evaluated, the ZIF and TVF policies have their flaws, so in the moment of replicating them with other countries, they are replicated. A progressive articulation starting from smaller scales to bigger ones could help to explore new territorialities that are more appropriate to the cross-border reality. Researchers and public officers have explored these schemes within the Trilateral

TVF between Argentina, Bolivia, and Paraguay to allow citizens a freer cross-border mobility, or the Trilateral ZIF between Bolivia, Brazil, and Peru that was promoted under forums and activities developed by local networks of actors (Wong Villanueva, Kidokoro and Seta, 2022). The same exploration of spatialities that was recommended for cross-border policies and spatial plans would be very useful to integrate the macroregional borders with neighboring countries.

6. Discussion

The process of governance transfer from nation-states to upper and lower levels represents how new scalar spatialities and governance models are becoming more relevant to promoting development. At first glance, this represents an increase in 'geographical entropy', where a multiplicity of new regionalities intertwines with each other and with the traditional Westphalia units, generating a plethora of scalar relationships. However, a closer look to reality reveals a very common characteristic of human nature: the need to (re)create order. From this point of view, although the macroregional cross-border mechanisms represent a refreshing perspective to facilitate cross-border bottom-up processes from a multilateral top-down approach, they also embed the idea of a systemic restructuring to chain these new territorialities under the paradigms of our era.

The present exploration and comparison between the Andean Community (CAN) and the Southern Common Market (MERCOSUR) offer an updated perspective of how these macroregions have target cross-border development since their formation. Although more cases would be recommended – especially from West Africa and West Europe, this initial step gives an overview of these scalar relationships, their success, setbacks, and opportunities that arise from them. From previous research on cross-border regionalism, institutional analysis, and rational policy analysis, we elaborated an analytical framework based on five categories: context of cross-border regions, cross-border approach, governance, policy system, and sectoral strategies. This allows us to conduct a descriptive and comparative analysis for both macroregions, offering some recommendations to increase their effectiveness.

The convergence of specific geographic conditions, cultural heritage patterns, historical contingency, and other factors configures two different contexts within the same continent, both for the macroregions, and for their cross-border regions. The Andean CBRs are characterized by rural and ethnic identities, resource-extraction productive activities, and socio-economic disconnection with the capitals. By the other side, with higher urbanization degree and subnational capacities, Mercosurean CBRs have stronger networks, agroindustry-based activities, but also bigger asymmetries across borders. Although this generalization gives an idea of the cross-border regional context, each border –

and even more, each small border section– defines specific cross-border dynamics, creating CBRs that are completely different from one another and requiring specific solutions.

Both macroregions, based on their political context and achieved consensus, followed two different paths for developing those CBRs. While the CAN considered cross-border integration as a dimension of its own macroregional integration, MERCOSUR conceived CBI as a component of the macroregional social integration. Thus, both had a different development throughout their history, with the Andean Community showing a greater interest on promoting a communitarian cross-border agenda. Although it looks that currently the CAN is witnessing a slowdown of its cross-border strategy, and in contrast MERCOSUR has an acceleration, historical evolution shows that this is not a lineal process and both organizations recreate themselves to have a better position to intervene.

To execute their strategies, both macroregional organizations structured themselves almost in opposite ways: while the CAN adapted its institutional structure to promote its cross-border agenda, MERCOSUR adapted its cross-border agenda to its institutional structure. Thereby, the CAN adopted a centralized authority, and the MERCOSUR had a branched and networked apparatus. Both models have its pros and cons in terms of cross-border know how, sectoral repercussion, capacity to articulate, and institutional risks. However, rather than setting which approach is more effective, it is more important to highlight how both deal with their own challenges.

The systems of macroregional cross-border mechanisms are at the hearth of this research and have been extensively discussed based on their design, performance, and results. Based on their interventions for cross-border integration and development, although they did not have the expected results, they clearly represent a change of paradigm as both promoted new dynamics under their actions. However, they did it from a different approach. The CAN's interventions were more direct compared with MERCOSUR's ones in terms of how they promoted policies, projects, fundraising, etc. This leads to consider that, while MERCOSUR acted more like an enabler, the CAN modeled a nation-state, or better said a region-state. Although further discussions on those models would be required, it also opens the possibility to explore other cases and see common patterns.

The final category, the sectoral approach, reveals which sectors have been prioritized for both macroregions. Despite of the little number of interventions in both cases, the CAN had a multisectoral approach, considering even more than one per project. MERCOSUR was involved in few sectors through projects, although other topics were explored through research or other initiatives from their sectoral agencies. Considering their developed projects, both regions have prioritized mainly the development of productive chains, governance networks, health CBC, and environmental activities. However, it is not clear whether the selected sectors respond more to cross-border needs or to national or macroregional ones.

To conclude, one question remains: Have macroregions facilitated bottom-up processes? The comparison between both macroregions provides insights for further steps, considering progressive approaches, articulating new spatialities, allowing more local entities, and fostering technical and financial capacities from and for the bottom. However, despite of the work on developing agencies, policies, plans, and other mechanisms, there have been a little number of interventions in terms of projects, sectoral initiatives, or rights granted to border populations. In the case of MERCOSUR, most of the first mechanisms failed and it is still too early to give a comprehensive evaluation of the recent ones. For the CAN, the 2014 reengineering led to the deactivation of several mechanisms, leading to consider cross-border cooperation bilaterally. However, the executed projects must be emphasized as they demonstrate the most tangible outcomes for CBI&D. Even though, whether they have facilitated bottom-up processes is a pending question that needs to be addressed by evaluating their local impact (**Chapter 6**).

Whether these macroregions established a complementary, competitive, or parallel development with cross-border microregions is a question that requires deeper research on the local governance models. However, it is possible to say that both CAN and MERCOSUR had elements from the three types of relationships: In some cases, the regions articulated with the cross-border local dynamics (e.g., the FCCR or the CAN-EU cooperation). In others, there was substitution (as MERCOCIUDADES) or competition (as the territoriality and financing schemes of ZIFs not matching local contexts). Lastly, there was also parallelism, as the informal cross-border structures in CAN that were replicated to develop projects, or the MERCOSUR border twin cities as traditional spatial unit to cooperate and integrate.

This research aimed to initiate a discussion on macroregional mechanisms to enhancing cross-border cooperation in South American macroregions, with the goal of fostering their institutional transformation: what is more beneficial for CBRs, macroregional initiatives or binational ones? How do they differ? How much influence do bilateral relations have on macroregional performance? Although there are multiple questions that should be answered in further research, the presented methodology and experiences can allow comparisons with other macroregions and their mechanisms, providing new insights and recommendations for achieving cross-border integration and development. Thereby, further research can promote a wider exchange of good case practices and, if possible, interconnectivity between macroregional cross-border systems.

Chapter 6 Connecting the Amazon Borders: Evaluating the Coffee Cross-Border Value Chain between Peru and Bolivia

Chapter 6. Connecting the Amazon Borders: Evaluating the Coffee Cross-Border Value Chain between Peru and Bolivia

0. Chapter Abstract

Focusing on the coffee cross-border value chain projects of the CAN, Chapter 6 evaluates their effectiveness in closing the institutional voids and promoting sustainable local development. The field research took place in 18 cities and communities in Peru and Bolivia and included 105 interviews, 10 technical visits, and focus groups (106 hours of recordings). Using Causal Graph Models, the theoretical framework is validated by analyzing the 1260 causal relationships observed in the case study. The analysis indicates that several voids were covered while the project was in implementation. However, the progresses did not last over time as they did not reflect the cross-border reality. The results of the study suggest that while targeting cross-border development through macroregional integration schemes has potential, it has not been effectively realized in South America, necessitating the development of more comprehensive and sustainable macroregional cross-border mechanisms.

Keywords: cross-border value chains, coffee global value chain, CAN, INPANDES, project evaluation, Peru-Bolivia cross-border region

1. Introduction

Placing the present chapter within the theoretical framework of Multi-Scalar Regional Relationships (MSRR) (**Chapter 1**), the main research purpose is to evaluate the effectiveness of institutional connectedness between macroregions and cross-border regions to promote economic connectedness between cross-border production systems and international value chains. **Chapter 4** and **Chapter 5** delves in the former relationship by considering exploring and analyzing the macroregional cross-border (MRCB) policies as mechanisms developed by macroregions to promote cross-border integration and development (CBI&D) that would lead to sustainable local development in cross-border regions (CBRs).

Among those MRCB mechanisms, cross-border value chains (CBVC) were recognized as spatial-economic configurations that promote the connectedness of cross-border regions between themselves, and with external markets by embedding their flows into international trade flows or larger

economic regions. However, literature on CBVCs has been scattered, non-uniform, and not consolidated. Facing this issue, **Chapter 2** proposes a theoretical-analytical framework to comprehend and analyze them by identifying what are the connectedness voids and how they interrelate between themselves. These voids are barriers or obstacles that discourage and efficient functioning of cross-border production systems, limiting their economic connectedness with other scalar arrangements (BVCs/RVCs/GVCs).

The evaluation of the effectiveness of institutional connectedness to economic connectedness translates in the evaluation of cross-border value chains promoted by macroregions. Based on the review of cases presented in **Chapter 5**, and the follow-up questions with officers from the Andean Community (**Chapter 3**), the INPANDES project on coffee cross-border value chain (Peru-Bolivia experience) was selected. The case study would shed light on three questions that would lead to fulfilling the purpose of this research:

- ***Question 1: What are the voids and their causal relationships in this case study?***

The first research question aims to comprehend the coffee CBVC in terms of its economic connectedness: how local productive dynamics in the CBR articulate with the coffee Global Value Chain. This review includes the study of the INPANDES project, as this intervention focused on improving this connectedness. From the analysis, the connectedness voids are analyzed to find the causal relationships between them. **The objective of this research question is to build a Causal Graph Model (CGM) that maps the relationships between connectedness voids present in this case study**.

- ***Question 2: Can the theoretical model (Chapter 3) reflect the Cross-Border Value Chain reality (Chapter 4)?***

Based on the CBVC literature review, **Chapter 2** proposed a theory on the causal relationships between connectedness voids. However, no previous evaluation has been made until this point to determine its explanatory potential. As both, the theoretical framework and the case study can be parametrized in directed adjacency matrices (causal networks), **the objective of this research question is to validate the proposed theory by comparing both CGMs**. This comparison is carried out from a quantitative approach using machine learning tools (confusion matrix), or networks analysis (network clustering).

- ***Question 3: Did the INPANDES project promoted local development based on the outcomes and their effect on the existing connectedness voids?***

Based on the results of the previous questions, this one strives to measure the performance of the INPANDES project based on its impact in reducing the existing connectedness voids. Based on an Outcome-Based Evaluation, **the objective of this research question is to instrumentalize the CGM for project evaluation**. This goal has a double purpose: first, to measure the effectiveness of the project per void (what was executed and what were the outcomes) and second, to determine why these results occurred the way they did by interpreting INPANDES within the CGM. This section ends by providing some recommendations for the formulation of CBVC-oriented policies within this case study.

The present chapter has taken a mixed-methods approach to answer the three research questions. Mixed-methods research collects and analyze data using both quantitative and qualitative approaches within a single case study (Doyle, Brady and Byrne, 2009; Halcomb and Hickman, 2015). While each question has a different set of methods to answer them properly, all they have causal graphs models as structuring element of their discussions. Thus, the following paragraphs highlight the main remarks of causal graphs and justify their implementation in the present research based on the benefits and limitations imposed by cross-border studies (especially the study of the connectedness voids in cross-border value chains). By validating the use of causal graphs in cross-border studies, this chapter could be considered as a preamble for more complex methodologies, functioning as an 'umbrella' for further studies related to causal relationships in cross-border value chains.

2. Objective 1: Building the Case Study's Causal Graph Model (CGM)

The present description and discussion are based on the collected official documents, secondary sources, conducted interviews for this research, and on my Master dissertation – that examined the cross-border dynamics in the tripartite border between Peru, Bolivia, and Brazil. When citing from interviews, quotes are indicated with a (code number) within the text, and references at the end. Quotes for **Section 2.1** and **Section 2.2** can be found in **Appendix 17**. Quotes for **Section 2.3** and **Section 2.4** can be found in **Appendix 18**. The most important ones are directly cited in the present document.

Within this analysis, we do not consider the ZIF scale as a unit of analysis due to the previous discussion in **Chapter 5**. To simplify this review and bring clarity to the multilevel approach, three

scales of analysis are selected (national, subnational, and local) using the nomenclature of the NUTE ANDINA in **Table 5.13**:

- **National Level:** or country level, involves the whole national territory (Peru and Bolivia) and the corresponding public institutions (Presidency, Ministries, National agencies).
- **Subnational Level:** or regional level, refers to the political divisions under national level, this means, the Peruvian Regions and Bolivian Departments, and how they are divided (both use the terminology of Provinces). For the present analysis, we focus on the dynamics of Puno Region and La Paz Department and their respective provinces. Although the alpaca CBVC considered the north area of Tacna region (cross-border market in the tripartite area with Chile), their institutions did not participated in the project as Puno did (we analyze them at local level).
- **Local Level:** considers the nearest Peruvian districts and Bolivian municipalities to the border, including the communities and specially producers that are in this area.

This section is composed by the six pre-processing analyses, the analysis of each void, and finish presenting the CGM of the coffee case study.

2.1. Phase 1.1. Descriptive Analysis N°1: The Bilateral Relationships between Peru and Bolivia

The concept of 'bilateral relationships' is used to address how the diversity of stakeholders of each country –governments, corporations, and civil society– interact between themselves shaping a complexity of dynamics across their borders, including how these relationships fit and are needed in multilateral frameworks (Pannier, 2020). Simultaneously, 'bilateral' differs from 'binational' as the former can be applied at different scales and the latter just at national one. A review of the dynamics at upper levels can set the context to understanding cross-border relationships at local level. This section describes the bilateral relationships between Peru and Bolivia at different levels, in terms of trade, institutionality, and geography.

2.1.1. Bilateral Trade

Peru and Bolivia have had a continuous historical trade relationship, either formal or informal (PE40N1). At binational level (**Figure 6.1**), most Bolivian exports are based on agriculture products with certain degree of processing (soybean meals, vegetable oils, etc.), equivalent to more than 80% of total exports. Around 5% of exports are petroleum gas (mainly oriented to the south of Peru). By the side of Peru, most exports are manufactured products such as metals (21%), chemical products (19%: plastics, papers, or cleaning products), and mineral products (15%). The 14% of Peruvian exports to Bolivia are refined petroleum. In other words, Bolivian exports are mainly primary production (food consumption), while Peruvian ones are basic manufacture (for construction, home products, industry). Energy market complementarity is still in exploration although there is trade of gas and refined petroleum between both countries. As it will be explained later in the case studies, there is none or minimum (official) trade of coffee and alpaca products between both countries.

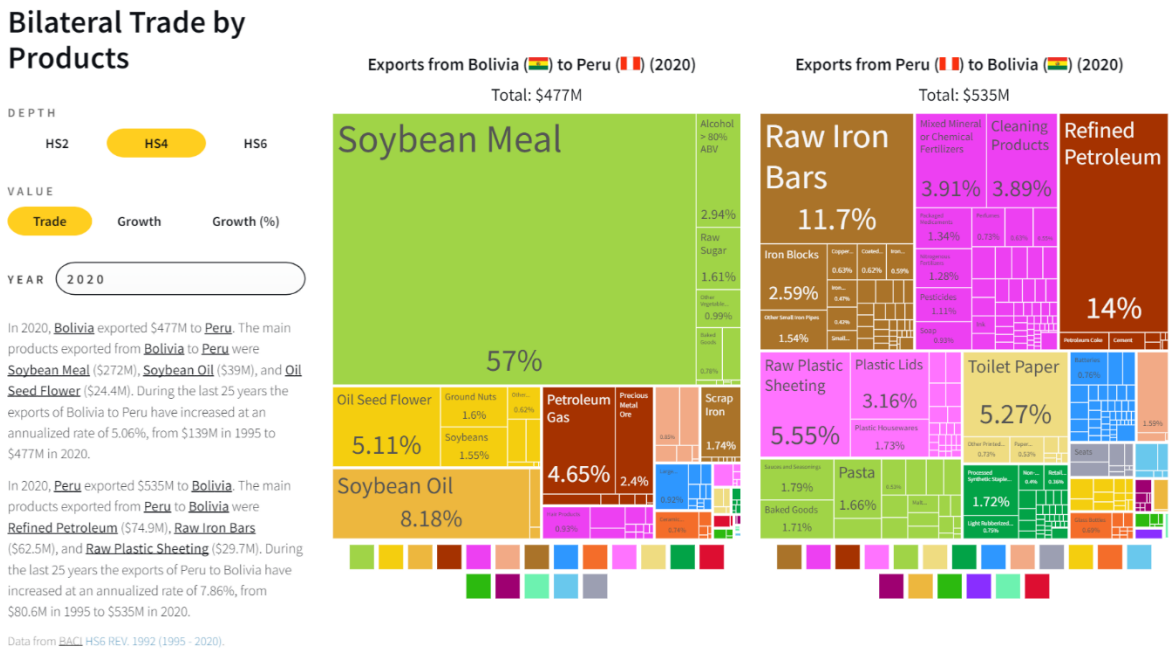


Figure 6.1. *Peru-Bolivia bilateral trade by products (2020)* (OEC, 2020a)

At regional level, Puno is the 10th most important region in Peru (2.3% of national production), and is the top producer of potato, quinoa, alpaca fiber, and tin (data by 2021). Most of the exports of Puno region are minerals (99% of trade value), followed by fishing (1%), and agricultural products (1%). The latter is divided in two types of agriproducts: no-traditional products or emerging markets such as quinoa and broad beans, and traditional products such as coffee and alpaca fiber – both products

represent 54% of agro-export value. Coffee products (non-roasted) goes to EU (41%), Canada (27%), USA (16%), Korea (5%), and UK (5%), and alpaca fiber is exported as no washed to Uruguay (6%), and UK (4%), and basic refined to UK (75%), Canada (13%), USA, (6%), Japan (5%), and Chile (1%). The 99% of imports and exports through Puno border customs (in Desaguadero) are from Bolivia: most exports are chemical, agriculture (spices and cookies), and paper-based products and most imports are agriculture (soybean) and chemical products (MINCETUR, 2021).

In the case of Bolivia, La Paz is the capital city and the most important political, financing, and cultural center of the country. The Department represents 25% of national GDP, second after Santa Cruz, the industrial capital. In terms of production, the main vegetal products of La Paz are tubers, fruits, and fodder, and within the animal products you can find birds, sheep, and llamas (SIIP, 2020). Among the top ten most exported products, more than 95% are mineral products, followed by coffee (0.7%), and timber products (0.4%). Exports of alpaca fiber products are under the 0.1% of total export value (INE, 2021). Exports from La Paz to Peru are very low, around 1% of total exports at it's the 10th export partner. Most of them are metal products (35%), electric machines (27%), and construction materials (21%), and 97% of exports to Peru cross through Desaguadero customs. After China, Peru is the second most important import partner of La Paz, with 25% of total import value based on petroleum oils, bituminous minerals, iron bars, and more. The 79.6% of those products cross to Bolivia through Desaguadero, and 19.6% through the customs in Cobija – crossing from Peru to Brazil before arriving to Cobija and then La Paz (CNC, 2019; INE, 2022).

From this level, we can see that in the agricultural sector, coffee and alpaca fiber plays a relevant role in the Puno economy more than in La Paz, as the latter region has a more diversified economy because is the capital of Bolivia. While no formal trade of coffee and alpaca fiber happens between both countries in a significant level, they export those products to other countries. In the case of coffee, it represents one of the most important agriculture products of Puno, and for La Paz, it is the only product that is in the top 10 exports after all mineral products. For the alpaca fiber, it is also one of the traditional exports of Puno, but in the case of La Paz, other animals such as llamas are more important in its economy: La Paz has almost four times more llamas than alpacas (SIIP, 2020). Thus, Puno and La Paz consider coffee and alpaca within their productive activities. Nevertheless, they have a stronger weight in Puno agriculture economy.

At local level, there is not trade data available. However, in terms of both products, this happens in an informal way through middlemen, cooperatives, or cross-border markets. For the case of coffee, most informal trade happens from the Bolivian side to the Peruvian through middlemen working in Peruvian cooperatives. For the alpaca fiber, the cross-border markets located across the border (mainly three markets) represent historical exchange nodes, where middlemen buy fiber from producers from both countries to sell them to companies (PE41N1). As producers from both sides sell to Peru or Bolivia

depending on the offered price and personal relationships with middlemen, it is possible to say that the cross-border informal trade of alpaca fiber is pendular –fiber goes to any side depending on the moment.

While trade happens at each level, formally or informally), it is not as dynamic as expected between neighboring countries. The similarity of products in terms of primary production and basic manufacture generates a spirit of competition rather than complementarity (BO65N1). This leads to unhealthy competition behaviors that, while they trigger protectionist measures that undermine formal trade (PE40N2), it does not mean that the products will not arrive the other market: informal trade is strong between Peru and Bolivia, and with less trade standards to accomplish, lower quality products will arrive to the other country, bringing more problems to the importing population.

PE40N2: *Despite the trade liberation, due to the fear of competency, lower prices and other factors, producers put pressure on national governments to make the import process more cumbersome (e.g., letting less trucks to cross the border, adding requirements or processes, cancelling imports, etc.). Trade 'retaliation' measures such as the no appearance of products (that should be available) in the 'foreign trade single window' platform, queueing trucks before customs and leaving there empty, among others.*

2.1.2. Bilateral Institutionality

Recapitulating **Chapter 5**, **Table 5.8** lists the bilateral mechanisms for cross-border integration and development at different levels. In terms of the agencies, at binational level, the highest mechanism is the Binational Presidential and Cabinet Meetings, that started from 2015 and set the yearly agenda of binational cooperation replacing the CAN's work on cross-border development. At subnational level, the Binational Technical Group for the ZIF Peru-Bolivia (GTB ZIF) would represent the mechanism with bigger extension, but it did represent an efficient institutional space nor a legal body. Oriented to a specific geography, the Binational Working Group for the implementation of CEBAF Desaguadero (GTB-CEBAF) focused on improving the main binational border customs in the binational city of Desaguadero. Then, we have the Binational Autonomous Authority of Lake Titicaca (ALT) that is the only legal body with permanent Secretariat in this list, and that focus on the cross-border IWRM System surrounding the binational Titicaca Lake. At local level, there are two Cross-Border Integration Committees (CIFs) to discuss local issues with representation of national governments, but they have not been active (PE63N1). One focus on highland issues, and the other in Amazon ones.

In terms of the tools to coordinate cross-border action, the main one is the Cross-Border Integration Zone or ZIF Peru-Bolivia, previously discussed and criticized due to the extension and lack

of instruments or agencies to implement it. Two plans are also mentioned, the 2000 PAIPB – Integrated Action Plan, and the 2018 Integration Plan for developing the Amazon sector of the ZIF. From here, other relevant policies and mechanisms have been promoted unilaterally (**Table 5.3**), being the Peruvian laws and agencies more oriented to border integration and development than Bolivian ones – more focused on border security.

Apart from the ALT (that will be explained on this section), the most recent progresses on bilateral institutionality are La Paz Declaration (Binational Presidential Meeting 2021), and the Amazon sector ZIF (2018). The main points of the Declaration were to improve the Peruvian Ilo Port conditions to facilitate Bolivian exports, to conclude the reengineering of the ALT, and to strengthen energy integration. It also emphasized the need to further develop cross-border socio-productive chains (Ministerio de Relaciones Exteriores - Perú, 2021), although CBI&D is not a priority (PE03N1). In the case of the latter document, the plan focuses on developing a cross-border model for intelligent specialization – similar to the EU strategy of smart specialization. Thus, the plan is mainly oriented to promote cross-border value chains in different sectors: Amazon fruits, tourism, pisciculture, and coffee – the alpaca production is located on the highland region, where there is no plan by the moment. The coffee component refers to the 'Frontera' coffee, one of the main achievements of the INPANDES project, showing a certain degree of continuity (MRE - DDIF, 2018).

Public relationships at national and subnational level (between Puno and La Paz) are good, but despite to the agreements between both countries, they are difficult to be carried: previous border conflicts (e.g., territorial disputes), the political reality of the countries (e.g., national elections), or the stability and credibility of the institutions (e.g., three governors in Puno for the same period) affect the way how agreements are fulfilled, passing decades to achieve consensus or implementation (PE40N1, PE40N2, PE40N3, PE40N4, PE40N5).

In relation to trade policies, the most important one is the Andean Free Trade Area, agreed in 1992 through the Decision 324 (Common External Tariff), that establishes the total elimination of tariff and non-tariff barriers between CAN members (IBCE, 2018). From 1990 to 2002, the Andean FTA increased the intraregional trade from 4% to 10% and presents several opportunities to complement even with measures such as Regional Value Chains. However, the FTA has not consolidated in the governments, action plans, and societies as an economic integration process that would lead to their development (Arellano, 2004; Iglesias and Vallecilla, 2021). Thereby, while in theory trade does not have barriers, governments incorporate tariff barriers in their national policies and non-tariff barriers in their trade performance as explained previously (PE40N2) (Arellano, 2004).

From the bilateral institutionality between Peru and Bolivia, it is possible to say that the ALT is the only binational legal body that can be considered as an international organization. However, it mainly focuses on watershed management. While the CAN framework for CBI&D was replaced by the

Binational Meetings, they have continued this agenda but just in a 'commitment' level, without concrete projects. As the 2018 Amazon Sector ZIF Plan is entirely oriented to cross-border value chains, and this has been reinforced in the 2021 Declaration, it shows a clear interest for more than a decade –including CAN projects– to promote cross-border value chains between both countries, where coffee is still considered as a potential industry to further develop.

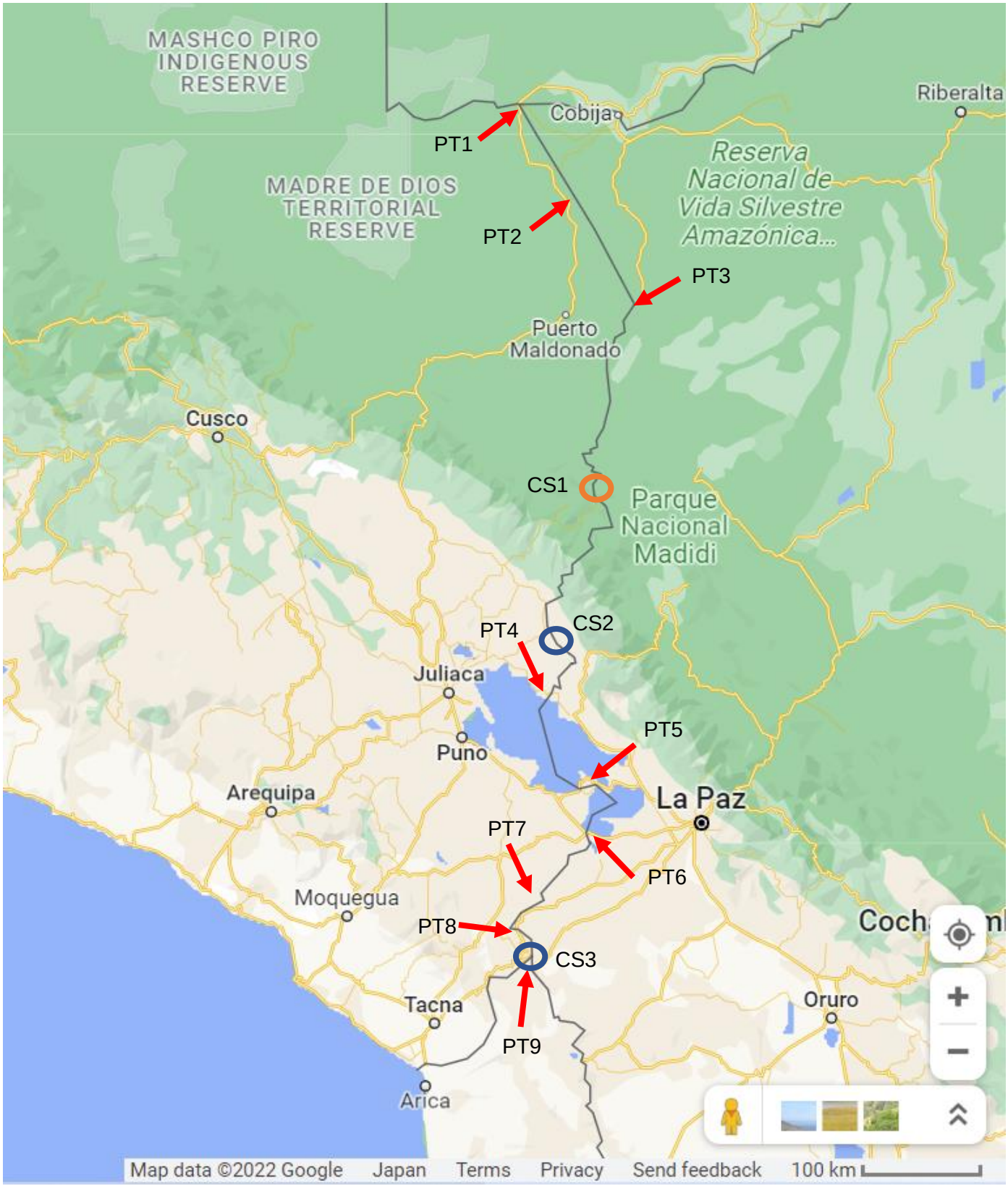
2.1.3. Border Geography

General Characterization

This section focuses on the geography of the border region, from the tripartite point shared by Peru, Bolivia, and Brazil, to the tripartite one from Peru, Bolivia, and Chile (**Figure 6.2**). The ZIF extension is not considered as it includes territories that are not related with the cross-border dynamics (even half of Bolivia is considered in that zoning). The main intervention areas of INPANDES projects are indicated, including the logistic hubs or export channels for both countries.

Geographically, the Peru-Bolivian border can be divided in two sections, the Amazon section (jungles and high jungles), and the Andean section (the highlands) (**Figure 6.3**). The Titicaca Lake is in the highlands region, becoming the highest lake in the world at an elevation of 3812masl. Apart from the lake, there are twelve cross-border watersheds, and three of them could be considered as tripartite (the Alto Acre basin with Brazil, and the Ushusuma basin and Caño basin with Chile) (GEOIDEP, 2017). Five National Reserves adjoin the border: From Peruvian side, there are the Tambopata National Reserve and the Bahuaja Sonene National Reserve. Bolivia has the Manuripi National Reserve, Madidi National Reserve, and the Ulla Ulla National Reserve. Most reserves are in the Amazon section, except from Ulla Ulla that also occupies the highlands.

With an extension of 1047km, the border starts in the north in the tripartite area with Brazil and finishes in the south in the tripartite area with Chile (we will use this north-south orientation to characterize the border). Three Peruvian Regions (Madre de Dios, Puno, and Tacna) and two Bolivian Departments (Pando and La Paz) can be considered as border regions. Between these political divisions, Puno and La Paz has the largest border extension, and both are the only ones with highlands and jungle. They share ten of the twelve cross-border watersheds and the Titicaca Lake. They also share three national reserves: the Peruvian Bahuaja Sonene faces part of the Bolivian Madidi, and below the latter is Ulla Ulla.



*__PT#__: border crossings, **CS1**: coffee CBVC area (SPPP – Puerto San Fermín/Cocos Lanza), **CS2**: alpaca CBVC area 1 (Cojata - Ulla Ulla), **CS3**: alpaca CBVC area 2 (Palca - Charaña)

Figure 6.2. *Peru-Bolivia Border Geography (Author's elaboration)*

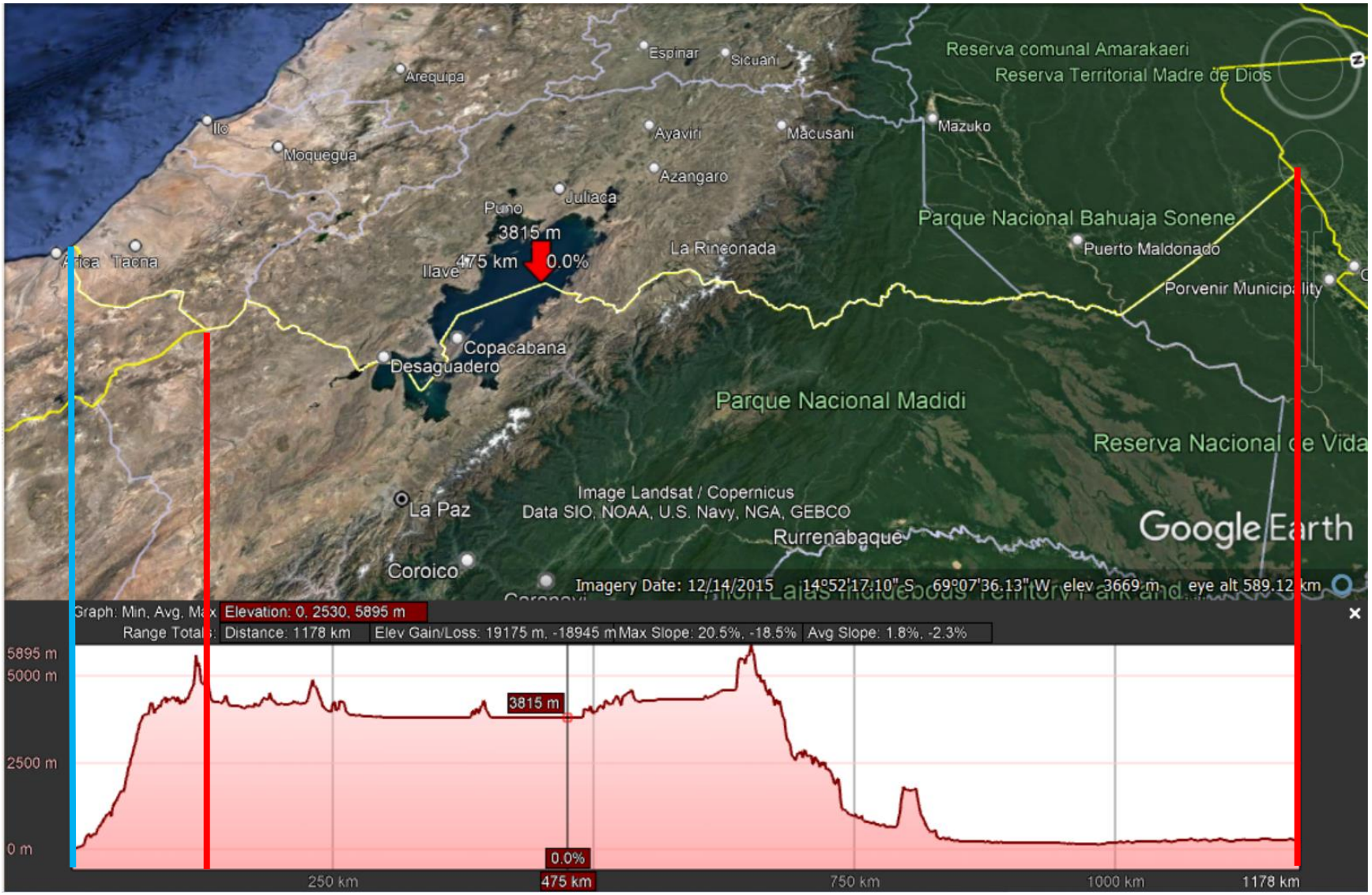


Figure 6.3. *Peru-Bolivia border altimetry (Author's elaboration)*

Border Crossings & Cross-Border Dynamics

In terms of border crossings, there are two official border crossings, one border crossing reachable through Brazil, and around five other informal crossings, without counting other cross-border dynamics that happen in specific sections of the border. However, in many cases, as most of the border has none or low population due to the rugged geography and there is a low presence of national regulatory agencies, the border is very permeable, and the only barrier to cross the other side is 'how fast the river flows' (PE40N6). In this description of the border, we will include the areas of intervention of INPANDES project.

Starting from the tripartite area between Iñapari (Madre de Dios, Peru), Bolpebra (Pando, Bolivia), and Assis Brasil (Acre, Brazil) (**PT1**) in the Amazon section of the border, there is not direct border crossings between Peru and Bolivia but between Peru and Brazil – as they are connected through the Interoceanic Highway. From the tripartite, crossing 110 km in Brazilian territory by car, (approximately 1.5 hour), there is the border crossing between Bolivian city of Cobija and the Brazilian twin cities of Brasiléia and Epitaciolándia. This route is frequently used to provide goods and services from La Paz to Cobija as there is not highway between both cities: any truck should cross through Desaguadero (Peru), climb all the way through Peruvian territory, pass through Brazil, and arrive to the city (Wong Villanueva, 2019).

While the formal way to cross from Peru to Bolivia results inconvenient as it highly depends on Brazil customs, and informal route usually used is through the informal border crossing of San Lorenzo (Madre de Dios) and Extrema (Pando) (**PT2**). This border crossing was informally used by merchants from both sides to trade and was especially supported by Peruvian ones coming from other regions such as Arequipa and Cusco (far from the border) (PE08N1). These dynamics have been supported by local authorities (e.g., enabling a road to the crossing, moving customs officers every Thursday) and their formalization has arrived as a discussion point at the Presidential Meetings (Ministerio de Relaciones Exteriores - Perú, 2021).

Another crossing point, although informal, is through the Madre de Dios River (**PT3**): as this river connects Puerto Maldonado (regional capital of Madre de Dios) with several Bolivian communities in Pando located throughout the river, there is a small and periodic flow of small boats with moderate cargo. Next to the border, there are two small localities: the Peruvian community of Puerto Pardo, and the Bolivian one of Puerto Heath. Surrounded by the National Reserves of Tambopata and the Manuripi, this area has a very low population density, with presence of indigenous people (CP10N1).

Following the border to the south, in the buffer area of the Bahujana Sonene and the Madidi (Puno and La Paz), we can find the first intervention area of INPANDES project (**CS1**), suitable for

coffee – and coca – production (PE11N1): By the Peruvian side, the district of San Pedro de Putina Punco (SPPP) has several border localities (Palmerani, Curva Alegre, Pauji Playa 1, Pauji Playa 2, etc.), connected with rammed roads and suitable for vehicular mobility. The Bolivian side has very low population density, and there are only two communities: Puerto San Fermin, and Cocos Lanza. Both are disconnected (barely existence of a walkable trail) and they are disconnected from the nearest urban center, the Provincial capital of Apolo by two to three days of walking. Their only access to goods and services are in the Peruvian side, and they need to cross by rafts (in Cocos Lanza) or motorized boat (Puerto San Fermin) to cross the river that works as borderline.

Moving to the south, the high jungles convert into the highlands, starting the highland section of the border. The Ulla Ulla National Reserve was part of the intervention area of INPANDES project, especially the border community of Ulla Ulla (**CS2**). This community is divided by a river with the Peruvian community of Cojata, but there is a bridge that connect them. However, there is a weak physical connectivity between them, and it mainly serves for local informal flows of goods for daily life (PE11N2). The opening of cross-border markets on Thursdays and Fridays are the main exchange space of products, including alpaca fiber. By the Peruvian side, there is a strong gold production (formal and informal), from Ananea, La Rinconada, and Sina, to the cross-border Suches River (PE08N2).

The following section, above the Titicaca Lake, is the highway between Tilali (Puno) and Puerto Acosta (La Paz) (**PT4**). It is an informal crossing with moderate to high flow due to the good conditions of the road and the lack of control from regulatory agencies. Known as the Culebra Corridor (Snake corridor), this road serves for smuggling products from Bolivia to Peruvian ports in Tacna or Arequipa (PE08N3). Cities close to this informal border crossing have more population than in the jungle area and play relevant roles in cross-border dynamics of stolen vehicles or drug operations (PE08N4). Although there have been intents to formalize this border crossing (COSIPLAN, 2017), no meaningful progress has been achieved by the moment. Under this corridor, the Titicaca Lake represents the largest water body in the highlands – and in the world top 20 largest lakes. Due to its extension, it is not a means for transport of people or good – it can take half a day to go from Peru to Bolivia, when less than two hours by car (PE20220317). However, it is important for local tourism and is one of the most visited places in Peru and Bolivia.

Splitting the Titicaca Lake in two, the Kasani border crossing (**PT5**) is the first official crossing from the tripartite with Brazil. The Peruvian city of Yunguyo and the Bolivian city of Copacabana have higher population city than the previous border sections and are interconnected with the main highway networks from both countries. However, the main official border crossing is in the binational city of Desaguadero – Peru and Desaguadero – Bolivia (**PT6**). As previously explained, it is the main border crossing for people and goods and where 90% of commerce between Peru and Bolivia happens. In the practice, it works as a binational city connected by two bridges and several boats where ‘borders do not

exist', but due to COVID19, it is slightly recovering the previous dynamics that they used to have (e.g., binational fairs) (PE40N7, BO65N2). Due to the large extent of traded goods, both countries established Binational Border Attention Center (CEBAF) Desaguadero, that in theory works as an integrated border crossing but in the practice, it has not solved the non-tariff barriers between countries due to the lack of coordination between regulatory agencies (PE62N1, BO65N3). This leads to congestion and delay on terrestrial trade flows, compromising buyers-sellers relationships and increasing transaction costs (BO65N4).

Going south, the next crossing is the highway between Pizacoma (Puno) and Santiago de Machaca (La Paz) (**PT7**). This is the only road between Desaguadero and the tripartite with Chile, and it has a Bolivian police station but no regulatory agencies from any country. From this part the next two crossings are between Tacna region and La Paz. The next crossing (without customs too) is the highway called PE-40A highway (Peru) or Route 43 (Bolivia) that, although it has no population the population, it has been thought as a future border crossing connecting Tacna city and La Paz city (**PT8**) (Conexión INTAL, 2017). Finally, yet importantly, the Tripartito or tripartite area between Peru, Bolivia, and Chile (**PT9, CS3**), represent an informal border crossing and the last intervention area of INPANDES project for the alpaca component. The tripartite area represents a strategic exchange node between the population of the three countries. Every Sunday, there is a cross-border market where producers sell their products (with high presence of alpaca producers) and buy daily life goods: processed goods from Peru and food from Bolivia (Chileans mainly deliver alpaca fiber) (PE21). The nearest Peruvian district is Palca (specifically the community of Ancomarca), and by the Bolivian side, the municipality of Charaña.

Apart from Desaguadero area, the Peruvian-Bolivian border is characterized by very low population density, a lack of regulatory agencies, and the abundance of informal and illegal flows and practices (PE03N2, CP03N1). Informal trade is very common and essential for local businesses and lifestyles and is frequent due to the existence of only two border crossings in 1047km of border (PE03N3, BO65N5). However, the existence of illegal flows of coca or gold undermines the presence of national governments, and the improvement of local conditions (PE63N1, PE63N2, PE63N3).

Main Urban Centers & Logistics Channels

As the Andes were the cradle of several civilizations that later belonged to Peru and Bolivia, eight of the top 10 highest cities (more than 75k inhabitants) in the world belong to both countries (**Table 6.1**). Considering Puno Region and La Paz Department, four of the main cities are located there: El Alto (4150masl), Juliaca (3825masl), Puno (3819masl), and La Paz (3640masl). Although these are not border cities, they represent important political and productive centers for promoting CBVCs.

Table 6.1. *Highest urban centers in the world (+75,000 inhabitants) (WikiWand, 2022)*

Avg. height (masl)	Town/City	Country	Population
4150	**El Alto**	**Bolivia**	**1,184,942**
4090	Potosí	Bolivia	170,000
3836	Shigatse	China	117,000
3825	**Juliaca**	**Perú**	**225,416**
3819	**Puno**	**Perú**	**120,229**
3706	Oruro	Bolivia	250,700
3658	Lhasa	China	373,000
3640	**La Paz**	**Bolivia**	**845,480**
3399	Cusco	Perú	358,052
3059	Huancayo	Perú	425,000

*Highlighted cities were visited during the case study

Puno Region is composed by 12 provinces (**Figure 6.4**), where Puno city (located in Puno Province) is the regional capital, holding the political functions to administrate the region. However, the biggest city in the region is Juliaca, located in San Román Province. This city represents the main industrial node of the region for legal and illegal economic activities, that have promoted a fast growth – high business concentration in the Taparachi Industrial Park. This happens due to its high level of connectivity with the international airport, land termina, and highways to Arequipa, Cusco, and the northern part of Puno region. Puno and Juliaca are distanced by 40km (40min) and while Juliaca is important to connect the north, Puno does the same with the south and especially with Desaguadero. Most provinces have average to good highway infrastructure except from the roads from Juliaca to Sandia Province (coffee area, **CS1**). The highways from Juliaca to Huancané Province (alpaca area, **CS2**) have very good quality – influenced by the high flow of trucks from gold mining areas to Juliaca.

La Paz Department is composed by 20 provinces (**Figure 6.5**) where La Paz city (located in Pedro Domingo Murillo Province) is the national capital. La Paz shapes a conurbation with El Alto city that represents the main industrial node of the department, with more than 28,600 businesses (27% of businesses of the department) (FundEmpresa, 2021). El Alto counts with the international airport and is an important waypoint to arrive La Paz from Desaguadero or other parts of the department. Connectivity is easy for some provinces for difficult or inexistent to others: for the alpaca intervention areas of INPANDES (**CS2, CS3**), roads to Ulla Ulla (Franz Tamayo Province) or Charaña (Pacajes Province) have regular to good condition. However, there is no road to the coffee intervention area (**CS1**) from Apolo city (capital of Franz Tamayo Province), or the road can be very rough or bumpy, as the way to Caranavi Province (the coffee capital of Bolivia).

In terms of national logistic channels, Bolivia, and therefore La Paz, does not count with seaports, so most exports of this province are through airport (66%) or through Arica port (Tambo Quemado crossing) in Chile (28%). Peru has several seaports throughout its coast, with a higher density in the north (Paita Port, Salaverry Port, Chimbote Port) and center (Callao Port). The Callao Port is the most important at national level with more than 73% of sea trade, and one of the most dynamic in Latin America (top 6) (ECLAC, 2019). In the south of Peru, there are three ports: Pisco, Matarani, and Ilo – these last two are closer to Puno. While Matarani Port has good infrastructure and manages twenty times the volume of Ilo Port, it does not count with the international trade capacities as Callao Port does (Sacex Consulting, 2018). Since 1992, there has been an agreement between both countries to promote Bolivian export through Matarani Port: land concession near the port, free transit of Bolivian goods, tax-free investment capacities, and more. However, no efficient progress has been made to change Chilean ports for the Peruvian one due to the higher technical and operational capacities of the former ones in terms of international trade (Vaca, 2010).

Figure 6.4. *Provinces of Puno Region (MIMP, 2015)*

Figure 6.5. *Provinces of La Paz Department (FamilySearch, 2022)*

The Aymara & Quechua Culture

In terms of ethnography, the Aymara and Quechua ethnicities are the most predominant ethnic groups in the Andean region, and the Peru-Bolivia border region has both types of ethnicities (**Figure 6.6**): while the Aymara live surrounding the Titicaca Lake, the Quechua spread in the surrounding areas, even arriving to the Amazon. Despite both speak different languages and dialects, Spanish is still the predominant language in Puno and La Paz. In the alpaca case studies, the population of **CS2** and **CS3** are mainly Aymara (around 90%) in both sides of the border (INE, 2013; INEI, 2018). In the coffee case (**CS1**), while Sandia and SJDO are mainly Quechua (around 70% and 40% respectively) with low Aymara population (1% and 16%), SPPP is predominantly Aymara (Aymara over 50%, Quechua 20%) (PE26N5) (INEI, 2018). The Bolivian communities of San Fermin and Cocos Lanza are mainly Quechua (90% and 75%) (BO51N1, BO31N6) (INE, 2013), showing that in the immediate area next to the border, ethnical composition is different.

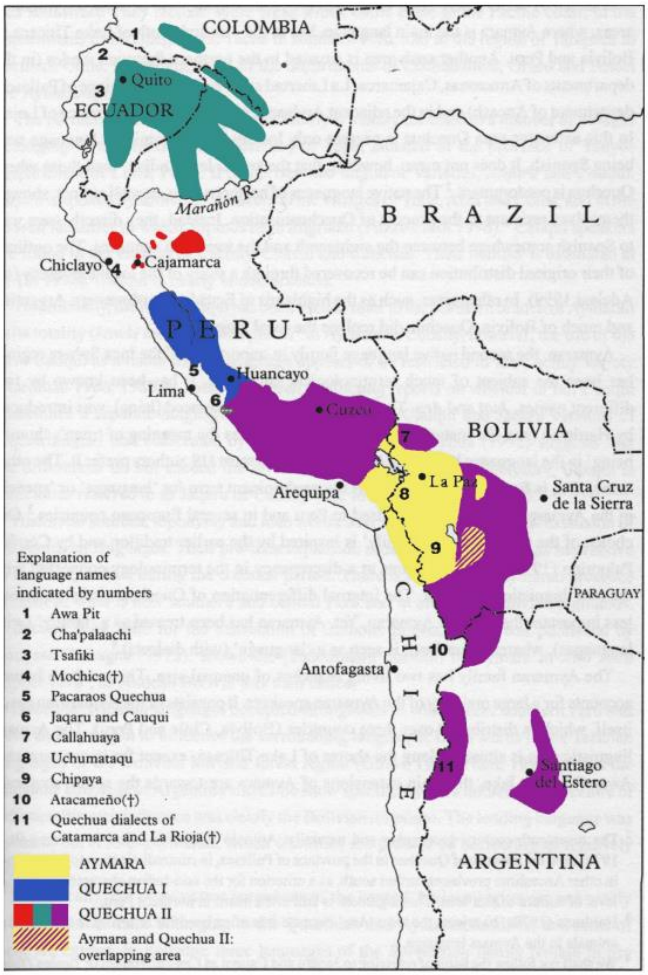


Figure 6.6. *Map of Quechuan Dialects & Andean Languages (Vargas Muñoz, Cruz Tello and Mamani Castro, 2012)*

Currently, ethnicity does not play an exclusionary role in cross-border relationships, but has a cross-border bonding role as, having both ethnicities on both sides of the border generates the idea of 'no limits' (BO65N6, BO51N2):

BO65N6: *We are an Andean region, we are Aymara, we use the same skirts, we are brothers and sisters. There are historical borders but for me, there aren't limits. We are the same.*

2.2. Phase 1.1. Descriptive Analysis N°2: INPANDES Project

As explained in **Chapter 5**, INPANDES was the last set of cross-border projects implemented by the Andean Community. Four of the six interventions were productive projects or had productive components. Based on interviews with the INPANDES team (**Chapter 3**), the 'Coffee and Alpaca Cross-Border Value Chain in the Peru-Bolivia ZIF' project represented the most successful one. This section elaborates on who was behind the projects (specifically behind the coffee and alpaca CBVC), how was the concertation process and the reasons behind it, the formulation of INPANDES and the individual interventions, and the implementation, management, and evaluation – according to different stakeholders that participated. Highlighting these processes is important to identify the advantages and disadvantages that the main project drivers generated and how they addressed (or did not) the local conditions in each case study.

2.2.1. Stakeholders

Here we display the main stakeholders that gave rise to INPANDES and the coffee and alpaca CBVC project.

- **Andean Community (CAN)**

While the CAN was one of the main discussion topics in **Chapter 5**, INPANDES was the culmination of two decades of institutional construction and consolidation through projects, until the reengineering process that they suffered and lost authority on the macroregional cross-border institutionality (IN01N1, IN05N1). Although the reengineering happened in 2014, due to the budget availability for INPANDES, the CAN's 'Cross-Border Integration and Cooperation' team continued existing until closing the project.

- **European Union (EU - Peruvian Delegation)**

The EU has been part of the development of Latin American countries, and the Andean Community for the last 20 years by financing since huge infrastructure projects in the beginning, to productive and smart specialization in recent times (IN05N2, IN05N3). The main EU's development cooperation instrument since 2002 has been the Regional multiannual indicative program for Latin America (*Programa Indicativo Plurianual Regional para América Latina* called PIPR-AL or regional MIP). This has been used to channelize around €5000M in non-reimbursable financing to the region through several projects and programs by 2020 (European Commission, 2013). It is under this budget (MIP 2007-2013) that the EU-CAN cooperation promoted the cross-border initiatives of CESCAN I, CESCAN II, and INPANDES (PE68N1, IN02N1). This cooperation was very accepted as the CAN is one of the most famous integration processes in Latin America following a 'European model' and its values – and therefore, should be supported (IN05N9).

Despite EU have not financed other CAN project after INPANDES due to the reengineering, it still works bilaterally with the countries (IN05N4), and even with cross-border initiatives such as INNOVACT. However, INNOVACT is not a continuation as it was promoted by the EU office in Brussels and oriented to authorities and managers, while INPANDES was promoted by the EU delegation in Peru and oriented to populations and producers (IN05N5). Due to the size of the EU organization, each Andean country has its own EU delegation with its own agenda but, as the CAN Headquarters are in Lima, the Peruvian delegation coordinated the CAN projects with the other Andean countries' delegations and Brussels (IN05N6, NB0N1, IN05N7). EU Delegation in Peru is mainly conformed by European chiefs and Peruvians with EU experience to broker the relationships with the country as they stay longer in position (IN05N8).

- **Peruvian and Bolivian Chancellery**

As the main representation of national government in their foreign affairs and in the decisions of the CAN, the chancelleries had a relevant role to use their diplomatic capacities and catch funding or bargain better agreements – as it happened during INPANDES formulation (IN05N10). Although the Bolivian chancellery showed certain degree of discontinuity, the Peruvian one took a relevant role for the coffee and alpaca project (IN05N11, PE40N8). Unlike other chancelleries, Peruvian one has a Border Integration & Development Directorate that participated actively in the CAN cross-border projects (IN05N13).

- **Executing agency: Binational Autonomous Authority of Lake Titicaca (ALT)**

Starting operations in 1996, the ALT is recognized as a binational entity under international public law that reports to the chancelleries but has full autonomy (decision making, management, technical, and financial). Its main function is to oversee the sustainable development of the Titicaca – Desaguadero – Poopó – Salar de Coipasa IWRM System (ALT, 1996).

According to the Statute, the President is always from Peru for a period of four years, while the Headquarters are in La Paz, with small coordination offices in Puno and Oruro (IN06N1) (ALT, 1996). This entity is the only binational entity between both countries, allowing several binational operations. However, it has been criticized due to its operationality and efficiency, and it has been in a restructuration process (PE11N3, PE63N4). The ALT was in charge of three of the six INPANDES interventions: water resources, food security, and cross-border value chains, while only having previous expertise in the water-related one.

- **Operational Agencies: SSE & MPS**

While the ALT oversaw the execution of the CBVC projects, two operational agencies were in charge of each component: The Provincial Municipality of Sandia (MPS) for the coffee component, and Highlands & Jungle Exporter (SSE) for the alpaca component.

The MPS is the main political-administrative body of Sandia Province, a province characterized by concentrating most of coffee production of Puno region. Due to its close relationship with coffee production and value chain projects as part of its economic development program.

The SSE is a national agency under the Ministry of Agrarian Development and Irrigation (MIDAGRI) that arrives to 8% of Puno region. Its main mission is to articulate producers with markets by supporting cooperatives with technical and business knowledge, legal processes, fulfill requirements of other public agencies, etc. (PE11N4) The SSE works with several value chains such as quinoa, alpaca, potatoes, cheese, and other traditional and non-traditional regional products.

2.2.2. Concertation & Formulation

Prelude of INPANDES

Based on its cooperation with the CAN, the EU promoted the regional MIP 2007-2013 under the two components of the program: promote 'civil society participation' and promote 'economic and social cohesion' (PE68N2). In the line of the first one, SOCICAN initiatives promoted civil society participation, some of them in border areas. Under the second component, the EU promoted projects for cross-border integration, ad jointly with the CAN team, they formulated CESCAN I and CESCAN II, with a particular focus on cross-border value chains projects (IN05N12).

Although in theory it would have been convenient to launch each set of projects after the culmination of the previous, due to delays to launch CESCAN I (2008-2010), the CAN team needed to start formulating CESCAN II after one year (2010-2014), and because there were still available resources of the MIP 2007-2013, INPANDES –approved in December 2012– started being formulated in 2013 (exploratory missions), before CESCAN II finished (PE68N3, PE68N4). Simultaneously, as SOCICAN (2007-2011) showed important results supporting 40 projects through competitive funding process, there was a strong desire to have a SOCICAN II (PE68N5). The CAN reengineering would start in 2013 and conclude in 2014, raising another issue to continue with cross-border projects from the CAN (**Chapter 5**).

Despite of the CAN reengineering, the availability of budget, the desire for a second SOCICAN, the expertise on cross-border integration projects, and the political will of the governments were the main triggers to continue with INPANDES until its culmination (PE69N1, BO42N1, PE68N6). Unlike previous projects, INPANDES had components from CESCAN I and CESCAN II (focus on CBI and CBVCs), and from SOCICAN (civil society participation in CBI) (PE68N7). **Although all interventions were not going to be completely cross-border, the main objective was to install capacities in the local actors so they could continue or generate new cross-border initiatives by themselves** (IN01N2).

IN01N2: *These projects were not going to be cross-border 100%, but they could be a good start that, in a long-term run, they could generate cross-border initiatives.*

Negotiation

As the CAN is not a discussion space but a decision making one, there was a need to bring all actors, especially chancelleries, to a common ground (BO42N2). There was a board between chancelleries (and other ministries) and the CAN as moderator to decide which projects to finance, with one or two meetings per year – not deciding meant waiting half a year more (BO42N3). At the beginning, there was not so much reception from national governments, especially from Colombia and Bolivia. In general, most were against to pay a counterparty of €100K (10% of project budget) per country – they preferred free full funding (BO42N4).

Second, as it was a funding for cross-border projects, Bolivia was not so supportive because they only had one Andean border – compared with Ecuador or Colombia, or Peru that has borders with all of them. In addition, Bolivia was concerned about the budget implementation – it had preference for tangible outcomes rather than consulting (BO42N5). And third, Colombian authorities were concerned about the destination of the money as it could go to NGOs that were not aligned to the governments' political interests (PE68N8). In the end, Colombia did not participate in INPANDES, but let the other countries to do it, and at local level, some Colombian actors were involved in cross-border interventions (IN02N2).

Facing those issues, the CAN team and chancelleries played a relevant role to achieve a common ground. First, in terms of the counterparty, while some countries as Peru were in favor, others as Bolivia did not want to pay it. As a solution, they transferred the payment responsibility to the executing agencies so national governments should not disburse that amount of money. In addition, the EU accepted that the counterparty could be paid in a non-monetary way (e.g., invested capacities, working hours, own technicians, etc.) rather than liquid cash (BO42N6, IN06N2). Second, the CAN team, supported by the chancelleries that wanted the project (especially Peru), negotiated, and brokered relationships with the other entities to achieve consensus in short time (BO42N7, BO42N8). Finally, despite the EU did not want a regional project without one country, they decided to continue the project due to the non-opposition of Colombia and the will of chancelleries (BO42N4).

Selection of Intervention Areas

Selecting where to implement INPANDES was part of the negotiation process to define the budget for each intervention, while following the EU funding guidelines. Throughout this process, the country members (chancelleries) had full ownership of the project as they negotiated until arriving to the final budget of each of the six interventions (BO42N9) – each of them had a different budget allocation. As a minimum requirement, each intervention needed to be at least between two countries (IN02N3).

The selection process was formal and informal simultaneously. From the formal side, as INPANDES was formulated and submitted by the CAN, the EU approved the project and realized a grant bidding process (competitive funding process) to determine the executing agencies and budget distribution per intervention (IN67N1). The final decision was under the EU Delegation and CAN Secretary considering both the political and technical demands in the competitive funding process (PE68N9). However, even before the contest, there were already established relationships with the possible executing agencies due to the previous projects of the CAN.

In some cases, as with the ALT, there was no need to compete because it was the only authority in the area (IN67N1, PE68N10, IN02N4). In addition, due to the time constraints, it was difficult to rely on external proposals with the expected professionalism and accuracy for the INPANDES interventions, so the CAN coordinated with the country members and supported the preparation of the required documentation (PE69N2, PE69N3). **Thus, in the practice, the bidding contest was a formalization of direct invitations** (BO42N10).

BO42N10: *[CAN representative:] There was no public tender due to the time constraints, but direct invitations. the team knew what was going to be financed and the CAN team prepared the required documentation for the EU.*

PE69N3: *[Chancellery representative:] The original idea was a competitive/bidding funding process, where any other institution could submit their proposal, but that was a very more complex process and that would not ensure the expected results. So, what we agreed with the EU was that the participating countries would define the projects that the executing agencies would do, and we would submit them as a project package to the CAN and EU.*

Each chancellery, in coordination with the prospective executing agencies, explored existing relationships with potential strategic partners (PE69N4). To define projects in the Peru-Bolivian border, Peruvian chancellery decided to design its projects based on already installed capacities by contacting previously established relationships (PE69N5). First, the Chancellery involved the ex-manager of the

Puno Amazonian Commonwealth, working at that moment in the Provincial Municipality of Sandia (MPS), as they implemented jointly a cross-border productive project in the CAN-AECID cooperation (PRA) (PE69N6). By the same time, Highlands & Jungle Exporter (SSE) was a very strong national agency that had expertise implementing value chain projects, and the National manager participated in previous CBI projects (PE69N7). Those contacts raised the importance of two traditional products of Puno region, the coffee and alpaca value chains, that even to this day, need more support (PE41N2). Moreover, both product's dynamics had some cross-border components such as the alpaca cross-border markets and the direct and indirect relationships of the CECOVASA coffee cooperative with Bolivian producers (BO42N11, IN01N3).

Based on the previously established relationships, the relevance of both products in Puno region, and the existence of certain cross-border dynamics with Bolivia, Peruvian Chancellery decided to propose the coffee and alpaca CBVC project and coordinated with Bolivia to jointly submit the proposal (PE69N7, BO42N12, PE69N8). In exchange, Peru accepted Bolivia's proposal for water resource management, while EU proposed the potato project (BO42N13, PE69N9). Thereby, as the coffee & alpaca CBVC intervention was more aligned with the Peruvian national and subnational interests, Peruvian participation was strong while Bolivian one was weak or inexistent (PE69N14, PE18N1). The cross-border component was also small, and the intervention would benefit more to Peruvian side, but as suggested from the beginning, the main idea was to incentive local actors to work cross-borderly (PE69N14, IN01N2).

By linking the ALT with the MPS and SSE, the latter two became the operating agencies and their technical teams made proposals to the ALT 'to be hired', following the EU funding guidelines, project requirements, and expected budget allocation (PE11N5, PE58N1, PE58N2). **Thereby, while the CAN created the opportunity, the governments arranged the mechanisms to make it viable** (NB04N1). For this project, the budget limitation (around €1M) was a constraint as the funding was going to be split between the coffee and alpaca component – previously decided between the Chancelleries (PE58N3). Finally, budget allocation was not equal but was achieved under consensus, and while the coffee & alpaca project received €900k (half for each component), the water management project got €1.54M, despite the lack of clarity of the cross-border nature of this latest intervention (PE68N11). The process would take a few more years of negotiation, planning and paperwork until early 2016 when the project started (BO42N14).

PE58N1: *From there, we made our proposal: we did not propose what we needed, but adequate to the political arrangements and assigned budget. […] €500k is not so much, SJDO in 3 years executes 5M Soles (~€1.4M), SPPP had projects of 3 to 4M Soles…. So, we focused on border producers.*

2.2.3. Description & Scope

The 'Integration, Inclusion and Innovation in Cross-Border Productive Chains of Coffee and South American Camelids with a Territorial Base in the Peru-Bolivia Border Integration Zone' project was finally subscribed the 14th of December 2015 under the DCI-ALA/2015/370-788 Grant Contract. The main objective was to contribute to the sustainable socioeconomic development and cross-border integration between the Andean countries through the strengthening of the organized participation of civil society and authorities.

These objectives translated in the strengthening of cross-border productive chains of coffee and camelid fiber (alpaca), with an approach (specific objectives) on 1) sustainable development (higher productivity in quantity and quality), 2) cross-border governance, and policies (cross-border productive integration), and 3) civil society participation (boost associativity). To develop the activities for the coffee and alpaca components, four intervention areas were selected, two for each component: For the coffee, the Amazon cross-border areas between CS1.A) San Pedro de Putina Punco (SPPP) and San Fermin, CS1.B) San Juan del Oro (SJDO) and Cocos Lanza. For the alpaca, the Andean cross-border areas of CS2.C) Cojata and Ulla Ulla, CS2.D) Palca and Charaña (**Figure 6.7**).

In the intervention areas, agriculture (including livestock) is the main economic activity for these rural producers (around 75% lives in rural areas) that belong to the lowest socioeconomic classes. More than two thirds of them live without basic water and energy services, and one third without basic sanitation. Their border condition affects their precariousness even more as the presence of the State is lower in terms of investments and programs, and the accessibility to their lands is very low (long distances, lack of roads, rugged geography, etc.). Low productivity, poor market access, and the low strategic skills of public officers keep these cross-border productive systems with low quantity and quality of production, at the mercy of middlemen that offer a very low price (SSE PUNO, 2017).

Coffee production in the selected areas has a relative low productivity, with 5 to 15 quintals per hectare in small farmlands (0.5 to 2 hectares per producer). Due to the coffee leaf rust or *roya amarilla*, production was even lower in all the region, and several producers lost all their crop. The Bolivian side is even more complex as, due to the lack of highways, the only available market is through Peru. Alpaca production is also very precarious, with less than 60 alpacas per producer in average, when an acceptable quality of life requires at least 120 alpacas. While producers oversee the alpaca breeding until shearing the fiber, most associations focus on collecting alpaca fiber to sell it even without classifying it (very low added value) (SSE PUNO, 2017).

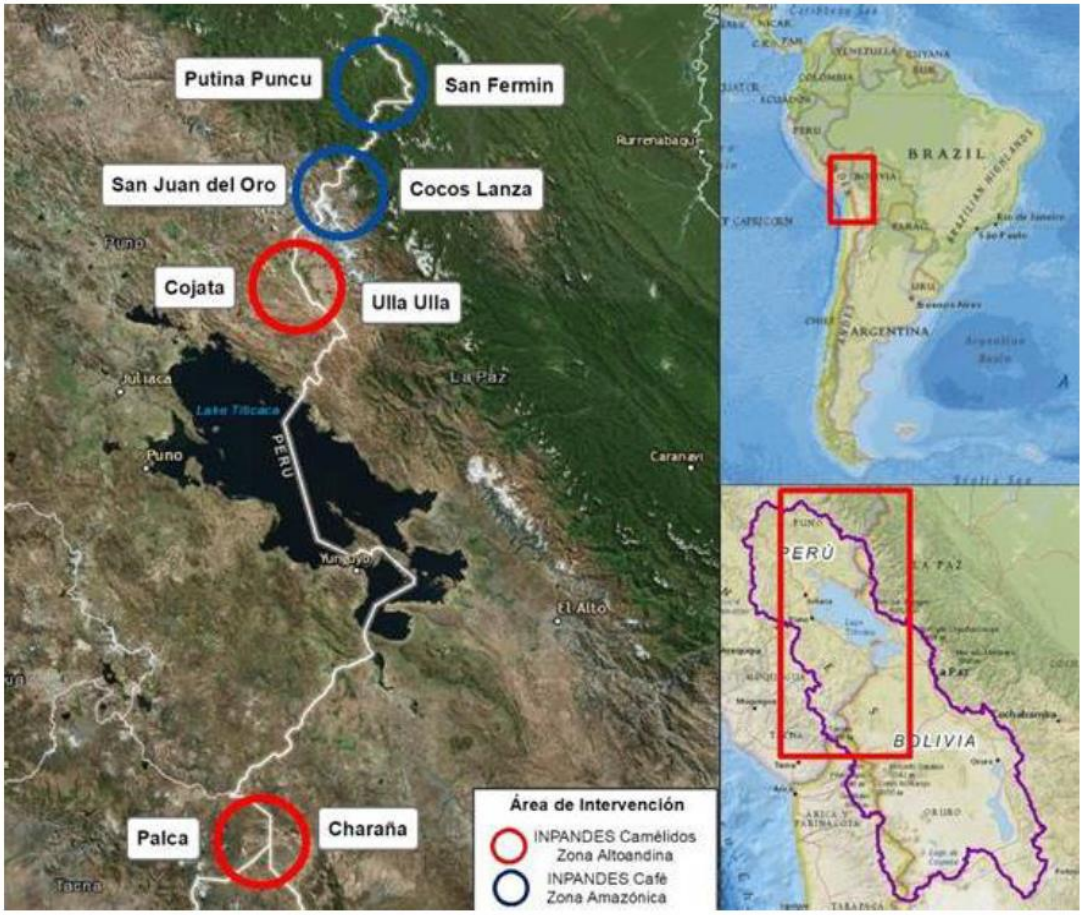


Figure 6.7. *INPANDES intervention areas for the coffee & alpaca CBVC (Comunidad Andina, 2019)*

As a solution, the project strives for technological innovation, cross-border productive systems, and associativity-driven economies of scale through a participatory process involving the border populations. The expected beneficiaries, as defined in the project proposal, were around 4900 in the four intervention areas and were divided in three groups or levels (SSE PUNO, 2017):

- Public officers from the Peruvian province municipality of Sandia the four Peruvian district municipalities of SPPP, SJDO, Cojata, and Palca, and the four Bolivian province municipalities of Iturralde, Franz Tamayo, Saavedra, and General JM Pando.
- Leaders, managers and technicians from producer associations and cooperatives (40 for coffee component and 40 for alpaca component)
- Producers in the intervention areas: 2400 coffee producers from SPPP, SJDO, Iturralde and Franz Tamayo, and 2400 alpaca producers from Cojata, Palca, Franz Tamayo, and General JM Pando.

Table 6.2. *Strategic Lines & Expected Outcomes of the coffee & alpaca CBVC (adapted from (SSE PUNO, 2017))*

#	Strategic Lines (SL)	Expected outcomes
1	Promote binational dialogue to harmonize intervention strategies and productive policies.	• Binational technical groups • Common cross-border productive vision • Program for integrating productive policies • Action plan (draft) for common development policies in the ZIF • Dialogue space to exchange productive knowledge
2	Strengthen public management capacities from local governance to foster a cross-border governance in the cross-border productive systems under a scheme of economies of scale and exchange.	• Agreement for public management with cross-border approach • Program for CBI & CBC between municipalities' development plans • Participation of producers in municipalities' development plans • Workshops for developing CBI & CBC municipal capacities • Animal/Vegetal health control center (production quality control) • Exchange of Good Case Practices
3	Strengthen cross-border social capital by fostering institutional cooperation, associativity, formalization, and strategic alliances.	• Formalization of producer associations and cooperatives • Transfer Peruvian cooperative model into Bolivian side • Plan for exchanging production-oriented organizational processes • Alliances between producers and private companies • Incentive Plan to promote economies of scale (fairs) • Process to facilitate financing to producer organizations • Program for business management training in producer orgs.
4	Develop mechanisms for transformation and value addition to reconnect value chain nodes by promoting cross-border productive complementarity.	• Technical assistance program for sustainable production • Gender-specific training program for value addition • Sustainable technical proposal for starting certification processes • Training program for extension technicians with CBI approach • Added-value program for product transformation (craft & roasting) • Technological innovation pilot centers in the ZIF
5	Promote joint commercialization strategies by developing product brands with border territorial identity to access international and national markets.	• Brand development with ZIF identity • Formalization of collecting centers • Support program for collection plans and business plans • Virtual platform for commercialization • Support for the preparation of letters of intent to purchase • Certifications for Good Practices and Fair Trade • Program for exchanging producers' experiences (fairs)

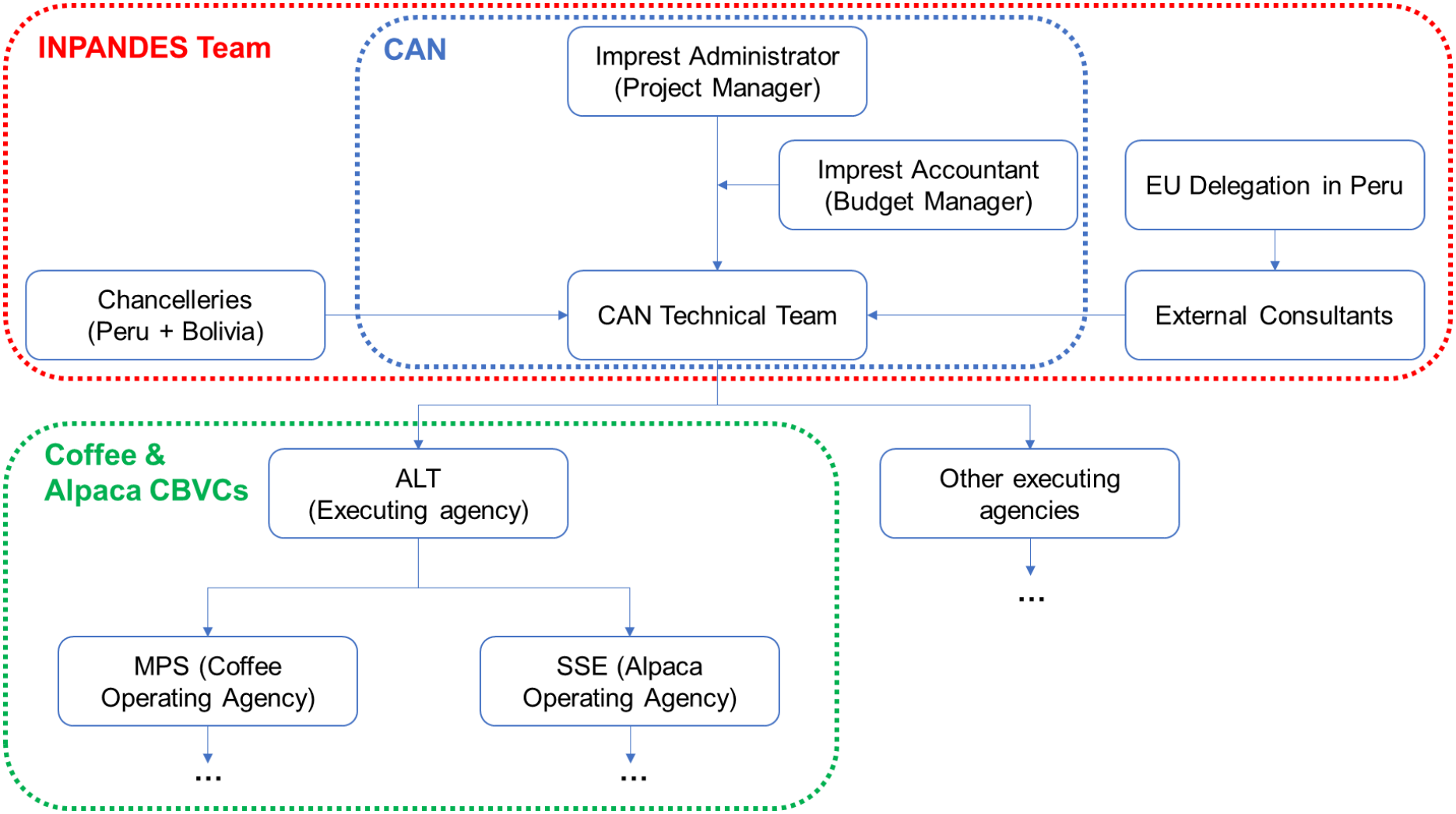


Figure 6.8. *INPANDES team structure for the six interventions (Author's elaboration)*

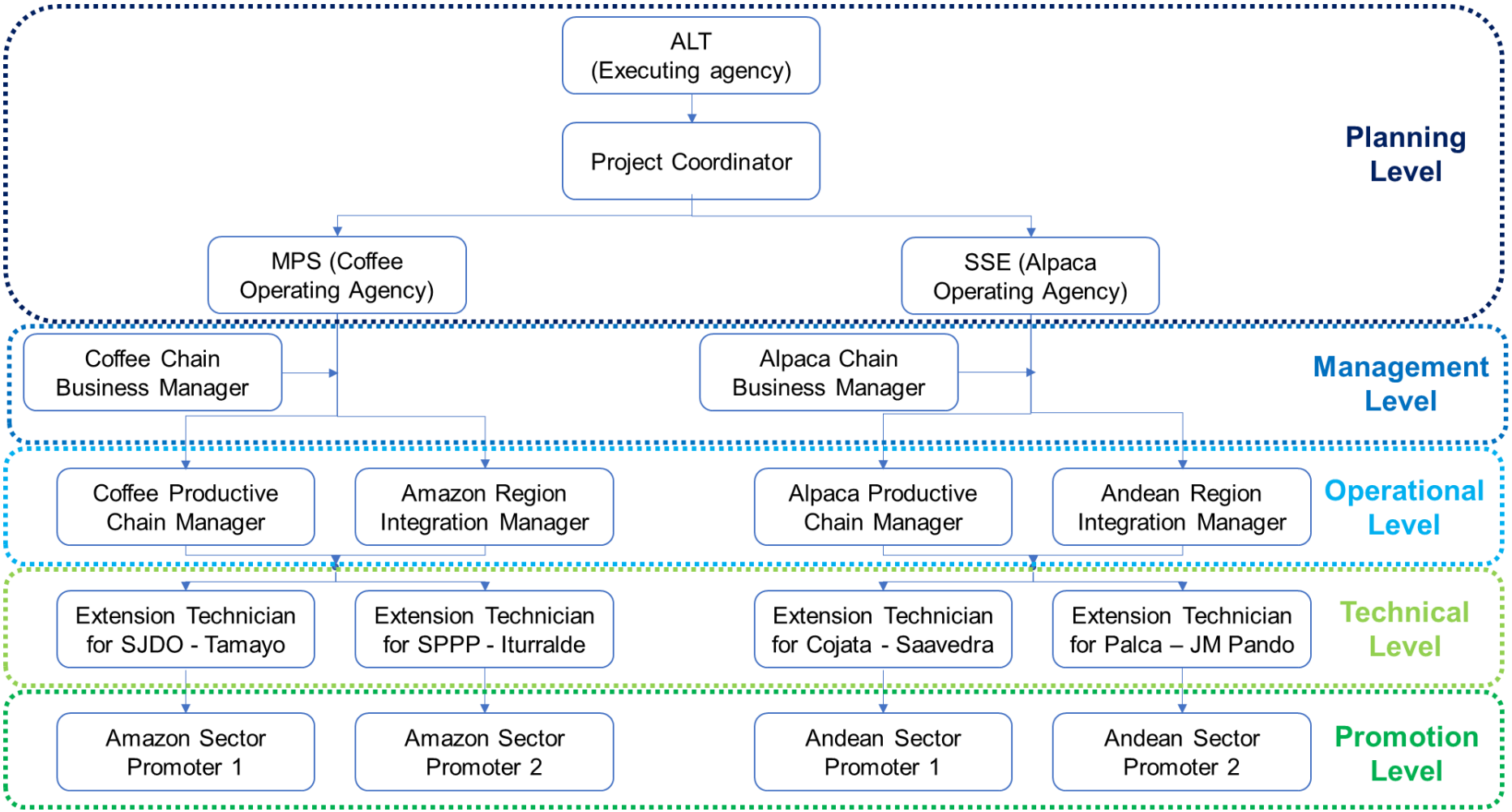


Figure 6.9. *INPANDES team structure for the coffee & alpaca CBVCs (Author's elaboration based on (SSE PUNO, 2017))*

To achieve the expected objectives, five strategic lines (SL) were selected for each component (**Table 6.2**), with similar activities for both CBVCs. In terms of the specific objectives, SL1 (binational dialogues) and SL2 (public management capacities) are oriented for cross-border governance, and policies (cross-border productive integration), SL3 (cross-border social capital) strives for civil society participation (boost associativity), and SL3, SL4 (transformation & value addition), and SL5 (commercialization) focus on sustainable development (higher productivity in quantity and quality).

The executing agency worked jointly with both operating agencies for the Andean and the Amazon intervention areas (**Figure 6.8** and **Figure 6.9**). The project coordinator reported to the ALT the progress from both components and each of them hired one professional per specific objective to fulfill (Productive Manager, Integration Manager, and Business Manager). The operational activities were executed by extension technicians and promoters (one technician and one promoter for each intervention area).

2.2.4. Implementation & Management (2016 – 2017/8)

This section describes the governance of the INPANDES project and how it particularly affected the implementation of the coffee & alpaca CBVC intervention. The most relevant actors, procedures and dynamics are highlighted.

Project Governance Model (Organization & Procedures) at High Level

The INPANDES project had a total duration of 2 years and 3 months, starting from 15th of December 2015 to 14th of March 2018 (the last three months were for administrative paperwork) (PE11N6) (Comunidad Andina, 2019). It was developed under the EU's 'program budget' modality rather than the annual operative plan (POA). The program budget approach can have more duration than a POA, but at the same time, it establishes a defined budget for the whole program (IN02N5). This administrative framework designates two responsible for the project: the imprest administrator (*administrador de anticipos*) or project manager, and the imprest accountant (*contable de anticipos*) or budget manager – both from the CAN team. The former oversees the technical components of the project (e.g., progress, goals, execution, etc.), and the latter presides over the administrative-financial components (e.g., files, billing, administrative procedures, etc.) (IN67N2). The imprest accountant could not do anything without the imprest administrator's technical report, and to change any of them, as it is considered a legal matter, a contract addendum was required (IN67N3).

The EU and the CAN took the role of facilitators and the success of the INPANDES projected depended on the success of each intervention (IN67N4). Thus, the CAN team monitored and supported each executing agency and the progress of their projects, since each of them was autonomous in the design, decision making, and execution (IN02N6, IN67N5). The EU, as the technical and financial partner, directly transferred the money to the executing agencies and monitored and supported the project too, mainly through their hired consultants (external firm) (IN05N14). In addition, the chancelleries had the role to monitor and support to solve any inconvenient during the project execution (PE69N10). These three groups of stakeholders would shape the INPANDES team that monitored and supported each of the interventions (**Figure 6.8**).

Due to the binational authority of the ALT in the cross-border region, this agency took two of the six interventions: the coffee & alpaca project, and the water resource management project. The ALT received the funding from the EU and managed and allocated these resources to its operating agencies, the MPS and SSE (PE69N11). The operating agencies could administrate its budget (e.g., hire personnel, small purchases, etc.), but depended economically on the ALT (PE26N1). As the budget executor, the ALT supervised the money, progress, or purchases of the operating agencies' executions, and reported them to the EU, CAN, and embassies (PE41N3, IN06N3, PE41N4). The ALT and operating agencies also established partnerships, and in the case of the coffee & alpaca project, they strengthened relations with the CECOALP and CECOVASA, two important cooperative centrals or 'champions' in Puno region: CECOALP was a very recognizable social enterprise, and CECOVASA has been the cradle of world coffee champions (LB04N1).

While disbursement from the executing agency to the operational ones was fast and based on the accountability of bills, the EU disbursement was a more complex process. The EU administrative framework operated under two disbursements: a first one of 50% of the total budget, and a second one of 40%, applicable after expending 70% of the former. The 10% left was used as guarantee (PE68N12). Prior to each disbursement, the EU did operational and financial evaluations to measure the progress (IN02N7). After one year of each disbursement, the executing agency needed to submit a progress report, and an expense verification report (IN02N8). In addition, under a Result-Oriented Monitoring (ROM) methodology (external monitoring consulting), the EU conducted a middle-term and a final evaluation to evaluate the efficacy of the project according to specific EU criteria (budget, impact, and sustainability) (IN67N6, IN02N9, IN67N7). As the EU administrative framework and formalities were very strict and demanding – even for the CAN team (IN02N10), the EU consultant played a role to support and monitor not only the interventions (e.g., field visits, technical solutions) but also the administrative procedures (e.g., project verification, documentation) (IN02N11, IN05N15, IN67N8).

Limitations & Problem-Solving

From the design to the end of the project, INPANDES had several limitations, some of them that could be solved due to their capacities and synergies, and others that would have an impact on the outcomes. Five main limitations can be identified in terms of the broad project scope, the limited capacities and articulation of institutions, the project team's setbacks, funding constraints, and uncertain sustainability.

- **Broad Project Scope**

INPANDES was a very ambitious project from the beginning: to complete six binational interventions within a communitarian framework that was falling apart, in two years (PE69N13). Executing binational processes after the reengineering, and even without one country in some intervention areas (as Colombia did not participated), was very complex as each demanded a plethora of stakeholders from the government, private sector, and civil society (IN01N4, IN05N16, BO42N15).

In addition, INPANDES had a 'dual nature': it was an integration project, and a value chain project simultaneously. Working in cross-border project is challenging by itself as it requires to reconcile and articulate two different local realities under their own institutions (PE57N1, PE68N13). At the same time each value chain is a different product reality with their own global dynamics (PE68N14). Doing six interventions in border areas required to several long trips to areas with difficult accessibility. The lack of local coordinators, the position of the stakeholders (CAN and EU in Lima, ALT in La Paz, and the intervention area 9 hours from Puno), the location of supervisors or consultants (traveling to Peru from abroad on each monitoring visit), and the price of international flights increased the cost of conducting a project of this nature (PE68N15, PE68N16, IN67N9).

PE69N13: *They [the results] were pretty good although we could not achieve all goals that we expected… maybe it was too ambitious, new operational scheme, limited timeline…*

PE68N16: *In the PEDICP project, to arrive to Caballococha (Peru), it was easier to go first to Bogota, then going to the border and get on a boat… It was better than doing the trip from Lima to Iquitos and then an eight-hours trip by fast boat. With the money to go to Iquitos… it was cheaper to go to Spain.*

- **Limited Institutional Articulation & Knowledge**

The assembling of stakeholders, putting them all together to work, was mainly driven by political interests (coffee and alpaca in Puno), established relationships (as the MPS and SSE), and institutional jurisdiction (binational territory of the ALT), and not exactly due to their synergies, capacities, and knowledge. The ALT, oriented to IWRM systems, did not have previous knowledge on productive value chains or cross-border cooperation (IN06N4). It was also the first time that the ALT was going to work with the MPS and the SSE, two institutions from a different nature (a province municipality and a national agency) with low or inexistent experience on cross-border articulation (PE69N11). In addition, the operating agencies started working after the initial planning phase and the budget was already assigned (and was not adjustable) (PE18N2, PE41N5, PE58N1), limiting how they should operate in their respective areas. Reporting was also a one-way flow: executing and operation agencies reported to the INPANDES team but there was no formal feedback to improve operations (PE41N6).

Another concern was about the articulation with civil society: while the INPANDES team could articulate with public entities, cooperatives, and to some extent with producers, there were not spaces to connect with civil society – despite the CAN has high-level civil society groups (PE68N13). There was some horizontal articulation between cross-border actors, but not vertical one such as technical groups or ad hoc groups with civil society participation (PE68N17). The INPANDES team hired a consulting study on this issue, and the outcome was the proposal for an Andean Platform for Cross-Border Cooperation (PACTF), the idea of a permanent coordination with cross-border populations did not overcome the paperwork – CBI was not part of the CAN's functions (ARFE, 2017). **Thereby, the project assimilated more to a top-down delivery rather than a multilevel articulation.**

PE68N17: *Who knows more the border than a person that lives there? They should participate in their own projects (e.g., regional or cross-border roaming, crossing, etc.) […] There was a local articulation (between local CB actors) but not vertical articulation (e.g., no Cross-border technical group/civil society ad hoc).*

- **Project Team's Setbacks**

INPANDES team was not exempt of setbacks and struggles in terms of knowledge gaps, team conflicts, change of personnel, and more. Apart from the learning curve that represented to work under the strict requirements of the EU administrative framework (BO42N16), there were issues with specific team members and leaders (IN67N10, IN67N11, IN06N7, IN06N8), or changes of personnel (the ALT representative and both imprest manager and accountant) (IN67N12) that brought delays and other logistic constraints that forced the project time to increase (IN06N5, PE41N7). Counterintuitively, the changes of personnel impacted positively as the substitutions fit better in the team (IN06N6, IN67N13).

Transition and continuity were not a problem due to the experience of the CAN technical team (PE69N12, IN67N14), and the relationships established between officers of the CAN, EU Delegation, and Peruvian Chancellery that improved the efficacy towards supporting the executing and operating agencies (PE68N18, PE68N19).

- **Context-relevant project & EU funding constraints**

Although the EU funding represented a great opportunity – and one of the main catalysts for all cross-border projects in the Andean Community, it also brought some limitations with the complexity and rigidity of the administrative framework, making very difficult to ask for time extensions or budget increase (IN05N19, IN05N20). In addition, the project also needed to follow the EU cooperation goals: 1) promote local development by increasing productivity and achieve EU market standards, 2) promote economic and social cohesion through cross-border integration, 3) support European businesses with knowledge on Latin American and EU market (IN05N17). Thereby, the main goal of the project was to improve productivity, but not commercialization as a market-oriented project would require other EU project standards (IN05N18, PE21N1). As the present analysis will indicate later, approaching CBVCs by considering only productive stages is not effective if the problems are in achieving access to markets. Other limitation was the EU Rules of Origin: any purchase of supplies or equipment was only possible with countries that have agreements with EU. Thus, buying equipment such as motorbikes from Japan or China at cheaper price was not possible, reducing the flexibility of executing and operating agencies to reduce costs (BO42N17, PE41N8).

- **Uncertain Sustainability**

The continuity of the project outcomes, one of the main goals of INPANDES, was very uncertain. The project expected to foster new initiatives based on the achieved results and installed capacities on the executing agencies, operating ones, and local governments. However, most executing and operating agencies, they cannot continue cross-border initiatives as public entities cannot invest in other country and as in the case of the ALT, it is not under its legal responsibilities (IN02N12, IN02N13, IN05N21). In addition, local governments did not continue with the cross-border alliances or achieved progresses due to the political changes in local governments, the COVID-19 pandemic, and the preference for fast results over productive projects (PE26N2, PE22N1, PE18N3). As it will be pointed later, the project outcomes were not enough to sustain long-term cross-border initiatives due to the lack of market access, the presence of trade barriers, and more (IN01N5). Moreover, no follow-up activities were carried out after the final evaluation (IN02N14), and the consultancies did not materialize in the intervention areas (BO42N18).

IN01N5: *[former CAN officer:] I don't know what happened after the project finished. We gave them all required tools, but they needed more support to make it sustainable, especially in relation to international trade.*

2.2.5. Evaluation & Appraisal

This section divides the analysis and evaluation in three parts: First, it starts with a review of the project scope and its main outcomes. While this is not going to give a detailed explanation of each strategic line and actions (more information are in the final report), it is going to highlight the most relevant activities and outcomes. Second, this is followed by a review on the project expenses to identify financial limitations in the execution of the activities. Finally, based on the stakeholders' interviews, the project is evaluated in a qualitative perspective in three lines of analysis: general satisfaction, promotion of local development, and facilitation of market access. More specific details on how the project impacted both cross-border value chains in their respective contexts are detailed in the case study.

Project Review & Outcomes

The final report indicated summarizes several specifications of the interventions in both coffee and alpaca component. Firstly, it reveals a better description of the zones that benefited from the project (**Table 6.3** and **Table 6.4**).

For the coffee case, it is clear the predominance of intervention areas from the Peruvian side (15 areas), most of them located in San Pedro de Putina Punco (SPPP). This makes sense as the border of San Juan del Oro (SJDO) does not have any Bolivian community by the other side as described in **Figure 6.7** (that was also included in the final report) (PE26N4). Both Bolivian communities of Cocos Lanza and Puerto San Fermin have direct contact with SPPP and its through its highways the only way to access to Peruvian goods and services. In other words, the initial proposal describes cross-border areas that exactly does not contain cross-border dynamics, especially the intervention area of SJDO – Cocos Lanza. Thus, SJDO could be considered as a border area, but not part of a cross-border area without depending on SPPP.

Table 6.3. *Intervention areas of the Coffee Component (Comunidad Andina, 2019)*

Country	Community/Sector	
Perú	San Juan del Oro	Charubamba
		Lucine
		Chuquiri
		Rio Blanco
		Uycusmayo
	San Pedro de Putina Punco	Urubamba
		San Roman
		San Lorenzo Palmenari
		Miraflores Lanza
		Rio Dulce
		Centro Miraflores
		Nueva Alianza
		Alto Miraflores
		Villa Rica
		Pauji Playa
Bolivia	Apolo	Cocos Lanza
		Puerto San Fermin

Table 6.4. *Intervention areas of the Alpaca Component (Comunidad Andina, 2019)*

ZIF	Country	District	Community/Sector
ZIF Cojata-Pelechuco	Perú	Cojata	Mallcunuta
			Pulla Pullani
			Bellapampa
			Koricancha
			Chajana
			Tomapirhua
			Umabamba
			Huancasaya
			Kantati Ururi
			Tarucani
	Bolivia	Pelechuco	Ulla Ulla
ZIF Palca-Charaña	Perú	Palca	Tripartito
			Cueva
			Ancomarca
			Sencca
			Hospicio
			Río Kaño
	Bolivia	Charaña	Charaña

Another discrepancy between the proposal and the final report was the inclusion of the Bolivian province of Iturralde that, although it limits with Peru, it does not have communities that participate in cross-border coffee dynamics. The capital of Franz Tamayo Province is Apolo city, and it participated in the project events representing its communities of San Fermin and Cocos Lanza, despite there is no access between both towns and the province capital. Both communities are the only Bolivian settlements located in that border section (Pata Canton in Apolo Municipality) (Tarqui Clavel, 2008).

PE26N4: *An initial problem was to decide where to execute. At the beginning, we thought it was all SPPP, but then we got that it was at border level. In addition, SJDO was not included at the beginning but as it also has border, it was included –although there are not communities by the other side. It was politically decided.*

The alpaca case also contains similar irregularities. First, only two of the eighteen selected sectors are from Bolivia (one community per intervention area). Unlike the coffee case, there are other Bolivian communities either in Pelechuco (Ucha Ucha Alto, Ucha Ucha Bajo, Rio Suches, etc.), or in Charaña (Tripartito, Sarcota, Zona Chuquiota, etc.) that even have cross-border dynamics such as binational markets (GAM Charaña, 2003; Charca Yanaca and Cuentas Cusi, 2005; GAM Pelechuco, 2017, p. 147). Some of them were included in some events or in the consulting studies, but not listed as beneficiaries in the report (Paxi Coaquira, 2018; Comunidad Andina, 2019, p. 41). The other issue to highlight is the consideration of Bolivian Provinces that did not participate. In the Cojata – Pelechuco ZIF, Ulla Ulla does not belong to Saavedra Province but to Franz Tamayo Province. In the other ZIF, Charaña does not belong to General JM Pando but to Pacajes Province. However, the infield work and activities were directly realized with the Bolivian municipalities.

The discrepancies in both coffee and alpaca intervention areas might imply little geographic precision (driven by the incentive to magnify the impact of the project) or plan adjustments (reducing the scope of intervention). In any of those cases, for each Bolivian community, seven to eight Peruvian communities were benefited from the project. The credibility of the final report is compromised until certain point, so its lecture might be more referential rather than a faithful reproduction of the reality of project outcomes.

In terms of the number of total beneficiaries, the project memory indicates that 2464 coffee producers and 2470 alpaca producers, with a similar distribution of Peruvian and Bolivian producers (between 40% to 60% in both components) (**Table 6.5**).

According to Bolivian National Census (2012), the population of San Fermin and Cocos Lanza is 224 and 123 inhabitants respectively (INE, 2013). This number is far behind from the 960 producers that are reported, even considering that all population are coffee producers. The same case happens in Ulla Ulla with 95 inhabitants, which is well below the 900 producers from Franz Tamayo and Saavedra (the respective intervention area). This indicates that the numbers have been enlarged, either for

justifying the actions in these areas, or multiply the times that the project have supported one producer. As happened with the previous analysis, these numbers should be taken as a reference rather than an objective outcome.

Table 6.5. *Total of beneficiaries reported by INPANDES (Comunidad Andina, 2018b)*

Country	District	Producers	Municipal Officers	Municipal Technicians	Assoc/Coop leaders	Assoc/Coop Technicians	Total Direct beneficiaries	
Coffee Component								
Peru	SJDO	720	3	3	4	8	738	1476 (60%)
	SPPP	720	3	3	4	8	738	
Bolivia	F. Tamayo	480	2	2	4	6	494	988 (40%)
	Iturralde	480	2	2	4	6	494	
Coffee Total		**2400**	**10**	**10**	**16**	**28**	**2464**	
Alpaca Component								
Peru	Cojata	780	3	3	4	6	796	1232 (50%)
	Palca	420	3	3	4	6	436	
Bolivia	F. Tamayo	600	2	2	4	6	614	1238 (50%)
	Saavedra	300	2	2	4	4	312	
	JM Pando	300	2	2	4	4	312	
Alpaca Total		**2400**	**12**	**12**	**20**	**26**	**2470**	
INPANDES Coffee & Alpaca CBVCs								
Peru Total		2640	12	12	16	28	2708 (55%)	
Bolivia Total		2160	10	10	20	26	2226 (45%)	
Total		**4800**	**22**	**22**	**36**	**54**	**4934**	

In terms of the strategic lines and executed actions, all planned activities were executed between March 2016 and December 2017 (the project was extended until March 2018 for administrative procedures). Most activities needed the participation of stakeholders from both sides. In terms of the immediate results after the project closed, **Table 6.6** and **Table 6.7** offer a summary of the main achievements and setbacks identified in the final report. As the credibility of the report might be compromised, its information should serve as reference, but for the respective analyses, it should be contrasted and validated with the in-field collected information. The cases studies will deepen on how these activities impacted on the intervention areas and if they were able to achieve sustainable economic development at cross-border local level (or why not).

Table 6.6. *Achievements and Setbacks from the project implementation in the coffee component (adapted from (Comunidad Andina, 2019))*

Coffee	Achievements	Setbacks
1.Binational Dialogue	-Stakeholders mix in binational technical groups: producers, cooperatives, regulatory agencies, local municipalities, etc. -Incorporating the technical groups' outputs to municipal plans, productive vision, and policies. -Updating the concerted development plans of SPPP, SJDO, and Sandia to incorporate coffee production goals.	-Geographic dispersion: Sandia and Apolo are far from the border area (6 hours, 2 days), hindering meetings in Sandia. -Unilateral agreements: The cross-border productive vision and policies were only incorporated in Peruvian municipalities (Sandia and SJDO). -No interest from local authorities for integrating productive policies.
2.Public Management Capacities	-Stakeholders mix for updating the concerted development plans: cooperative leaders, municipal officers, producers, etc. -Installation of Vegetal health control center in SJDO. -Training visits for municipal officers in La Paz and Caranavi.	-Difficulty in bringing together municipal officials and producers for the elaboration of a Cross-Border Policy Agreement. No elaboration due to time, geographical dispersion. -No implementation of a CBI&CBC plan for coffee development between municipalities.
3.Cross-Border Social Capital	-Promoting higher associativity in APOCOM under CECOVASA model (90% satisfaction). -Quality & Volume contest between 1st-level cooperatives. -Credit facilitation for Peruvian producers (39/63) through Agrobanco. -Institutional alliances between CECOVASA-JNC and APOCOM-FECAFEB (starting process). -Business management training for associates from CECOVASA and APOCOM.	-Partial incorporation of organizational change measures in APOCOM due to low operative/organizational capacities. -No financial entity in Bolivian side to support producers. -No roads that connect APOCOM with FECAFEB.
4. Transformation & Value addition	-Execution of 1513 personalized training sessions (seven types of training) and 16 workshops on sustainable coffee production under productive calendar, organic coffee, and national regulations & standards. -Delivery of educational material. -Training coffee taster ladies (15 Bolivian, 5 Peruvian). -Training technical extension promoters (17 Peruvian, 3 Bolivian). -Purchase of 25kg industrial roaster machine for CECOVASA. -Tech Innovation Centers (equipment, nurseries, infrastructure, collecting centers, etc.) in some areas of SPPP, SJDO, San Fermin, or Cocos Lanza.	-Technical assistance executed since 2017 (last year) for 135 Peruvian producers and 14 Bolivian producers. -Low participation per workshop (avg.: 16 producer/wksp). -Few workshops for training coffee tasters. -The APOCOM did not accomplish with the minimum standards to start an international certification process for validating organic coffee.
5. Commercialization	-Brand development of 'Frontera Coffee Peru-Bolivia' and registration in INDECOPI (Peru). -Letter of Intention to Purchase from Kaffee Siddhartha (German company) for 500 quintals of parchment coffee, and 500 quintals of green coffee (achieved by CECOVASA during the project). -Installing 6 collecting centers (4 SPPP, 1 SJDO, 1 San Fermin) and their business & collecting plan. -Design of a Good Practices program for Bolivia. -Training visit in Colombia (7 Sandia technicians, 1 APOCOM , 2 CECOVASA). -Participation in two national and two local fairs.	-The Frontera Coffee was not registered by Bolivian side. -No collecting center for Cocos Lanza (only one for both and located in Puerto San Fermin). -The producers did not fulfill the minimum standards to start a Fair-Trade certification process. -No developing virtual platform and weak social media.

Table 6.7. *Achievements and Setbacks from the project implementation in the alpaca component (adapted from (Comunidad Andina, 2019))*

Alpaca	Achievements	Setbacks
1.Binational Dialogue	-Stakeholders mix in binational technical groups: producers, cooperatives, regulatory agencies, local municipalities, etc. -Incorporating the technical groups' outputs to municipal plans, productive vision, and policies in both ZIFs. -Groups for sharing productive experiences for technological innovation and knowledge transfer.	-The cross-border productive vision was inserted in the Municipal Development Plan of Cojata (Pelecucho, Palca, Ulla Ulla in review). -Concerted Development Plans should be validated by the next municipal administration. -The experience sharing groups highlighted the need of tangible guidelines to shape cross-border policy agreements.
2.Public Management Capacities	-Development of guidelines for a Cross-Border Policy Agreement. -Formulation of four programs for CBI &CBC that were inserted in the concerted development plans of Palca and Pelechuco to promote econ dev, env. protection, connectivity, and cooperation. -Stakeholders mix for updating the concerted development plans: cooperative leaders, municipal officers, producers, etc. -Installation of animal health surveillance centers in both ZIFs (supported with constructions materials by municipalities, and workforce from producers in both cases). -Exchange of experiences between municipal officers in each ZIF.	- Difficulty in bringing together municipal officials and producers for the elaboration of a Cross-Border Policy Agreement. -The CBI &CBC programs for Cojata and Charaña should be validated by next municipal administration (should be supervised by the ALT).
3.Cross-Border Social Capital	-Formalization of one alpaca association (Cojata). -Promoting cooperative model to Bolivian producers under CECOALP model (90% satisfaction). -Stakeholder mix (university, municipality, regional and national agencies, NGO, etc.) to design Work Plan for improving associativity & organizational processes. -Improving collecting volume in both ZIFs (405qq & 119qq respectively) and selling directly to private companies, leading to a price increase of 12%. -Quality & Volume contests between cooperatives in each ZIF. -Credit facilitation through Agrobanco for two Peruvian associations (1 Cojata, 1 Palca, S/.10k for collecting). -Business management training for producers. Support from Palca municipality in accountability to three organizations.	-Only 1/4 associations could formalized (one in progress, two rejected). All were Peruvian. -Low or inexistent level of associativity in Bolivian side (resistance to Peruvian cooperative model). -No financial entity in Bolivian side to support producers.
4.Transformation & Value addition	-Execution of 2921 personalized training sessions (nine types of training) and 75 workshops on sustainable alpaca production under productive calendar, Andean knowledge, and national regulations & standards. -Technical assistance executed since March 2016 to December 2017 (both years). -Delivery of educational material -Several activities to improve alpaca fiber quality, leading to a fiber increase of 12.5% (4lb to 4.5lb) per alpaca (approx. +S/.7). -Training alpaca sorter ladies (27Aspirants, 8 Juniors) -Training 38 technical extension promoters (23 Cojata-Pelechuco, 15 Palca-Charaña) -Inaugurate two Artisan Centers for the manufacture of garments and fiber crafts (each ZIF) to support seven craft associations (5 Peruvian, 2 Bolivian). -Tech Innovation Centers (genetic improvement, animal health, nutrition, equipment, etc.) for six associations in Cojata, Palca, Ulla Ulla, and Charaña. -Installation of 50kg/h washing & drying machine in CECOALP.	-Participation per workshop: avg.: 20 producer/wksp -Low retention for alpaca sorter program (50% women quitted) -Two to four workshops for training alpaca sorters -Weak organization level of cooperatives undermined the proposal for international certification for validating fiber quality. Education on NTP. -Four or Five sessions for training technical extension promoters.
5. Commercialization	-Brand development of 'CECOALP Collection' and registration in INDECOPI (Peru). -Formalization of two collecting centers (2 Palca) and their business & collecting plan. Elaboration of two other plans. Other collecting centers received equipment and supplies. -Design of a Fair-Trade program for CECOALP. -Training visit in Argentina (4 Cojata-Pelechuco, 3 Palca-Charaña). -Participation in two national training visits, two national and two local fairs.	-No branding progress by Bolivian side. -No formalized collecting center for Cojata-Pelechuco. -No developing virtual platform and weak social media. -Letter of Intention to transform fiber with CLAMASAC SAC (Peru), YACANA and COPROCA (both Bolivia) did not progress. -Letter of Intention to purchase fiber with COPECAN (Peru), YACANA and COPROCA (both Bolivia) did not progress.

Both components executed similar activities within the same strategic lines, although its implementation varied because they were executed under different team with low or inexistent contact between them (to facilitate cross-learning), and their results also depended on the specific characteristics of the intervention area in terms of its institutions, geography, product development, etc. In the case of coffee, it could be considered that it was a single case area (the productive system of Puerto San Fermin – Cocos Lanza – SPPP – SJDO) (CS1), while for the alpaca there were two considered as small ZIFs by the project: the ZIF Cojata-Pelechuco (CS2), and the ZIF Palca-Charaña (CS3). Both sites were separated by 500 km, representing a higher logistic challenge.

In terms of 'SL1: binational dialogue', there was a variety of stakeholders from national agencies to producers that participated in creating and integrated vision and policies of local development and product development, both organized from a binational/ cross-border approach. The establishment of binational technical tables was the main mechanism to achieve dialogue and consensus. However, its incorporation in the concerted municipal plans was very low, only achieved by the Peruvian side in coffee municipalities (due to the geographical distance), and in one alpaca municipality. In both cases, no interest from public authorities (CS1) or the experience sharing groups (CS2, CS3) revealed little motivation or the need for more previous work to shape cross-border policy agreements (binding agreement between municipalities).

The 'SL2: public management capacities' was oriented to public officers and their municipal functions for productive development. Based on the binational technical groups, public officers started developing a Cross-Border Policy Agreement, although low progress was achieved in the coffee case, and there were some general guidelines in the alpaca one. This agreement was the basis for a CBI & CBC program for the municipalities of Cojata (CS2) and Pelechuco (CS3), so there was not mutual agreement in any case – in the coffee case there was no implementation at all. The project also installed animal and vegetal health control center in each intervention area to support municipal control functions. Finally, while there were exchange experiences between officers from the alpaca municipalities, in the coffee case, they did internships in the coffee production areas of Bolivia.

For the 'SL3: cross-border social capital', as Peruvian cooperatives' institutionality is higher than in Bolivia –in terms of organization, administrative capacities, collecting volume, access to partners, and more, the idea was to formalize (in the alpaca case) and replicate the Peruvian model of CECOVASA and CECOALP with Bolivian producers. However, in the alpaca component, there was still great resistance from Bolivian producers to group themselves, and in the coffee case, the APOCOM did not have the required capacities for technological/organizational/administrative transfer. Business management training was given to cooperative leaders to improve their capacities. In the alpaca cases, municipalities involved as teaching partners.

A second point in the agenda was to increase quantity and quality in cooperatives through promoting joint collection (more volume), contests (reward quality), and facilitating credits (more volume). Increasing volume was an interesting experience in the alpaca case as it showed tangible outcomes that impacted in the producers' profits. Credit facilitation was only possible with Peruvian producers and organizations in the alpaca and coffee as no Bolivian financial agency participated.

The 'SL4: transformation & value addition' referred to the technical assistance, formation of technicians, and provision of productive infrastructure, equipment, and supplies. In terms of training sessions and workshops, the alpaca component showed better results in quantity (also because they needed to do it for two miniZIFs) and participation of producers. In addition, technical assistance in the coffee case started in the second year, limiting their intervention. Training ladies for quality control (coffee tasters and alpaca sorters) and technical extension promoters to supervise production were two interesting benefits of the project, although it is questionable how much expertise they got with few sessions.

In third place, the construction of technological innovation centers would represent not only the provision of productive infrastructure or equipment, but the R&D component of the project: in the alpaca cases, a small program for genetic improvement was included as a long-term strategy to increase fiber quality. The alpaca cases also included the installation of two Artisan Centers for the manufacture of garments and fiber crafts, that target the last part of the fiber value chain and help women (as they are the main actors in that stage). Finally, the most expensive contribution would be the washing & drying machine for CECOALP, and the 25kg roasting machine for CECOVASA, both oriented to move downstream in the value chain (transformation).

The 'SL5: commercialization' strategic line focused on branding, certification, and marketing channels (social media, fairs, direct sales). There is a clear benefit for CECOVASA in the three aspects as the Frontera Coffee could be commercialized to a German company. However, while both coffee and alpaca brands were registered in Peru, this was not possible in Bolivia, so both were not legally binational. Strategies for selling alpaca fiber in the two ZIFs did not have success as the letters of intent (to sell or transform fiber) did not progress. A positive result would have embedded the cross-border productive system into Bolivian fiber industry and its international buyers.

Summarizing by specific objective, in relation to the cross-border integration actions (SL1 and SL2), although there was participation from several stakeholders and a conversation started in each area, it is quite probable that there was not enough social capital and weak motivation to institutionalize a common cross-border region to achieve joint policies for local development and productive development. However, the alpaca cases showed more results than the coffee one, mainly attributed to the geographical distance between the areas that they wanted to integrate (Sandia, Apolo, and border communities). For boosting associativity (SL3), the idea of transferring the Peruvian model to Bolivia

was very radical an ineffective as there were several other steps to achieve before trying to replicate the institutional framework of two cooperatives with 25 to 50 years of experience.

Most efforts and budget went for reaching a higher productivity in quantity and quality as the project focused on cooperative-based volume (SL3), transformation (SL4), and commercialization (SL5). Measures to increase quantity (joint collecting, and credit facilitation) and quality (contests) with cooperatives had evident results as they could sell to businesses directly with a better price, generating more profits. However, due to the access of funding, Peruvian side was more benefited, especially alpaca organizations. According to the data, technical assistance favored in higher degree to alpaca producers from both sides, while for the coffee case, Bolivian producers benefited from selling their product to CECOVASA (Peruvian ones were already doing that).

Although the alpaca cases showed better productivity increase, it was the coffee one that achieved the best results. As CECOVASA already had several market channels (brands differentiated by coffee sector, international clients, worldwide coffee winners, etc.), it developed the Frontera Coffee brand and sold it internationally in short time. The other involved producer organizations (APOCOM, CECOALP, and other alpaca organizations) struggled starting with certification processes, finding potential buyers, or even formalizing their collecting centers.

The difficulties implementing several of the initiatives reveal first, the short time that the project wanted to implement sustainable measures and second, the presence of several connectedness voids, many of them interconnected between them. In relation to the former, strengthening cross-border social capital is a process that take more than just some discussion spaces, but cycles of shared experiences that shape stronger relationships across borders, generating more motivation to cooperate (Wong Villanueva, 2019). In this way, the project achieved the incorporation of several outputs (on local development, joint production, and cross-border cooperation) from the binational technical groups into the concerted development plans, but without strong relationships behind them, there was opposition to further integration. In relationship to the latter, the presence of connectedness voids undermines the achievement of improvements. As the project showed, weak producer associations could not formalize their operations, apply certifications, find possible buyers, get access to credits, and more. On the contrary, CECOVASA could take more advantage of the project activities and got a new international buyer for 1000 quintals of coffee. Finding the relationship between those voids can help to design better projects that are tailored to the product and to the context – and not standardized blueprints.

Despite the positive results obtained after its immediate completion, the analysis on the collected data and interview from the field study revealed that most of the implemented initiatives did not stand the test of time. Most agreed policies and plans changed with the new administrations, cooperatives have faced several struggles and some of them became inactive, and without defined markets, training sessions and productive equipment were not very useful to obtain better prices when

selling to middlemen. However, it is needed to highlight that the design of the project was very innovative, and it really focused on border populations, involving several groups (producers, officers, cooperative leaders), value chain stages (R&D, primary production, transformation, and commercialization), and cross-border needs (cross-border governance for local development and productive policies).

Project Expense Review

In term of the project expenses, the total cost of the coffee & alpaca CBVC project was €891,489.74 of €900,000.00, that means, a budget execution of 99.1%. From that amount, €100,000.00 came from the counterparty paid by the participating agencies (ALT, SSE, and MPS) in a non-monetary modality. Budget execution was almost the same for both components: 41.2% (€367,376.69) for the coffee component, and 39.9% (€355,610.98) for the alpaca one (the other 18.9% was for general costs for both). **Table 6.8** summarizes the expenses per project item for the whole intervention. Budget allocation helps to explain patterns in the project performance and outcomes.

Table 6.8. *INPANDES budget (adapted from (Comunidad Andina, 2018a))*

Items	Expenses (€)(%)	
Professionals & Technicians (salaries, supplies, travel expenses)	€ 295,100.79	33.1%
Productive Equipment for cooperatives (washer & roaster)	€ 152,000.00	17.1%
Productive Infrastructure for producers & cooperatives	€ 117,912.07	13.2%
Productive Equipment for producers & cooperatives	€ 65,381.04	7.3%
Productive Supplies for producers	€ 59,407.85	6.7%
Project marketing, consulting, auditing	€ 67,253.50	7.5%
Branding & Certifications	€ 11,000.00	1.2%
Training Visits	€ 31,719.02	3.6%
International & National Fairs	€ 33,705.29	3.8%
Indirect Costs	€ 58,010.18	6.5%
Total	**€ 891,489.74**	**100.0%**

Budget allocation shows that one third of financial resources were used for human resources. However, the team was relatively small (**Figure 6.9**): 1 project coordinator, 6 professionals, and 8 technicians for the selected intervention areas. Thus, only two technicians would be in the field in each intervention area, located in the nearest city to the border producers. It represented a logistic constraint due to the number of producers and the location of their lands in the hills far from the communities (difficult for to access them with motorized vehicles, and around one-hour walking from the nearest

settlement). In addition, the initial lack of transport (bikes), and the weather conditions undermined even more the accessibility to the border areas (PE57N2). Producers reported a low amount of training visits, most of them to the whole community rather than personalized (BO30N1).

BO30N1: *[Fel] We wanted the technician to stay 3/4 days here to support us, but they just used to come one day…. Why one day? Is the project not paying them? They needed to come every week or once every two weeks… but it was not like that. They used to come once a month or three weeks, for one day and then left. They should have stayed at least one week to visit all production lands, how are we doing, how is our land, how should I work my land... do we need more fertilizer? or less?*

By the other side, salaries could be considered low for the involved professionals and technicians: €1300 for the coordinator, €1000 for the managers, €600 for technicians, and €300 promoters (Peruvian minimum wage: ~€270). During the project, salaries would be one of the main reasons for high turnover, hindering continuity in the field (PE26N3).

PE26N3: *Remuneration for technicians/professionals was very low compared with DEVIDA project salaries, so some professionals/technicians left and were replaced. The INPANDES budget was very low compared with DEVIDA 4/5M soles projects.*

In terms of the budget allocation for productive equipment, infrastructure, and supplies (44.3%), most benefits were oriented to the communities or organizations, not directly to individual producers. Individual benefits were very low in both components, with a small number of productive tools such as 40 combs and 40 alpaca-shearing for the reported benefited producers. In addition, most productive infrastructure was installed for demonstrative purposes for the whole community (not exactly for each producer). Moreover, several supplies were reduced from the budgeted amounts to those implemented (reducing from 646 fertilizer bags to 212 ones). While investing in producer organizations or communities is a very logical measure to promote wide-range development, it might not consider the positive impact of individual incentives in the motivation of smallholder producers (Wollni, Lanza and Ibanez, 2018).

The highest productive investments were oriented to the transformation machinery, the washing & drying machine for CECOALP (€70,000.00), and the industrial roaster machine for CECOVASA (€82,000.00). Due to budget and technical constraints, the washing machine was locally manufactured, leading to technical issues after the project (PE41N9). By the other side, the roaster machine was imported from Germany, and was highly appreciated (Comunidad Andina, 2019).

P41N9: *The washing machine technology was not available in Peru or in other part according to the characteristics/budget requirements, so we looked for who could produce it… handcrafted. So, we do not know if the washing machine fulfilled the standards.*

CAN (2019): *In an interview with the CECOVASA manager, he mentioned: "Until now we sold a quintal of green coffee beans for S/ 400. With the added value that this new plant will give it, that same product will be marketed at about S/ 800 per quintal of roasted and ground coffee, resulting in a good income for farmers", having placed the first 100 quintals in foreign markets at a differentiated price, indicated the same manager.*

For the project, auditing and several consulting services were hired, as well as marketing activities, representing around 7.5% of total budget execution. Most marketing budget was to externalize the project through promotional videos, not exactly a direct benefit to producers. In terms of the consultancies, is not clear how much was implemented and how much of the knowledge generated would stay after the project. However, several printed materials as the coffee and alpaca manuals were delivered to the producers. Some consultancies included the 'Preparation of the Situational Diagnosis and Baseline', a study that should have been realized even before designing the project – or deciding where to intervene. Training visits equaled the 3.6% of the budget implementation, and they included international internships to Colombia (coffee) and Argentina (alpaca).

Summarizing, it was a very limited budget, even more so since it was divided in two components, equally distributed – without considering the different realities in each intervention area. The project included several activities that would have been justified for a longer period such as the international training visits, the coffee nurseries, or the male alpacas for breeding[20], not exactly for a short-term intervention. As the project encompassed many of the to-do activities for a cross-border value chain project (as it will be analyzed later), budget was distributed to achieve the goals in each strategic line, without a further review on where to focus the budget allocation. Nevertheless, with more time, financial resources, and better understanding of each intervention area, the project would have been very suitable for developing cross-border value chains as it targeted several connectedness voids together.

[20] From sowing seedlings in a coffee nursery, moving them to the farmlands, and waiting for the first production, it needs to pass around four years. For breeding alpacas, the gestation period takes nine months, and then, it is needed to wait at least three years for realizing the first shearing and getting baby alpaca fiber. A R&D program for increasing fiber quality would need to breed the new alpacas over and over, taking even 15 years to see a relevant decrease of fiber micron (better fiber quality). These productive activities need to be executed according to the product calendar, so it is not possible to start them whenever a project begins.

Project Appraisal

Based on the qualitative data collected from the field study, the analysis helps to understand the project execution and outcomes. This analysis has been realized under three categories: project satisfaction, impact on local development, and progress on market connectivity. **Table 6.9** summarizes the arguments for and against the project in the three categories.

Table 6.9. *Positive and Negative appraisals of the INPANDES CBVCs (Author's elaboration)*

Evaluation	Positive Appraisal	Negative Appraisal
Project Satisfaction	(a) INPANDES as the end of a chapter	(d) Relativism of success
	(b) Civil Society's ownership as success	(e) Short-term intervention
	(c) Expectations for an INPANDES II	(f) Latent connectedness voids
		(g) Producers' feeling of abandonment
Local Development	(h) A progress, small but a progress	(k) Short time to improve quality of life
	(i) Learning experience beyond productivity	(l) Two different realities (Peru/Bolivia, Coffee/Alpaca, Amazon/Andean)
	(j) More than technical training	(m) Broken cross-border dynamics
Market Connectivity	(n) Value chain upgrade (moving downstream)	(o) Lagging trade barriers (tariff and nontariff ones)
	(ñ) Market Access	

i) Project Satisfaction (Positive Appraisal)

(a) INPANDES was the last cross-border project conducted by the Andean Community, and the zenith of a cross-border institutionality shaped from a macroregional approach in South America – an even in the American continent (IN02N15). This project is also the best examples of European-Andean cooperation, and the closure of the EU financing cycle 2007-2028 (IN05N22). As commented, the project faced several political, institutional, technical, and social challenges since its ideation to culmination, with the expectation that it should be the beginning of cross-border dialogues on productivity for the four Andean borders – inspired in the EU experiences but adapted to the local context (PE69N15). Despite its short duration, the high number of developed activities showed that doing this kind of projects is possible and, even for a brief period, can generate positive outcomes (BO42N14).

As the last chapter of cross-border integration from the communitarian perspective, it was a very complete project, taking care of the social dimension (stakeholder mix, grassroot participation, gender approach, cooperativism, PPP, etc.), the economic one (higher productivity, economies of scale, value chain approach, market penetration, etc.), and environmental one (agroforestry systems,

certifications, etc.), and trying to create the basis for its own sustainability over time by building paradiplomacy and civil society participation (PE41N10, PE68N20). However, with the end of the project and the CAN reengineering, the Andean cross-border articulation methodology that was constructed based on several projects has been archived and is not part of current activities (IN01N6, PE68N21, LB01N1).

(b) In second place, the project was designed to promote ownership, from the CAN to the executing/operating agencies, and to the local producers. The EU was the main development partner (technical and financial support), and the CAN oversaw the project, but success depended on the executing and operating agencies, and how fast they could developed capacities to take ownership of such a complex project like INPANDES (IN67N15). Ownership was also perceived in how local actors: producer associations, municipal officers, and local producers involved and articulated in joint activities, become protagonist of their own development, to be in charge of their own production and stop depending on market price or intermediaries (BO42N19, BO30N2, PE21N2).

The project in many ways, fulfilled its goal of being the starting point of a productive dialogue spoken through bottom-up actions: Producers participating in binational technical groups, cooperatives conditioning their infrastructure to install new equipment, municipal officers donating construction materials for communal infrastructure, and more. Despite there was no civil society participation in the project design and no vertical articulation mechanisms (PE68N17), ownership was a key element for achieving several of the activities, showing that local actors are motivated for this type of interventions.

BO30N2: *[Producer Fab:] We were so hopeful to be incorporated in the binational integration process that would let us take charge of production.*

PE21N2: *[From 1 to 10, how impactful was the project for local dev.?] 8.5/10 in terms of integration, associativity, empowerment, and how they become protagonist of their development, in generating awareness… to stop being dependent and establish their own productive policies.*

(c) The motivation that this project generated could be also perceived in the expectations for developing an INPANDES II. Although there was not a second project because the cross-border articulation was withdrawn from the communitarian agenda and the CAN did not attract more funding from international cooperation, there is a desire for a similar project or continuation from the chancelleries to the local producers. From the point of view of the former, it was because of the EU budget constraints that the project was executed relative fast compared with other binational initiatives between Andean countries (e.g., project from the binational funds) (IN05N23). Cooperatives were also expecting a continuation: as INPANDES was mainly oriented for primary production and transformation, they wanted a new project to promote commercialization and new marketing channels

such as cafeterias for CECOVASA (PE11N7, PE14N1, PE34N1). Producers also showed interest on a continuation, especially as several activities could not finish their productive cycle (PE11N8, BO31N1).

IN05N23: *In the chancelleries they ask… when is INPANDES 2 coming? There is a need to continue. Working under EU international cooperation is faster to achieve objectives rather than working with national budget: projects are not implemented; they do not achieve results fast. All this dynamism is only allowed by international cooperation.*

PE14N1: *The second part of INPANDES was to finance and open five cafeterias for CECOVASA. But it did not progress because CECOVASA manager changed, the mayor changed, and the new one did not have so much relationship with the chancellery.*

BO31N1: *[Producer:] I hope we can have another project… all project has its beginning and its end, but the project could not conclude. […] In a new project, we expect that technicians arrive to where we produce coffee, more technical assistance that is close, or bigger chainsaws to clean…[other male voice] we would like other coffee variety, not catimor… better quality. [female voice] a more serious training.*

ii) Project Satisfaction (Negative Appraisal)

(d) While asking stakeholders about their satisfaction towards the project in a Likert scale from 1 to 10 (1 = not satisfied at all, 10 = very satisfied, successful project), stakeholders located in the CAN/EU, executing/operating agencies, and professional/technical team showed an average score of 8.7 points (only answers of 8 to 9 points). However, producers showed an average score of 4 points (answers from 0 to 6)[21]. This relativism of success – more than double the score from one group of stakeholders to the other, could be evidenced in the collected dataset: While INPANDES was a 'success' for achieving all its goals in such a short time and the reports highlight the executed outcomes (BO42N14, IN05N24, IN06N11) (Comunidad Andina, 2018b, 2019), producers do not think the same after five years of its culmination. For example, in the coffee component, due to the coffee calendar, the delays, and the time that a coffee plant takes to grow, Bolivian producers did not give the coffee from the project to CECOVASA. Even more, they barely transplant the seedlings to their lands, and due to several constraints, they just continue growing their own coffee (not the project one) and selling

[21] The Question on project satisfaction was executed for the coffee case and asked to six officers from the CAN, EU, ALT, MPS, and operational team, and to six producers in Cocos Lanza (5 Bolivian) and in Centro Miraflores (1 Peruvian).

it to middlemen (BO30N3, BO30N4, BO30N5, BO30N6, BO30N7). In the words of public officers that participated in the project, the alpaca case was even worse, as the pre-project trends continued for both Peruvian and Bolivian producers (giving fiber to middlemen that will deliver to big companies) (PE11N9).

BO30N3: *[Producer Arn:] The project did not benefit us, rather it has harmed us in a way. We worked on our lands, but at the end it stopped. The project brought us some equipment, tiny axes, shovels, pickaxes… and two little chainsaws. And that's what was left of the project. Some people stopped producing, but some of us continued harvesting and selling... to the compadre, we do not give to Charuyos or Cecovasa. This year we have had coffee production and we really want to sell out coffee. [did the project harm you? In what sense?] It took our time. We went to work to the mountains to grow coffee, all of us worked, but at the end… it was left as it was. We did not benefited.*

BO30N4: *[Producer Fel:] We have received almost nothing from the project… Peru and Bolivia are happy because of the project but… what did it benefit us? Almost nothing benefited us, it has been a nuisance. We were very happy because our production was going to expand… but we could not take it out from here. They also did not let us know when they were going to pick...*

BO30N5: *[Producer Fab:] They said that the ALT supported, raised up through coffee production the communities that have been forgotten… it is not like that, because the project arrived to nursery and after that we could not take it to the cultivation lands. What we used to have before the project, was sold as Frontera coffee during that time. That was the reality, we cannot cover the sun with a finger... the project should have benefited the producer families.*

This 'scale difference' in the perception of INPANDES between border actors and non-border actors (national entities, CAN, EU, etc.) is common in cross-border projects (Wong Villanueva, Kidokoro and Seta, 2022), and it raises concerns, especially between producers, about how funding is implemented and where it goes (PE37N1). This exactly does not allude to an embezzlement of funds, but to the lack of knowledge of the idiosyncrasy of the producer and the effectiveness of typical agricultural extension projects that are executed by the governments – as it was carried out in the SL4 of INPANDES. The lack of participation of producers into designing the project does not only refer into defining strategic objectives, but also into having more ownership in the budget allocation as they will be the end beneficiaries. Despite this problem does not only concern to CBVC projects but common in any public agricultural intervention, raising this issue is relevant to promoting bottom-up projects with civil society ownership rather than just participation.

PE37N1: *Apart from everything, we have support from projects… from municipalities and NGOs… but I really do not want to talk bad about them, but in the projects, there have not been so many results as they inform. Not so many results… local governments, I do not want to talk bad about them.... but those projects are politically oriented, and they invest more in vehicles: truck, bikes, and professionals' salaries: engineers, supervisor, technicians, extensionists, nurserymen... and I think the money mainly goes there, to their offices, management... the money goes... and what does it arrive to the producer? In last project, we only get 2 sacks of island guano per 1 hectare of coffee, and a saw.... and a lot of technical training. They continue with technical training but... we know how to cultivate our coffee. We more need to be evaluated or something like that. That is how they lose money! Projects are good but, as I have been talking with the president of the Central, why this public funding is not directly executed through the cooperatives? CECOVASA and we cooperatives know how an associate is, how much each associate has produced, is going to produce... but when a municipality's project comes, they put everybody there. What does municipality do? In each sector they have ECAs - Field Schools (Escuelas de Campo)... I do not want to talk of other sectors, but in mine, in SJDO, we had two ECAs for more than 100 inhabitants. At least, you need 25 to 30 producers for an ECA, so we were 60. We started like that. The technician came, after three classes... the people started leaving... 25, 20,15.... and his supervisor told him, you cannot be with 15 beneficiaries... let's make it one ECA. So, what did he do? he put all together both ECAs, 30 producers. So, each producer starts deciding how many hectares they will produce...1hec, 1hec, 0.5hec, and then the technician/supervisor asks for results and the producers resent, "you are demanding a lot from me"... so he retires, maybe he did something but... as the coca is in fashion. So, in the ECA is left 25,20...15 producers have finished. But from those 2 ECA, less than 10... only 6 have produced coffee: 5 in cecovasa, and 1 from SJDO coop. So, how much does the government spend in vain... for six producers. I produce my coffee, and I am giving back to the government when I export my coffee, but the rest? money is wasted in that way. Municipalities, the first that they do is to buy a truck, buy bikes, put more technicians, more engineers... that is what happens with public money for productive development, and I can say that as producer, as a farmer, and as a leader. the municipalities love to inform, how many hectares of coffee are increasing… the same with SDJO, Yanahuaya… the big public officers enjoy those numbers but, in the reality, with the facts… how many people are they giving coffee… maybe it is beneficial for them [municipalities] to have more projects... and that is their best income.*

(e) One of the main critiques of the project was its short-term duration. Despite it represented a great achievement to finish a 4/5 years project in two years, constructing cross-border social capital, increasing productivity based on the product calendar and timing, or improving capacities in municipalities and producer associations are medium to long-term processes and the short duration compromised the sustainability of the project (PE18N4, PE41N11, PE21N3, PE41N14). Based on the 'caliber' of the project, it was reported that a project of that kind would require at least a duration of five to six years (PE57N3, PE57N4, PE57N5, PE57N6, BO31N5).

BO31N5: *[Producer Carc.] The project was two years... we need at least five years from plantation to commercialization. We did not do that last part, the commercialization, so there was no one to buy our coffee, and we do not have so much high lands… our coffee is not so competitive. We need more commercialization. At least five years, to commercialize the product to any side (Peru or Bolivia) or country... to have an own brand... we need that. Frontera is for both countries.*

(f) As previously commented, sustainability was one of the main concerns from the beginning and this happens because the project could not solve the institutional voids where the cross-border value chains are embedded (IN06N10, PE11N10, PE21N5). Thus, sustainability was compromised by, for example, the lack of political will from Bolivian government to continue it bilaterally (PE69N16), the product's power dynamics at subnational scale (alpaca oligopoly) (IN06N9), the bottlenecks to transform products and access markets (PE69N17, PE68N22), no interest from local governments (PE21N4), the lack of a cross-border agency as the ALT to continue activities, and more.

Interpreting the CBVC intervention of INPANDES as an assemblage or a spatiotemporal geoeconomic configuration, the flow of resources (non-refundable funding) and political will – especially from national governments (Bolivian permission in exchange of the water resources project)– in these intervention areas were the main drivers to stimulate the cross-border dynamics and reduce temporarily their voids, achieving certain degree of cross-border articulation (PE41N12). In other words, a top-down facilitation of bottom-up processes depends on the performing and repetition of cross-border relationships that overcome the voids (e.g., direct sales of Bolivian coffee to CECOVASA, public-private cooperation between cooperatives and municipalities, better transition of municipal administrations, etc.).

PE41N12: *The impact that we had in that was moment was good, like a photo. And everybody was satisfied. From there… no more.*

(g) Another complaint from the project emerges from the producers' feeling of abandonment after it concluded. The field activities finished in 2017 and since then, there was no institution approaching to the participants, especially to the Bolivian coffee producers (BO30N1, BO30N8, BO30N9, BO31N2, PE57N7, BO30N10). This feeling was also found between alpaca producers as the project finished and took away the actors that were promoting development and cross-border cooperation in these areas (BO50CN1, PE11N9).

BO30N8: *We want a project that does not abandon us, from the beginning until we produce coffee.[…] Where to take it, where to sell it. We need a market.*

BO30N9: *The project was good; we were happy to grow coffee and that we were going to have money as it was going to be exported in the name of APOCOM. But… it was not like that, the technician abandoned us as the project finished. Later, nobody appeared, and we got tired.*

PE11N9: *if you want to see the impact of the project, people have not taken importance… the project has disappeared and everything has come back as usual without the pression of technicians… the alpaca case is even worse, but at least the coffee producers have a DEVIDA project.*

iii) Local Development (Positive Appraisal)

(h) Although the project did not have the expected outcome at local development, it was perceived by local producers as a means for their own development because it brought benefits to increase their production in quantity and quality (e.g., training, tools, supplies, and more), despite of the limitations found in the knowledge transfer process (PE35N1, PE71N1). In addition, its local benefit went even beyond just productivity: an opportunity that improved relationships within the community (BO30N11), an alternative to coca production (BO30N12), better administrative capacities for their producer organizations (PE11N11)

PE71N1: *The projects that arrive here always have brought benefits, and we have been improving. A training is important. Sometimes we do not listen it, but it is given by professionals that come to train us… but it helps in a way, in an idea… and how to improve our parcels […] We have taken advantage of the trainings and benefits…. The training will be always in our head, and we won't forget.*

BO30N12: *[Producer] The project was useful. We want a project. We do not have coca, and we do not have any other income. Our economy is suffering.*

(i) INPANDES was a learning experience in promoting local development in cross-border localities for the international organizations, executing/operating agencies, and producers by itself. As the first project of this kind in those intervention areas, it revealed that building cross-border value chains are more than just productivity and partnering stakeholders across the border: it is about highways that make interactions faster, it is about access to affordable social services so producers can generate enough to have quality of life, it is about women empowerment and participation, and more (PE11N12). Under another reading, promoting this type of projects requires previous conditions to solve and/or innovative approaches to close the existing voids (PE69N18, PE71N2).

PE11N12: *the project let us know several problems… health, connectivity, etc…. […] It allowed us to highlight the lack of bridges, highways, health service centers… they need to walk 5-6h to the nearest health center. […] Palca is even worse….*

PE69N18: *Lesson learned: to execute a project of this kind, we need to develop the conditions that will allow the initiative to have a better scope…. And we are implementing this in the new projects executed from the chancellery.*

(j) Finally, yet importantly, another contribution for local development was the holistic scope to target value chain problems: Following the 'Smiling Curve' concept (**Chapter 2**), the project strived to create value from the beginning with R&D activities (genetic improvement), primary production (technical assistance, supplies, tools, infrastructure), transformation (equipment), and even commercialization (branding, social media, etc.) although it was not included originally in the EU funding requirements (PE41N13, PE21N6). However, while this was a daring approach to achieve more market connectivity and add value in different stages, it also made a wider budget and resource allocation.

iv) Local Development (Negative Appraisal)

(k) Echoing previous comments, translating productive improvement into profits and then to higher quality of life is not a simple equation based on the duration of an intervention to show results, but implies other variables such as the quality of knowledge transfer processes, the solution of other critical connectedness voids, or the need of intangibles resources like producers' motivation (IN67N16, IN67N17, PE69N19). It is also about measuring quality of life from a more human perspective and related to the daily life of producers (PE71N3, PE07N1).

IN76N16: *Productive projects are difficult: for an entrepreneur, to have success, they have to fail 4-6 times…. In projects, we need to make it work in 100% at first time [...] I cannot give it a score, it is our baby.*

PE71N3: *[Producer:] Quality of life increase with better income, our profits improve, our nutrition improve, our clothes, our children's education… and we target for more. With more income, we improve our farmlands… to reinvest maybe in fertilizer or consult with a technician/professional...*

PE69N19: *[Coffee component] We achieved added value by technical training, manufacture (toasting), but we needed to solve other complementary issues that were out of the project scope (e.g., coca, roya, low production, etc.). These complementary issues did not allow us to have the expected impact, but was out of the scope of the project, CAN, chancelleries….*

In the case of INPANDES, the project was not specifically oriented to promote productive development – and even less commercialization, but to interconnect the existing social tissue with cross-border productive articulation activities (more focus on cross-border governance) (PE18N5, BO31N5). Furthermore, evaluating a project as a macroregional cross-border mechanism, a stand-alone initiative would not be enough to solve decades of lack of connectedness (PE25N1, PE41N14, PE18N6).

PE18N5: *[MPS team] The project was not so oriented to improve coffee quality, but to create awareness of cross-border governance. […]In addition, we did not work so much in fieldwork (primary chain: coffee growing), but we focused on transformation (big toaster, and small toasters).*

PE25N1: *[Public Officer] A project will not solve their quality-of-life issues… most funding goes to administrative expenses, technical team…. For producers, just technical training and some tools or supplies. To generate a real change, producers need at least 3/4hec, but now they have 0.5/1hec... a survival agriculture.*

(l) Another critique related to the promotion of local development is the presence of 'two different realities' throughout the project: the Peruvian system and the Bolivian one, the needs of the alpaca value chain and the coffee one, or the context of the Amazon localities with the Andean ones. Although project standardization helps to improve management effectiveness, having the same strategic lines, the same budget, or the same activities for the complexity of three cross-border intervention areas represent a reductionist approach of tackling cross-border issues. For example, the difference between coffee cooperatives and alpaca cooperatives was determinant for the former to reach better results (PE68N23), as having similar objectives and activities would benefit the most prepared institutions. Different geography and location of beneficiaries also influenced as the dispersion of producers and the quality of their lands may require other strategies to facilitate effective knowledge transfer (PE57N8, PE71N4).

Driven by political motivation, the project itself focused more on the Peruvian side and great part of the equipment and infrastructure stayed there (PE41N15, PE25N2). It was executed in this way due to the difference in technological level of Peruvian and Bolivian producers, since the latter had a lower level, 'any knowledge would be useful' (PE68N22). This reveals another dual reality: while realizing a project, it is different to target producers with knowledge and/or motivation ('devoted' producers), with those who lack them, as the former would be eager to learn faster and better than the latter (BO31N3, PE57N9). Thereby, CBVC projects require an understanding of several 'dualities' or even multiple spectrums that would lead to more context-appropriate interventions.

PE41N15: *In both VCs, Peru managed more technology than Bolivia, so while managing the budget, the idea was to transfer some knowledge to nearer Bolivian communities in terms of training. Goods and services went to Peru.*

BO31N3: *Projects that want to come are very welcomed… but implementations like humid benefit…- do you call it like that? - only benefited few people. Other people received some equipment like wheelbarrow or waterpipes… but the project was not executed equally for all people.*

(m) A last emerging issue, although it might not be a direct consequence of the project, is the 'cracking' of the cross-border productive dynamics, including those existing before the project. In the coffee component, while Bolivian producers used to be associated to CECOVASA through its first level cooperatives, the post-project events (intensification of trade barriers, global coffee price variations, coca proliferation and eradication, etc.) reduced the number of Bolivian producers contributing to Peruvian cooperatives to almost none (PE14N2, BO30N13, BO30N14), but it does not represent that they could be reactivated (as commented in **Chapter 3**) (**Appendix 19**).

BO30N13: *Nowadays, CECOVASA has 3/4 producers in the Bolivian side that are associates and participate in Charuyo cooperative living in San Fermin. We used to have more producers during the INPANDES project.*

BO30N14: *Nowadays, we do not have CECOVASA producers in Cocos Lanza. They used to be CECOVASA producers in the organic program, but due to the roya or other motive, they quitted the organic program.*

v) Market Connectivity (Positive Appraisal)

(n) One of the challenges that the project embraced was to promote value chain upgrading measures by moving downstream with transformation processes. While the washing machine was not operative for long, the roaster represented a great advantage for the CECOVASA and to opening new markets with roast coffee production (PE18N5, PE25N3, PE41N16, PE14N3). After five years, some progresses have been done to sell roast coffee to Chile, but there is more work to do to penetrate more profitable markets (PE14N4). However, upgrading requires more knowledge is roasting technology, marketing information systems, and roasting professionals.

PE14N3: *[About INPANDES] I have the knowledge that our associates near border participated… and from there we 1) manage the brand of Frontera coffee, 2) got the precision roasting machine… there are only 4 or 5 like that in Peru, that ensure quality by ensuring homogeneous roasting.*

(ñ) Last but not least, INPANDES promoted market access when the CECOVASA got the letter of intent to purchase from the German company to buy the Frontera coffee, a binational brand promoted by the project team (PE41N17, IN05N25). The CECOVASA participation in national and international fairs, its experience managing a broad portfolio of georeferenced brands, and its reputation based on its worldwide award winners facilitated the process of developing and selling a new brand in a short time, achieving the objective of connecting border production with international markets. Although the CECOVASA still sells coffee to that company (**Appendix 20**), Bolivian producers do not contribute to that cooperative anymore (BO30N13, BO30N14), although their coffee might arrive there through middlemen.

vi) Market Connectivity (Negative Appraisal)

(o) Although one of the unspoken objectives of the project was to eliminate intermediaries (BO42N20), the problem of trade barriers was not targeted by the project and therefore, any sale from Bolivian producers to CECOVASA would be considered as informal trade and not possible, the involved governments and organizations ignore this issue and continued with the project activities (BO42N21). In other words, the project, as an assemblage, 'legalized' the cross-border informal trade of coffee and alpaca with the final purpose to achieve the goals. With the end of the project and the raise of legal standards from the cooperatives to pay taxes, Bolivian producers could not sell to their Peruvian cooperatives (BO30N15, BO30N16).

BO42N20: *We need to discuss the lack of clear rules for bilateral trade, or it will be always clandestine. We never discussed the legality of coffee movement in the project… both governments ignore this issue.*

BO30N15: *[Producer Fab] We were very excited to work on coffee, but the coffee price dropped even to 200/250soles per quintal, so it did not cover at all… because harvesting needs investment, needs many day laborers for a quintal… it disappointed the producers, and since then, we did not care so take care so much of coffee... Neither Charuyo nor CECOVASA wanted to pick our coffee. Once I went with 5/6 quintals and I did not have were to drop them, they seemed closed, or without the economy to buy more coffee... So, we started to do other works.*

BO30N16: *[CECOVASA officer] The main problem with Bolivian was the CECOVASA tax issue: technically, their coffee is Bolivian, so we could not document it because SUNAT asked us that she should give a purchase receipt, so we needed customs services to validate the export process. There were a lot of Bolivians. They were even in the organic program, but to overcome the problem, we documented their product as Peruvian not Bolivian. The issue was not solved, the roya came, and the producers stop delivering. In the best case, Peruvian producers went there to buy the Bolivian production and bring it [middlemen].*

Currently, Bolivian coffee producers from both Puerto San Fermin and Cocos Lanza desire, if not the opportunity to sell again to CECOVASA, a direct channel to the consumer (BO30N17, BO31N4). However, this might require reducing more tariff and non-tariff barriers (e.g., no presence of customs) and therefore, intermediation of national governments.

BO30N17: *[Fab] What we would like the most is a direct export channel to the consumer, not managed by second or third parties. We have human capacity, we can shape more people with proper training… we knew about management, but as we do not have a project to incorporate us to export, we could not progress more.*

BO31N4: *We want a direct sale to the buyer because selling to Peru is difficult, it is not possible. We want an agency for direct sale, that is what the project should be oriented and generate better profits and value addition. So, we need at technician to guide us from plantation to production, all the procedure until it arrives to the market... we need to ensure market so everybody will be motivated.*

2.2.6. Brief Summation

Despite of the multiple challenges that it faced, INPANDES and especially the coffee and alpaca experience, can be considered one of the most relevant cross-border value chain experiences in Latin America. Its holistic approach, the application of years of communitarian experience in cross-border integration, and effective concertation and execution were some of the factors that place the project as a cornerstone in cross-border productive systems in the region. Despite the coffee & alpaca project was not completely cross-border as it obeyed a political agenda (mainly execution from the Peruvian side and more inclusion of Peruvian communities), it recognized cross-border dynamics in both cases: the coffee flows from producers in San Fermin and Cocos Lanza to middlemen or CECOVASA, and the alpaca cross-border dynamics such as the cross-border markets and the pendular fiber flows for Peru or Bolivia depending on market price. As CAN officers mentioned, the project was not planning to solve the lagging issues in those areas, but to start a cross-border dialogue in how to solve them jointly. However, creating this kind of social infrastructure takes more time than a two-years project can promote.

The coffee and alpaca cross-border dynamics have existed for decades in their areas, mostly as cross-border informal trade as the low value-added products cross the borders to arrive to cooperatives (as they have the coffee technology to further process it and market to sell it) or companies (as big fiber companies especially from Peru dominate the export market). The act of taking a product from one side of the border to the other and 'formalize' it adds value to the product, although this does not arrive to the producer. From that point, producers are no longer part of the value chain and therefore, further value does not promote regional development. Thereby, cross-border value chains bring producers back into this process by removing middlemen and other bottlenecks so that they can place their products in domestic and international markets.

Although INPANDES did not give an explicit definition for a 'cross-border productive chain', the set of executed processes and activities follows the definition of cross-border value chain given by **Chapter 2**: the CBVC project, as a political economic initiative, executed value-adding activities in several (if not all) stages of the value chain to increase the final product value and achieve international markets that would bring profits back to the cross-border region. Based on the execution of the project, despite the alpaca intervention promote more actions and better partial results than the coffee one, it was because of the CECOVASA and its 50 years of experience that they could translate the INPANDES efforts in positioning a cross-border brand in foreign markets. However, looking at the project after five years, border producers are no longer part of these dynamics and the CAN does not oversee the cross-border articulation between Andean countries, leaving this responsibility to rearticulate dynamics to the national governments.

Two questions are left for further inquiring. First, where the 'cross-border' should be in a cross-border value chain or project? A theoretical answer might be, in the place where cross-border articulation would increase more the value of an activity or product: increasing volume together, accessing technology not available in their own side, sharing experiences to increase knowledge and information access, and more. Further studies would be needed per case to determine where to focus actions. Second, what are the most effective ways to build cross-border governance (CBG)? While INPANDES tried to achieve this in a short time through binational technical tables, aligning municipalities, or partnering cooperatives, constructing CBG is a medium to long-term process that requires cycles and cycles of interactions, articulations, and joint interventions (Wong Villanueva, Kidokoro and Seta, 2023). Standardizing a methodology to promote it is requires more examination of experiences to move from theory to guidelines for policymakers and infield officers.

2.3. Phase 1.1. Descriptive Analysis N°3: The Coffee Global Value Chain (C-GVC)

This analysis explores the Global Value Chain of Coffee (C-GVC) by identifying 1) the value chain processes, 2) the international trade and its geography, 3) the governance and the upgrading opportunities (move to downstream nodes of the value chain. Special consideration is given to the place that Peru and Bolivia occupy in these dynamics.

2.3.1. The C-GVC Flow

As commented in **Chapter 2**, the Global Value Chain of a product reflects the nature and purpose of a product, the global dynamics and organization of its value addition processes, and the behavior and patterns of its involved actors. **Table 6.10** outlines the Coffee Global Value Chain (C-GVC) flow by highlighting the main value-addition processes –in terms of their inputs, processing, and outputs, and other approximated values such as timing, pricing, and stakeholders to understand the product value chain dynamics (values should be taken as reference). To bring further clarity to the C-GVC, a brief explanation is provided.

Table 6.10. *The Coffee Global Value Chain (C-GVC) (Author's elaboration)*

	Cultivation & Harvesting	Post-Harvesting	Trade	Transformation	Commercialization	Consumption
Input	Seedlings Fertilizer Land & Utilities Labor Tech. assistance Prod. Installations	Coffee Cherry Productive equipment & infra. Utilities	Green coffee Contract Documentation Fees & Bills	Green coffee Productive equipment Utilities	Coffee Products (Roasted coffee) Certifications	Coffee Products & Services Equipment & Tools
Processing	• Nurseries & Seedlings production • Transplanting • Integral mgmt. • Harvesting	• Wet process (pulp & ferment) • Dry process • Wet-hulled pro. • Collecting • Milling • Packaging	• Dom. Transport • Warehousing • Exp. Clearance • Intermodal Freight Transpt. • Imp. Clearance • Delivery	• Blending* • Decaffeination* • Roasting • Degassing • Grinding* • Soluble* • Packaging	• Marketing • Retailing • Wholesaling • E-Commerce • Distribution	• House consumption • Coffee Brewing
Output	Coffee cherry	Washed, Dried & Parchment coffee** Green coffee Husks Honeywaters	Imported coffee	Coffee Products (Roasted, ground and soluble coffee)	Coffee Products & Services Profits	Social experience* Disposal
Timing	To produce (3-4 years, once/year) Flowering (9月-11月) Maturing (12月-3月) Harvest (4月- 6/7月)	Green Freshness (6-12months) Green expiration (~10 years)	Logistics & Clearance (~7days) Freight (~45 days)	Degassing (~1week) Roasted Freshness (1-3 weeks)	Distribution (3-7 days)	Roasted Expiration (3-6months, 2years)
Pricing	$0.45/lb (x1)	$1.36-$1.70/lb (x3~x4)	$2.14/lb (x4.75)	$3.43/lb (x7.5)	$4.40/lb (x10)	(CupPrice)*16 cup/lb ($3/cup=$48/lb) (x100)
Actors	Producers, government, NGOs, financing entities	Producers, cooperatives, middlemen, companies	Exporters, importers, logistics companies, traders, brokers	Large roasters, instant coffee manufacturers, coffee chains	Retailers, coffee bars, wholesalers	Restaurants, coffee shops & bars, consumers

Processing Stage 1: Cultivation

Coffee production starts with the access to cultivation supplies such as seeds or seedlings, fertilizers, productive equipment, available land, utilities (water), and labor with technical skills. Several of the organoleptic characteristics of coffee are correlated with the localization and properties of the land (altitude, latitude, type of soil, etc.), representing an initial factor that shape coffee production (e.g., lowlands need to be harvested more quickly) to decide the end-products and market opportunities (e.g., coffee from high lands can reach higher quality).

Seeds or seedlings are divided into two types of grain, arabica and robusta. While robusta is most used for soluble (instant, powder) coffee and espressos due to its higher caffeine content and stronger flavors, the arabica varieties have half caffeine but double amount of sugar and fats, generating a greater complexity of flavors, oils, acidity, sweetness, and floral and fruits notes – and opening a more diversified market (Specialty and organic coffees) according to consumer's preferences. As robusta variety grows under 1000masl, and Arabicas have better quality above 1200masl, producing countries have oriented their coffee producing according to their geography being Vietnam, Brazil, and Indonesia the top producers of robusta (predominance of Southeast Asia and Africa), and Brazil, Colombia, and Ethiopia the ones for arabica (predominance of South America and East Africa). The arabica coffee includes several coffee varieties, each of them with different productivity, disease resistance, cupping quality, and altitude requirements. While coffees such as Catimor have very low cupping quality but are resistant to diseases, Bourbon and Geisha varieties have a very high quality – and therefore can get a better price – but are weak against diseases and need to be planted in higher lands (Comunidad Andina, 2017; Adams & Russell, 2019; International Trade Centre, 2021).

Coffee Technical Management, that means technical knowledge on primary production, represents a relevant factor to determine coffee quality, higher productivity, and therefore the end-market. All processes have already national and international standards (e.g., soil sampling, spacing between plants, shadow requirements, plant size to transplant, etc.) to ensure a good quality and the traceability of the product to apply for certifications. With the initial preparation and selection of seeds, they are installed in a coffee nursery and after 4-6 months, they are transplanted to the farmland. This process also influences the end-market as eco-friendly practices (e.g., natural shadow or agroforestry systems) or organic requirements (e.g., usage of organic fertilizers or compost) can give access to more profitable markets. Integral crop management against undergrowth, diseases, and other threats are relevant to ensure a good coffee. It takes between 3 to 4 years until a seedling produces.

Coffee plant flowering starts usually between September and November (three months), followed by the maturing process or development of the coffee grain, during December and March (four months). At the beginning of April, harvesting season starts and depending on the altitude (lower lands

are hotter and therefore it matures faster), it can finish earlier (under 1200masl harvesting finishes by June), or later (above 1200masl harvesting can extent to July, August or even September). This affects product quality as not harvesting on time – or harvesting earlier, can give under-matured and over-matured coffee grains that have a higher rate of defects (7% and 14% respectively) compared with mature ones (around 1%). In addition, harvesting can be done in three modalities: selective picking (by hand, preselected), stripping (pulled al together), and mechanical harvesting, that are determined by topography, and available labor and equipment. The final output of this process is the coffee bean or coffee (red) cherry, with an average price of $0.45 per pound (Fitter and Kaplinksy*, 2001).

Processing Stage 2: Post-Harvesting

Post-harvesting processes represent the second stage of primary production, having as main input the coffee cherries and productive equipment, infrastructure, and their respective utility consumption. There are three main procedures that can be executed: wet processing, dry processing, and wet-hulled processing – all of them with clear process quality standards. This can be executed in the farmland or processing mills. The wet process (or washed coffee process) is resource-demanding (time, water, equipment, labor, and sometimes fuel): cherries must pass the 'float test' to eliminate defects (floating on water is a defect indicator), and then they are de-pulped to take them out of their husks (manual or mechanized de-pulper), usually within 8 to 12 hours after being harvested (tight time framework to consider if processing at farmland or the mill).

After that, the coffee is transferred to a fermentation tank, and is fermented with water for 12 to 18 hours to break the bean structure (mucilage removal) and increase quality, flavor, acidity, brightness, and other properties –implying a higher price. This is followed by the washing process to remove impurities. This requires installations such as wet processing plants or washing station (*plantas de beneficio húmedo*), scurry channel (*canal de correteo*), and soaking tank (*tanque sifón*). The washed coffee grains are drained and spread out on a drying platform (*tarima de secado*), while correctly disposing wastewater.

Drying process starts immediately after it, collocating the beans on dryer modules (*módulos de secado*) or solar tents (*carpas solares*) to avoid any pollution by direct contact with the ground. This step finishes when the coffee arrives to a humidity level between 10% and 12% ("when the bean 'cracks' after being bitten"). This final product is called as parchment coffee (*café pergamino*) (Comunidad Andina, 2017; Cafe Imports, 2019b). Despite its quality benefits, this process demands high volumes of water: to produce a cup of coffee requires about 140 liters of water in total (Chapagain and Hoekstra, 2003). Coffees that are sent to dry right after pulping (no fermentation) are called honey coffee.

While the wet process is very resource-demanding but ensures more (and faster) income for the producer if executed in-situ, the dry process (or natural coffee process) does not imply high costs (except from labor) and requires less technical knowledge. First, the coffee cherries float in water and are sorted, like the wet process. After that, the cherries with all their husks are brought to raised beds (airflow allows better uniform drying while seeds absorb the husk properties) and dry ferment for a period of three to six weeks until it arrives to a humidity level between 10% and 12%. This dried coffee is then carried to the mill. As the coffee is exposed to natural conditions, this process is possible only in low humidity environments and with infrequent rain as Ethiopia and requires more time and drying area extension than the wet process – that allows harvesting little by little and reuse productive equipment (Cafe Imports, 2019a; Counter Culture Coffee, 2022).

The well-hulled process (or semi-washed/ Sumatra process) is exclusively done in Indonesia due to its high humidity: with similar steps to the wet process (sorting, pulping, fermenting, washing), beans are partially dried until 40%-50% of moisture and then removed from their parchment skin through hulling machines.

If the producer cannot continue the following processes by himself, he sells his parchment coffee, honey coffee or other variety to a cooperative, a private company, or other producer. Coffee is sealed in GrainPro bags and packaged in jute sacks to its storage. Transporting the coffee from the farmlands to the collecting center (*centro de acopio*) to carry out the transaction is not easy task due to the difficult accessibility, available conveyance, and logistics conditions (e.g., transporting coffee on mules or donkeys limits the carrying capacity and the animal odors can permeate the grains, reducing quantity and quality).

To cut these inconveniences, middlemen (local intermediaries) buy the coffee in-situ, paying instantly a fraction of what producers could receive from a company or cooperative. In the collecting center, the coffee is registered, weighed, and graded, and in the case of cooperatives, producers receive an advance payment (*adelanto*) in that moment – the rest or also called refund (*reintegro*) is paid when the final product arrive to the client. Coffee is stored in the collecting center under several quality standards to not reduce coffee quality (e.g., wooden platform, humidity control, minimum sack distance, etc.) (Comunidad Andina, 2017).

From the collecting center, the coffee is transported to the processing mill. The milling process (*trillado*) is subdivided in four subprocesses, most of them executed through with machinery: hulling (hulling machine: removal of parchment skin or husks depending on whether it is parchment coffee or dried one), polishing (polishing machine: improve bean appearance through friction), air cleaning (airflow: dust removal), sorting by size (screeners), sorting by density (gravity separator), and sorting by color (color sorting by machine or by sorting ladies) (Alsela, 2018; International Trade Centre, 2021). The outcome is the green coffee beans, that later are graded (to score its coffee cupping quality), blended

(if it is required by the client), sealed in GainPro bags, sewn in jute sacks, and labelled. Although green coffee can be stored for over 10 years under proper controlled conditions, it has should be roasted between 6 to 12 months to not lose its quality (Daly *et al.*, 2018; Morphew, 2022). This duration makes it convenient for international transport.

Processing Stage 3: Trade

As most coffee is exported from producing countries to processing ones, coffee traders (multinational trading and exporting companies) connect the large roaster companies with coffee producers and associations: roasters rarely have direct contact with producers (Bamber, Guinn and Gereffi, 2014; Daly *et al.*, 2018). Thereby, intermediaries (traders and agents) play an important role to match supply and demand in the C-GVC. Five coffee traders control half of the exporting market, and they buy and sell coffee for their own account, providing several logistic services (International Trade Centre, 2021). By the other side, agents serve as marketing channels to connect buyers and sellers based on their knowledge of the import market (contacts, language, etc.) and the export one (local conditions, competitors, etc.).

The trading process starts with the formulation of a sales contract that stipulates quality, quantity, price, shipment period, delivery commitments, transport costs, risk transference (Incoterms), and other conditions agreed between both parties (Minondo Durán, 2018; International Trade Centre, 2021). After that, coffee is moved (shipment of coffee in bags or in bulk by truck) to a warehouse or logistic center near a Ports of Entry/Exit (POEs in border crossings, airports, and seaports) while the required documentation is approved for customs clearance (e.g., letters of credit, bill of lading, certifications, etc.).

In the usual case of maritime transport, the coffee is uploaded in containers (that should be in good conditions to avoid contamination) and sent through shipping services. Depending on the contract specifications, shipment can take from 15 days to 45 days. Shorter shipping periods reduce quality issues and market fluctuations (International Trade Centre, 2021). After arrival, the cargo is unloaded, goes through customs clearance, warehousing, and delivery to the client. After confirming the arrival and contract specifications (especially cupping quality), the buyer makes the bank transaction to the seller (Omori Kaisoten Ltd, 2009).

Processing Stage 4: Transformation

Transformation processes require several productive equipment, infrastructure, technical and technological knowledge, and utilities to generate a range of coffee byproducts. In the roasting factory (or coffee house), the green coffee beans are weighted and there is an assessment based on their size, properties, cupping quality, density, etc. Blending with other coffees is optional. If the roaster plans to make decaffeinated coffee, the decaffeination process is realized before roasting, involving chemical solvents or a steam bath. According to the coffee beans characteristics and the expected type of roasting (light, medium, and dark roasts highlight different properties), the roasting parameters are calibrated (temperature, preheat, etc.), and the roasting time is estimated (higher time increases some properties such as body and astringency, and reduce others such as acidity and sweetness) (International Trade Centre, 2021).

Then, the roast coffee needs a cooling time or 'degassing phase' to avoid changes of quality and flavor: as heat catalyzes chemical reactions, gases such as carbon dioxide are formed and released, while sugars caramelize, and fats become oils. Roasters therefore wait three to seven days for the gases to be released, but not long for the oxidation process to begin (Associated, 2016; Molina Ospina, 2019; Coffee Lounge, 2020b). After approximately a week, the coffee achieves a condition of 'freshness' and is suitable for brewing.

Roasted coffee can be further transformed depending on the coffee time and expected product to be released to the market: it can be sold as single origin or blend, in coffee beans or grinded, or even as soluble coffee and coffee capsules. All these coffees offer different benefits but also inconveniences according to the freshness shelf life and expiration. Depending on the variety, roasted coffee beans have a freshness shelf life (optimal consumption time) between one to three weeks and after that, their properties start decaying (before the first week, it is still degassing) (EspressoWorks, no date; Carr, 2018). However, its expiration date extents up to three to six months, or even more depending on the storage conditions. The grinding process allows to have ground (grinded) coffee and ready to be brewed, but it also reduces the freshness shelf life, approximately one to two weeks before start deteriorating (Coffee Lounge, 2020a). Finally, soluble (instant/ powder) coffee is made from grounded coffee: using extraction cells and hot water under pressure, the coffee essence is extracted to later freeze it, dry it, and powder it (Nestlé, 2022). This process increases its expiration time up to two years.

Packaging is a relevant process that can increase freshness shelf life of coffee products and were technology can play an important role: coffee bag valves allow degassing while the coffee is in the bag (Beck, 2019), and gas-flushed packaging increases freshness shelf life up to eight weeks rather than three (Carr, 2018). Thereby, good packaging not only increase shelf life but also represents a logistics opportunity. The shorter duration of freshness and shelf life of roasted coffee is much shorter

than that of green coffee (six months to ten years), imposing great challenges to the geographical distribution of value-adding processes on a global scale. Thus, roasting is highly concentrated, especially soluble coffee: 70% of worldwide production is controlled by Kraft and Nestlé (Bamber, Guinn and Gereffi, 2014). Thereby, concentration of roasting capacities leads companies to also control the coffee commercialization, marketing, and distribution channels to generate greater benefit (Daly *et al.*, 2018).

Processing Stage 5: Commercialization

The C-GVC have three main marketing channels: retailing, food service industry, and specialty coffee bars. The retail channel (e.g., supermarkets) represents 70% to 80% of total coffee consumption and currently, several supermarket chains even roast their own coffee and offer a great variety of products from conventional to organic coffees (Bamber, Guinn and Gereffi, 2014; Daly *et al.*, 2018). Wholesalers are also a large source of sales, where roasters that supply to several coffee shops, restaurants, businesses, etc. Finally, specialty coffee bars (e.g., Starbucks) provides not only coffee products but also services, where the 'power of stories' behind the coffee (traceability of the product to its origin) takes a more relevant role to facilitates the sales to the consumers (Bamber, Guinn and Gereffi, 2014; Daly *et al.*, 2018). Digitalization and e-commerce have facilitate the direct contact with consumers through e-commerce platforms, online marketplaces, or online auctions, where retail brands (e.g., Nestlé) have reported growth in the last years – especially during COVID-19 pandemic (International Trade Centre, 2021). Distribution time from coffee roasters to commercialization intermediaries takes approximately between 3 to 7 days (Home-Barista, 2011).

Processing Stage 6: Consumption

Consumption is the last process that add value to the product, and until certain point, it conditions the previous processes: local preferences in each country determines the type of roast, coffee amount, brands, etc., and therefore, production and utility consumption. Coffee consumption usually take places in coffee shops/bars or at home, and both modalities are the gateway to complementary products and services required for coffee brewing: sales of coffee equipment (e.g., small roasters, espresso machines, blenders, etc.), tools (e.g., grinders, tampers, etc.), cups, packaging, filters, and more. In addition, coffee bars emphasize the concept of customer experience, converting the act of coffee consumption into a 'social experience'. Thus, they tend to prefer specialty and certified coffees due to their higher quality and the stories behind them. Coffee-related businesses have a great impact on

environment: only in USA, more than 23 billion paper coffee cups are used per year. This represents 363 million pounds of solid waste made of 100% virgin paper (coffee cups are not made of recycled paper) (Murphy and Dowding, 2017).

2.3.2. The Global Coffee Market

With more than one trillion cups served every year, the coffee is the most drunk commodity after water and tea, representing the economic livelihood of over 25M people in over 50 producing countries (Goldschein, 2011; Cámara Peruana del Café y Cacao, 2017). The World Coffee Market (HS6 code: 0901) is an industry of $30.8B (2020) and is the world's 112th most traded product, representing the 0.18% of global trade (OEC, 2020b) –a radical difference from 1960s when it used to be the second most traded commodity after oil (International Trade Centre, 2021). The world coffee industry – considering specialist retailers, chain stores, equipment suppliers, etc.– is valued in $384.9B (2021) and projected to reach $497.9B by 2028 (IMIR, 2022). As described in **Figure 6.10**, in 2020, the top exporters were Brazil ($5.08B), Switzerland ($2.71B), Germany ($2.59B), Colombia ($2.54B), and Vietnam ($2.24B), while the top importers were United States ($5.43B), Germany ($3.4B), France ($1.94B), Belgium ($1.71B), and Italy ($1.64B) (OEC, 2020b). While South America and Europe are the main producing regions (65.1% of export market), North America and Europe are the main destination regions (80.4% of import market).

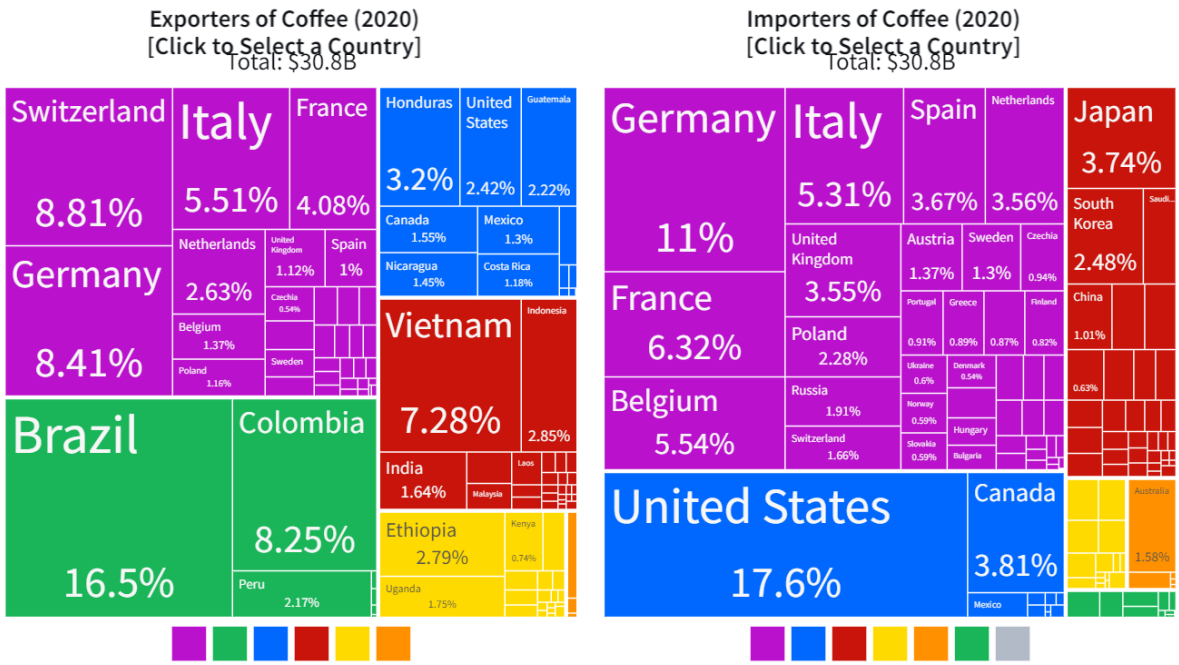
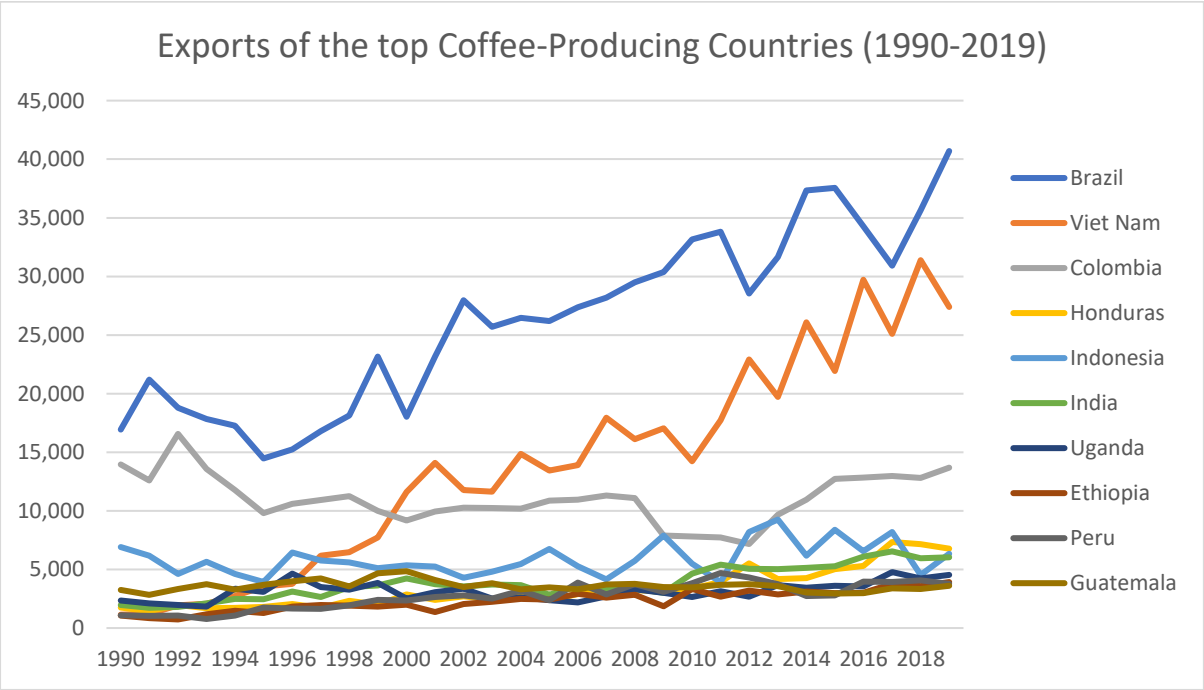


Figure 6.10. *Top Exporters and Importers of coffee in the world (OEC, 2020b)*

Among the top exporters, non-producing countries such as Switzerland, Germany, and Italy have significantly increased exports of roasted/processed coffee in the last 15 years (International Coffee Organization, 2022b), positioning over top producing countries such as Colombia, Vietnam, and Honduras. According to the International Coffee Organization (ICO) (**Figure 6.11**), coffee production is concentrated in Brazil (30.9%), Vietnam (20.8%), and Colombia (10.4%), with more than 60% of worldwide coffee production together. The Top 10 coffee-producing countries accumulates almost the 90% of worldwide production. In total, more than 50 countries produce coffee to a greater and lesser extent and are located in a productive region called 'Bean Belt', between the Tropic of Cancer and the Tropic of Capricorn (**Figure 6.12**). The Bean Belt overlaps the geographical extension of the Global South, highlighting that most producing countries are middle-income and lower-middle income countries, and therefore, with several institutional, financial, and technological to upgrade their value chains.



*Figures in thousands of 60kg bags

Figure 6.11. *Exports of the main coffee-producing countries (based on (International Coffee Organization, 2022a))*

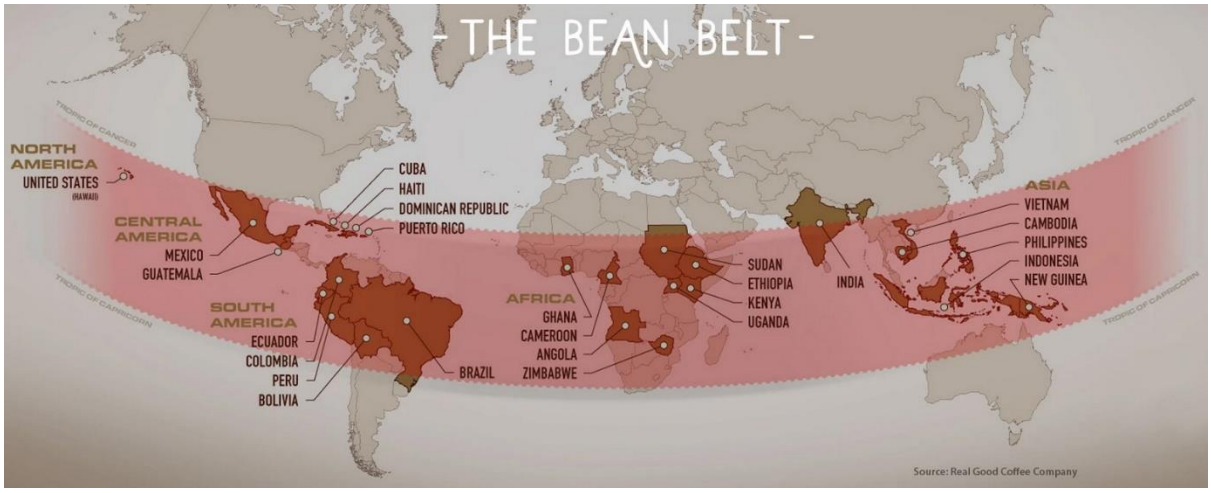


Figure 6.12. *The Coffee Bean Belt (Deshmukh, 2021)*

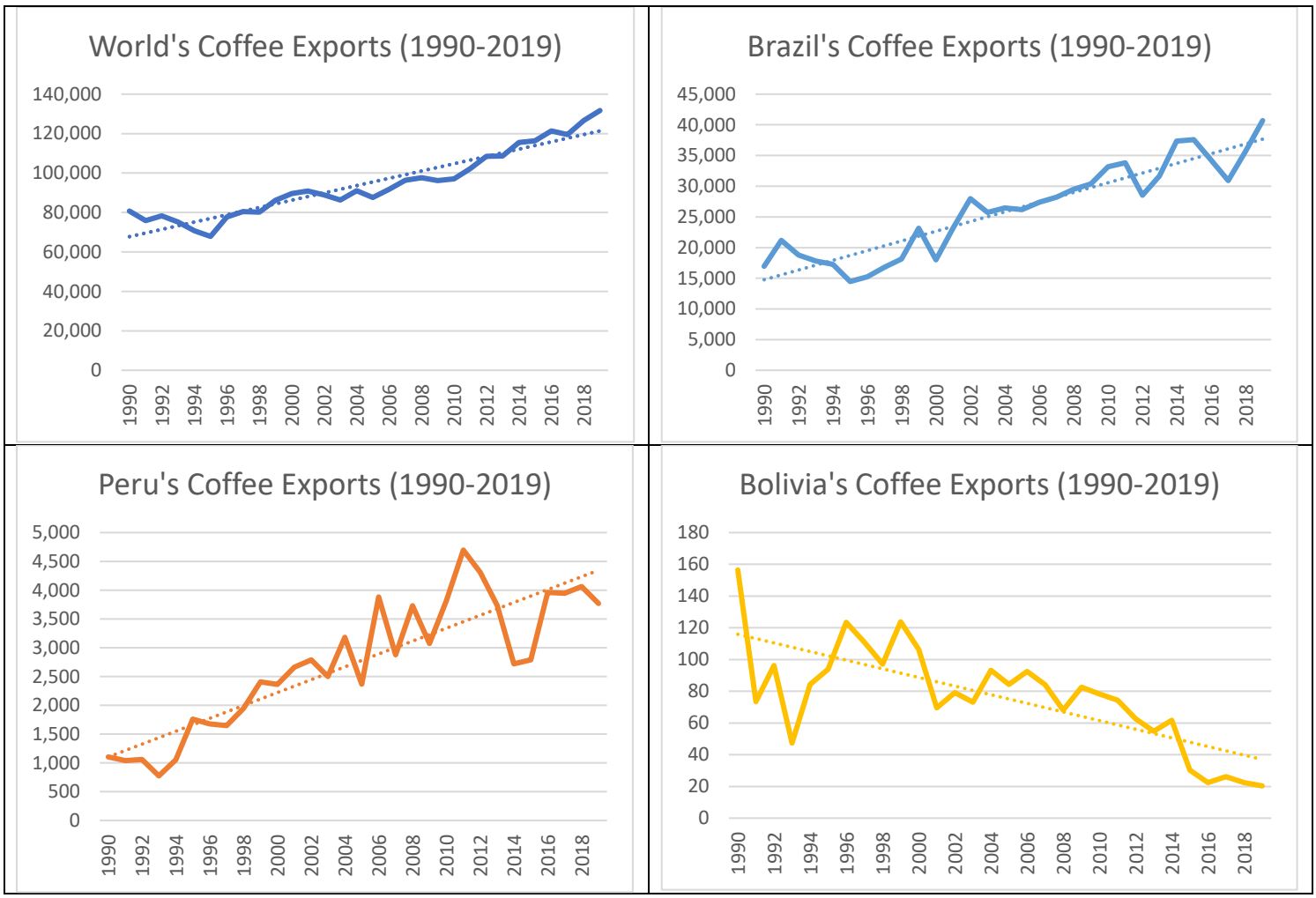


Figure 6.13. *Coffee Export Growths (1990-2019) (based on* (International Coffee Organization, 2022a)*)*

Peru is considered as one of the top 10 exporting producing countries in the world. In 2019, Peru positioned itself as the world top 9 exporter with 3.77M coffee bags (60kg bags) that represented the 2.86% of coffee global exports. By its side, Bolivia achieved the 0.02% of coffee global exports, with 20K exported coffee bags (position 36th) (International Coffee Organization, 2022a). As shown in **Figure 6.13**, during the last three decades (1990-2019), the total export of coffee bags has had an Average Growth Rate (AGR) of 1.80%. Brazil follows this trend with a positive AGR of 3.88%, and Peru with almost twice the former (6.99%). On the contrary, Bolivia shows a negative AGR of -2.71%. Apart from the continued decline of Bolivia in the last decade, Brazil and Peru suffered great losses since 2012, that matches with the spread of the 'roya amarilla' or Coffee Leaf Rust (CLR, *Hemileia vastatrix*) a coffee disease that undermined primary production until, approximately, the end of last decade.

Global Coffee Exporters

Analyzing the Global Coffee Market 2020 (**Table 6.11**), especially the first four exporters (Brazil, Colombia, Switzerland, and Germany), and considering Peru and Bolivia, we can identify some trends in the global dynamics of coffee. World production of not roasted / not decaffeinated coffee (090111), usually called as green coffee, is led by Brazil and Colombia that generate more than 40% of world exports in that by-product. At the same time, this product represents 99.1% and 96.7% of their total exports value respectively. Similar numbers are obtained by Peru and Bolivia, whose green coffee exports are equivalent to the 97.0% and 96.2% of their export values. These four countries show a low level of processing and could be considered as primary exporters. Germany is also a leading exporter of this by-product ($574.4M, 3.16%) even though this country does not have coffee farms: around a third of its total coffee import is directly re-exported to other countries (Thiemann, 2012).

Table 6.11. *Coffee Exports by-products from top exporters (2020) (based on (OEC, 2020b))*

HS06 code - Product / Country ($Millions)	Brazil	Colombia	Switzerland	Germany	Peru	Bolivia	World
090111 - Coffee, not roasted, not decaffeinated	5,033.4	2,457.3	13.9	574.4	646.8	8.9	18,155.4
090112 - Coffee, not roasted, decaffeinated	18.7	12.3	4.6	408.3	18.5	0.2	849.3
090121 - Coffee, roasted, not decaffeinated	26.3	68.4	2,491.8	1,551.6	1.4	0.1	11,007.8
090122 - Coffee, roasted, decaffeinated	1.4	2.1	201.4	52.8	0.1	0.0	657.2
0901XX - Others (husks, skins, subs, etc.)	1.3	1.2	0.7	2.2	0.1	0.1	126.2
0901 - Coffee	5,081.1	2,541.3	2,712.3	2,589.2	666.8	9.3	30,795.9

*Units in $ millions

In terms of decaffeinated green coffee (090112), Germany is the worldwide leader owning 48% of global production. The rest of selected countries do not exceed the 2.5%. This by-product requires more technology than the former due to the complexity of the decaffeination processes (withdraw caffeine without losing coffee properties). Roasted coffee market, considering the not decaffeinated (090121) and decaffeinated (090122) by-products, is led by Switzerland, and both represent the 91.9% and 7.4% of the national export value. Switzerland, Germany, and Italy control more than half of the not decaffeinated roasted coffee, and Switzerland by itself has almost a third of the decaffeinated roasted coffee market.

Europe has a large coffee-roasting industry (especially Germany), dominated by large multinational roasting and grinding companies that are responsible of roasting 35% of world coffee (CBI, 2022). Thereby, coffee transformation processes are agglomerated in Europe, allowing processing countries to generate as much (or more) value as the producer countries. As an example, Switzerland's success on coffee market expansion was highly attributed to Nestlé's innovation on roasted coffee products such as the Nespresso coffee capsules, that allowed the company to move upwards in the GVC processes and generate more revenues than Colombia (International Coffee Organization, 2022b). Nowadays, recent coffee innovations are in the final transformation processes to access new markets rather than primary production to improve productivity (VisualPolitik, 2021).

Global Coffee Importers

Analyzing the top importers in 2020 (**Table 6.12**), not decaffeinated green coffee (090111) is the main imported coffee by-product (59% of global imports). The imports value in this by-product in USA, Germany, Belgium, Italy, and Japan is around three quarters of their national coffee imports. Germany is by far the main green coffee importer, with more volume than Belgium and Italy together. This product is followed by not decaffeinated roasted coffee (090121), that represents more than two thirds of France's national coffee imports. Imports in decaffeinated roasted and not roasted coffee are relatively low in these countries and do not show a significant trend.

Table 6.12. *Coffee Imports by-products from top importers (2020) (based on (OEC, 2020b))*

HS06 code - Product / Country ($Millions)	USA	Germany	France	Belgium	Italy	Japan	World
090111 - Coffee, not roasted, not decaffeinated	3,936.1	2,584.7	528.1	1,263.2	1,234.9	1,006.4	18,155.4
090112 - Coffee, not roasted, decaffeinated	181.7	0.0	29.7	31.7	7.2	2.4	408.3
090121 - Coffee, roasted, not decaffeinated	1,022.3	773.5	1,299.1	373.7	335.6	115.2	11,007.8
090122 - Coffee, roasted, decaffeinated	74.9	33.0	76.3	35.0	54.4	12.4	657.2
0901XX - Others (husks, skins, subs, etc.)	214.9	10.7	11.7	3.6	4.6	15.1	567.2
0901 - Coffee	5,430.0	3,402.0	1,944.8	1,707.3	1,636.7	1,151.4	30,795.9

*Units in $ millions

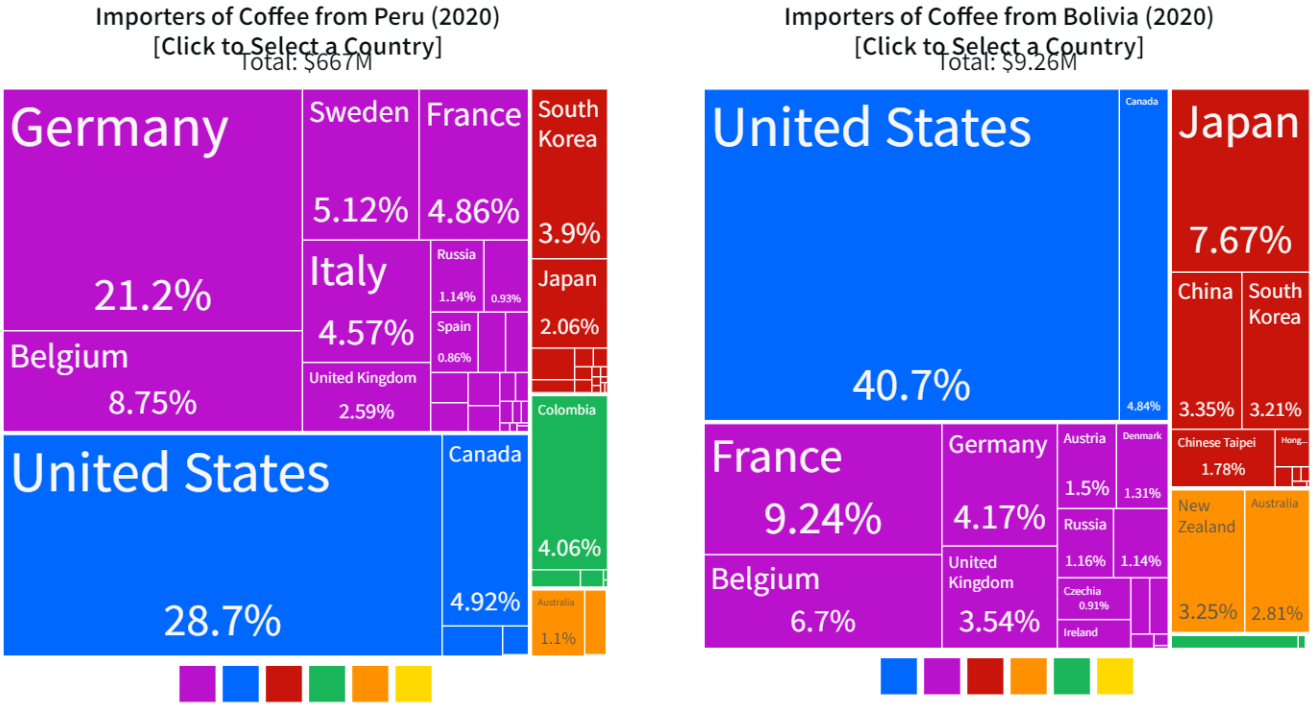


Figure 6.14. *Main export destination countries from Peru and Bolivia (2020) (OEC, 2020b)*

Focusing on the import countries that receive exports from Peru and Bolivia (**Figure 6.14**), Peru's top three partners are USA, Germany, and Belgium, that are equivalent to 58.7% of Peruvian coffee exports. By the other side, 57.6% of Bolivian coffee exports go to its three top partners: USA, France, and Japan. Both sets of destination countries are among the top worldwide coffee importers, highlighting that both Peru and Bolivia follow the global coffee dynamics of supply and demand. In addition, considering intraregional trade, 4.06% of Peruvian exports are exported to Colombia. Both Peru and Bolivia export to Chile and Argentina but they represent less than 1% of exports. Finally, Peru – Bolivia coffee trade is practically null: only $59 are registered as Peruvian export to Bolivia in 2020.

Coffee Consumption & Segmentation

In 2020/21, coffee consumption was the highest in Europe with 54M bags of coffee, representing one third of world coffee consumption. This is followed by Asia & Oceania (22%), Latin America (20%), and North America (19%) (International Coffee Organization, 2021). As coffee market demand is expected to grow, coffee-based revenues follow a similar trend, especially in the most profitable markets and main importing countries as Europe and USA (**Figure 6.14**). Coffee consumption per capita is strong in both regions, while most of the Global South (except for Brazil) has

a low and very low coffee consumption per capita (**Figure 6.15**). This means that most coffee producer countries do not consume their own coffee and global consumption is accumulated in the Global North.

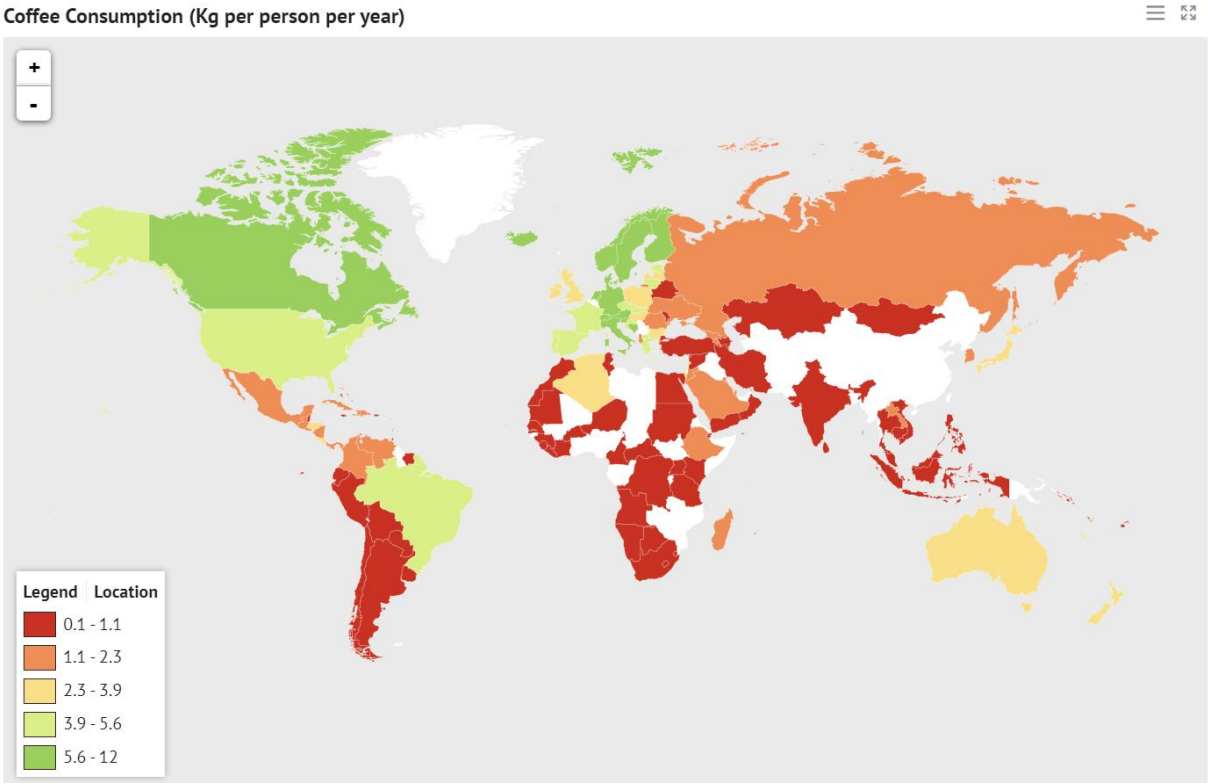


Figure 6.15. *Coffee consumption in kg per person per year (Knoema, 2019)*

To answer the several market opportunities, the coffee market demand has been subdivided by multiple segmentations according to its degree of transformation (e.g., green coffee, roasted, soluble, etc.), organoleptic characteristics (e.g., smell, taste, color, grain type, etc.), geography (e.g., region-based, country-based, etc.), and more. However, the main segmentation is based on product quality and divides coffee market in three segmentations: the conventional or high-volume coffee segment, the special and gourmet coffees, and the certified and sustainable coffees.

Market strategy on specialty coffees is based on quality and long-term relationships rather than on price (CBI, 2020b). To achieve the 'specialty' standard, green coffee must fulfill a number of legal and non-legal requirements. Legal requirements are related to food safety by ensuring the lack or minimum levels of pesticides, mould, and other health-harming agents. This is achieved by high hygiene practices, and clear traceability. Quality requirements are based on several criteria such as geographical origin (altitude, region), processing level (washed, natural, etc.), organoleptic characteristics (botanical variety, bean density, etc.), number of defects or imperfections, and more (Specialty Coffee Association, 2021). These characteristics influence the coffee cupping profile:

parameters such as fragrance, sweetness, or acidity that serve to assign a value to coffee quality through a scoring system.

Although there is no universal grading and scoring system to classify coffee quality, one of the most popular ones is the Specialty Coffee Association's standard that grades cupping profile in eleven attributes, giving them up to a maximum score of 100. Scores under 80 are not considered as specialty. From 80 points, specialty coffees can be classified as very good (80 – 84.99 points), excellent (85 – 99.99 points), and outstanding (90 – 100 points) (Specialty Coffee Association of America, 2015). Finally, there are other requirements in relation to their labelling and packaging (e.g., ICO identification code, GrainPro bags, jute bags, etc.) and sustainable requirements (certification standards such as Rainforest Alliance-UTZ or Fair-Trade certification).

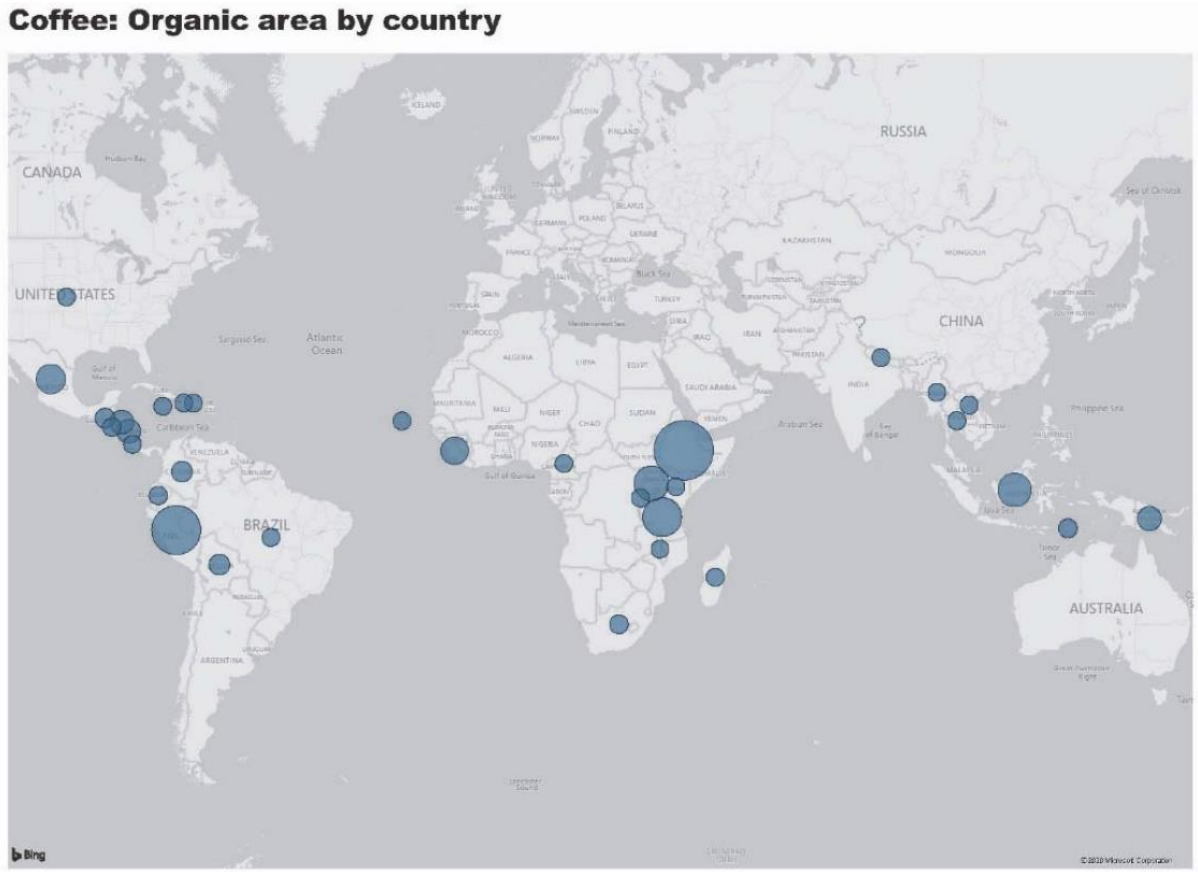


Figure 6.16. *Coffee organic areas in the world (2018) (Willer et al., 2020, p. 105)*

Among certified coffees, organic coffees are highly priced as they represent coffees without any type of chemical substances (pesticides, herbicides, and additives), and imply the implementation of good production practices as 100% organic fertilizer, shade-grown productive systems, sustainable crop rotation plan, and more. Organic coffees are under strict requirements and are subject to the standards and laws of each market that ensure organic production and labelling (CBI, 2020a). Due to those high standards, only 6.5% of global coffee area (around 701k hectares) is under organic management (Willer *et al.*, 2020), representing a very sophisticated market niche (**Figure 6.16**).

Peru produced the three types of coffee: conventional, specialty, and organic. Nevertheless, Peru is the worldwide leader in the production and export of organic coffee (2.2M quintals), followed by Ethiopia, which has a bigger coffee area (180k certified hectares), but lower productivity (2M quintals) (PE66A1) (USDA-FAS, 2018; Willer *et al.*, 2020). Peru is also the largest organic coffee supplier to Europe, with an estimated 31% of total EU imports (CBI, 2020a). The active promotion of specialty and organic coffees is promoted by the government and NGOs, positioning the country as the fourth-largest producer of coffees with sustainability certification (CBI, 2020a), and standardizing primary production on a national scale (PE66A2). The internationalization of coffee is considered a national priority as it can promote better income for farmers, generate more jobs, and encourage coffee production over coca leaf cultivation (USDA-FAS, 2018). Thereby, Peruvian coffee promotion lies on three focus areas: the unique origin, the sustainability of production, and the high quality of coffees (CBI, 2020a). Furthermore, Peruvian coffee has received several international awards, especially productions coming from the Sandia Valley in Puno region.

In the case of Bolivia, despite its low numbers in national coffee exports, it is the country with the highest organic coffee area share in the world: almost half (47.5%) of its coffee lands are oriented to organic coffee production (11,185ha), allowing the presence of more organic area than Brazil (689ha) and Colombia (10,495ha) together (Willer *et al.*, 2020). This shows a clear national strategy to position Bolivian coffee in the organic market niche, oriented to promote reestablishment of production levels, generate more profits for local farmers, and replace quantity with quality (BO46A1, BO46A2). Peru and Bolivia's orientation to specialty and organic coffees differentiates them from other regional competitors as Brazil and Colombia, countries that have focused on mass-market coffee production.

Despite of the relevance of coffee for their national exports, domestic coffee consumption is very low in both countries. While Brazil's coffee consumption per capita is around 4.8-5.1kg per capita and Colombia is around 2.2kg/capita, Peru's domestic consumption is between 0.75-0.9 kg, which is higher than global average (around 0.5-0.6kg) but one of the lowest consumptions in the top10 exporters (PE07A1) (USDA-FAS, 2022a, 2022b, 2022c). Bolivian domestic consumption is very low compared with the previous countries, with an average of 0.2kg per capita (USDA-FAS, 2022b).

Traditionally, both countries have had a very low domestic consumption. In the case of Peru, the coffee consumption culture was very weak until 2010s, and most popular coffee by-product was soluble/instant coffee (PE11A1). Even Peruvian producers –specially from the studied border areas– do not used to drink their own coffee, or they used to sell it without tasting due to the lack of habits, productive equipment, or coffee shops (PE07A2, PE07A3, PE57A1, PE14A1). Bolivia presented similar patterns to Peru, with a weak consumption culture and the predominance of soluble coffee for three quarters of consumers (InfoCafes, 2015). Producers and its border producers from Bolivia also experienced similar limitations as Peruvian ones (BO31A1).

Currently, soluble coffee is still the main coffee by-product which accounts 75% of total domestic consumption (USDA-FAS, 2022c). However, consumption patterns have been changing – especially through a stronger national campaign from public sector and civil society (PE11A2), leading to a better penetration of national coffee into supermarkets, the appearance of more coffee shops, and the emergence of a youth-oriented coffee drinking culture (PE41A1, PE07A4) (USDA-FAS, 2022c). Bolivian coffee consumption has also increased, even at a rate greater than 20% in 2019 and its market patterns are also changing, promoting consumers to explore diverse coffee preferences, and look for coffees with higher quality based on their organoleptic characteristics (LibreEmpresa, 2019). During the COVID-19 pandemic, while coffee shops were forced to close in several countries, coffee consumption at home increased significantly globally, serving to consumers to explore new coffee brands and explore different preparations (PE11A3) (National Coffee Association, 2021).

Market, Labor, and Product Competitors

This section describes some of the market competitors (relevant coffee producer stakeholders in the region), labor competitors (economic activities that compete for local workers in the same geographic area), and product competitors or derivates (products that fulfill similar needs for the same market, or derivates than can expand market opportunities). This analysis considers elements at national, regional, or local scale depending on its relevance to the project.

In terms of market competitors, in the South American region, Brazil and Colombia are the top coffee producers, with higher technological level or institutional development. As mentioned previously, Peru and Bolivia strived for more profitable market niches based on their production of specialty and organic coffees, while Brazil and Colombia focus on high volume of conventional coffees (PE41A2). However, the purpose to analyze these countries is not based on volume competition but identifying their strategies and how they influence the other countries in the region. Brazil is the worldwide leader in coffee production and export, so variations on its production affect coffee pricing, as it happened during the impact of the roya or climatic factors (PE57A2, PE07A5, PE11A4). Large-scale production

has been supported by technological upgrade promoted by the government, focusing on three key strategies to increase coffee-yield productivity: plantation spacing, land fertilization, and soil management (Comunicaffe International, 2016). Thus, Brazil has one of the highest productivity rates in the world (second only to Vietnam) (Deshmukh, 2021).

Colombia is another reference on coffee production in South America. Despite Colombian production is lower, this country has managed to export more than 2.5 times roasted coffee than Brazil (**Table 6.11**) and has opened a market niche to produce and sell soluble coffee (BO51A1). However, the most remarkable advance on Colombian coffee industry is the institutional development that has been achieved through *Café Juan Valdez*, a multinational coffee shop business promoted by the National Federation of Coffee Growers of Colombia (FNC). Launched in the 60s, Juan Valdez brand is the result of almost 100 years of institutionality that strengthen the linkages between the government, cooperatives, and producers. The FNC has also promoted other initiatives such as the National Coffee Fund, and more recently since 2002, more than 200 coffee bars have opened in America, Europe, and Asia (BO51A2, PE66A3). As strong coffee producers and higher coffee consumption, Colombia and Brazil represent two difficult markets to penetrate, making other countries in the region such as Chile and Argentina better market opportunities (PE14A2).

Analyzing the labor competitors at local and regional level (the border areas between Puno and La Paz as well as both regions), two economic activities overlap a similar territory. Puno region has a strong mining activity especially in the highlands (Ananea, La Rinconada), but also it is a common practice the illegal extraction of gold with dredgers from riverbanks in the jungle, especially near the urban centers located throughout the Sandia River (Cuyo Cuyo, Yanahuaya, San Juan del Oro, and San Pedro de Putina Punco) (CP02A1). In La Paz, gold mining extraction is mainly located in the Ulla Ulla National Fuana Reserve and in the Titicaca Lake plateau, locating gold extraction more in the highlands than in the jungle (Bartolomé and Ventura Barreiro, 2019; RAISG, 2020).

While gold mining represents a threat to coffee in terms of labor due to higher wages (1g of gold costs S/.180-190, equivalent to 17-30kg of green coffee) (CP03A1, PE57A3), coca leaf production overlaps the same territory as coffee production and competes for not only labor but also land area: the jungle from Puno and La Paz are suitable for both type of products. After the roya, several producers changed their coffee production to coca one, not only because of the difficulties imposed by the coffee disease, but also the profitability that coca production offers: the coca can be harvested up to four times in a year compared with coffee, and coca price is higher than coffee –although this has begun to decline in recent years (BO30A1). The cross-border region between Puno and La Paz plays an important role for the coca GVC, as production in the jungle is processed in the nearest urban centers (as Juliaca), and later is moved to Bolivia by airplanes that arrive to landing tracks hidden in the jungle, or by trucks through the Tilali – Puerto Acosta highway (PE08A1, PE08A2, PE08A3) (Romo Espinoza, 2012;

Bartolomé and Ventura Barreiro, 2019). This is a clear threat to coffee production because apart from competing in terms of land and labor, coca cultivation requires a considerable amount of pesticides, that undermine the organic coffee production.

Product competitors or also called substitute products of coffee are other beverages from mineral water to wine and beer. However, coffee market has diversified in several differentiated lines for specific products (Fitter and Kaplinksy*, 2001). While several coffee products and services have been mentioned, some others can be highlighted due to its relevance for upgrading in the value chain or maximizing profits. One type of coffee that has achieved a rare, high profitable, and sophisticated market niche is the animal-ingested coffee: the civet coffee or coati dung coffee are produced when the animal (civet, coati, weasel, etc.), eat the coffee cherries, ferment them while passing the intestines, and excrete the beans with a particular flavor. This makes this coffee 20 to 60 times more expective than regular coffee, although it requires a systematization of production and technology to achieve volume (IN76A1, PE66A4) (MacDonnell, 2023).

A second option that has become more common in Puno and La Paz, is the production of Sultana wine or pisco. The sultana, or also known as the coffee husk, is a common leftover of coffee production. While it has been traditionally consumed fried or in hot beverages and considered as a leftover for poor people, it has been becoming in an opportunity to increase profits from a production leftover by transforming it into alcoholic beverages. It has received support from both countries, mainly through local governments and cooperatives (PE27A1, BO30A2) (Slow Food Bolivia, 2019). However, further transformation requires productive equipment, utilities, and technical experience, that represent challenges for producers that want to expand their business line.

Coffee Pricing

Green coffee price fluctuates daily according to the global supply and demand. While quantity and quality are the main drivers for bargaining, other factors such as climate disruptions, market expectations, or currencies changes affect the final coffee price (International Trade Centre, 2021). Due to its influence in the global supply and demand flows, coffee is traded in the commodity market. According to **Figure 6.17**, current coffee average price is around $226 per 100 pounds (one quintal). During the realization of INPANDES project (2016-2017), coffee price started in $116.35 and finished in $121.77, with a maximum peak of $163.87 in October 2016. Considering an average pricing of $140 during those two years, it is equivalent to the 60% of current price. It is expected that global price of coffee will increase in the next years, with a minimum price around $250, and maximum near $400 per 100 pounds by 2024 (**Figure 6.18**).

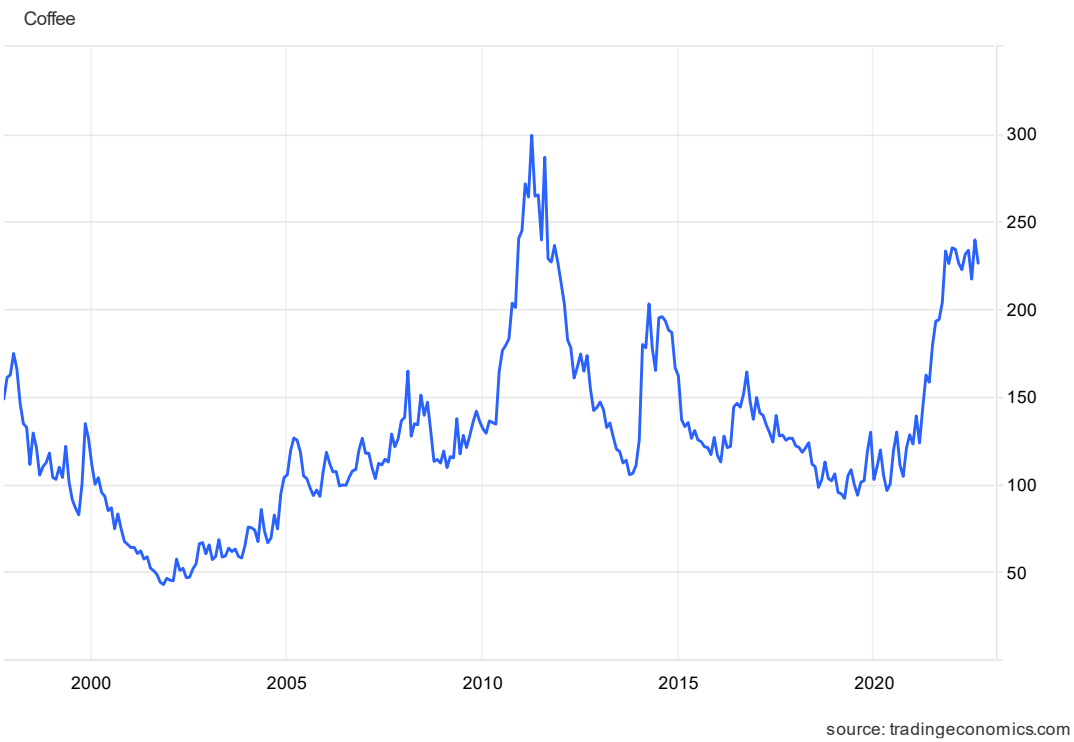


Figure 6.17. *Coffee Price (USD/lbs) by Oct2022 (Trading Economics, 2022)*

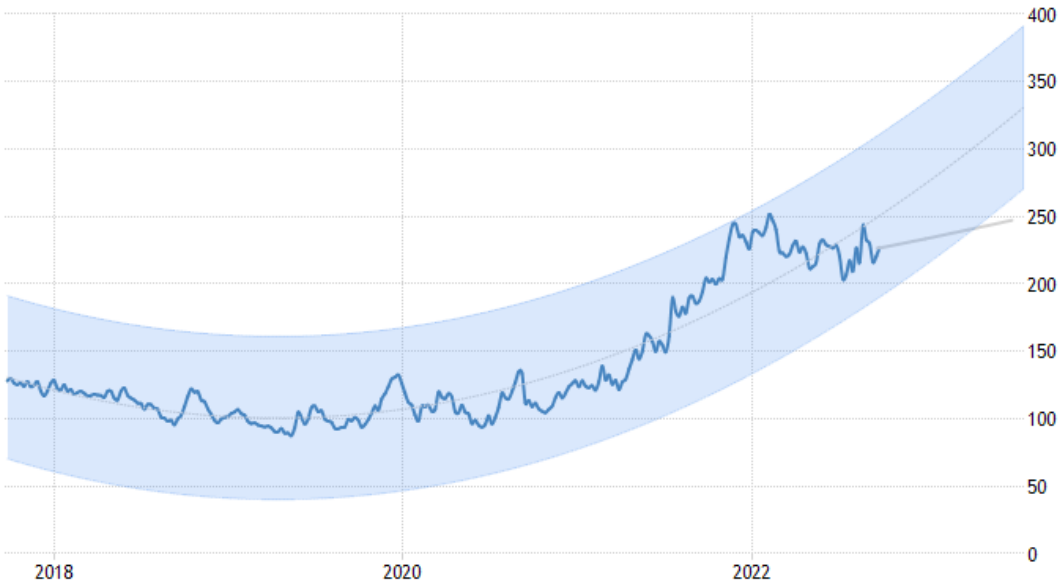


Figure 6.18. *Coffee Price Forecast (5 years, estimated by Nov2022) (Trading Economics, 2022)*

In more recent years, coffee is being traded more as product than as a commodity: the positioning of specialty and certified coffees has turned into a mechanism to accessing higher prices and create differentiated market niches (International Trade Centre, 2021). There, the decommodification of coffee as a market response is driven by sustainability and quality demands (Borrella, Mataix and Carrasco-Gallego, 2015).

2.3.3. The C-GVC Governance

The coffee global dynamics started between 17th and 18th century when the coffee consumption and production around the world were promoted within the European colonization projects: the establishment of colonial powers in coffee-producing countries of the Global South and the popularity of coffee in the Global North were the cornerstones to promote mass production and exponential growth in the 19th century, turning coffee into one of the most traded commodities by the time (International Trade Centre, 2021). It was not until the 1960s when significant changes in the coffee industry were introduced, and the idea of coffee as commodity started moving towards the opportunities of looking it as a more refined product, giving more importance to the quality, the way of drinking, and the stories behind a cup (International Trade Centre, 2021).

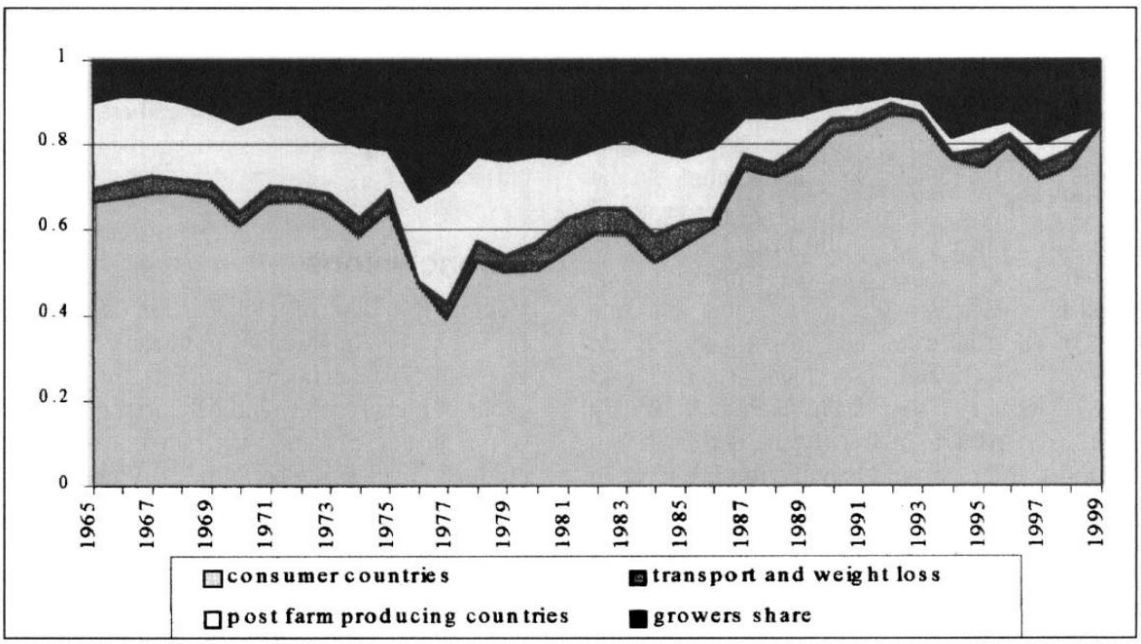
The current global production system and spatial distribution of labor in the coffee industry replicates the colonial trade patterns of transferring value creation capacity from the primary production to the transformation phase and therefore, from the Global South –high concentration of production– to the Global North –high concentration of consumption (Cheap Coffee, 2022). Thereby, there are two sets of lead firms in coffee industry: the roasters and the traders (Daly *et al.*, 2018).

The coffee global market is led by the roaster firms: as coffee manufacture is more capital intensive (International Coffee Organization, 2022b), four companies (Kraft, Nestlé, Sara Lee, and Smuckers) account 40% of the roast coffee market, and two companies (Kraft and Nestlé) for more than 70% of instant coffee (Bamber, Guinn and Gereffi, 2014). Five trading companies (Neumann Kaffee Group, Louis Dreyfus Company, ECOM, Olam, and ED&F Man) control over half of the market (conventional coffee) under a 'make or buy' strategy: they build their own divisions or acquire existing ones (International Trade Centre, 2021). However, due to the trend to reduce intermediaries and have more control over supply, the establishment of direct relationships between roasters and producers have promoted a power shift from traders to roasters (Bamber, Guinn and Gereffi, 2014). The commercialization stakeholders also play a relevant role on the C-GVC, as coffee houses such as Starbucks and Costa Coffee account 43% of total sales (Fitter and Kaplinksy*, 2001).

By the other side, the first part of the chain (cultivation, harvesting, and post-harvesting) is more labor intensive (International Coffee Organization, 2022b), and around 70% to 80% of global coffee is produces in farmlands smaller than 5 hectares (Fitter and Kaplinksy*, 2001; Daly *et al.*, 2018). The traditional commodification of coffee, the negative impact of market liberalization (export-led growth and oversupply of coffee), and the poor quality of national structural adjustment programmes (e.g., failure of marketing boards, agrarian reforms, or land legislations) have led to the 'atomization' of producers' sales into commodity markets (market-set prices without regard of farmers' costs of production) and with low associativity capacities that have fragmented possible agriculture or bottom-up governance models (Fitter and Kaplinksy*, 2001; Murphy and Dowding, 2017).

The limited economies of scale, access to market information, commercial skills, and capital have reduce the producers' bargaining power and the reduction of their share of profits in the C-GVC: more than 90% of global coffee volume is traded as green coffee and primary producers capture less than 20% of final retail value and even between 5% and 10% of that value (Bamber, Guinn and Gereffi, 2014; Daly *et al.*, 2018; International Coffee Organization, 2022b) (**Figure 6.19**). Thereby, the imbalance of power has generated an unequal distribution of income, where profits are mainly enjoyed by roasters, traders, and retailers, while producers perceive low (or even negative) rents (Fitter and Kaplinksy*, 2001; Utrilla-Catalan *et al.*, 2022). Currently, the C-GVC – or the absence of it – have no durable solutions and cannot prevent asymmetric income distribution (Pelupessy, 2007).

Figure 5: Distribution of income: share of final retail price



Source: Update of data in Talbot (1997b)

Figure 6.19. *Estimated distribution of income in the C-GVC (Fitter and Kaplinksy*, 2001)*

The governance of certified coffees is more controlled than conventional market but there are more available governance arrangements depending on the third-party certification organization (e.g., first-party corporate schemes, non-profit partnerships, for-profit schemes) (**Table 6.13**). By establishing minimum standards of quality, production, or price, certifications have captured around 9% of the market and even attracting major roasters. Despite the higher entry barriers to sell certified coffee, there has been an oversupply and market saturation, and some certified producers are obligated to sell their product as conventional one (Bamber, Guinn and Gereffi, 2014). Nevertheless, specialty and certified coffees still represent a big opportunity for producers to achieve higher-value market niches as the final prices of those products are more stable and higher (coffee as a product and not commodity) (Borrella, Mataix and Carrasco-Gallego, 2015).

Table 6.13. *Most popular coffee certifications and certifier actors (Daly et al., 2018)*

Table 3. Select Private and Civil Society Standards in the Coffee GVC

Certification	Participating Arabica Lead Firms	Major end-markets	Description
UTZ Certified	Nestle, Kraft, Tchibo, JDE	Netherlands	• Code of conduct for roasters and growers. • Sets sustainability and traceability standards. • Partnership with Nespresso and Kraft • 2012: 716,000 MT of certified coffee produced.
Fair Trade Labeling Organization (FLO)	Starbucks, Tchibo	UK, Netherlands, USA*	• Certification for small growers and associations. • Focused on ensuring equitable and stable prices for growers, setting minimum prices • Partnership with Starbucks • 2012: 380, 000 MT of certified coffee produced.
Rainforest Alliance (RA)	Nestlé, Kraft, Tchibo	Germany, UK, USA	• Sets minimum standards for farming practices. • Based on multi-crop guidelines developed by Sustainable Action Network. • Partnership with Nespresso • 2012: 266,000 MT of certified coffee produced.
International Federation of Organic Agriculture Movements	Tchibo	Germany, Italy	• Certification program for organic farmers. • Sets standards for pesticide use, conservation practices, biodiversity and social justice. • 2012: 249, 000 MT of certified coffee
Starbucks' Coffee and Farmer Equity Practices (C.A.F.E.)	Starbucks	Worldwide	• Corporate standards for quality and sustainable farm practices. • Focus on areas of Product Quality, Economic Accountability, Social Responsibility, and Environmental Leadership
AAA Sustainable Quality Program	Nestlé	Worldwide	• Corporate guidelines for verifying farm practices. • Focus on environmental sustainability, origin and taste.
Global Coffee Program (Formerly 4C)	Nestlé, Tchibo, Strauss, Aldi; JDE	Worldwide	• Code of conduct for roasting industry. • Sets baseline criteria for social, ecological and economic conditions in producing countries. • Formed in 2016 as a merger of the Common Code for the Coffee Community (4C) and IDH Sustainable Coffee Program

Sources: FLO, 2012; ITC, 2011; TCC, 2012; Potts, 2014. **Note:** *The American fair-trade organization, Fairtrade USA, split from FLO in 2011.

According to the International Coffee Organization (ICO) and the International Trade Centre (ITC), despite the several obstacles for coffee producers in the C-GVC, some strategies can allow them to achieve a better positioning (International Trade Centre, 2021; International Coffee Organization, 2022b). Closer and more durable relationships between producers and other value chain actors such as traders and roasters (e.g., direct trade schemes, contract farming) or public sector (e.g., market-driven PPP, FDI policies) can help to cut intermediaries, facilitate the transfer of resources (technological and financial), and promote higher standards (e.g., facilitate certifications).

Upgrading in the value chain (functional, product, and process upgrading) can increase participation and more profits to producers by adding value through specialization, technification, or sustainable standards that reduce the distance to consumers. Farmer associations and cooperatives can promote collective action, reduce costs, and reach higher-value markets by enhancing their bargaining power, upgrading opportunities, and market access. Digitalization and e-commerce can reduce market entry barriers by directly linking producers with even end-consumers while ensuring traceability and transparency simultaneously. Finally, South-South trade and cooperation can be beneficial due to the lower entry barriers in a market with increasing demand.

Upgrading the C-GVC

In front of the several challenges and opportunities delivered in the C-GVC, some possible activities have been mapped to upgrading coffee value chain in producing countries (**Table 6.14**). There are two strategies that are transversal to the upgrading activities: research & development, and digitalization (International Trade Centre, 2021). Integration of more efficient technologies start by developing them according to the contextual factors where the activity is realized. R&D can help to increase performance, standardize processes and practices according to determined conditions, or even reduce risks. Alliances with research, educational partners and public officers are required for good knowledge transfer to the farmlands. Digital transformation represents another opportunity in this era to promote innovation throughout the value chain: from monitoring soil conditions to blockchain technology to ensure transparency and traceability. The idea of high-tech farming is becoming very attractive to adapt coffee production to the old and current challenges from improving productivity to climate change adaptation (e.g., solar panels). However, implementing both strategies demand requires to overcome the lack of financing, the digital divide, the absence of institutions in the area, and more.

Table 6.14. *Upgrading strategies in the C-GVC (Bamber, Guinn and Gereffi, 2014; International Trade Centre, 2021; International Coffee Organization, 2022b)*

Upgrading	Focus	Activities
Process	Productivity & Efficiency	Improved coffee varieties, good agriculture practices, reduction of per-unit cost, better technology
Product	Quality	More profitable varieties, international standards, tech-upgrade initiatives
Functional	Downstream processing	Transforming green coffee, moving to roasted, soluble, ready-to-drink coffee, packaging technology
Channel	Market access	Traceability, geographical indication, Direct sales, e-commerce, cupping contests, brand identity
Intersectoral	Diversification	Coffee-related products & services
Socio-environmental	Impact	ILO framework, worker safety, sustainable requirements,

2.4. Phase 1.1. Descriptive Analysis N°4: The Coffee Cross-Border Governance System (C-CBGS)

This analysis describes the Cross-Border Governance System of Coffee by highlighting 1) the geography of the coffee value chain, 2) involved stakeholders, 3) existing policies, and 4) the intangibles around coffee production. These topics are discussed at the national, subnational, and local scale from a bilateral perspective.

2.4.1. Geography

As part of the Bean Belt, Peru and Bolivia are two countries with the ideal geography to cultivate coffee, especially the arabica variety due to the predominance of high jungles or *ceja de selva* (transition area between the highlands and the jungle) that have the soil and altitude conditions for coffee growth. Thereby, the coffee productive areas of Peru and Bolivia (**Figure 6.20** and **Figure 6.21**) are located between the Andes and the Amazon, shaping a continuous binational coffee corridor from the north of Peru to the south of Bolivia, by the right side of both countries. This section describes about the national coffee industries and their spatial development.

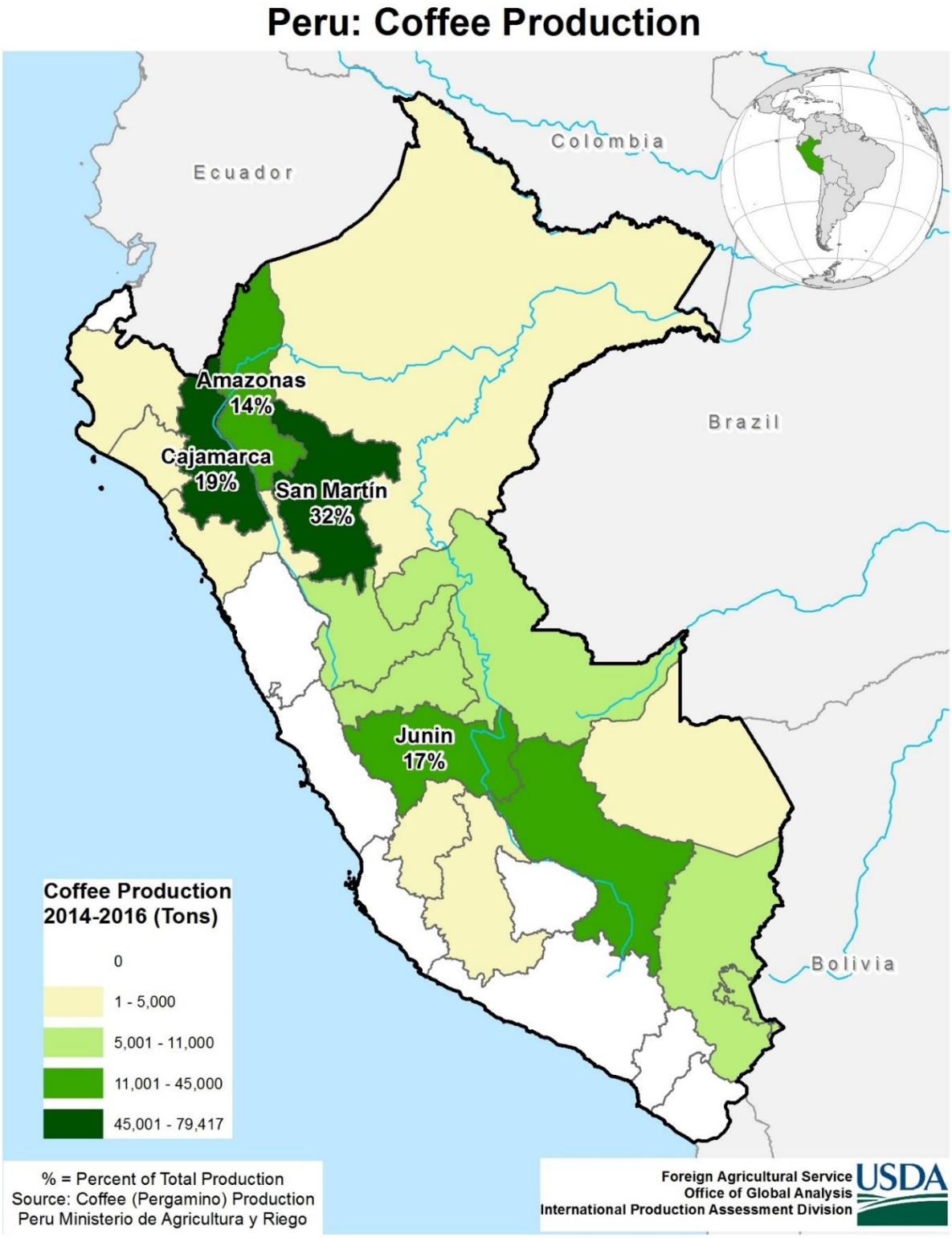
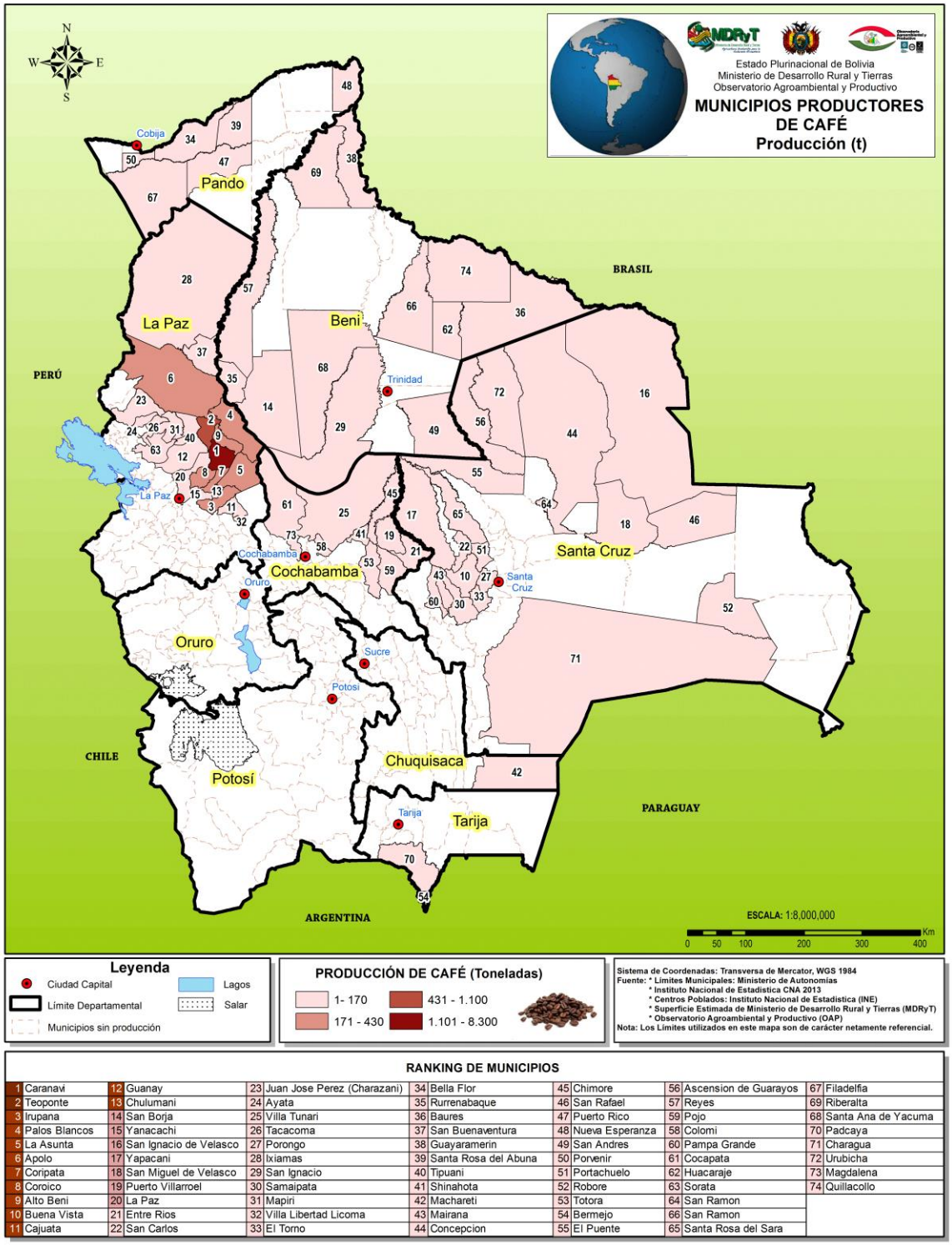


Figure 6.20. *Coffee Production in Peru (2014-2016) (USDA-FAS, 2017)*



RANKING DE MUNICIPIOS

1	Caranavi	12	Guanay	23	Juan Jose Perez (Charazani)	34	Bella Flor	45	Chimore	56	Ascension de Guarayos	67	Filadelfia
2	Teoponte	13	Chulumani	24	Ayata	35	Rurrenabaque	46	San Rafael	57	Reyes	69	Riberalta
3	Irupana	14	San Borja	25	Villa Tunari	36	Baures	47	Puerto Rico	59	Pojo	68	Santa Ana de Yacuma
4	Palos Blancos	15	Yanacachi	26	Tacacoma	37	San Buenaventura	48	Nueva Esperanza	58	Colomi	70	Padcaya
5	La Asunta	16	San Ignacio de Velasco	27	Porongo	38	Guayaramerin	49	San Andres	60	Pampa Grande	71	Charagua
6	Apolo	17	Yapacani	28	Ixiamas	39	Santa Rosa del Abuna	50	Porvenir	61	Cocapata	72	Urubicha
7	Coripata	18	San Miguel de Velasco	29	San Ignacio	40	Tipuani	51	Portachuelo	62	Huacaraje	73	Magdalena
8	Coroico	19	Puerto Villarroel	30	Samaipata	41	Shinahota	52	Robore	63	Sorata	74	Quillacollo
9	Alto Beni	20	La Paz	31	Mapiri	42	Machareti	53	Totora	64	San Ramon		
10	Buena Vista	21	Entre Rios	32	Villa Libertad Licoma	43	Mairana	54	Bermejo	66	San Ramon		
11	Cajuata	22	San Carlos	33	El Torno	44	Concepcion	55	El Puente	65	Santa Rosa del Sara		

Figure 6.21. *Coffee Production in Bolivia (2013) (OAP, 2022)*

Peruvian Geography of Coffee

The coffee has been in the Peruvian territory for more than 270 years, and since the 1990s, Peru has occupied a place in the world top 10 of productive countries, having a production record of 5.2M (60kg) bags by 2012 (Statista, 2022). Currently there are 450,000 coffee hectares in 400 rural districts of eleven regions, that give direct employment to more than 200,000 coffee producers. While coffee spreads over 12% of the available arable area, in terms of land ownership Peru has one of the lowest coffee land per capita ratios in Latin America, with an average of 2 hectares per producer (PE66A5, PE66A6). Around 35% of these producers are associated to a coffee association or cooperative, and despite this low number, there are large cooperatives with up to 2000 associates that offer several benefits to their members (e.g., better prices, marketing, market access, etc.) (PE66A7) (USDA-FAS, 2022c).

Peruvian coffee production has an average productivity of 722kg per hectare or 12 (60kg-)bags per hectare, being under the breakeven point of 1600kg per hectare because around 80% of coffee lands are cultivated with traditional technologies – shade-grown techniques and hand-picked collection (PE66A8) (USDA-FAS, 2016, 2022c). However, Peru has improved technologically in the last years, standardizing post-harvest processing (washed coffee) and a higher supply of specialty coffees (PE66A2, PE66A9): Peru is the world leader in organic coffee production and one of the leaders in production and export of coffee with fair trade certification (PE66A1, PE66A10), and since 2017, started selling its coffee at a differentiated price and not as a commodity (PE66A11). The development of Peruvian coffee industry based on both organic and fair-trade certifications highlights a quality-oriented industrialization as one of the main factors for improvement and for the institutional development of grassroot producer organizations and cooperative governance:

PE66A10: *Peru has been positioning pretty well in global market, with fine coffees, special organic coffees, fair trade. For the last 15 years, Peru has been leader in the production and export of coffee with fair trade certification. The combination of organic and fair trade has been a crucial factor with high contribution to structure the business social fabric of smallholder producers. The differentiated price helped small producers to improve their quality, make investment in infrastructure, and access to market. That was a key factor within a political, economic, and social context of exclusion within small farming and cooperative associations.*

Geographically, Peruvian coffee production divides in three regions: the northern corridor (Amazonas, Cajamarca, and San Martin region) with 60% of national production, the central jungle (Junín, Pasco, Huánuco, and Ucayali) with 23%, and the southern corridor (Cusco, Ayacucho, and Puno) with 17% (PE66A12). The north corridor is the main productive area in terms of volume,

productivity, and cooperative governance, achieving special niches in the national and international markets (PE66A13). The three regions have an average altitude from 800masl to 2050masl, suitable for high quality coffees but presenting a difficult geography to technify and replace manual production (PromPerú, 2019). As almost all coffee production is arabica, around 85% to 90% of production is exported to 45 countries and the rest is used for national consumption (PE66A14).

Bolivian Geography of Coffee

In the case of Bolivia, the first written records mention about small coffee cultivations by the end of the 18th century, but by the beginning of 20th century, the coffee was just a small alternative to coca production (95% of national agriculture production). From 1970s, with strong policies against the coca, coffee industry consolidates by the end of the century, with a production up to 156K (60kg) bags – around 3% of Peruvian peak production. According to Bolivian Coffee Census 2011/2012 (Ministerio de Desarrollo Rural y Tierras, 2012), there are 36,000 hectares in six Departments for 17,000 producers, but 91% of them are in La Paz Department. The 85% of those lands are old unproductive plantations. Coffee production spreads in less than the 0.8% available arable land, and there are on average 2 hectares for each coffee producer. Most of the coffee is produced by small producers with 20 hectares, of which 3 to 5 are for coffee cultivation (BO46A3). Only 18% of Bolivian producers are part of a coffee association or cooperative.

Bolivian coffee industry has an average productivity of 391kg per hectare or 6.5bags per hectare (half of Peruvian productivity). Despite the low volume and productivity – compared with other regional coffee powers, Bolivian production is under shadows and focus on specialty and certified coffees (BO46A4) and as previously mentioned, quality-oriented production has been promoted by the government to. National coffee policy has been oriented to improving coffee technology for washed Arabica coffee, specially to promote certified coffees. However, coffee production is part of a national diversification strategy to reduce and mitigate the risk of monoculture and ensure more income to family economies.

BO46A5: *Bolivian strategy to risk mitigation is agricultural diversification, so nobody will orientate their 20 hectares to coffee… they have coffee, citric, coca… all diversified to ensure profit to familiar economies. In Madidi is more diversified compared with Caranavi where coffee-based income is higher, bu Maddidi coffee production is marginal. Due to diversification, coffee peak is in May-August, overlaps with tubers peak in Abril-Oct, and coca (30x30) that has 5 harvest per year that stabilize all fluctuations.*

Geographically, most coffee lands are in the transition area between the Valleys and Amazon of Bolivia, with an average altitude of 1200masl to 2500masl (BO46A6). Around 95% of national coffee production comes from Nor Yungas, Sud Yungas, and Caranavi Provinces, the three located in La Paz Department, making it the main coffee region (Caranavi is considered the coffee capital of Bolivia). Those areas are followed by Santa Cruz (3%) and Cochabamba (1%) (BO46A7) (Ministerio de Relaciones Exteriores - Bolivia, 2020). Coffee collection depends on the technological level of the associations and is limited by the geography and accessibility to coffee areas (BO46A8).

After several intents to 'Colombianize' production (technified mass-production), areas such as Yapacaní (Santa Cruz) became very industrialized, with a productivity of 45 to 50 bags per hectare. However, replicating the Colombian system has failed in several other regions due to the context limitations (topography, associations, etc.) (BO46A9) (Publiagro, 2021). From 1990 to 2017, Bolivian coffee production decrease from 156K bags to 31K bags (80% reduction) due to the plagues, coca production, and lack of incentives (**Appendix 9**). From 2016, La Paz became the only exporter Department in Bolivia. The 95% of production is exported to 21 countries and the rest is used for national consumption (IBCE, 2020; El Diario, 2021).

A Binational Coffee Corridor

The concept of a binational coffee corridor between Peru and Bolivia, presents several commonalities and differences in terms of the spatial division of production. The coffee productive areas share similar geographical and environmental characteristics, with similar altitude and soil predisposition to cultivate high-quality arabica coffee. Due to the rugged geography and low accessibility, technification has been a challenge in both countries, and the atomization of land (more in Peru than Bolivia), has been a constraint to generate volume and economy of scale. While cooperatives movements partially overcome these issues, the number of associated producers is still low (35% in Peru and 18% in Bolivia). Thereby, national governments and coffee organizations have focused on quality-oriented strategies such as further development of specialty, certified, and organic coffees to increase market access for green coffee export. Around 90% of production is exported, and the rest goes for national consumption, that is still low in both countries compared with other coffee producers in South America.

In terms of the spatial division of production (**Table 6.15**), Bolivia production is less than 10% or even 5% of Peruvian one[22]: Consider the Peruvian southern zone and Bolivia together, the average production and surface will be equally or lower than Peruvian center jungle zone, and almost half of the volume and surface of the northern zone. This shows an opportunity to increase economy of scale by promoting a greater integration in the Peruvian southern zone and Bolivian coffee areas (especially La Paz) due to their geographical proximity and complementarity possibilities. However, an examination at regional (and local) level –in terms of the spatial configurations of production and participating stakeholders– can bring more insights about what kind of cooperation could be beneficial for this possibility beyond volume.

Table 6.15. *Statistics in the Binational Coffee Corridor (Author's elaboration)*

Sector	Region	Surface (ha)		Production (ton)		Productivity (Ton/ha)	
Peru (North)	San Martín	87163	201465	82319	168511	0.94	0.84
	Cajamarca	53038		48182		0.91	
	Amazonas	53285		34966		0.66	
	Piura	7979		3044		0.38	
Peru (Center)	Junín	79808	106804	44692	62636	0.56	0.59
	Huánuco	16202		7850		0.48	
	Pasco	10794		10094		0.94	
Peru (South)	Cusco	53850	70574	30318	41133	0.56	0.58
	Puno	**10858**		**6940**		**0.64**	
	Ayacucho	5866		3875		0.66	
Bolivia (whole)	**La Paz**	**22285**	23306	**20525**	21427	**0.92**	0.92
	Santa Cruz	600		584		0.97	
	Cochabamba	190		176		0.93	
	Beni	189		110		0.58	
	Tarija	14		10		0.71	
	Pando	23		18		0.78	
	Chuquisaca	5		4		0.80	
Binational Coffee Corridor		**402149**		**293707**		**0.73**	

[22] While the Bolivian Coffee Census 2011 shows a lower productivity (0.391), the National Institute of Statistics reveal higher numbers (0.920). As Table BI summarizes production and surface quantities by 2016, the latter source was used although due to data availability, but the table should be considered as a reference.

In terms of export logistics, the main gateways from Peru are the border crossing of Tumbes (4% exports), the seaport of Paita (55% exports), and the seaport of Callao (41% exports), the first two located at the north, and the last one at the center (capital City). No seaport is used at the south of Peru for coffee export. Bolivia, as an enclave country, does not have direct access to seaports so exports are sent by airway or transported to Arica (Chile) through the border crossings from Charaña or Tambo Quemado (World Bank, 2016; IBCE, 2021).

A last aspect to consider is the influence (direct and indirect) of coffee production into environmental issues, and vice versa (Dijkhorst, Kuepper and Thoumi, 2017; Hernandez, 2019): By 2050, even up to 50% of world production will reduce due to climate change. In the Peru-Bolivian Amazon, the expansion of coffee lands and roads has been endangering areas previously protected by their remoteness. Deforestation and slash-and-burn techniques exercises pressure over the environment and, due to the poor quality of the jungle soils (lack of nutrients), agriculture is not suitable for permanent activity, inviting to continue expanding the agriculture frontier. However, agroforestry systems with shade-grown techniques are usually practice in both countries, but more awareness is needed specially for new coffee producers or migrants.

Coffee Production at Subnational Level

As coffee production, especially Arabica coffee, is linked to the geographical conditions (especially altitude), coffee lands have specific locations either in Puno Region or La Paz Department (**Figure 6.22**). In the case of Puno, the coffee lands are located at the north of the region, in the provinces of Carabaya and Sandia. La Paz has better conditions as the optimal lands cross the department in the middle. However, most coffee producing communities are in three provinces: Caranavi, Nor Yungas, and Sud Yungas (DAPRO, 2020). The border provinces are Sandia (Peru), Franz Tamayo (Bolivia), and part of Abel Iturralde (Bolivia).

In Puno region, Sandia Province (**Figure 6.23**) is the main production area since Carabaya's coffee producers are in early stages of coffee production and association compared to Sandia (PE10). Since the colonization of the Tambopata basin and Inambari basin, the Valleys of Sandia (northeast side of the province) transformed in an area conducive to coffee cultivation, especially in the districts of Alto Inambari (17 producing sectors), Yanahuaya (12 sectors), San Juan del Oro (24 sectors), and San Pedro de Putina Punco (39 sectors) (Florez Delgado, 2020). The last three coffee districts could be considered as border districts although only one of them (SPPP) has direct contact with Bolivian communities. The province capital is in Sandia district, but it is not oriented for coffee production but for other products such as tropical fruits (PE24N1).

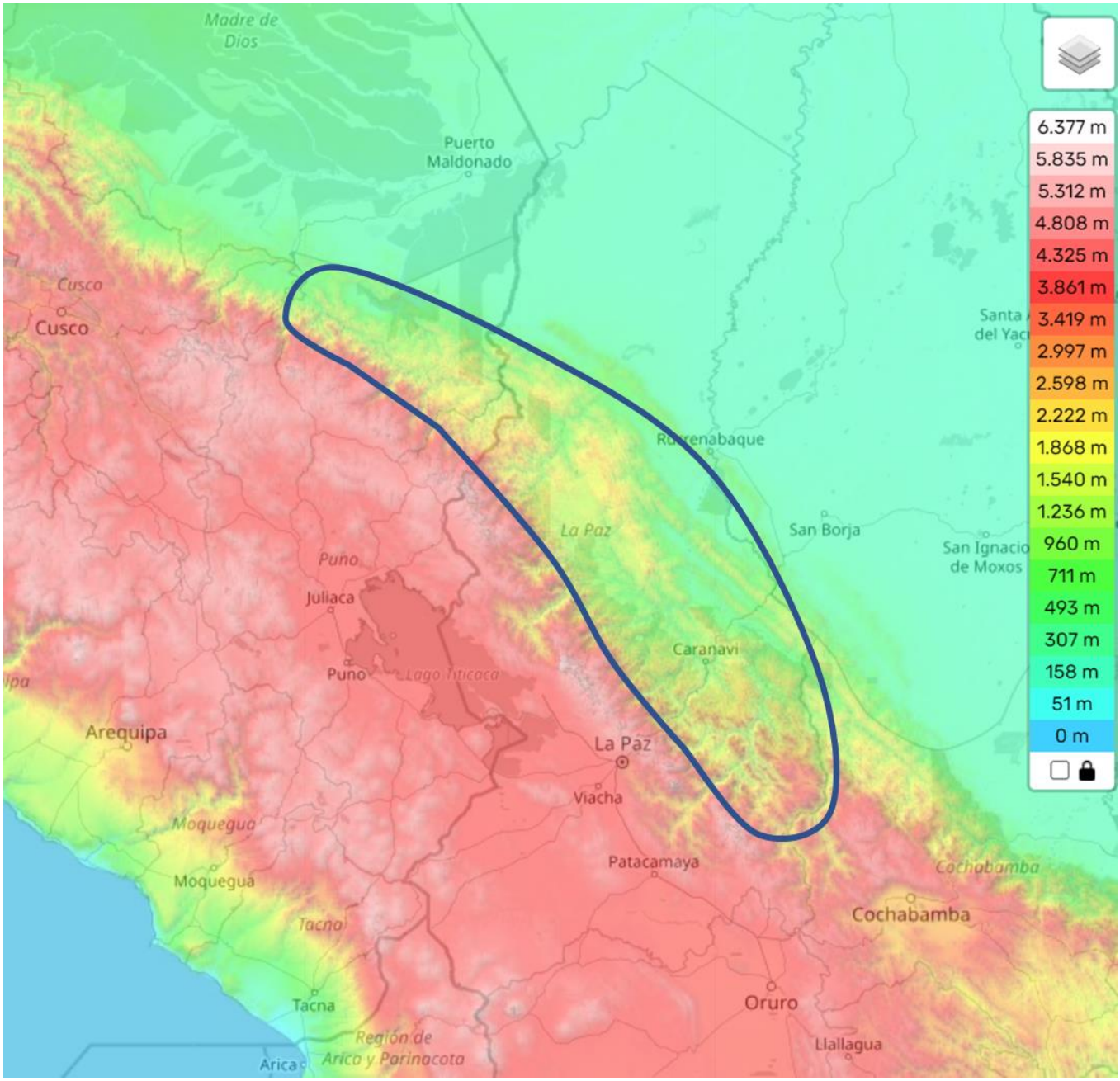


Figure 6.22. *The coffee binational corridor: Puno-La Paz section (Topographic-map, 2014)*

Figure 6.23. *Province of Sandia (FamilySearch, 2021)*

The valley geography is composed by high jungles cut by the Sandia River and its prolongation until the Peru-Bolivia border. The PE34H highway follows the path of the rivers connecting the main district cities of this area: Sandia city, Yanahuaya, San Juan del Oro, San Pedro de Putina Punco, and arrives until Pauji Playa, the nearest community to Bolivian border (and to Puerto San Fermin). In other words, urbanization have been produced in a linear path or corridor between the rivers and the high jungle / mountains.

The PE34H is main (and only) highway connecting the whole coffee production area to Juliaca, but highway conditions are not the same throughout the route: while road conditions are good from Juliaca city throughout the highlands (paved road and basic pavement), the rugged geography of the Amazon section (starting from Sandia province) increases the risk of landslides, where mountain slides can fall onto the one-way pavement, or the road can fall into the river. Road conditions decrease even more arriving to Yanahuaya, San Juan del Oro and San Pedro de Putina Punco, as there are only one-way rammed roads with high risk of landslides (DGCF, 2017). As the cities and roads follow the river paths, river mining is very intense especially in SJDO, while coffee and coca production happen in the high jungles of the three border coffee districts.

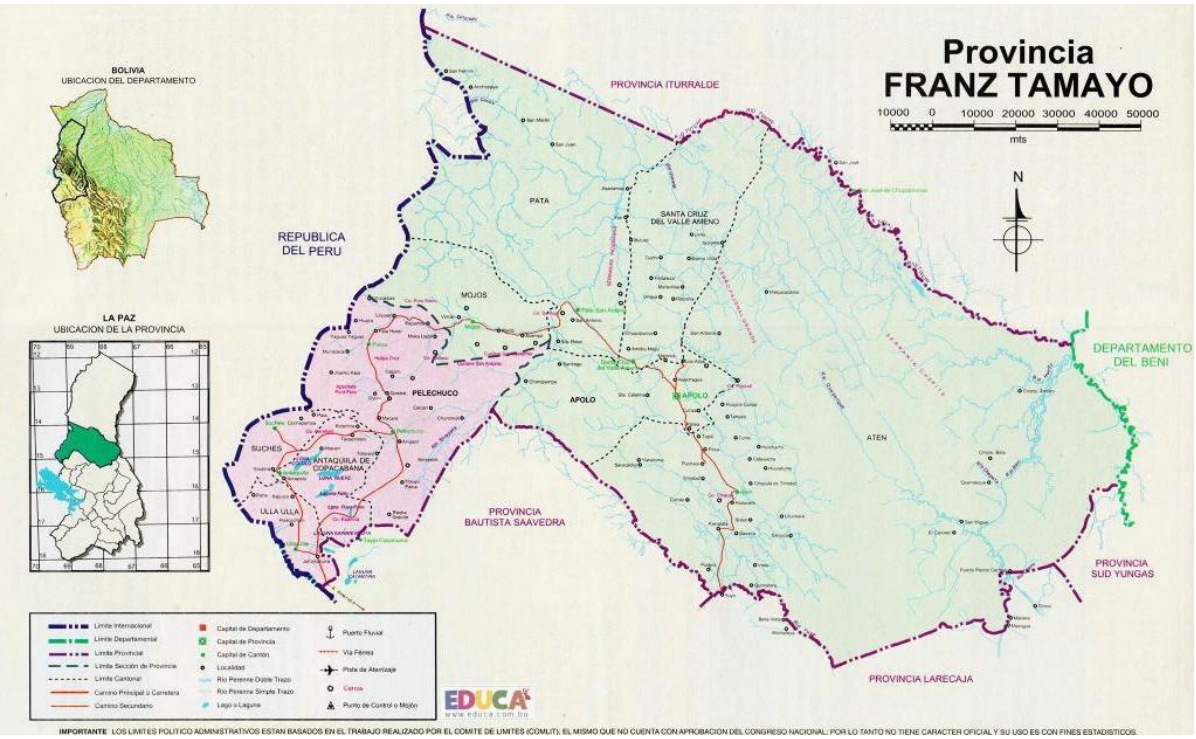


Figure 6.24. *Province of Franz Tamayo (EcuRed, 2019)*

The Province of Franz Tamayo is divided in two districts: Apolo and Pelechuco (**Figure 6.24**). While Pelechuco belongs more to the Andean region (it will be examined in the alpaca case), Apolo Municipality has both Andean and Amazon regions, having high jungles suitable for coffee production. The border section (Pata Canton) is completely unconnected from Apolo city (the province capital) as highways only arrive to Pelechuco. Currently, the highway Apolo city – Cocos Lanza – Puerto San Fermin is in construction, but by the time of the field study, it was suspended due to the rainy season. Mining activity is scarce due to the weak accessibility, and while coca has been one of the most traditional crops, even before coffee, military intervention for coca eradication has decimated its production.

Studies on the organoleptic characteristics and coffee cupping quality in the area (conducted in San Juan del Oro and Apolo) indicate that several conditions such as geo-environmental factors (altitude, soil characteristics, and weather) and productive processes (harvesting, pos-harveting and collecting processes carried out by cooperatives) are similar, delivering similar cupping score and wide variety of organoleptic profiles (flavors) in both areas (slightly higher in SJDO) (Ramos Cotacallapa and Lima-Medina, 2019). San Pedro de Putina Punco and the border area of Apolo have a lower average altitude, leading to lower coffee quality (especially near the river that acts as borderline) (PE58N1) (Ramos Cotacallapa and Lima-Medina, 2019).

The Coffee Cross-Border Region & Localities

While INPANDES project did not delimit an exact geographic scope for a cross-border region (CBR) or localities (CBLs) (but their intervention areas were next to the border), this section simplifies this process by modeling the CBR and CBLs based on the coffee cross-border dynamics (**Figure 6.25**). As described in the previous section, the most fluent cross-border dynamics happen in San Fermin and Cocos Lanza, as those communities require to cross the border (Lanza River, or also called Mosoj-huaico River) to access the public services and goods from the Peruvian side (most time available in the nearest communities or in SPPP city). Peruvian border producers do not tend to cross to the Bolivian side unless they want to buy coffee, but this occurs once per year (coffee middlemen). Their main dynamic is within Peruvian territory (their coffee lands and SPPP). River transportation is rare, unless used by Bolivian producers to access their own coffee plantations located upriver. Communication between both communities is scarce in a daily basis. Thus, considering the geographic elevation (for coffee production), daily life needs, and usual dynamics, two main cross-border localities (CBLs) can be defined in terms of the dynamics from Puerto San Fermin and Cocos Lanza. The INPANDES project considered communities from both sides located mainly in the CBLs.

To define a cross-border region (CBR), the coffee production of flows includes not only the areas next to the border but San Pedro de Putina Punco city too (the main offices of the coffee cooperatives are there). Most Peruvian middlemen that buy coffee in Bolivian side sell it in SPPP, and Bolivian producers need to go to this city for further services not available at Peruvian border communities. As the largest city in the area, SPPP offers a wide range of services from social services to coffee processing ones (PE28A1). Although Yanahuaya and especially San Juan del Oro are also border districts, they do not play a direct relationship in the cross-border dynamic unless they cross SPPP. These cities and their coffee production spaces play a more relevant role within a subregional approach connecting with Juliaca. Thereby, the CBR embeds the product dynamics of the coffee cooperatives and border communities, being SPPP a productive node that will later connect the area with Juliaca.

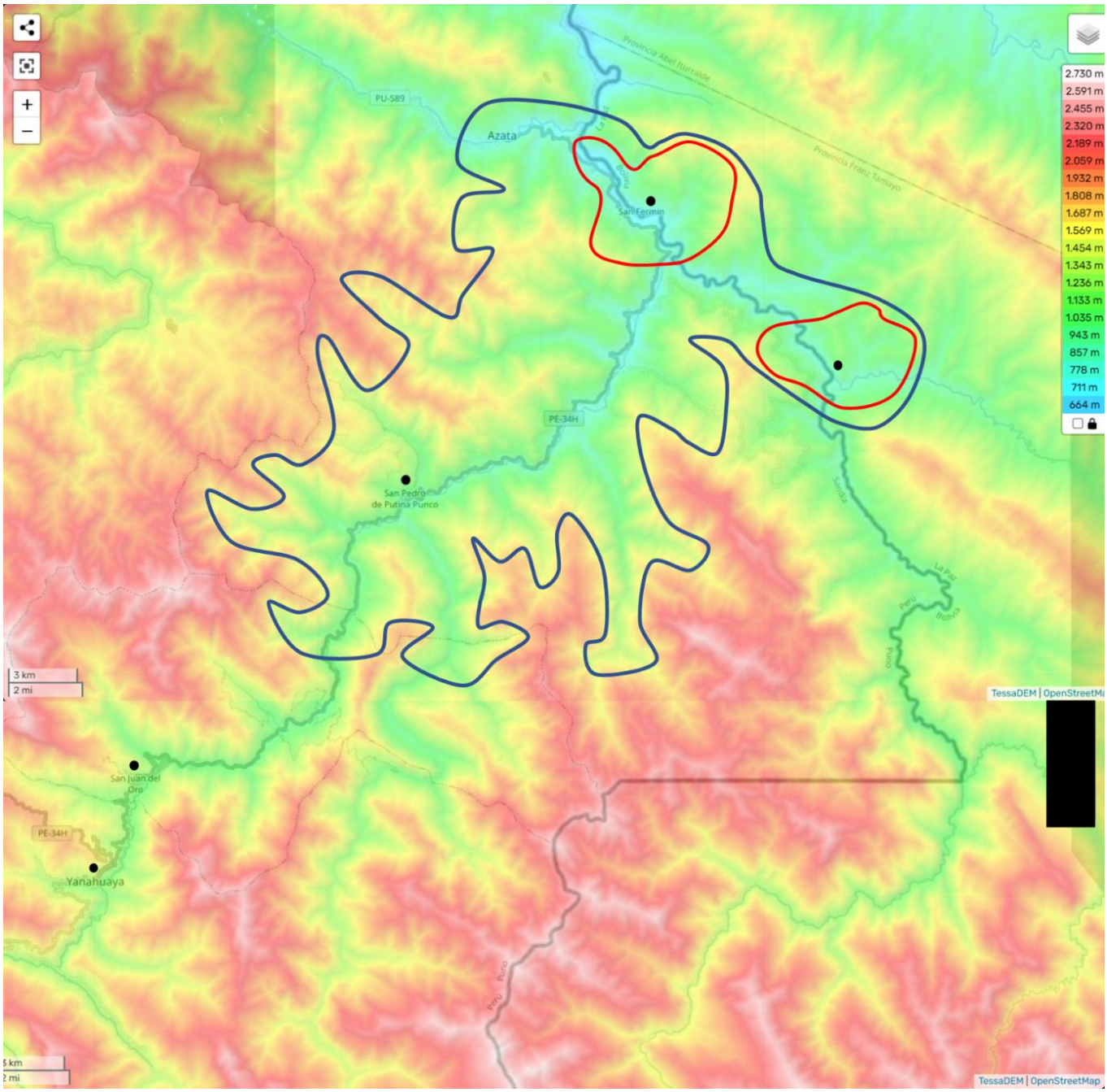


Figure 6.25. *The Coffee Cross-Border Region & Localities (Author's elaboration)*

2.4.2. Stakeholders

At national level, government and non-governmental entities are relevant for the present case study. Despite the opinion of public officers working in the field might differ from the ones allocated in the national capitals, this section highlights the most important nationwide institutions for the cross-border area at regional and local level. While previous institutions related to foreign affairs and border development were cited before, this section focus on the ones oriented to the coffee industry.

Peruvian Coffee Institutionality

At national level, the highest entity related to coffee production and development is the Ministry of Agrarian Development and Irrigation (MIDAGRI). This ministry oversees national agricultural policy and orientates its multiple agencies to accomplish it in each region. Under the current National Agrarian Policy 2021-2030, the national government targets the low agrarian competitive development by tacking 1) low vertical integration of agrarian value chains, 2) subsistence agriculture, and 3) unsustainable resource management (MIDAGRI, 2021c).

MIDAGRI has several attached public bodies, programs, special projects, and more. Some of them related to coffee production are the National Agricultural Health Service of Peru – SENASA (vegetal health control), Rural Agricultural Productive Development Program – AGRORURAL (Agrarian PPP investment), Compensation Program for Competitiveness – AGROIDEAS (associativity promotion through financial and technical packages), Highlands & Jungle Exporter – SSE (Value Chain & Agri-export promotion), or the National Institute of Agrarian Innovation – INIA (public R&D program) (MIDAGRI, 2021b). As part of the decentralization process, there is a transfer process of national government capacities (functions, funding, programs, and projects) to the regional governments. However, the intergovernmental articulation plan in Puno region has not been effective during the last years (PE09). All agencies are in Puno city.

MIDAGRI is in charge to articulate the joint public action between its own agencies and other ministries and public institutions. In the National Action Plan for the Peruvian Coffee (PNA-CAFE), the MIDAGRI recognize the interdependency and multisectoral nature of coffee development, highlighting the institutions that should collaborate, and towards which objective according to their functions. Among them it is possible to find the Ministry of Education, Health, Housing, Foreign Trade, Vulnerable Populations, Social Development, Production, and Environment. The document also specifies the participation of the Cabinet of Ministers, and DEVIDA (MIDAGRI, 2015, 2018).

Among these actors, DEVIDA (National Commission for Development and Life without Drugs) – under the Presidency of the Council of Ministers –has a special relationship with Puno region due to the close relationship of coffee production with coca one. This agency works by giving funding to provincial and municipal governments, especially to Carabaya and Sandia and promoting productive development of coffee, cacao, citrus, and other fruits to replace coca crops (PE23A1). With offices in Puno and SJDO, DEVIDA's presence in Puno region has been strong – even more than any other national agency: DEVIDA has invested around S/. 20M to benefiting 7000 families. In addition, this agency has financed several highway projects in the area to connect coffee production lands with the road network (PE58A2) (PCM, 2022).

Among, the non-public actors, the main stakeholder in the Peruvian coffee industry is the Coffee National Board - JNC (*Junta Nacional del Café*). With 56 coffee organizations (associations and cooperatives with more than 100 associates) representing 70,000 families in 14 regions, the JNC is the highest representation of coffee producers' interests to the government, and support coffee organizations by providing market information, technical knowledge, better articulation with other actors, defending cooperatives' interests, and more (PE66A15, PE66A16) (Junta Nacional del Café, 2020). Other entities related with coffee production are the Exporter Association (ADEX), financial entities such as Agrobanco or cooperative rural banks, processing companies, etc. (MIDAGRI, 2015)

Apart from the role of the SSE in the alpaca component and the credit facilitation offered by Agrobanco, none of the previously mentioned institutions participated in INPANDES. Some of the representants participated in INPANDES events but they did not have a direct intervention in the project (e.g., DEVIDA participation in the binational technical groups) (DEVIDA, 2017).

Bolivian Coffee Institutionality

At national level, the highest authority related to the coffee productive development is the Ministry of Rural Development and Lands (MDRyT) that focus Bolivian Agrarian development in three axes: land ownership & management, food sovereignty & rural development, and comprehensive sustainable development (Ministerio de Desarrollo Rural y Tierras, 2014). Like its Peruvian counterpart, the MDRyT has several public bodies, programs, or special projects. Some of them related to coffee development are the National Agricultural Health and Food Safety Service – SENASAG (vegetal health control), Decentralized Public Institution Food Sovereignty – IPDSA (national product development programs), or the National Institute of Agricultural and Forestry Innovation – INIAF (provision of supplies & technological research) (Ministerio de Desarrollo Rural y Tierras, 2016). The IPDSA, in collaboration with the SENASAG and INIAF, started in 2018 the 'Coffee Investment Program at the National Level 2018-2022' better known as Coffee National Program – PNC (*Programa Nacional*

Café). This program is oriented to increase coffee production and productivity by renewing coffee lands, reducing plagues, promoting coffee technology innovations, and consolidating domestic markets and exports. This program involves other national institutions such as the Bolivian Chancellery to promote its strategic objectives.

Among, the non-public actors, there are two important coffee organizations at national level, the National Association of Coffee Producers (ANPROCA), and the Federation of Exporting Coffee Growers of Bolivia (FECAFEB). Starting in the 70s by National Decreet, ANPROCA has been the largest coffee organization in Bolivia, with the biggest coffee processing plant in La Paz (BO51A4, BO51A5). In those times, ANPROCA used to produce twice as much as Peru (BO51A6). In 1991, ANPROCA started its own trading company, the FECAFEB, that years later would separate taking the coffee cooperatives and entering the fair trade and organic certification markets, generating more coffee volume than ANPROCA (BO51A7) (Estevez, Bhat and Bray, 2018).

Before the PNC, both organizations used to fill the void created by the lack of coffee institutionality at national level. While ANPROCA mainly represents independent coffee producers (BO51A8, BO46A10), FECAFEB does the same with producers associated to coffee organizations (BO46A11). However, due to the different nature of both organizations, they have been competing rather than cooperating (Estevez, Bhat and Bray, 2018). Both organizations are part of the National Bolivian Coffee Council which cooperates with the MDRyT and the Chancellery to annually promote the 'National Presidential Coffee Cup Tournament' as part of the PNC activities (Consejo Nacional del Café Boliviano, 2021). Comparing with the Peruvian institutions, ANPROCA has similar functions with the JNC, and FECAFEB would be like the National Coordinator of Fair Trade (CNCJ) (BO46A12).

In relationship with the INPANDES project, any of the Bolivian institution described in this section participated or had knowledge about the development of cross-border initiatives.

Subnational & Local Institutions

Starting with the public institutions, the Puno regional government and the Municipal Autonomous Government of La Paz, although they might have some productive projects or political mechanisms oriented to coffee production (GAP La Paz, 2022; Gobierno Regional Puno, 2022), this topic has not been part of their development agenda. At province level, while Bolivia does not have a government authority, Peru has the Provincial Municipality of Sandia (MPS). As previously mentioned, the MPS was the operating agency for the INPANDES project during 2016-2018. Although the MPS played an important role during the project and later continued with coffee promotion projects (PE23A2, PE22A1), currently coffee is not part of the productive development agenda as other products – if it is

not supported by DEVIDA (PE23A3). However, during the last administration (the next one after INPANDES finished), the MPS applied and was selected as one of the top 100 green destinations with the 'Sandia, the route of the best coffee in the world' proposal in 2021 (PE23A4) (Green Destinations, 2021).

At local level, the three border governments (Apolo, SPPP, and SJDO) consider coffee as part of their Development Plans. As coffee is the second most important crop after the coca in Bolivian communities, the Municipal Autonomous Government of Apolo considers it as one of the main economic potentialities and have a program to promote coffee & cacao agroforestry systems (GAM Apolo, 2013). In the case of District Municipality of San Juan del Oro and the District Municipality of San Pedro de Putina Punco, both consider coffee development within their strategic objectives: the former focusing on specialty and organic coffees, and the latter for agroecological productivity and as a component for experiential tourism (Municipalidad Distrital de San Juan del Oro, 2016; Municipalidad Distrital de San Pedro de Putina Punco, 2016). The three development plans mention partnerships with their respective coffee cooperatives (APCA and CECOVASA, or San Juan del Oro cooperative), but in the practice, these alliances do not happen (PE35A1). Currently, the SPPP municipality is running the Productive Project of Special Coffees (or Special Coffee Program) in cooperation with DEVIDA funding (PE27A2).

Within the non-public actors, while there are some NGOs with projects in the area (e.g., the WCS with its Madidi-Tambopata Landscape binational Project) (WCS Bolivia, 2021), the main actors are the coffee cooperatives. In the National Directory of Cooperatives of Peru, there are nine Agrarian Coffee Cooperatives (CAC) registered in Puno region, all of them located in Sandia (PRODUCE, 2016). Eight of them (CAC Charuyo, CAC San Jorge, CAC San Ignacio, CAC Unión Azata, CAC Inambari, CAC Túpac Amaru, CAC San Isidro, and CAC Valle Grande) are considered as first-level cooperatives (or grassroot cooperatives) under the Central of Agrarian Coffee Cooperatives of the Sandia Valleys or CECOVASA (PE20A1) (Cayo Esquivel, 2014). The ninth cooperative, non-affiliated to the CECOVASA, is called CAC San Juan del Oro or also known as Cooperative 64. Historically, while CECOVASA used to dominate Puno coffee production and export, Coop64 has been gaining market share in the region (PE18A1). Due to the lack of coffee companies in Puno, CECOVASA and Coop64 commercialize almost all the coffee in the region, with 61.7% and 38.2% of the coffee export value, respectively (PE20A2) (**Table 6.16**).

PE20A2: *CECOVASA and Coop64 practically commercialized almost all the coffee production in Puno region. Practically 100%, a minimum percentage through other intermediaries. They used to own the market, but in the last years, new dealers have appeared in the high lands, representing businesses or other stakeholders... so they collect around 10% of this region, reducing the cooperatives' volume. Although we*

are in a free-market country, and we mainly avoid monopolies, it was owned by the coffee producers of the area with the mindset that: organized we can do it all. And they did it. So, this was and is a great work potential. It does not happen in other coffee regions in Peru. In Cusco, north, and central jungle, you can see coops and private companies, but here, in Puno region, they only commercialized coffee through their social organizations. That is why it has been relevant to give them more support and recognize them as organizations and not as private companies. A company's goal is to generate profit, but a cooperative... producers organize, and they continue being producers, promote the sale of their product, and move their product towards profits, assuming the costs that implies a manager, technicians.... but the final purpose is to cut the intermediaries. That was the way here.

Founded in 1970, CECOVASA represented the consolidation of the 'colonization process of the microregion of Tambopata and Inambari' carried out by Aymara and Quechua migrants (Florez Delgado, 2020) in the 50s. The process of urbanization/colonization in the Valleys of Sandia was closely tied with the coffee production and the construction of highways that facilitated its mobilization (Florez Delgado, 2020). Due to the various limitations that coffee producers faced at that time, such as the proliferation of intermediaries, low prices, or the dispersion of production, the first cooperatives in the area began to form, which would later found the CECOVASA to achieve foreign markets (PE20A3) (Florez Delgado, 2020).

PE20A3: *Cooperatives, shaped a long time ago, had the purpose to commercialize. If you check their history, because of some limitations of their commercialization model – they used to sell through intermediaries, they shaped associations to have better market access. And they have been doing a pretty good job, sometimes more, sometimes less, but pretty good. But they knew, even they were established as cooperatives, that they did not have considerable volumes to improve commercialization in foreign markets. So, they built the central of cooperatives, the CECOVASA. The San Juan del Oro started almost together with CECOVASA, and they were keen to shape the central but, there were disagreements that make it work alone.*

With more than 50 years of associativity experience, CECOVASA groups more than 4850 coffee producers within its eight cooperatives. By 2021, CECOVASA exported almost 70% of the regional coffee production with a value of $786k (**Table 6.16**). However, this number is almost ten times lower as it used to be ten years ago with an export value of $7M (2012), placing CECOVASA as the sixth top exporter in Puno – even above some mining companies (PromPerú, 2012). This decrease of almost 90% was due to the coffee leaf rust or *roya amarilla* disease, that punished national coffee

production (**Figure 6.26**). In its best times, CECOVASA used to produce more than 150k quintals of coffee per campaign (approx. 9M kg), contributing to local economy not only by processing and exporting coffee, but also constructing local infrastructure (e.g., highways, community centers, etc.) or organizing events (PE14A3, PE14A4, CP03A2, PE27A3, PE20A4). Currently, CECOVASA is still the major coffee exporter of Puno, but it is not even the top100 coffee exporters in Peru (position 102nd), with export market share of 0.11% (**Table 6.16**).

Apart from the benefits generated by its economy of scale and good prices for producers, the success of CECOVASA can be summarized in three pillars: its organic coffee program, its portfolio of georeferenced brands, and its innovation center. CECOVASA's organic program, different from the Special Coffee Program from the SPPP municipality, strives to promote organic coffee production in four years, where the price given to producer rises with each new level (BO30A3). This program includes technical training, monitoring of farmlands, and quality-based bonuses (**Appendix 9**).

Its second success was the development of nine brands that represent specific coffee varieties depending on its geographical location and organoleptic characteristics. As the grassroot cooperatives are not spatially concentrated (producers are spread throughout the Valley) and coffee quality varies from one zone to another, CECOVASA developed georeferenced brands by collecting and organizing coffee production depending on the location and quality assessment of each producer (**Appendix 9**). Finally, the Technological Institute of Production (agency from the Ministry of Production) gave to CECOVASA the quality of 'Productive Innovation and Technology Transfer Center' or CITE. The CITE CECOVASA, located in the CECOVASA plant, focuses on technical assistance in production, certification training, quality control, coffee processing, coffee traceability, research & innovation projects, shaping strategic alliances, and more (Instituto Tecnológico de la Producción, 2018).

In Apolo, coffee cooperatives are relatively young and small. The most important one is the Apolo Coffee Producers Association (APCA), and the one related to the case study, is the Association of Organic Coffee Producers Madidi San Fermín and Cocos Lanza (APOCOM). As most coffee producers are inside or in the buffer area of the Madidi National Park, this has served to attract several funds and projects such as the Madidi Coffee project with German cooperation (benefiting APCA), or the 2014 coffee CBVC project financed by the CAN-AECID cooperation (before INPANDES) that gave rise to the APOCOM (GAM Apolo, 2013; Molina, 2013; MMNPT, MMAP and CECOVASA, 2014) (**Appendix 9**). The APCA is composed by 19 producing communities of the district and its production (less than 1% of national production) is bought almost entirely by one company (BO46A13) (APCA, 2020). Due to the distances from Apolo to La Paz, APCA does not have contact with ANPROCA (BO51A9). Simultaneously, because of the lack of highway, APOCOM does not have relationships with APCA (BO54A1). APOCOM was one of the beneficiaries of the INPANDES project.

Table 6.16. Peruvian coffee exporters between January 2021 - December 2021 (based on (VeriTrade, 2022b))

N°	PERUVIAN COFFEE EXPORTERS	FOB US$	WEIGHT Kg	U.V. US$/Kg
1	PERALES HUANCARUNA S.A.C.	116,488,311	27,384,566	4.242
2	OLAM AGRO PERÚ S.A.C.	73,591,608	19,878,428	3.693
3	ED&F MAN VOLCAFE PERU S.A.	50,944,537	10,863,597	4.635
4	COMERCIO AMAZONIA S.A.	33,539,264	8,177,905	4.129
5	H.V.C. EXPORTACIONES SAC	31,102,010	7,300,125	4.256
6	CIA.INTERNACIONAL DEL CAFE S.A.C.	25,253,123	6,212,075	4.235
7	COOPERATIVA DE SERVICIOS MULTIPLES NORANDINO LTDA (COOP.NORANDINO)	20,333,862	4,861,405	4.233
8	COOPERATIVA AGRARIA CAFETALERA ALTO MAYO	18,524,690	4,959,355	3.813
9	EXPORTADORA ROMEX S.A.	16,150,549	3,839,482	4.252
10	COOPERATIVA DE SERVICIOS MULTIPLES CENFROCAFE PERU	13,915,633	3,524,321	4.687
102	**CENT.DE COOP.AGR. CAF.VALLES SANDIA LTDA**	**786,059**	**236,532**	**3.954**
116	**COOP.AGRARIA CAFETALERA SAN JUAN DEL ORO**	**486,511**	**107,019**	**4.491**
223	GRUPO INDUSTRIAL ALEXANDRA E.I.R.L.	7	14	0.517
224	COORPORACION ROSALES INTERNACIONAL E.I.R.L.	2	6	0.325
	Grand Total	**724,367,840**	**185202818.8**	**4.521**

*CECOVASA (102nd) and Coop64 (116th)

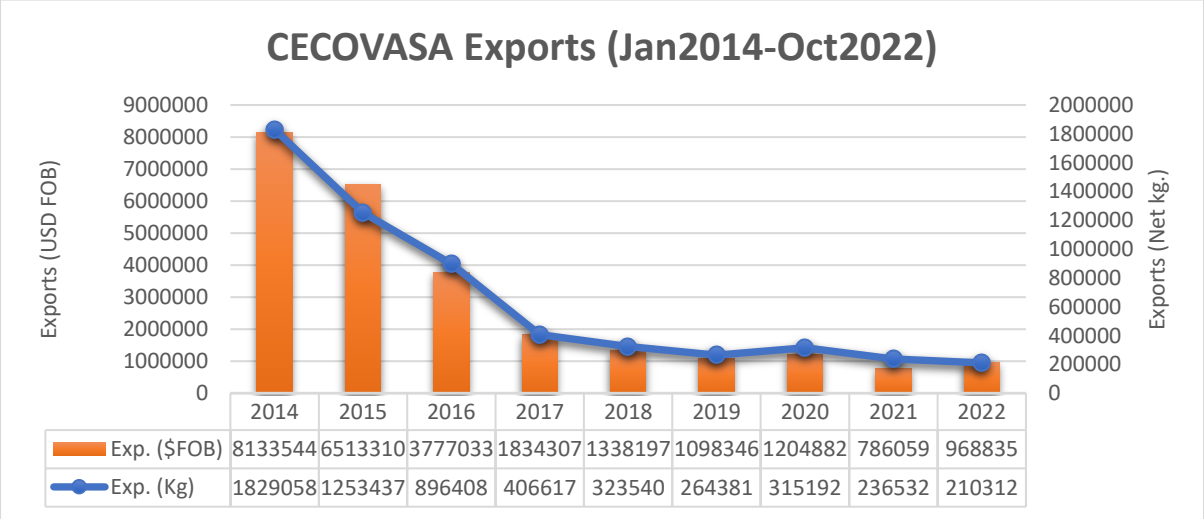


Figure 6.26. CECOVASA Exports in USD FOB & Net kg. (Jan2014-Oct2022) (based on (VeriTrade, 2022a))

In this 'coffee universe', the commonwealths have had an important role shaping the dynamics of the coffee cross-border value chain. In 2013, with funding of USAID and RG, CECOVASA promoted the creation of the Municipal Commonwealth of the Amazon of Puno (MMAP) that would represent the Tambopata and border districts of Sina, Yanahuaya, SPPP, SJDO, and later Quiaca (PE58A3, PE58A4). As a public entity, the MMAP became the first commonwealth to become operative in Peru and developed projects such as productive development, highways, schools, and more (PE58A5). The MMAP promoted the construction of the CECOVASA processing plant with Japanese cooperation funds under the 'One Town, One Product' program (一村一品運動) (PE58A6) (Tsukamoto, 2015). However, in 2014 the MMAP professional team moved to the MPS and local governments, and without much political will, the commonwealth and its operations were weakened (PE58A7, PE58A8).

By the Bolivian side, the Commonwealth of Municipalities of the Tropical North of La Paz (MMNPT) was founded in 2001 but started operations in 2004 with USAID funding (BO54A2). Apolo would join it officially in 2007, and the commonwealth would be finally constituted by eight municipalities of the north of La Paz (MMNPT, 2009, 2019). As a private entity, it could not receive financial resources from its municipalities, pushing them to work based on international cooperation funds, managing several projects at the same time (approx. €150M per year) (BO54A3). Due to its experience with IC projects, it first collaborated with the CAN in the elaboration of municipal environmental plans (BO54A4). Later, by the initial contact from the MMAP to the MMNPT, both applied for the CAN-AECID cooperation program: the Andean Regional Programme (PRA), project that would finish with the legal constitution of APOCOM (BO54A5) (MMNPT, 2014). Due to the COVID-19 pandemic, Bolivian government' policy on international cooperation, the lack of funding and other factors, the MMNPT was closed (BO54A6). This experience led to the idea of shaping a binational commonwealth, which was not possible due to the legal incompatibility or the lack of a binational SNIP (BO54A7) (Ramos Cotacallapa, 2012; Comunidad Andina, 2014b).

Apart from commonwealths, there are other organizations that represent groups of public institutions. In Peru, under the umbrella of the National Council for Development and Border Integration (CONADIF) of the Ministry of Foreign Affairs, the 39 mayors of the southern border (from Madre de Dios to the Pacific Ocean) are part of the Southern CONADIF, currently represented by the mayor of SPPP (PE27A4). Under his period, their proposal for financing border development was approved with the Invest Fund for Territorial Development (FIDT), making available a budget of S/.50M, later expanded to S/. 319M (€82M) (PE27A5) (Ministerio de Economía y Finanzas, 2022). From the Bolivian side, there are not organizations of border municipalities, and the most similar one is the Association of Autonomous Municipal Governments of the Department of La Paz (AGAMDEPAZ), that mainly focus on training and as meeting space.

From the previously mentioned entities, the MPS was the only government that participated in the INPANDES project (no participation of the subnational or other local government). From the non-public actors, CECOVASA and APOCOM participated as key partners. The commonwealths did not participated too, but as the technical team of the MMAP moved to the MPS, they had previous experience on CBVC projects.

2.4.3. Law, Policies, & Regulations

Although the amount of legal and administrative instruments related to the coffee cross-border value chain is very extent, this section focuses on describing the main joint mechanisms (from binational agreements or communitarian ones) and comparing both legal frameworks and policies. As the trade barriers have been already discussed in terms of the Andean community, this section focuses on explaining the Amazon Sector ZIF Plan, the national coffee policies, the laws and regulations related to associativity, and other complementary policies related to our topic.

The Amazon Sector ZIF Plan

The Development Plan for the Amazon Sector of the Peru-Bolivia Border Integration Zone, finalized in 2018 but has not ratified yet (PE69A1), considers the development of cross-border models for intelligent specialization based on several products, including coffee. The coffee component recognizes the relevance of its production for Sandia and Apolo. However, it does not mention the INPANDES project – it even points the need a cross-border brand to promote the coffee local industry (MRE - DDIF, 2018, p. 22). In front of the disarticulation of CBVC actors, low technification & productivity, few market research, and the link with subsistence farming, the plan emphasizes six strategic lines to develop the CBVC: cross-border branding, international marketing, R&D, technification, and associativity (INFYDE, 2018a; MRE - DDIF, 2018). This proposal, based on the Andean Platform for Cross-Border Cooperation (PACTF) report, involves other stakeholders that were not considered in INPANDES such as knowledge centers, supply & equipment providers, export companies, or more public entities (INFYDE, 2018b). However, this model does not make clear how the cross-border component plays a role in the value chain as only Peruvian entities are identified (INFYDE, 2018a).

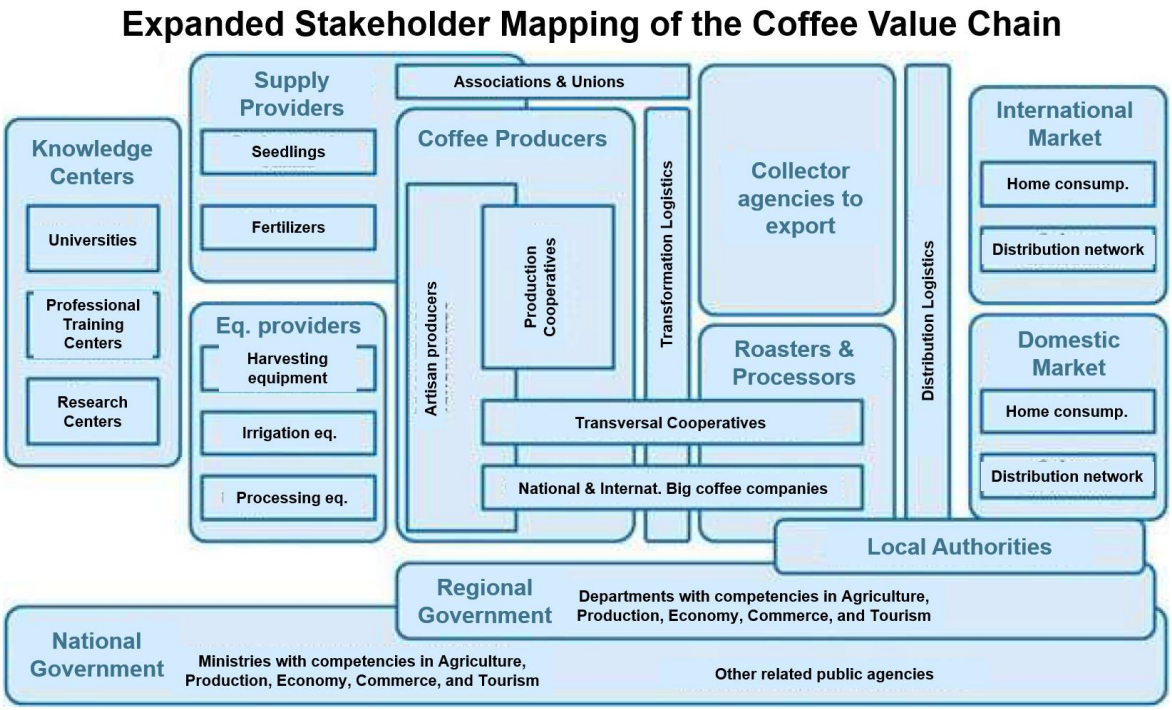


Figure 6.27. *Expanded Stakeholder Mapping of the Coffee Value Chain (INFYDE, 2018b)*

Coffee Promotion

At national level, both governments have some instruments to promote coffee development. In the case of Peru, the MIDAGRI launched the National Action Plan for the Peruvian Coffee 2018-2030 (PNA-CAFE) under the Multiannual Sectoral Strategic Plan (PESEM) – used to fulfill the Agrarian Policy. This plan articulates and defines strategic objectives for other Ministries, promoting a multisectoral interdependency and complementarity (MIDAGRI, 2018). To tackle the several issues that coffee industry faces, the PNA-CAFÉ focuses on sustainable productivity increase, coffee quality improvement, facilitation of financial services, better marketing positioning, territorial articulation, and governance (MIDAGRI, 2018). However, executing this consensual agenda is an on-going process with several institutional obstacles as none of the previous plans have been implemented in the last 25 years (PE66A17).

In Bolivia, the Coffee National Program 2018-2022 (PNC) appeared as a public mechanism to fill the institutional gap of Bolivian coffee governance. Oriented to benefit more than 6600 families in 27 municipalities in La Paz, Cochabamba, and Santa Cruz, the PNC was approved with a budget of B/. 182M (€27M) for five years: B/.71M went for the IPDSA to manage the Coffee National Project (production, productivity, marketing, and monitoring), B/. for the SENASAG (vegetal health), and B/. 91M for the INIAF (production of 29M of coffee seedlings, construction of the Technological

Innovation Center, and development of 35 coffee technologies) (BO52A1). Working in a counterparty scheme with the producers and municipalities, the PNC focus on renewing the old coffee plantations (with more than 30 years in operation) and improving disease control – two of the main factors that reduced Bolivian coffee production (BO52A2, BO52A3, BO52A4, BO52A5) **(Appendix 9**). Although the project was still operational during the fieldwork, the PNC is forecast to reach 60% completion, with several actions to be taken in a possible continuation of the program (BO52A6, BO52A7).

Provincial to local governments also count with policies and programs to target coffee development. Simultaneously, other entities such as DEVIDA or the Bolivian Chancellery complement their national measures with their own programs and activities. While the different institutions articulate, there is a need of more coordination within public entities and with non-public actors, especially in the in-field operations (PE71A1, PE23A5, PE14A5). This is even more critical for Bolivian border communities as they never received any support until the CAN projects intervened.

Associativity

In terms of cooperatives, both countries do have specific laws and regulations to promote cooperativism. Bolivia has the Law 356 of April 11th, 2013, the 'General Law of Cooperative Societies' and its regulation, that support the development of cooperatives (MTEyP, 2014). However, the lack of monitoring of cooperatives (e.g., not even a directory), the size of the informal sector –and high level of individual producers, and the governmental interventionism through public companies have led to weak cooperatives that cannot be means for a more egalitarian and community economy (Loza, 2016). In Peru, the new 'Law of improvement of the associativity of agricultural producers in agricultural cooperatives', or Law 31335, was approved in 2021, complementing the existing Cooperative Law from 1990 (PRODUCE, 2018; El Peruano, 2021).

Due to the lagging low level of horizontal and vertical articulation of producers, the difficult access to financial resources, and the limited knowledge on agriculture, the new law expects to promote associativity to the individual producers, strengthen and monitor the producer organizations, and facilitate them with access to credits (MIDAGRI, 2021a). Producers, cooperative leaders, and public officers have a good perception on this law (PE14A6, PE34A1, PE37A1). Under the Andean Free Trade Area, as CECOVASA and APOCOM have a legal person, it is possible to establish cooperation between them, but trade barriers (lack of flexibility to cross coffee from Bolivia to Peru) are still an obstacle for efficient productive complementarity (MMNPT, MMAP and CECOVASA, 2014) (**Appendix 9**).

In terms of commonwealths and the association of governments, they represent a good opportunity to make higher investments when one municipality cannot do it only by itself (Ramos

Cotacallapa, 2012). Although the commonwealth 'figure' is considered by both governments, it is very different one from the other. Under the Peruvian Law 29029 and its regulation, the commonwealths are local public entities shaped by two or more local governments (El Peruano, 2007, 2020). The Bolivian legal regime of municipal commonwealths considers commonwealths as private associations, making difficult the transference of financial resources without the participation of the Ministry of Economy (Gaceta Oficial de Bolivia, 2001; Machicado, 2012). There is not a commonwealth law because making them public represents extra fiscal expenses and to associate them with a higher public body (BO54A8). The difference between both legal systems and the non-existence of a financial mechanism for binational investments hinder the compatibilization and creation of a binational commonwealth – despite this model have generated good outcomes in both sides.

Other mechanisms to strengthen cross-border relationships can be found under the CAN legal framework. For example, in 2018, the Andean Parliament approved the Regulatory 'Framework to Promote the Development and Internationalization of SMEs in the Andean Region' that promotes productive integration (value chains, clusters, rural programs, trade harmonization, etc.), horizontal & vertical coordination (financing SMEs, infrastructure, capacity development, development plans, etc.), sustainability & monitoring (tax exemptions, quality standards, incentive programs, monitoring system, etc.), formalization (legal reform, social security, business development, etc.), and innovation (R&D, governance, ITCs, etc.) (Fairlie, 2018; Parlamento Andino, 2018). Other mechanism is the 'Andean Designations of Origin' (geographical indication of a product), defined under the Decision 486 (Comunidad Andina, 2000). Under this tool, it is possible to considerate a bilateral brand as a collective brand (IN67A2) (MMNPT, MMAP and CECOVASA, 2014), but it still needs to be updated to be a more efficient mechanism for the intellectual property offices (Mancera Rojas, 2017).

Other Policies

Other policies related with cross-border value chains are related to the own border development & integration policies of each country. Previously mentioned in **Chapter 5**, Peru has a better institutionality for border integration and development (the Law 29778, the CONADIF, the national policy 2018, and the FIDT funding), while Bolivia focuses more on border security (the Law 100, the Border Council, and the ADEMAF) (PE58A9). The difference between these mechanisms makes difficult the task to harmonize within this topic.

Another issue where there is a big gap is in terms of civil society participation, especially in relation to the role of women. While Peru does not have any specific mechanism, Bolivia has the National Confederation of Native Indigenous Peasant Women of Bolivia "Bartolina Sisa": a union of indigenous women that has an organizational structure and representation in each community of the

country. These grassroot women's organizations has as equal authority as male representation in the communities, and they are involved in several topics such as protection of women rights, family welfare, monitoring house cleanliness, organize events, and more (BO65A1, BO31A2) (CNMCIOB-BS, 2019). The different role of women during INPANDES project was evident as more Bolivian women participated during the events and trainings.

This brief analysis on the compatibility of both systems indicates that there are more bottlenecks than opportunities to promote the coffee CBVC from a formal or legal perspective. A previous study on the legal possibilities to articulate CECOVASA and APOCOM –executed during the CAN-AEICD cooperation– indicates that an 'Agreement on Productive Complementarity and External Commercialization' between both cooperatives can start a discussion on a cross-border productive integration. However, this requires the articulation of the cooperatives with local and national governments to enable formal export-import processes. Although this is possible to be achieved bilaterally, the study points the relevance of the CAN to facilitate consensus and support these agreements within its legal framework (MMNPT, MMAP and CECOVASA, 2014) (**Appendix 9**).

2.4.4. Intangible Resources & Collective Imaginaries

While intangible resources are not usually considered in project evaluations and are a topic for sociological or ethnographical studies, as **Chapter 2** reveals, four voids are linked with topics that are not easy to weight economically such as credibility, motivation, identity, or bargaining power – although they have influence on better performance or cooperation. This section brings more details to understand how these topics affect coffee production to be included in the analysis. Four historical events are described due to their importance to the case study. They are followed by describing two collective imaginaries that have been identified throughout the interviews with stakeholders at different levels.

The (Coffee) Colonization of the Borders

While we have simplified the coffee cross-border dynamics as trade patterns from one side to the other – to better study the cross-border value chains, the coffee has been a fundamental element for local development that has affected and been affected by cross-border interrelations. By when the borders were delimited in 1909 with the Polo–Sánchez Bustamante Treaty, this Amazon area was almost uninhabited on both sides, and among the several practiced economic activities, coffee would take a leading role into its colonization.

According to the historical compilation of oral and written sources of the inhabitants of the valleys of Sandia (Florez Delgado, 2020), the main pre-colonization drivers in the Tambopata and Inambari valleys were the extraction of gold and rubber, abundant in Amazon areas. These extractive activities did not lead to the settlement of these areas until the end of rubber exploitation in 1922. By 1935, Quechua migrants started settling near the Inambari river and present-day Sandia City, and Aymara colonizers went near the Tambopata River. While the miners and rubber tappers brought the first coffee seedlings to the Quechua lands, some Peruvian and Bolivian Aymara brought theirs from the Yungas in Bolivia, and the latter began an intensification of coffee production in both valleys. The worldwide coffee boom in 1945 led to the consolidation of the colonization process in the valleys of Sandia, and the increase of coffee production from 15k quintals per year to 100k quintals/year in less than a decade. This brings the attention of national and regional governments, constructing new highways to connect the valleys with the country. San Juan del Oro would be officially founded in 1955 and fifty years later, San Pedro de Putina Punco would separate and constitute as a district in 2005.

By 1970s, young Peruvian coffee producers would expand their lands beyond the border, settling in the Bolivian border due to the vast expanses of virgin lands and the optimal conditions for growing coffee (PE38). In 1984, Bolivian military intervention expulsed most Peruvian producers, and the few that stayed, nationalized as Bolivian (PE38, BO31A3, BO51A10). The settlement of the Bolivian border by Bolivians would begin in 1994 with the idea of "making a homeland", moving towards that area without incentives such as the ‘border bonds’ or even constructed paths (CP03A3). However, one of the main motivations was the proximity to Peru and the better economic conditions compared to Apolo (BO31A4). The newcomers would take the existing coffee lands and continuing this economic activity. The community of Puerto San Fermin would be founded in 1995, and Cocos Lanza in 2004 (BO31A5).

BO31A3: *First to this community, the Peruvian came to this side before, but the only one that stayed was my dad. It was a Peruvian colony… so the Apolo military came and expulsed them.*

BO31A4: *[Motive of migration] We looked that things were better because it was border with Peru…. Goods were cheaper in Peru, the workday paid you in money, they paid you more… in Apolo they did not pay you, there was no money, just in goods.*

BO31A5: *We came here in the 94/95, but before us… the Peruvian here were already coffee producers, so… we have grown coffee always. […] The San Fermin Anniversary is March 8th, 1995. (Felix: already 15 years, now 42)*

This short historical review reveals that the cross-border dynamics started even 90 years ago, when coffee from Peru and Bolivia was instrumentalized as an economical driver to colonize, consolidate and attract services into the Peruvian Amazon. Coffee would later be one of the main reasons to settle in the Bolivian border, driven first by Peruvians and continued by Bolivians. With less than 30 years of existence, the Bolivian communities have been influenced by the coffee cross-border dynamics and have replicated them through the trade dynamics of the last two decades, leading to the conditions that attracted the CAN to promote projects in this area.

The Power of Coffee Cooperatives

While we have previously explored the relevance of CECOVASA in Puno and Sandia for coffee and local development, this cooperative has been a fundamental element to knit the social fabric of the Valleys of Sandia.

From one perspective, the CECOVASA is perceived as a bottom-up triumph of coffee producers. Cooperativism was constructed from the grassroots and the concept of economic development intertwined with social development one, as building institutions –the grassroot cooperatives and later the Central– so far from the capital was a tough challenge, even more in those times (Florez Delgado, 2020). The evolution of the local history of cooperativism has not been linear nor an instant success: fifty years of ups and downs have placed CECOVASA as one of the few central coffee cooperatives in the country, owner and exporter of most of the coffee production from small producers in Puno, while simultaneously preventing the penetration of private companies (PE41A3, PE07A6, PE07A7, PE20A2, PE20A3) (Florez Delgado, 2020). In other words, a coffee-made Leviathan emerged.

CECOVASA lived several bonanza times, as in the early 1970s with the higher relevance of coffee as global commodity in front of the oil crisis, the frosts in Brazil that reduced its production, and the increase of global consumption that raised the international price (Florez Delgado, 2020). In some moments of its history, even most coffee producers were part of the Central at least once (PE18A2), generating an economy of scale and a good profit margin that, as previously mentioned, reinverted in the local economy through local infrastructure (e.g., highways, community centers, etc.) and events (CP03A2, PE27A3, PE20A4). Thus, CECOVASA was filling the voids left by the historical absence of the governments and became the main –and even only– channel to export coffee: it was 'the father' of the region (PE35A2).

PE35A2: *The central is like our father, we deliver to them, and they take care on the rest. They mainly support in commercialization: coffee export. Nothing more.*

The closed relationship between CECOVASA and local development was accompanied by an intense sense of belonging or 'love to my cooperative' –as several mentioned by producers: being part of the Central became a symbol of identity as coffee producer, as inhabitant of the valleys, or as the origin of several successes and local development in these lands (PE28A2, PE20A5).

PE28A2: *I [Raul – international winner] also won with Tunki brand, and I am still the brand promotor. Even though I create my other brand, I am going to be part of the CECOVASA. How can I despise my cooperative? I could make a living for my seven children thanks to CECOVASA. Thanks to the cooperative, Thanks to our parents that came to this land walking one week from Sandia... it is a long story... it is not that I am winner just because of myself. My parents were from CECOVASA too.*

PE20A5: *If someone says…. Let's sell by other side… It will not be received so easily. Many producers, almost out of love for their cooperative, produce coffee. There is always opportunity to sell to intermediaries, but they do not do it. In SPPP, there is a special case, there are producers that, for not losing their status of cooperative associate, they buy coffee and deliver a minimum volume of coffee to the cooperative to not lose their condition as associate. That happens a lot in SPPP because it is the zone that most people abandoned coffee plantations and moved to coca... where it is getting a better coffee reconversion, is in the high lands, SJDO, Yanahuaya... Quiquira is the zone with most advantages now, selling a lot outside cooperatives, over 600-1000 soles for one sack, compared to lowest lands that paid 350-450 soles. A huge difference... In those areas, Quiquira producers have been recognized with high coffees, good and well managed varieties. They also have a winner, lady Vicentina. So, the sale experiences have increased the popularity of the region, and a sack is at least 600soles.*

Being part of CECOVASA also represented a synonym of success or belonging to the 'Land of the best coffee in the world', as the three international winners, Wilson Sucaticona, Raul Mamani and Vicentina Phocco, were associates of the cooperative and won in some of the most prestigious international coffee contests (2010 SCAA, 2017 SCAA, and 2018 SCAA respectively) (PE28A3) (Durand, 2010; Agencia Andina, 2017, 2018). These awards, achieved despite having small farms or without much coffee tradition, became success stories that have been fundamental in the local narratives of development since they are proof of the land quality –and that other producers can achieved it too (PE28A4, PE28A5). In this way, the quality of the coffee became an implicit 'membership requirement' to belong to the cooperative (PE66A18).

PE28A3: *[Raul] In the coffee fairs, we need to be the first ones there, showing, going to other fairs in other cities, representing Sandia, but it is not exactly Sandia but the district of SPPP. That is why we identify as "Land of the best coffee in the world" in all our documents. Others can say it, but it is not true. Sometimes media says that we are cocaleros (coca producers), but we are seven times winner at national level and twice [Raul and Wilson from SPPP] in the world.*

PE28A5: *[Wilson] If everybody dedicates, everyone here could win an award. However, when we apply through the cooperative, we do not have a benefit from it. We want recognition. In Lima, Tunki is famous, but would be better if we, the winners, have a special franchise or a special collecting with a good price that encourage us. Even myself I demotivated... I would prefer my own franchise in CECOVASA rather to be collected with all the Tunki coffee together. That is why I became independent from the cooperative in 2011.*

PE66A18: *Only 35% of producers are associated… cooperatives have looked more for quality of associates rather than quantity of them: producers that deliver their harvest, fulfill standards, and execute all productive process correctly. There are people that are only interest in the price and do not go to technical training, no good execution... so cooperatives apply their statute and play with their loyalty. At the same time, there is a prejudice that cooperatives are bad, thieves, no trustworthy... That is the same in every country...*

However, 'loving the cooperative' does not imply loyalty to CECOVASA while there are several on-going issues (BO30A4, PE18A3, PE20A10). This cooperative still has a long journey to go as there are several issues related to weak administration and monitoring, lack of personnel and professionals, financial scarcity, harmful power relationships, and more (PE11A5, PE11A6, PE35A3, PE20A6). In addition, some of the sources of its success and governance, such as the predominance of monoculture or the importance of coffee volume in the decision-making processes, do have a negative effect on the cooperative and hinder their evolution (PE66A19, PE20A7). In addition, as CECOVASA did not need the help of public entities for a long time, in the face of challenges such as the volatility of global coffee price and the *roya amarilla*, they demanded it to make alliances with governments or agencies that have not been so willing to cooperate with 'private entities' (PE20A8).

PE66A19: *Cooperatives still have a monoculture mindset, a very traditional approach specially in Puno that are very conservative. They brought their traditions from the highlands to the tropical jungle… To do agriculture in the tropic is crazy… in the highlands they have monoculture, not so much complementarity... and to survive in the jungle, you need to do several products.*

PE20A7: *[Cooperative governance] The collecting volume of a cooperative has a huge relevance in determining how important you are in the Central, and in the decision-making processes. It is not the same when the president of the biggest collection talks, compared with the lowest collection cooperative. Organizationally, it should not be like that under their cooperative model, but it is a social dynamic within CECOVASA. But also, who is the President that year changes the cooperative dynamics: there are years with a more prepared President, with more leadership capacity... others not, and that influence the performance of cooperatives within the central. There is competition between cooperatives, and that is one of the factors that have influenced certain distortion. In some cases, competition has positive outcomes but in others as we are living currently, it can have negative ones. As Inambari coop is the strongest, they are taking an attitude of resentment against the cooperatives that used to have a bigger role, the cooperatives from SPPP. As those cooperatives used to have more power, they used to threaten the small ones, as Inambari those years. So, nowadays, with the opposite dynamic, Inambari shows a revengeful attitude, to do the same as they received. We should not fall in a resentment circle. And... there are worries that Inambari want to quit the central and do it by themselves. In coffee production, it is very important to have volume. Coffee is a very competitive product, not like others.*

PE20A8: *There is a strong social opinion that organizations (especially cooperatives) are private, so we should not take care of them. And this has been generalized, starting from local authorities: they do not consider them openly, even brazenly. So, organizations are alone, and we go to support them, we cannot receive so easy support from municipalities and authorities, because as they are perceived as private, we should not be supporting them.*

Despite the internal and external problems that CECOVASA faces, the Central has been a historical trigger or channeler of local development and even more, an experiential means for long-term engagement with a place (Feld and Basso, 1996), promoting a sense of place within the Valleys of Sandia and the cross-border region (PE58A10, PE34A2). Considering local development without this cooperative would represent to set several other requirements to fulfill the value chain. Thus, its capacity to create opportunities (products, markets, funding, prices, etc.) is an opportunity to engage more producers into better development schemes (PE68A1, PE20A9).

PE20A9: *If we do not give support to the cooperatives and they disappear, we would be in a worse scenario. Without organic certification and fair trade, the coffee price would drop considerably, in a zone with high-cost workforce, accessibility issues… the coffee production would be even less profitable. They truly depend on their cooperatives because they set the minimum price, and this price is even higher than in the commodity market because it is organic and fair trade. Both CECOVASA and Coop64 work under those certifications.*

The Coffee, the Coca, and the Roya

La roya amarilla, or coffee rust (*Hemileia vastatrix*), was first reported in South Asia in the 1860s and arrived in Brazil in the 1970s, spreading by air throughout the region. This disease affects the coffee berry growth and size, and can have a long-term impact, undermining coffee crops completely (Ferreira and Boley, 1991). The roya arrived in Puno by 2008, but its effect was drastically felt since 2011/2012, when more than 70% of production was lost (BO30A5, PE14A7). This has several economic and social consequences in the Valleys of Sandia and in Bolivia as the roya, added to the old age of its coffee plantations, decreased Bolivian national production in an 80% (BO52A5).

First, as coffee monoculture was widely practiced, the high dependence to coffee affected seriously most producers that moved to other economic activities, mainly illegal such as mining or coca production (PE25A1, PE28A6). The coca can grow in the same lands as coffee, but it is more profitable, takes one year to grow, and produces four crops per year (PE37A2). Moreover, the coca represented a secure income reducing the precariousness of former producers, or at least extra profits for coffee producers since the roya remains a lagging unsolved problem (BO46A5, PE71A2, PE37A3).

PE37A2: *In those years we suffered the roya, so many producers dedicated to the coca, and they so that it was more profitable and faster. You can have coca after one year and harvest several times a year. Coca is four times… coffee only one. So, if we restart planting, it will take us three years, and probably the roya will take it over again. However, the coca is the present but not the future.*

PE71A2: *The roya punished and practically disappeared our coffee. We need to renew with more resistant variants. It practically vanished the Caturra. I am using Catimor, Gran Colombia, Bourbon - very strong, and Caturra… resisting between the Catimor. Bourbon is also resisting. with the roya, they don't mature... The roya is still attacking, not in a 100%, but 65% of the coffee plants do not mature.... currently*

we are harvesting around 35%. I am doing geisha now, and I hope that the roya does not affect it.

PE37A3: *I also had my coca, I also did it. If I have a little, it is for my own consumption. In its moment, the coca brought some profits to my family, I am also a cocalero [coca producer], but I most identify as cafetalero [coffee producer].*

In second place, the roya affected not only economically, but also motivationally. The abrupt breakup of coffee tradition, a product that has been part of the local identity and success, led to a general demotivation of coffee producers, even more considering the long-term effects (PE28A7). This demotivation has also led to a low commitment to cooperatives because coffee is no longer the main source of life. (PE20A11). Thus, the coca filled this motivational gap while simultaneously, reducing the coffee production: more lands for coca represent less for coffee, and the use of pesticides for coca production undermines organic coffee production (PE11A7).

PE20A11: *The coca rise has distorted the reality. Coffee producers have become into coca producers because of the better incomes. So, there are several producers that are disappointed with their own product (coffee) that so much they loved, because if you take a historical look, the Sandia coffee producers have put so many efforts on coffee, they have really shown that have a strong identity with their product and have made several sacrifices to develop it. The CECOVASA did many managements to construct the highway, to construct community centers, and had a strong influence in the social and economic development of the area. But with the coca, producers demotivated, and it costs them a lot to come back to their coffee and to their association. This distortion has originated very low commitment to their organization because coffee is not the product that give them peace of mind and security of income, because they almost always have coca and they know, even if it is illegal, it has a faster/agile dynamic.*

PE11A7: *Coffee producers have their coffee plants, but next to them their coca parcels, generating cross contamination of the coffee due to the pesticides.*

Third, the roya took down the position that CECOVASA used to hold, in terms of quantity and quality. Coffee volume did not only represented a source of power within the cooperative, but also outside it as higher volume increased its bargaining capacity and access to better prices and profits (PE20A12). Lower volume, and therefore profits, constricted its financial capacities, limiting its operations (PE14A8, PE11A8). In addition, the massive use of pesticides reduces coffee quality, which can lead to lose its organic certification, drop the coffee price, and crumble the main competitive advantages of CECOVASA (PE25A2, PE14A9).

PE14A8: *[PE11] CECOVASA does not reinvest because they are currently losing money: around 10 professionals/technicians, 8 certifiers that they need to hire… 18 in total, around 80k-100k soles monthly, electricity 9k, water & electricity… 20k, they need a lot of water for their process. Monthly, to cover all CECOVASA expenses, they need around 120k soles. there are not so many profits in coffee business...*

[PE13A] They do not produce all year and the plants have death time... to turn on/off energy is and additional cost. CECOVASA is easily decapitalizing.... with a negative cash flow. That is why they do not pay to producers...

PE25A2: *Currently, CECOVASA is not so good, but it was worse… there was a problem with the certification. Due to the coca, the certification team found pesticides in coffees. The coffee was already in the storage as sold as organic, but there was no certification. With certification, coffee price is $180... without is like $140/120... just the price of the bag.*

PE14A9: *To lose the certification, represents a loss of more than $500k… it is our main tool. To this tool, we add 1st) volume, and 2nd) quality.*

While the counteractions from Bolivia were executed through the PNC, DEVIDA was the main actor involved to solve this problem in Puno due to the close relationship between coca, coffee, and roya. However, the interventions of this agency were questionable, not only because of the implementation of old-fashioned projects, but also the coca eradication led to other economic, social, and environmental problems in the region (PE57A4) (TUMI QUISPE, 2019). For the coffee areas, DEVIDA promoted crop replacement with a more resistant variety, but that delivers a lower cupping quality, and therefore more difficult to sell and with a lower price (PE57A5, PE20A13).

PE20A13: *There is an issue, I do not know if I should mention it. We 'catimorized' the production. After the roya, the producers were under high stress/trauma to lose their production, that means, to not have incomes for two or three years or reduction of income due to lower coffee production. If you lose your harvest, it is ok, you lose one year... but the roya affected the crops, that means 3 or more years... and the coca was by the side. The roya started in 2012 and 2013, and the coca started in 2013, 2014. So, there was a competency of crops, better salaries, and a strong pressure from cocaleros to cafetaleros. There were comments like... you are crazy working on coffee, you just want to be poor. Look at me with my production [coca] for these years, and look my A, my B, and my C. After the roya and without crops, betting for coffee was very difficult. Why should I bet for a product that I just lost. In that moment, DEVIDA financed projects through the municipalities, and here the question came for producers: why would you do coffee? you need a resistant crop*

that you cannot lose... so we gave them catimor (higher resistance, higher productivity), but also decreased coffee quality. People can judge this catimorization but they do not understand that other better varieties, would have been lost easily.

After a decade from the beginning of the roya, coffee production has improved but it is still a lagging problem in Sandia. While overcoming this disease is an on-going task, integrated management, R&D (e.g., innovation on new coffee varieties), and working with producers at a motivational level are some routes that should be further explored (PE35A4, PE35A5, PE57A6).

PE57A6: *If we mix catimor and geisha/bourbon, it can give better quality… but it needs research. I've personally have done it in my lands, and it worked, achieving an 86 coffee with high resistance.*

The Andean Regional Programme (CAN-AECID) 2012-2014

INPANDES was not the first Andean project intervening in this area but the second one after the Andean Regional Programme (PRA) financed by the CAN-AECID cooperation 2012-2014. The 'Support for the development of the cross-border coffee productive chain in a sector of the Peru-Bolivia Cross-border Integration Zone' project was executed by the Municipal Commonwealth of the Amazon of Puno (MMAP), the Commonwealth of Municipalities of the Tropical North of La Paz (MMNPT), and CECOVASA.

While the MMNPT had previous experience working with the CAN and the Peruvian Chancellery (BO54A4, BO54A9), the MMAP learned about the CAN-AECID funding through the Ministries of Agriculture of Peru and Bolivia and got to know about the MMNPT through the Wildlife Conservation Society (WCS), an NGO working in that cross-border area that connect them by 2012 (PE58A11, PE58A12, BO54A10) (Ramos Cotacallapa, 2012; Comunidad Andina, 2014b). The MMAP manager would contact his MMNPT peer and visit him in Bolivia, talking not only about the project, but also about the reality of Bolivian border communities that until that time, was unknown for the MMNPT and local authorities (PE58A13, BO54A11, BO54A12, PE58A14). This visit led to the consideration of applying jointly to the PRA funding, and the concertation process with the Chancelleries began.

BO54A12: *They, the MMAP, came to visit, and they knew what was happening in the border, what we did not because of the lack of access. They showed us the problem at the border, nothing was legal in the commercialization of coffee.*

In the concertation phase, Peruvian Chancellery was in favor from the beginning and supporting the project from its Border Integration and Development Directorate. However, Bolivian authorities, especially the ADEMAF, opposed initially to later accept (PE69A2, BO54A13, PE58A15, PE58A16, PE58A17). The project would not have so much participation of the Bolivian public institutions, but support from Peruvian Chancellery and the CAN (BO54A14, PE58A18).

The formulation of the project started by acknowledging the conditions of the Bolivian border communities, especially by the MMNPT, that was unaware of their situation: weak accessibility, isolated coffee producers, and the indirect trade with CECOVASA - where the coffee arrived through middlemen (BO54A15, BO54A16). Thus, in cooperation with CECOVASA, this cross-border project aimed to support especially the Bolivian side (PE58A19).

This project had a budget of $131k (€133k, six/seven times less than INPANDES), with a non-reimbursable funding of $100k from CAN-AECID, and a counterparty of $31K between the MMNPT ($15k), and CECOVASA ($16k), paid in non-monetary modality (services and modality) (BO54A17, PE57A7, PE58A20, PE58A21) (MMNPT, MMAP and CECOVASA, 2014). As the MMAP was a public entity, it had legal constraints to receive funding, so the MMNPT (private one) was in charge of executing the budget, and the accountability was executed in La Paz (BO54A18, PE57A8). In addition, hiring personnel or purchasing items was complicated due to taxing and labor laws (BO54A19). Four technicians (one local Bolivian and three Peruvians) were hired for this project (PE57A9).

PE58A21: *The funding was just used to support to San Fermin & Cocos Lanza… and because of that, For the first time, the Apolo Mayor went to those areas. As he was linked with Evo Morales, that helped to give some social services to those communities. Two Bolivian trucks went and gave all services related to health, education, telephony.*

BO54A18: *We organized the project but there were legal issues on financing: the legal framework did not allow Edwen to receive money and spend it in other country (Peru commonwealth is public). In our case, Bolivian commonwealths are private… so the MMNPT was going to be in charge of financing (executing the budget).*

BO54A19: *We had tax issues: their bills (Peru) are useless for paying taxes here (Bolivia), we could not hire [Bolivian] technicians to work in Peru border… we needed to hire Peruvians technicians, but for that we had to transfer resources to CECOVASA (economic support transference).*

The project was executed in 2014, from April to December (eight months), and had three specific objectives: 1) to strengthen associativity (creation of APOCOM, organizational strengthening, and legal study on trade compatibility), 2) standardization of production (technical assistance) (MMNPT, MMAP and CECOVASA, 2014). The interventions focused on four communities: Puerto San Fermin and Cocos Lanza from Bolivia, and San Ignacio and San Fermin from Peru (BO54A20). Thus, the project focused on association, integration, and productivity.

First, as CECOVASA had already several capacities, the priority was to formalize Bolivian producers and give them training on associativity, business, accountability, and more. From these activities, the producers formalized the APOCOM (BO54A21, BO54A22). Second, while the original idea was to consolidate a binational coffee association, the legal study on the compatibility indicated that it was possible under certain agreements that required political will between national governments –that did not happened due to the resistance from the ADEMAF (BO54A23, BO54A24). Some agreements could he achieved between CECOVASA and the APOCOM, but the trade barriers were still a problem for formal transactions (MMNPT, MMAP and CECOVASA, 2014). Third, several technical improvements were executed in Bolivian border communities, increasing coffee production in 20 hectares (2ha for Peru, 10ha for Cocos, and 8ha for San Fermin) (MMNPT, MMAP and CECOVASA, 2014).

BO54A23: *In the project, 1. We needed to create a binational coffee association., 2. We needed to do a study on the compatibilization of the political constitutions of both states. So, we hired a law firm (6-7 lawyers) to do that comparative analysis, but there was no coincidence between Constitutions. However, as there is a CAN agreement, it is needed a resolution giving a no-cost commercialization and generate a binational product.*

BO54A24: *We had the opportunity to create a binational association, However, the problem was with Bolivia. Peru had the predisposition to do it, but the ADEMAF was against it. We met with Peruvian chancellery in Juliaca, and the ADEMAF was against the mayor (president of MMNPT).*

The project had many bottlenecks, and some of the initial goals such as the binational articulation or the coffee certification could not be achieved (BO54A25) (MMNPT, MMAP and CECOVASA, 2014). However, as the first cross-border value chain project in this area, it brough several lessons to the involved actors: the relevance of compatible bilateral or communitarian legal frameworks, the financial constraints of binational projects, and the need of market access for border communities (BO54A26). Despite the MMNPT was invited to be part of INPANDES, the small budget disincentivized its participation (BO54A27). Some MMAP professionals, especially the MMAP manager, that moved to the MPS and two of the extensionist technicians participated in INPANDES.

The CECOVASA manager was the same during both CAN projects and community leaders did not vary so much. Thus, although the commonwealths did not participate, the individual actors were helpful in transferring some learnings from this first experience.

BO54A27: *INPANDES invited us to be part of the project, but the budget was small (it could be executed from Peru, no need of other partner).*

The Devoted Producer & the Alms Culture

Another identified intangible resource was the idea of 'devoted' or 'dedicated' producer (*productores dedicados*), a concept that involves not only motivational factors, but also their translation into higher productivity[23]. Literature on farmers' motivation (Darnhofer, Schneeberger and Freyer, 2005; Darnhofer and Walder, 2014; Hammond *et al.*, 2017) would consider it as a farmer type or motivational typology in which producers instrumentalize their personal values, aspirations, and their degree of knowledge about a technology to adapt to agricultural challenges. In other words, a 'call to action'. While the field study did not aim to define an ethnographic profile of this farmer type, based on the interviews, these devoted producers would refer to small to medium producers with at least three to five hectares of land that can be used to make a living and improve their quality of life. Despite they deal with high transactions costs to access market, learn technologies, or find funding, they care about their lands and have the vocation to improve themselves based on their production (PE07A8, PE07A9).

Based on the interviews, the idea of a devoted producers implies three characteristics that complement the previous description. First, they are aware of their strengths and weaknesses and act accordingly (PE18A4, PE07A10, PE28A6).

PE07A10: *When the roya came, dedicated producers could recognize it faster and take measures…*

PE28A6: *[International winner] The roya also affected me…. But because it is high lands, it destroyed 20%.... But my mates were deeper… almost 80%. They went to the mine or to other crops (coca).*

[23] Motivational factors were not considered initially in the survey questionnaire. However, initial meetings (PE07) raised the importance to consider them. During the semi-structured interviews, several interviewees (PE07, PE28, PE41, PE57, PE71) explicitly verbalized 'dedicated producers' (*productores dedicados*) as a specific group of producers – having taken care of the interviewee's language to not conducting the interview in that way. Thereby, 'productores dedicados' was included as a category of analysis to explore.

Second, devoted producers are characterized by the constancy and effort that they invest on their product(s), showing resilience and taking advantage of the opportunities that they get. In other words, they believe in their product as a means of progress, and that distinguishes them from other types of producers (PE57A10, PE37A4, PE41A4, PE57A11).

PE57A10: *Some producers benefit from several projects because they are good to attract them.*

PE37A4: *Many of my neighbors received their fertilizers, their plastics, their tools… but nowadays they do not produce at all. I have been producing coffee, and they just went for coca. And now that the coca is very cheap, they regret… they do not have lands to grow coffee.*

PE57A11: *In San Fermin, several producers were devoted, but in Cocos Lanza… only three. The rest was in the coca business.*

Third, devoted producers have high expectations on a better quality of life that can be achieved based on their production. Those who have achieved it (e.g., international winners), have success stories that exalt their trajectory and show others that it is possible to live from agriculture, reinforcing their own beliefs (PE71A3, PE28A8, PE07A11, PE28A5).

PE71A3: *When someone dedicates more, they deserve to get more. […] I mainly have coffee. With the 0.5hec that I have increased, I have 4hec of pure coffee. And then I have some for my own consumption: citric, avocado, fruits… I have dedicated mainly to my coffee, and it gives me time for my additional businesses. After harvesting, I start processing coffee, selling to markets, finding clients.... after harvesting, I dedicate to do the coffee business. That's how we work. [...] From January, I start traveling to Arequipa, Tacna, Puno...*

PE28A8: *[Raul] Thanks to the coffee we live quiet, we live better… we can give education and health to children. From 1980, there was no Fair Trade, just conventional coffee. Since the 80s, we have organic, and receive bonus/prize from fair trade, that help our children. […] Thanks to the coffee nowadays I have a road from SPPP to my farmland, that is 12km… a prize that the national government through DEVIDA gave me in 2018, one year after I won. DEVIDA financed it with S/. 1.58M and was opened in 2012. Before, I used to carry the coffee by myself from my farmland to SPPP, on our backs, donkeys, or wheelbarrows. So, there were accidents... even deaths.*

Finally, opposing to the idea of the devoted producers, comes a worry mainly portrayed by public officers, related to the 'alms culture' or welfarism. This concept implies that they need to receive support, even for free, because they deserve it due to their condition as farmers and as border inhabitants (IN01A1, PE35A6, PE37A5, PE35A7). While this phenomenon could be reduced as 'cultural', there are several factors such as the traditional paternalistic behavior of the State, the political interests within cooperative governance (show results with low investments), or other motives at individual level that promote welfarism among producers (PE34A3, PE07A12, PE35A8). The producers' welfarist behaviors (e.g., opportunism, passivity, low participation, etc.) hinder the effectiveness of projects, so a better design of knowledge transfer processes, professionals with educational capacities, and appropriate technologies to the reality of the producers are some considerations that should be taken to address motivational voids (Landini, 2016).

IN01A1: *Producers develop an 'alms culture': "Government that comes, government that you ask money." "We need to sell the product because we are poor, not exactly because the product is good."*

PE35A6: *[what kind of support do you need?] what kind of support can you give us? 1) As we are in crisis, we do not have so much money to do installations, coffee plantations, solar tents, post-harvesting, pulp machines… 2) maintaining the farms, fertilizers, seedlings…*

PE37A5: *Every entity that comes is welcomed but always, it will be interesting… a contribution. Even more nowadays with the economic crisis due to the low coffee production in this valley, national level, and global level. It is said that in the next years, worldwide coffee production will be even worse due to climate change.*

PE35A7: *[About public funding] We know AGROIDEAS, but it is with counterpart. We will not be able to rescue what we will invest… if we get a free project, that would be awesome. [me: you need to invest in your own business] that is why our accountant does not want to invest, the money does not come back... and at the end, the president loses with an expense without reimbursement.*

The Coffee Culture, the Quality Culture, and Development

The idea of a coffee culture or quality culture resonates with the impact of CECOVASA in promoting devoted producers, where the border identity or indigenous identity are not used for welfarist purposes, but as a landmark to value their progress (IN01A2).

IN01A2: *In the coffee case, the alms culture changed to a quality culture: they compete in strong markets with very high coffee quality (+85points). They used to say: "Apart from high quality, we are border communities, we are indigenous, we work in protected forests, we are rural women producers (e.g., Vicentina)"*

CECOVASA, through its quality standards, organic program, and quality control center, has achieved (in cooperation with allies and partners) to construct this culture of coffee quality even beyond the borders (PE11A9, BO30A6) that have been instrumentalized by the provincial and local governments from Sandia to SPPP, calling themselves as 'The Land(s) of the best coffee in the world' (PE28A3) – a territorial marketing strategy to promote international competitiveness (CECOVASA, 2019) (see more in **Appendix 9**). **Thus, this strong relationship between high quality standards, marketing channels (especially international certifications), and local development, constructed throughout the evolution of CECOVASA, is the cornerstone of the coffee & quality culture in the Valleys of Sandia and its main competitive advantage in the coffee Global Value Chain.**

PE11A9: *The people in those areas already know about the importance of quality: if they use pesticides, they do not have a good management of their coffee… that can affect their certification. So, it is an issue that they are also aware.*

BO30A6: *[Hilda] We love to produce coffee. I have always been coffee producer. My dad was also a coffee producer. We know what is organic, how to cultivate it, organic/inorganic waster. It is beautiful…. It is not like the coca; we do not need to be afraid of the police. [daughter] I love to harvest under their shadows…*

As each cultural setting, this local coffee & quality culture brings opportunities, but also setbacks for local population. In terms of opportunities, CECOVASA represented a channel for producers to meet the world through their coffee, and that the world can also meet them (PE28A9, PE36A). Coffee culture also represents a good quality of life as cooperative prices are above average buyer prices and well above middlemen's prices (BO30A7). In addition, despite the high-quality standards, CECOVASA offers several opportunities (e.g., buying the coffee cherries without post-harvesting processing) so producers can have a better access to its services (BO30A8).

PE36A: *[CECOVASA officer] I have my coffee in SJDO. I do not know if you have heard about me, I won with 90.75points in Paris, France… in the AVPA contest in December 2021.*

BO30A7: *[Edwin] Due to the rise in coffee price, CECOVASA and Coop64 are buying coffee in a good price. Currently, the advance price is 500 soles per quintal, that is 46kg. And then, it comes the refund that depends on the coffee quality. If your coffee is 86/87 points, apart from the 500 soles, they will give you, they will add 100 or 150 soles. That is how CECOVASA works. Everybody that is interested can come back to CECOVASA. [...] If it reaches 86-87 points, your coffee would be 700-800 soles... more points, better price. You must do good harvest and post-harvest processes.*

BO30A8: *[Edwin] if you want to re-enter the organic program, please do it, you are welcome. If you become organic producers, I must automatically visit you. You will be my producers and I will give you in the organic coffee training. And that topic is very broad... you must be very careful, take care of the weather.... or you can spoil your coffee. Even honey coffee you can spoil it. Washed coffee... you can save it with platforms, but if there is no sun, it may start to rot or ferment. Last year, Simon Calcina delivered 15 quintals of natural coffee, and he will get a good refund (reintegro). Even more, taking the coffee husks costs... and the hush adds weight so you will get more money.*

[Hilda] How is the sultana? How could we do it?

[Edwin] Now the quintal of coffee sultana is 250 soles. And CECOVASA is collecting this year too.

[Hilda] We are throwing away money [laughs]… How much time do we have to reincorporate?

However, this coffee culture has its setbacks. As mentioned, coffee quantity and quality play a relevant role in the governance of the coffee cooperatives, especially in CECOVASA – a dynamic that can endanger the cooperative (PE20A6, PE20A7). Second, as this coffee culture of wealth and success depends on an organization, even more so, if the producer is an associate, being part of this prosperity resembles to a 'club good': you need to have and conserve your membership if you want to continue receiving the cooperative benefits – some of the bests to develop in that geographic area. Thus, if the associates do not have enough to fulfill their coffee quotas, they need to buy from other producers (Peruvian or Bolivian), creating the possibility to undermine quality (PE20A5, BO30A9). Third, despite the broad variety of possibilities created by CECOVASA to be part of the coffee movement, high quality standards do not only limit membership (PE66A18), but also production practices due to the rigor of

the programs (PE71A4). Finally, as CECOVASA and Coop64 are the only coffee exporters in the region, there is a high dependence on these cooperatives (PE35A9).

BO30A9: *We still harvest, and they come here to buy, the people from the organic programme in SPPP… the ones that must complete their quintals or they are punished, they come to complete. Last time they came in August, to complete their quotas… they buy our coffee pretty cheap.*

PE71A4: *[why can you not implement all improvements?] For example, when we are in the Organic coffee program, we cannot fertilize, we cannot fumigate, or we lose the certification. It should be 100% organic, without fertilize, fumigation, hand weeding or with saw... so it limits us... We can use certificate fertilizers, so maybe yeah... but fertilizing for us... carrying 60kg bags... and it is not only one bag because, for one hectare, you need many... it is a lot of sacrifice.... everything is based on costs, but we are learning that fertilizing it improves our crops.*

PE35A9: *[why do you love CECOVASA?] without CECOVASA, where could we export? There is no other way to go out from here. Only CECOVASA has organic certification, wanting without wanting, we must collect for CECOVASA. To leave CECOVASA is very difficult, organic certification is very difficult and without it you cannot export.*

While these setbacks explain the current low percentage of producers associating to cooperatives (PE66A18) and therefore, limiting their development opportunities, rather than portraying associativity as a club good it is more like a trade-off: reducing membership standards would undermine the constructed coffee culture and access to foreign markets. In this formula, certification plays a key role to keep the cooperatives united: **despite the several internal disagreements, managerial problems, or financial issues, it is because the market access created by the certifications (an externally recognized proof of coffee quality) that everything keeps all grassroot cooperatives, producers, or farmlands in a single cohesive assemblage.**

In other words, they have internalized the limitations of local coffee production, and they know that quality is the main driver to export: Certification is the means to others understand the quality in the way that they do. It is the channel to arrive the market with the prices that they think they deserve. Nowadays, CECOVASA is the provider of the certification, a channeler to the benefits that coffee can bring to the Sandia jungle. Thus, certification is a key *actant* that keeps the regional coffee production and the local coffee culture together, despite of the roya, the coca, or personal interests.

As exploring the coffee culture leads to consider certifications as fundamental to access territorial benefits, unwrapping what is behind these coffee credentials reveals the relevance of coffee traceability: how value is added and monitored in each value chain stage (LB1012). Rescuing the previous analysis on the C-GVC, the local dynamics and exports reveal that traceability arrives to green coffee, and this CECOVASA-led coffee culture rewards and punishes the producers' performance on primary production (harvesting and post-harvesting). At national level, in Peru and Bolivia, traceability of most cooperatives does not arrive to roast coffee and focus on production standards (PE11A10, PE14A10, BO52A8).

To retain more product value at (cross-border) local level, value chain upgrading and especially functional upgrading (transformation), is essential to improve traceability. However, upgrading strategies must consider the interconnection between the coffee global dynamics and the challenges that the local context faces. For example, as coffee freshness (an indicator of quality) lasts at most a month after roasting and maritime shipment to the main coffee markets (Europe, USA, and Japan) takes from 15 days to 45 days (without counting other logistics processes), there is a clear time constraint that should be considered in functional upgrading plans.

Planning these improvements implies the participation of a variety of stakeholders: e.g., better coffee packaging (cooperatives & ancillary services), streamlining customs procedures (national government), better port infrastructure and highways (national and/or regional governments), R&D con roasting (knowledge centers), and more. In addition, from a territorial approach, the cross-border reality should be considered (e.g., direct trade scheme) and even the subregional reality (e.g., ANPROCA selling to CECOVASA), as project proposals at higher scales can attract investment more easily and allocate them to cross-border realities.

Based on the description of the INPANDES project and this preliminary review on the coffee reality in the selected cross-border territories, the following three analyzes shades light on the bottlenecks in creating value (Value Chain Analysis), the localization of territorial capacities (Social Network Analysis), and the main connectedness voids that should be targeted (Root Cause Analysis). The results will be compared with the INPANDES outcomes in terms of how it increased (or not) project satisfaction, producer income, and coffee exports.

2.5. Phase 1.1. Value Chain Analysis (VCA)

Based on the descriptive analyses, we focus this VCA analysis on the six processing stages (not enough data to analyze the supportive activities as it depended on CECOVASA financial plan). The VCA starts with the primary production processes: cultivation & harvesting, and post-harvesting. **Table 6.17** reveals that a quarter of the budget of the coffee component was oriented for cultivation & harvesting process, including productive supply, infrastructure, and technical training. However, these trainings were mainly conducted by only two technicians, and with low effectiveness in transplanting. The INPANDES project did not execute more than transplanting due to time constraints. Border communities, from Peru and Bolivia, counts with disadvantages as they are lowlands, having lower quality, a greater number of defects, and shorter harvesting season – requiring more workers to harvest faster and funding to pay them. If producers sell at this stage, they get a price of 5soles/kg. However, considering production costs they make around 2-3soles/kg. Furthermore, with small parcels (avg. two hectares/producer) and low-average productivity (12 qq/ha), they make profits under 50% of minimum wage, making coffee production unsustainable.

Table 6.17. *VCA: Cultivation & Harvesting (Author's elaboration)*

Cultivate. & Harvesting	Local Conditions (CBR)	INPANDES
Input	**Seedlings:** coffee varieties are conditioned to altitude & productive knowledge. Better varieties in Peruvian side, although catimor is predominant in both due to its resistance to the roya. **Fertilizer:** Organic producers cannot use chemicals. Only organic ones. **Land & Utilities:** most producers have less than 2ha, this amount is bigger in Bolivian side. No need of irrigation. **Labor:** Most producers receive support from family or other producers during harvesting. Limited by #producers in coca. **Tech. assistance:** Own experience. Peruvian side receive support from cooperatives and municipalities. **Productive Installations:** Productive equipment (nurseries) depends on producers' financial capacity. More developed in Peruvian side.	**Seedlings:** Due to the limited productive capacities in Bolivian side, most received catimor. Peruvian producers received catimor, Bourbon, and Geisha. **Fertilizer:** Provision of organic fertilizers and other supplements **Land & Utilities:** No provision **Labor:** No provision **Tech. assistance:** Two technicians for visiting 140 producers. Low frequency of technician visits (once/ twice per month), for one day, and most of the time, not personalized and not arriving to producers' lands (group teaching). **Productive installations:** Installation of 12 nurseries in the CBR and SJDO. Giving some tools such as saws, collecting nests, etc.
Processing	**Nurseries & Seedlings production:** Limited to financial and technical capacities (underdeveloped in Bolivian side). **Transplanting:** Bolivian producers od not have knowledge about transplanting. **Integral mgmt.:** Coffee production management is more developed in Peruvian side, especially by organic producers. **Harvesting:** Geographical conditions do not allow mechanization. Selective harvesting is executed by	**Nurseries & Seedlings production:** Two technicians oversaw installed nurseries. **Transplanting:** low transplanting ratio in Bolivian communities (33% in San Fermin, 0% in Cocos Lanza). **Integral mgmt.:** Technical assistance programme (weed control, fertilizing, harvesting, post-harvesting, organic residuals, etc.). **Harvesting:** The project did not cover this stage.

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	producers with technical knowledge. Harvesting season is faster in borderlands (lowlands).	
Output	**Coffee cherry:** Production is lower in a 70% to 80% due to the roya (both sides).	**Coffee cherry:** In Bolivian side, few coffee plants were transplanted, limiting production during INPANDES.
Timing	**To produce:** 3-4 years, once/year. First three years are for growing, cleaning, coffee management. **Flowering:** 9 月-11 月 **Maturing:** 12 月-3 月. Rainy season. **Harvest:** Once a year. Starts from 4 月, but finishes by 6 月 in borderlands (lowlands), and 7 月 in high lands of the valley (near SPPP city, but specially in SJDO). Peak months: 6/7 月. Producers living in farmlands during weekday, going down on weekends.	**To produce:** the project followed the coffee calendar, having only one year since growing the seedlings in the nurseries. **Flowering:** --- **Maturing:** --- **Harvest:** Project did not arrive to this phase more than demonstrative sessions.
Pricing	**Land price:** 5000soles/ha (12-18quintals per hectare) **Harvesting Wage:** 8-10soles per bucket of dried coffee (~3.75kg) when hiring workers. Harvesting is also carried out by family members. Collection per worker: 12.5kg/day. **Harvesting cost:** With five workers a day, 1 quintal of natural coffee (~60kg, 16 buckets) cost: 128-160 soles. **Coffee cherry price:** Due to its rapid decay, coffee cherry should be sold at least under dried process (with husks), around 300soles per quintal (unit price: 5soles/kg). Without including land & utilities cost, income per coffee quintal is 140-172soles (46-57% of production cost). Profit: 1680-3096soles/hectare with a productivity of 12qq/ha. **Producer income:** With an average of 2ha/producer, they make 280-516 soles/month (70-129 €/month). Peruvian min. wage: 1025 soles/month. Coffee producers with low productivity and selling just coffee cherry make ~50% of minimum wage.	**Technicians:** 43,950€ **Training material:** 3,757€ **Training sessions:** 2,608€ **Supplies:** 28,413€ **Infrastructure:** 33,603€ -Demonstrative parcels: 14,313€ -Nurseries (10k seedlings): 19,289€ **Total: 112,330€ (24.9%)**
Actors	-Coffee producers in the Sandia Valleys (SJDO, SPPP), and Bolivian communities. -SJDO and SPPP municipalities (technical training) -DEVIDA (financing supplies)	-INPANDES team: MPS, professionals, and technicians (technical assistance, construction of nurseries, provision of supplies) - Producers as participants. Key producers for sharing experiencies.

The next stage post-harvesting process (**Table 6.18**), that highly depending on financial and technical capital of producers, and financial capacity of cooperatives for collecting campaigns. Around 15% of the INPANDES budget oriented to this stage, providing from post-harvesting demonstrative sessions to improving collecting centers, and giving equipment. Most benefits were for the cooperatives (CECOVASA and APOCOM) or community, although in this CBR, the wet process is traditionally carried out in the own producers' farmlands. Under good processing and getting a good cupping quality score, producers can get 10-13soles/kg selling to CECOVASA, with 8soles/kg paid at that moment, and the rest would be paid after the international buyer receives the coffee cargo. This price is lower if producers sell to middlemen, receiving between 5-8soles/kg, representing a loss of 15%-62% of the potential price.

Table 6.18. *VCA: Post-Harvesting (Author's elaboration)*

Post-Harvesting	Local Conditions (CBR)	INPANDES
Input	**Coffee cherry:** Coffee cherries should be processed almost immediately after harvest. Thus, most post-harvesting is produces in the farmlands. **Productive equipment:** Depended on the financial and technical capacities of producers. **Utilities:** Washed coffee demands great amount of water, although it was not reported as a problem. One quintal can represent 2,000-3,000 liters of water. Under good processing, this is 200 liters.	**Coffee cherry:** Coffee delivered from border producers were not sowed during the project (previous harvests). **Productive equipment & infrastructure:** Installation of coffee dryers, wet benefit modules, collecting centers, several equipment (scales, milling, etc.). **Utilities:** No provision
Processing	**Dry process:** Natural coffee, Efficiency of 0.33 (cherry to dried/natural coffee). **Wet process:** Most producers sell washed arabica coffee as price increases. Most Bolivian producers does not wash their coffee. Final product is parchment coffee. It is packaged and stored in the farmlands until its transport to collecting centers. Efficiency of 0.2 (cherry to parchment). **Collecting:** Producers sell their coffee directly to cooperative, or indirectly through middlemen. Coffee collecting ins clustered in SPPP. Coffee volume depends on 1) individual production, and 2) how much cooperative can pay in that moment. **Milling:** Coffee goes from collecting centers to Juliaca plant to transform parchment coffee into green coffee. Both dry and wet process give similar quantity of green coffee (Efficiency: ~0.16). **Packaging:** Cooperatives package the green coffee for export.	**Wet process:** Demonstrative sessions about wet processing for communities. **Collecting:** Improvement of collecting centers and collecting plan. Milling: --- Packaging: ---
Output	**Washed, Dried & Parchment coffee:** Intermediate products from producers. **Green coffee:** Processed by cooperatives. Approx., 70% of collected coffee is possible to export (20% parchment, 10% defects). This amount decreases if coffee bean quality is lower (lower technical knowledge or coming from lowlands/ borderlands). **Husks:** New associations and cooperative are producing alcohol from sultana (coffee husk). **Honey waters:** No report about how they treat water after post-harvesting.	**Washed, Dried & Parchment coffee:** --- **Green coffee:** --- **Husks:** --- No specific change in terms of output
Timing	Collecting starts during harvesting season.	Activities executed from mid2016 to end2017.
Pricing	**Three schemes** (prices per quintal of parchment coffee): 1) **Middlemen:** 300-500soles (arbitrary price, paid at that moment in cash, only possibility for Bolivian producers, transaction in the farmland/community). 2) **Cooperative:** -1st payment: 500 soles (price settled in the statute for Peruvian associates, paid at that moment, cash, transaction at the collecting center) -2nd payment: 100-300 soles (quality-based price, after export sale approx. one year)	**Professional** (chain manager)**:** 23,000€ **Training sessions:** 2,608€ **Equipment** (scales, milling, etc.)**:** 18,848€ **Infrastructure:** 22,614€ -Wet benefit modules (7.5): 6,041€ -Drying modules (12): 1,585€ -Collecting centers (7.5): 14,988€ **Total: 67,070€ (14.9%)**

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	-CECOVASA also collects other coffee subproducts (natural or honey coffee, sultana, etc.). Comparing both models, middlemen prices represent from 38% to 85% of cooperative prices (loss of 15%-62%). Cooperative unit price: 13soles/kg. 3) **Entrepreneurs:** coffee producers with good coffee varieties (Geisha, Bourbon), good knowledge and infrastructure, can sell coffee outside cooperatives for prices over +1000soles/quintal. A coffee with a cupping quality of 89/90pts. is over 2500soles/qq. **Water consumption:** Water in Peru is 2.36soles per 1000 liters if connected to public pipes. Most producers use natural sources, so they do not pay for water costs. **Producer income:** Considering same production costs, two hectares can give even 1680soles/month for a productivity of 18qq/ha. Experts recommend a productivity of 25qq/ha (equal to 2,800 soles/month in 2ha).	
Actors	-Producers (as before) -Middlemen (associated to cooperatives) -Cooperatives (CECOVASA, and Coop64. APOCOM did not collect without support).	-INPANDES team: value chain manager to design collecting strategy, and technicians for post-harvesting demonstrations. -Cooperative technicians (collecting procedures) and cooperative leaders (collecting plan).

As 95% to 99% of coffee volume collected by CECOVASA is exported, trade becomes the next processing stage (**Table 6.19**). CECOVASA gets an average price of 17soles/kg, considering that the cooperative bought the coffee from producers at 12soles/kg, and estimating that processing (milling, packaging, etc.) and logistic costs (transport, customs, fees, etc.), are around 2soles/kg, cooperatives, cooperatives have a profit margin of 3soles/kg. Furthermore, profits depend on volume as cooperatives need a minimum of sales to survive (breakeven at 10,000 quintals) – situation that has not been achieved in the last five years (+50% below breakeven). In 2017, CECOVASA got a letter of purchase with Kaffee Siddharta, however this sale was executed in 2019. This was later repeated in 2022 with a higher volume and a higher price (above CECOVASA's average price). Transport is executed from Callao port to Hamburg.

Table 6.19. VCA: Trade (Author's elaboration)

Trade	Local Conditions (subnat & nat)	INPANDES
Input	**Green coffee:** Coffee is evaluated (quality control) and sealed for export. **Contract:** CECOVASA has several international buyers. **Documentation:** The most important is the organic certification and SPS requirements. **Fee & Bills:** FOB sales required fees	**Green coffee:** ---- **Contract:** INPANDES created conditions for CECOVASA to get a contract with Siddharta (German wholesaler). **Documentation:** No progress in certification process for fair trade. **Fee & Bills:** FOB sales required fees
Processing	**Dom. Transport:** Transport from Juliaca to Lima/Callao (approx. two days). Logistics running by CECOVASA central. **Warehousing:** CECOVASA used to have its own warehouse next to the port. **Exp. Clearance:** run by cooperative. **Intermodal Freight Transpt.:** Transport takes between 15-45 days. During shipping, coffee quality usually decreases one or two points. **Imp. Clearance:** run by buyer **Delivery:** run buyer	INPANDES did not have intervention on this processing stage.
Output	**Imported coffee**: According to veritrade, 99.6% of CECOVASA exported coffee is green coffee.	---
Timing	**Clearance:** around 4-7days **Shipping:** Approx. 15 to 45 days. Less number of stops required to pay more on shipment.	**Clearance:** Same time **Shipping:** Callao-Hamburg around 36 days.
Pricing	**Export coffee value:** CECOVASA sells their coffee to an average price (eight last years) of 4.47$/kg or 17soles/kg (1020soles/quintal). This represents approx. a profit of 200-400soles/quintal for the cooperative. **Cooperative finance:** According to experts, cooperative needs at least 10,000 quintals to cover fixed costs (approx. 3M soles/year). Before 2014, CECOVASA used to sell more than 30k quintals/year. Between 2018-2021, CECOVASA has sold 4,750 quintals/year, running operations below half the break-even point.	**Sales to Kaffee Siddharta (Tunki & Frontera coffee):** -1st sale (Mar2019): 6,900kg (Price: 3.527$/kg) -2nd sale (Dec2019): 10,695kg (Price: 3.527$/kg) -3rd sale (Feb2022): 18,975kg (Price: 4.850$/kg) -4th sale (Mar2022): 18,975kg (Price: 4.850$/kg) 2019 sales: 293quintals, under avg. price. 2022 sales: 633 quintals, above avg. price (+116% export volume and +38% unit price compared to 2019).
Actors	-Cooperatives (CECOVASA, Coop64) -Regulatory agencies (SENASA) -Logistics companies -International buyers	-CECOVASA -Regulatory agencies (both countries) -Shipping company (Mediterranean Shipping Co. Peru SAC) -Importer company: Schwarze & Consort GMBH -Buyer: Kaffee Siddharta

The next processing stage is transformation and refers to roasting, grinding, and packaging coffee (**Table 6.20**). INPANDES invested 18% of the budget in this stage, as it bought the 25kg PROBAT semi-industrial roaster machine for CECOVASA. No knowledge on roasting was provided, so the first times to roast were not successful. This process is mainly executed abroad, and prices differ at domestic and international level. More info is required to calculate estimated the cost and price of coffee directly from the roaster.

Table 6.20. VCA: Transformation (Author's elaboration)

Transformation	Local Conditions (subnat/GVC)	INPANDES
Input	**Green coffee:** Most coffee is exported. Between 5-1% is roasted by CECOVASA. Grassroot cooperatives and entrepreneurs also roast for local markets. **Productive equipment:** Roasters and grinders. Grassroot cooperatives and municipalities provide maquila services, without so much knowledge. **Utilities:** Triphasic energy at industrial level. Peruvian side of the CBR does not count with triphasic. Bolivian side does not count with energy.	**Green coffee:** --- **Productive equipment:** INPANDES provided the PROBAT roasting machine for CECOVASA and a small roaster for Bolivian communities. **Utilities:** A generator was budgeted for Bolivian communities but cancelled and not provided.
Processing	**Roasting:** In CECOVASA, first roasting experiences failed due to lack of experience. Efficiency of 0.85 (green to roast). **Degassing:** This process is carried out in the machine and coffee bags. **Grinding:** CECOVASA has a grinding machine with very low capacity of 200-250g each grinding (four/five times per kg, one quintal: 240-300 times) **Packaging:** CECOVASA counts with special coffee bags with valves, logos, and certifications.	**Roasting:** No provision of technical knowledge, only the roaster. **Degassing:** --- **Grinding:** --- **Packaging:** ---
Output	**Roasted Coffee:** CECOVASA had only one export of roast coffee to Chile.	---
Timing	**Degassing:** Approx. three-seven days **Roasted Freshness:** two weeks after degassing (standard time can increase with better packaging).	---
Pricing	**Transformation price:** Depend on energy usage and cost of packages. No prices were registered about the plant/factory price of coffee, although	**Equipment:** -Small roaster: 3,255€ -PROBAT machine: 82,000€ **Total: 85,255€ (18.3%)**
Actors	-Domestic market: Cooperatives, municipalities, supermarkets, retailers. -Foreign market: intermediaries and buyers, wholesalers, supermarkets, retailers.	----

Commercialization (**Table 6.21**) was another stage where CECOVASA has already developed several strategies (coffee certifications, georeferenced brands, international fairs, etc.), although they are not integrated in a marketing plan. The biggest success was the letter of purchase with Kaffee Siddharta when the project financed the trip to SCA international fair. This company imports Tunki and Frontera coffee, having several videos and posts from both in its social media (Kaffee Siddhartha GmbH, 2020, 2021) – it has better digital platforms than CECOVASA. In terms of sales, the sale of CECOVASA coffee at domestic markets in Lima is around 140soles/kg. This price equals to the 60% of the price in international markets, around 235soles/kg.

Table 6.21. *VCA: Commercialization (Author's elaboration)*

Commerce.	Local Conditions (subnat/nat/GVC)	INPANDES
Input	**Roasted coffee:** Minimum amount compared to green coffee export. **Certifications:** CECOVASA counts with several organic certifications.	**Roasted coffee:** --- **Certifications:** Consultancy service to implement a Fair-Trade program for APOCOM.
Processing	**Marketing:** CECOVASA does not count with a proper marketing strategy. However, it has marketing channels such as georeferenced brands, participation in national and international fairs, etc. **Wholesaling:** Main sales of CECOVASA roast coffee is to supermarkets. **E-commerce:** social media is weak and there are not proper channels to sell products. Instagram has good strategy, but website is not working. **Distribution:** from Juliaca to Lima.	**Marketing:** Formulation of the Frontera coffee brand to sell the coffee from border producers. The project sent delegations to national and international fairs. **Wholesaling:** ---- **E-commerce:** INPANDES upgraded certain social media channels, although not good process. **Distribution:** ---
Output	**Coffee products:** CECOVASA had only one export of roast coffee to Chile. Most roast coffee, although in low quantities, are sold to domestic market (especially Lima city).	----
Timing	**Distribution:** no reference but approx. 3-7 days	----
Pricing	**Organic coffee certification**: fees vary from $700 to $3000 per year depending on the certifier. **One coffee bag (roasted & grounded coffee):** -Sold by CECOVASA at Lima supermarket: 34.90soles (250gr bag). Unit price: 140soles/kg. -Sold by intermediary in German market: 15.3€ (250gr bag). Unit price 61€/kg (245soles/kg). -Sold by intermediary in Japan market: ¥1,620 (200gr bag). Unit price: ¥8,100/kg (225soles/kg). Exports are ~60% more profitable than local sales. However, it should be included the difference on prices due to logistics, transformation, etc.	**Professional (**business manager**):** 22,800€ **Certification (**Fair trade consulting**):** 3100€ **Brand register** (Frontera coffee): 2400€ **National fairs:** 8905€ **International fairs:** 8000€ **Total: 45,205€ (10.0%)**
Actors	-Domestic market: Cooperatives in Puno, local wholesalers, supermarkets. -Foreign market: intermediaries and buyers, wholesalers, supermarkets, retailers.	---

The consumption stage was not included in INPANDES as CECOVASA has not developed this phase yet. Only one grassroot cooperative (San Jorge) has a coffee bar in SPPP. Although INPANDES did not consider this step, a possible INPANDES 2 would have aimed to construct five coffee bars for CECOVASA. Considering the typical prices in coffee bars at main urban centers, in domestic markets the cup price is 7soles, and at international market (~¥400) is 11soles. As 1kg of ground coffee represents around 125cups (an Americano or expresso uses 8gr) that can generate 875soles or 1375soles respectively. This price is around 6 times the price from the wholesaler/retailer, although fixed costs are also high due to the rent payment, staff, own marketing, etc.

Table 6.22. Summary of the Value Chain Analysis (Author's elaboration)

	Cult & Harvesting	Post-Harvesting	Trade	Transformation	Commercialization	Consumption
Coffee CBVC						
Profits to whom?	Producer (CBR)	Producer (CBR)	Cooperative	Foreign Roaster	Foreign wholesaler	Foreign Coffee bar
Avg. unit price (soles/kg)	Natural coffee: 5sol/kg	Parchment coffee (avg.): 8.3sol/kg (middlemen) 12sol/kg (cooperative)	Green: 17sol/kg	-[A]	Roast: 235sol/kg	1375sol/kg
Coffee volume equivalency [B]	Harvest: 1000kg (cherry) Dry: 333kg (natural)	Wet: 200kg (parchment) Milling: 160kg (green)	Green	Roast: 136kg	Roast	Roast
Unit Profit	2.5 sol/kg	9.5 sol/kg	3.1sol/kg	- [A]	47sol/kg[C]	265sol/kg[C]
Profit in 1Ton cherry	832soles (natural)	1900soles (parchment) (1170soles to middlemen)	500soles (green)	- [A]	6.4Ksoles (roast/ground)	187Ksoles (brewing)
Strengths	Several Peruvian producers count with good practices. Local conditions are favorable for good quality coffee. Even coffee from lowlands can have quality with good techniques.	Post-harvesting is well-managed by Peruvian producers.	CECOVASA has several international buyers and established logistics network. Good unit price.	CECOVASA started upgrading and selling to domestic markets (especially in Lima).	CECOVASA counts with good strategies for selling coffee: certifications, georeferenced brands, participation in fairs, etc.	-
Weaknesses	Producer: Low technical knowledge, financing resources, lower volume due to coca/roya, no productive supplies. Lower quantity/quality at border areas.	Producers: Low knowledge, no productive infrastructure, quality control is mainly empirical. Middlemen: loss of 15%-62% price. Coop: no funding for collecting campaign, or supervision visits.	95%-99% of coffee is exported. Participation of two logistics intermediaries before arriving to buyer.	Roasting is mainly executed in consuming countries. Difficult to penetrate without contacts. CECOVASA has low/avg. knowledge on roasting.	CECOVASA counts with weak marketing plan and digital channels to sell directly.	No coffee bar, although
INPANDES Project						
Budget (€)[D]	**112,330€ (24.9%)**	**67,070€ (14.9%)**	**0 (0%)**	**85,255€ (18.3%)**	**45,205€ (10.0%)**	**0 (0%)**
Strengths	Provision of installations supplies and training (sessions together).	Provision of wet processing modules and collecting centers for the cooperatives. Demonstrative sessions.	CECOVASA got a German wholesaler due to the project, and still sell to it (+profitable).	Provision of PROBAT semi-industrial roaster.	Design of Frontera coffee, international and national fairs, certification program for Bolivia.	-
Weaknesses	Low efficiency of technical visits and transplanting of seedlings. Benefits were mostly for the cooperatives, not individuals.	Mainly through demonstrative level. Benefits were mainly to cooperatives, although wet process is executed at farmlands. CECOVASA-APOCOM agreement did not work.	-	No provision of technical knowledge. CECOVASA has not penetrated roast market by the date.	Weak social media and digital strategy.	-

[A]: Factory prices of roast coffee could not be estimated/collected.

[B]: Ratios extracted from interviews and literature review (International Trade Centre, 2011; Sualeh and Dawid, 2013; Wikiversity, 2016)

[C]: Estimated prices considering 80% of production cost.

[D]: Budget arrives to 68% of project total costs. The rest was oriented to other project activities related to integration events, project management, etc.

Although not all possible numeric data could be collected (especially production & transaction costs as well as prices due to the data was reserved by companies), **Table 6.22** summarize the main characteristics of the studied value chain, showing that prices behave similar as in **Table 6.10** in terms of the inequal distribution: According to our estimated values, **for each cup of coffee at ¥400, producers earn between ¥1.8 and ¥4**, depending on whether they sell their coffee under dry or wet processing– **even less if sold to middlemen (¥0.7~0.1.5)**. In other words, **the best they can get is 1% of consumption profits.**

From this, we can highlight that the best option for producers is to upgrade their processing capacity to wet process as they can earn 2.3 times more. In addition, sales should be directly to cooperatives or buyers, because sales to middlemen reduces prices in a 40%. This strategy should be accompanied by 1) improving yield productivity (especially to 18qq/ha or 25qq/ha) and increasing land size (from 2ha to 3/5ha). However, these strategies are viable at a 3-10 years horizon. Thus, the fastest (and most recommendable) strategy would be to associate in a cooperative under the organic program, increasing quantity, quality, and coffee price each year for 3 years.

CECOVASA, as a collecting intermediary, has a low profit while incurring in several expenses: administrative costs, hiring technicians, certification costs, and more. Increasing profits requires 1) higher volume, 2) selling at better prices, or 3) functional upgrading into roast coffee market. By this moment, due to CECOVASA's low volume, its survival strategy has been supported on higher prices relying on several marketing channels. However, even if the cooperative cannot arrive to the international roast coffee market, the domestic one still provides high profit margins.

Although the spatial configuration of the CBVC will be oversee in the next section, we can identify that the main cross-border transaction is the moment where Bolivian producers sell to middlemen, or to the cooperative. Other productive activities to generate value are only in their own countries. Thus, **under a Value Chain Approach, the value of the cross-border transaction relies on increasing volume (for cooperatives) and get access to a market (for Bolivian producers). The INPANDES project, as a CBVC, increased the scope of cross-border cooperation, by adding cross-learning, and binational brand.** This does not imply that this were the only benefits of INPANDES as the project had discussion tables, technical groups, joint policies agreement, and more. This highlights that **the VCA approach is not enough for evaluating a CBVC, as it does not contemplate the governance component.**

2.6. Phase 1.1. Mixed-Methods Spatial Analysis (MMSA)

To start this analysis, **Table 6.23** summaries the distances and times between the most relevant sites (urban centers and communities in **Figure 6.28**) related to this CBVC. This analysis was conducted with *ArcGis Pro*, field study notes, and other geospatial data sources (Ports.com, 2022).

Figure 6.28 and **Table 6.23** shows the main important routes that connect the sites from the coffee CBVC and case study. In both routes (I and II) from the main urban centers (Puno-Juliaca and La Paz-El Alto) to their respective coffee production areas at the border (SPPP and Bolivian communities) the highways have good conditions at the first sections but begins to decay and becoming inaccessible. The last sections in Peru are composed by one-way rammed earth roads, susceptible car accidents and especially landslides and deformations (due to truck weights) during rainy seasons. Although conditions have improved in the last decades (e.g., trucks full of coffee falling into the river, rain wetting coffee, mud polluting coffee), coffee logistics are still under high risks. The last sections towards Bolivian communities are not more favorable: most of the way from Apolo to Cocos Lanza can only be crossed by walking throughout the jungle, in a two to three days journey, where travelers need to sleeping in the middle of the forest and carry on their back any supply.

In terms of the connecting across the border, while arriving from SPPP to Puerto San Fermin takes around 1.5h (approx. 26km) –and crossing the Lanza River by boat or raft–, the 'formal path' requires going from SPPP to Juliaca and then cross all the way to Apolo and walk through the forest, a trip of 1161km for 4 days. It also represents a 'vertical distance' of more than 3000m.a.s.l. because going from jungle to jungle requires to cross the highlands. Coffee tends to frost while crossing the highlands, requiring special coffee bags or trucks with good storage conditions.

While most conditions in terms of connectivity and logistics seems unfavorable, the current established road network presents some advantages. Connecting Juliaca-Puno to El Alto-La Paz takes around 4.5h, a time that is even shorter than the route from Juliaca to Arequipa (5h) or Lima (~17h). Juliaca and El Alto are the industrial centers in this geographic area, and both have productive capacities for processing, packaging, or roasting coffee. This relative closeness is an opportunity to complement productive activities and shape an economy of scale. In the future scenario with a road connecting the Bolivian communities to Apolo (~6 to 7h), transporting coffee from San Fermin to La Paz would take 20h, that is seven hours more than transporting it from the communities to Juliaca.

Figure 6.28. *Main sites related to the coffee CBVC (Author's elaboration)*

Table 6.23. Origin-Destination Cost Matrix of CBVC Sites (Author's elaboration)

COD	Sites	Heigh (masl)	O→D	O→D Travel conditions	O→D Dist. (km)	Distance* from A (km)	OD Time (d/h/min)	Time* from A (d/h/min)
Route I: Juliaca → Sandia → CBR								
A	**Juliaca**	3829.3	---	---	**0 km**	**0 km**	**0h 0min**	**0h 0min**
B	Huancane	3829.9	A→B	PE34H: two-way highway, good conditions	57.4 km	57.4 km	1h 30min	1h 30min
C	Sandia	2182.0	B→C	PE34H: one-way pavement, average conditions, hillside (landslides)	174. km	231.4 km	5h 40min	7h 10min
D	SJDO	1301.6	C→D	PE34H: one-way rammed road, bad conditions, hillside (landslides)	73.3 km	304.7 km	3h 15min	10h 25min
E	SPPP	917.8	D→E	PE34H: one-way rammed road, bad conditions, hillside (landslides)	26.2 km	330.9 km	1h 5min	11h 30min
F	Curva Alegre	771.9	E→F	PE34H: one-way rammed road, average conditions, landslides	19.2 km	350.1 km	1h	12h 30min
G	Pauji Playa	771.6	F→G	PE34H: one-way rammed road, average conditions, landslides	5.5 km	355.5 km	20min	12h 50min
H	Puerto San Fermin	708.9	G→H	Walkable trail, boat across Lanza River	1. km	356.5 km	15min	13h 5min
I	Palmerani	1086.9	F→I	One-way road, bad conditions, landslides	13.2 km	363.2 km	20min	12h 50min
J	Cocos Lanza	815.3	I→J	Jungle Trail, landslides, flooding, raft across Lanza River	2.9 km	366.2 km	1h	13h 50min
Route II: Juliaca → Bolivia → CBR								
A	**Juliaca**	3829.3	---	---	**0 km**	**0 km**	**0h 0min**	**0h 0min**
K	Puno	3837.3	A→K	PE3S: two-way highway, very good conditions (recently built)	43.6 km	43.6 km	1h 10min	1h 10min
L	Desaguadero	3812.0	K→L	PE3S: two-way highway, good conditions. Border crossing & CEBAF	147.7 km	191.3 km	2h 25min	3h 35min
M	El Alto	4001.9	L→M	RN1: two-way highway, good conditions	99.6 km	290.9 km	2h 15min	5h 50min
N	La Paz	3634.6	M→N	RN1: urban road network, good conditions	17.7 km	308.6 km	35min	6h 25min
Ñ	Apolo	1440.3	M→Ñ	RN16: one-way rammed road, bad conditions	404.6 km	694.9 km	12h	16h 10min
J	Cocos Lanza	815.3	Ñ→J	Jungle: most route on foot	97.4 km	792.3 km	2d 12h	3d 4h 10min
H	Puerto San Fermin	708.9	J→H	Jungle: no clear walkway	13. km	805.3 km	9h	3d 13h 10min
Route III: Juliaca → Lima → European Market								
A	**Juliaca**	3829.3	---	---	**0 km**	**0 km**	**0h 0min**	**0h 0min**
O	Arequipa	2274.4	A→O	PE34A: two-way highway, good conditions	267.9 km	267.9 km	5h	5h 0min
P	Lima/Callao	160.3	O→P	PE1S: Pan-American Highway, relatively good conditions	1006.1 km	1274. km	16h 47min	21h 47min
Q	Hamburg	116.2	P→Q	Sea route: from PECLL Port to DEHAM Port	15823.5 km	17097.5 km	35d 14h 24min	36d 12h 11min

*Accumulated distances & times from the origin (A: Juliaca)

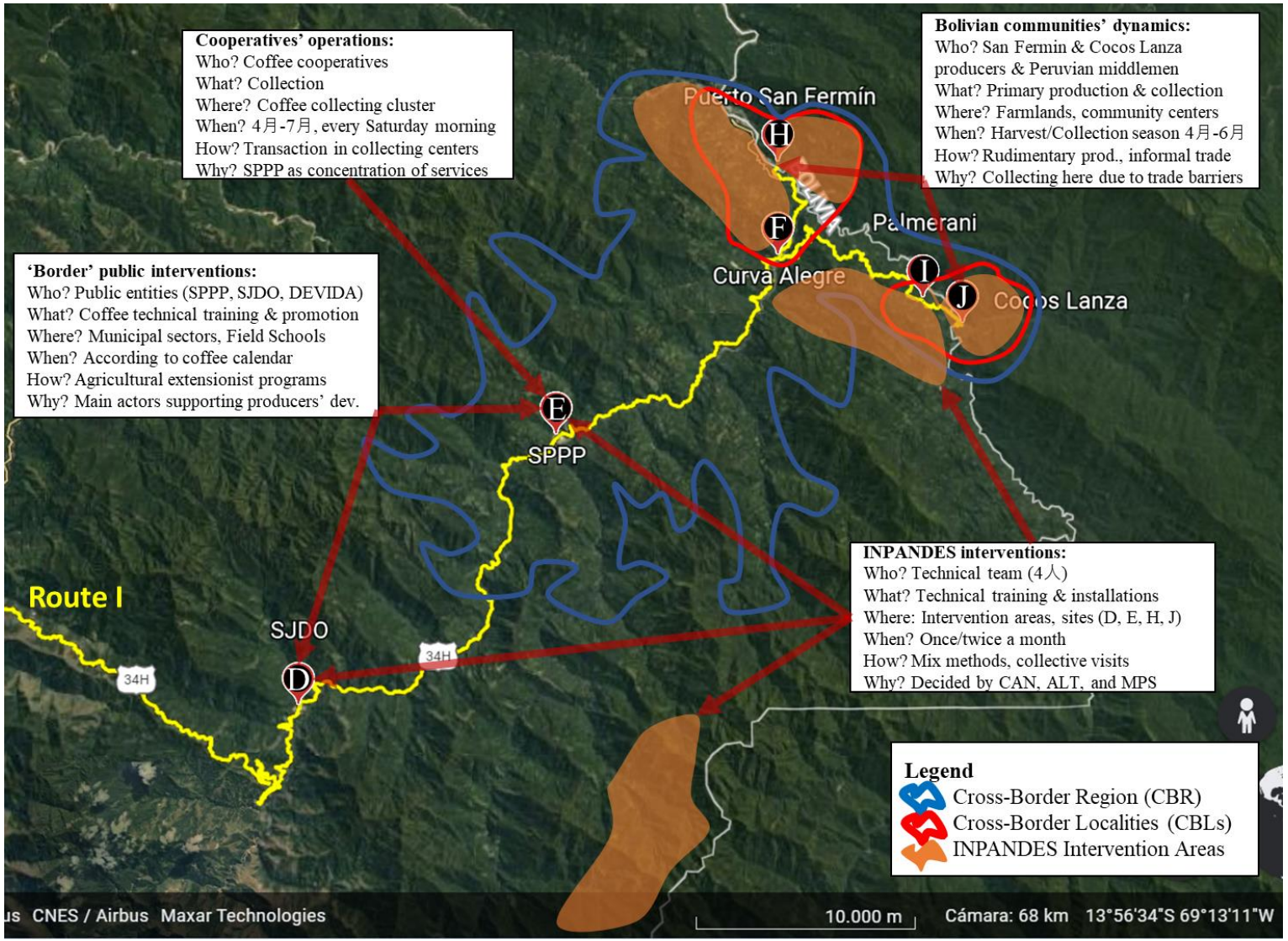

Figure 6.29. *Project & Production Network Analysis at Cross-border level (Author's elaboration)*

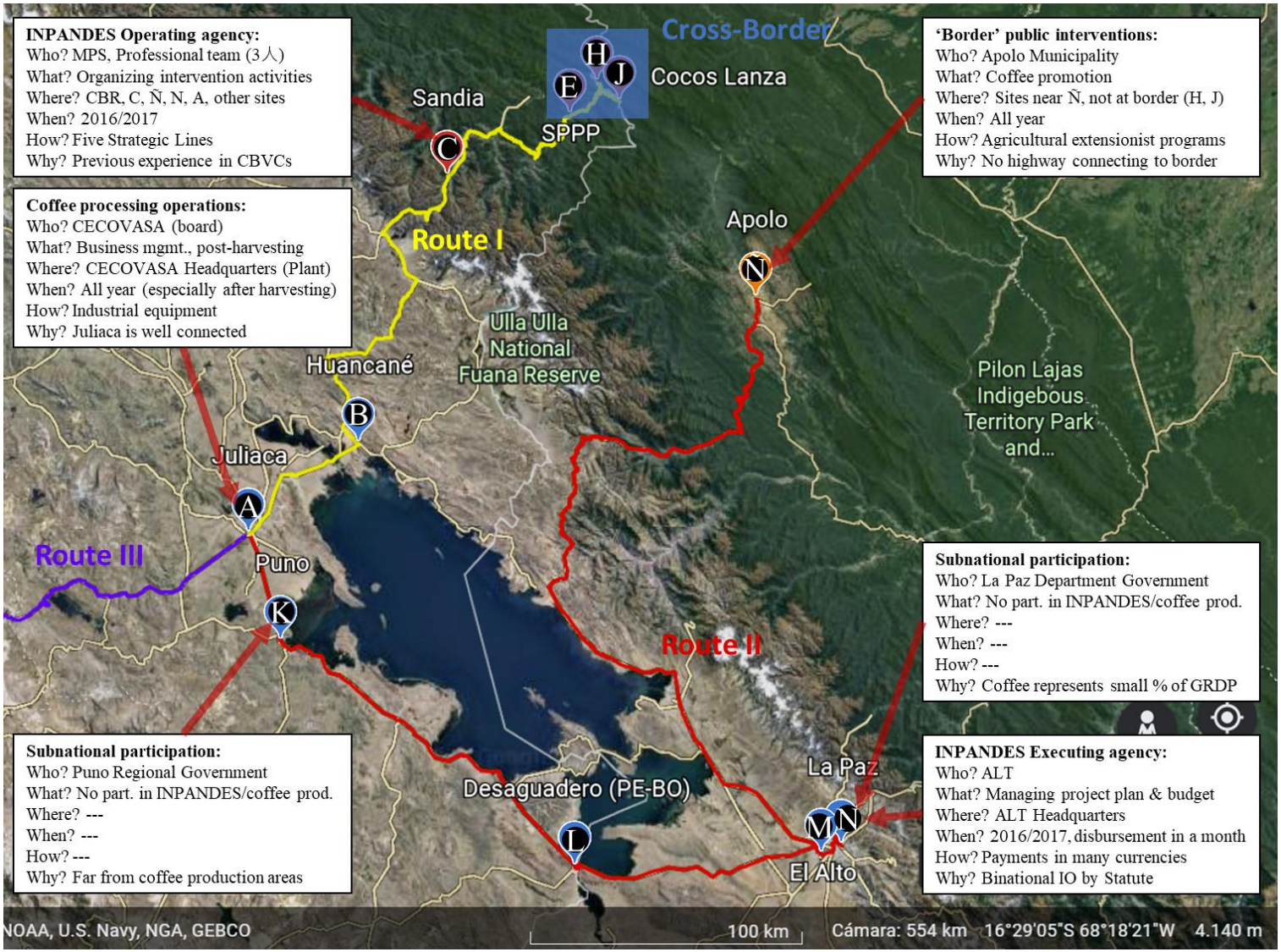

Figure 6.30. *Project & Production Network Analysis at Subregional level (Author's elaboration)*

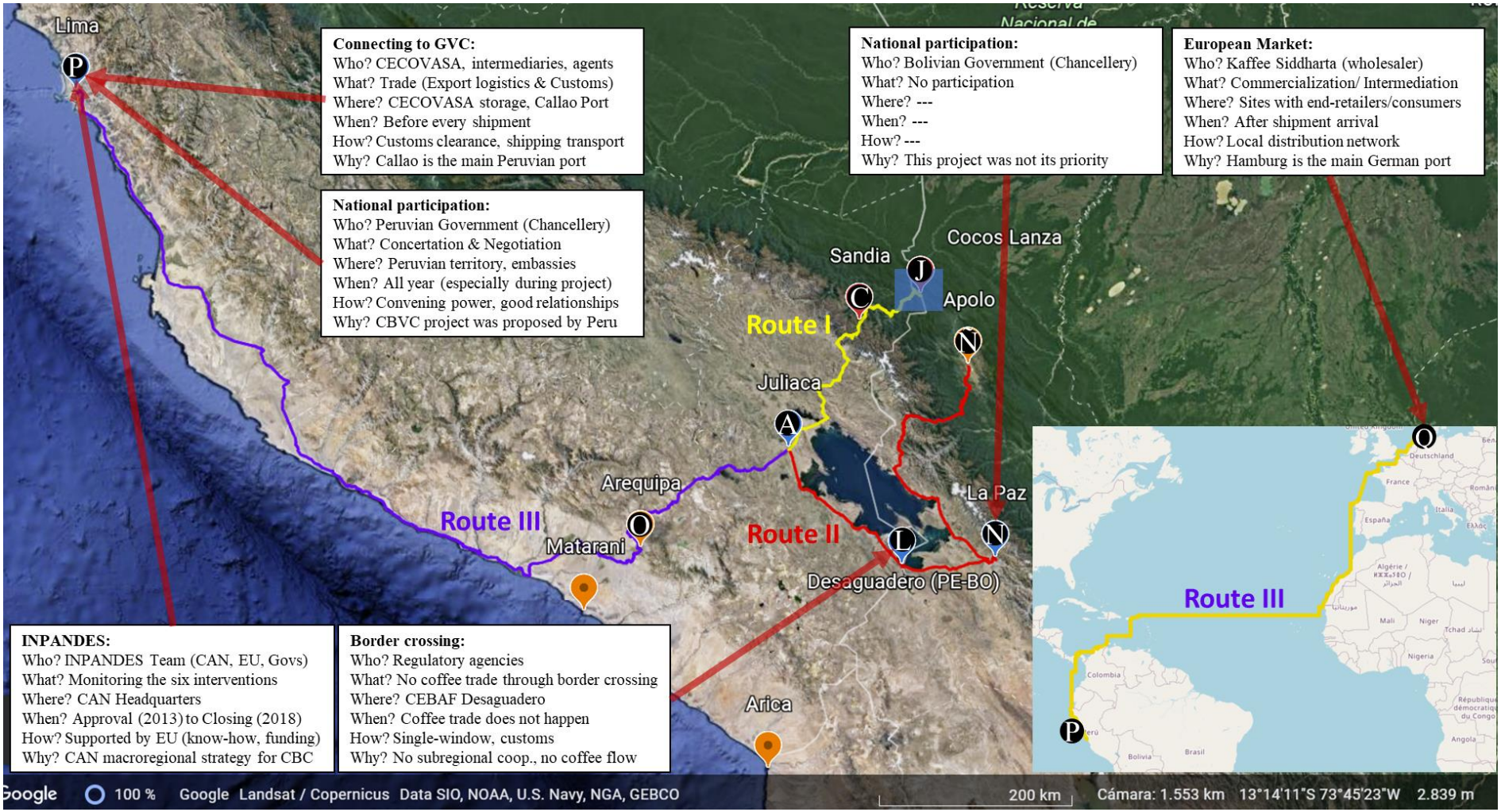

Figure 6.31. *Project & Production Network Analysis at Binational & Global level (Author's elaboration)*

A last characteristic to highlight is the connection with ports. As previously commented, Bolivia does not have sea access, so coffee shipping is only possible through Arica, Chile (7h away from El Alto). In Peruvian side, coffee shipping is only possible through Callao Port in Lima, 22h away from Juliaca. While the Peruvian port of Matarani is two hours away from Arequipa (7h from Juliaca), and there are bilateral agreements to facilitate access of Bolivian freight to this port, port logistics are still weak compared with Arica Port or Callao Port. Enhancing the Matarani Port logistics and border crossing procedures in CEBAF-Desaguadero could promote higher connectivity in Puno-La paz subregion.

Based on the results of the OD Cost Matrix, the MMSA is oriented to 5W1H or 6W question model in the coffee CBVC spatial configuration: who (actors), what (product), where (space), when (time), how (productive capacities), and why (location rationale). We divide this analysis at three levels: cross-border level (CBR and CBLs), subregional level (Provinces and Departments), and binational level (country level and relationship with the GVC).

Based on **Figure 6.25**, **Figure 6.29** shows that the cross-border daily reality and coffee trade between the Bolivian producers and Peruvian cooperatives were the main dynamics that defined the CBLs and CBR respectively. Thus, most cross-border activities would concentrate in SPPP directly or indirectly as 1) it is the main urban center in Sandia province (facilitating access to more groceries, services, etc.), and 2) it has a 'cluster' of coffee collecting centers (six cooperatives: CECOVASA, Coop64, San Jorge, Charuyos, San Ignacio, and Azata), so most producers and middlemen with Bolivian coffee sell their coffee there. Thus, the main cross-border transaction (collection) locates either in the Bolivian communities, or in SPPP. Thereby, at CBR/CBL level, we can observe cultivation, harvesting, and post-harvesting (until collection).

INPANDES interventions could be considered as oriented to cross-border development (as already explained), but also border development, as areas selected in SJDO are not part of the cross-border dynamics but their coffee finishes in the collecting center of that city. The main actors before INPANDES have been the Peruvian public entities, and due to their presence, the technicians of INPANDES located in these cities and traveled from there to the intervention areas. However, due to the conditions of the roads and paths to those areas, technical visits used to happen once or twice a month.

Figure 6.30 reveals the distances between stakeholders that should cooperate, and highlighting why an agglomeration of capacities (financial, productive, knowledge, governance, etc.) is a high challenge to consider when developing CBVC projects. In productive terms, the CBR connects with Juliaca after a 330km trip across the highlands. However, although **Figure 6.22** showed a continuous coffee binational corridor, due to the geography, the CBR is disconnected from Apolo, and at the same

time this site is far from Caranavi (9h trip). Better connectivity exists between the coffee processing centers, Juliaca and El Alto, but there is not subregional cooperation between them.

In terms of the coordination of INPANDES project, why the executing agency (ALT) is in La Paz, the operating agency (MPS) is in Sandia, separated by 540km and hindering coordination process between them and also limiting the supervision process (initially, the ALT did not conducted supervision visits to the MPS). While Sandia municipality was in charge of the execution of the project activities, this place is far from the CBR and is far from Apolo, hindering the process of articulation. Subnational governments do not have coffee policies, do not have any kind of relationship, and were also not included in INPANDES. Thus, while at CBR level there are dynamics of complementarity, at subregional level there are not dynamics across the border, just connecting the CBR with the main urban center in Peru. However, as reported in interviews, there is a potential for cooperating between CECOVASA (Juliaca) and ANPROCA (El Alto), as both are the biggest coffee cooperatives in the area and their leaders perceive opportunities for complementarity (higher collecting volume, take advantage of CECOVASA equipment, exchange of experiences, joint contests, etc.).

Figure 6.31 shows in perspective the distance of the CBR and subregion to Lima and then to the European Market. Considering the governance components, while the CAN, EU, and Peruvian chancellery are in Lima, ALT is in La Paz, and the MPS in Sandia, three sites well separated from each other. CAN-EU supervision meetings required to travel by plane to Juliaca or La Paz, becoming a very sporadic process. Simultaneously, the MPS needed to go to La Paz to report to the ALT, and the latter had to go to Lima to do the same. Future interventions should consider how the project management teams have lower restrictions to interact.

Considering the productive/business components, the CBVC could be also interpreted as the inclusion of the Bolivian collection to the CECOVASA articulation in the coffee GVC. The cooperative is the main actor articulating the value chain, as it has the logistics (trucks, collecting centers, storages, etc.) from Sandia to Lima (although it already sold its storage next to the port), and the experience of clearing customs and connect with international markets. The idea of a binational coffee corridor (**Figure 6.20** and **Figure 6.21**) is a biogeographic concept rather than a spatial-economic configuration of development, as the productive centers are divided and cross-learning between them is not even considered in the national plans and programs – as well as there is not bilateral cooperation in terms of coffee development between both national governments.

Evaluating at these three levels, we can highlight three different strategies for developing stronger CBVCs. At CBR level, the elimination of tariff and non-tariff barriers is essential for moving Bolivian producers from informal trade to a CBVC. This elimination starts by providing border crossing & customs services, better highway infrastructure, and safer means to cross the river. Shaping a CBVC requires strong actors locating in this area, especially in the border communities, or in SPPP. At

subregional level, coffee development faces great opportunities by interconnecting cooperatives from both sides and promoting economic complementarity and economy of scale. The ALT has still a relevant role as the only subregional bilateral international organization, but its distance to the CBR should be shortened (e.g., installing temporal office or committee). At binational level, the CBVC would benefit of better port logistics and faster custos clearance. Improving the Matarani port to become the main port infrastructure for the South of Peru is another opportunity that should be considered as it could benefit both countries. In addition, there should be higher participation of national governments to shape coffee policies that are compatible.

2.7. Phase 1.2. Connectedness Voids Analysis (CVA)

Based on the proposed method to analyze connectedness voids, the results from Phase 1.1 are classified according to its pertinence for each void chart as short statements indicating if it has a positive connotation [+], a negative one [-], or could be interpreted as positive or negative depending on the situation [*][+/-]. The implemented quotes and material per void chart are referenced in **Appendix 15**.

2.7.1. Governance Voids

CV01: Weak Articulation of the Cross-Border Social Capital

The analysis on CV01 (**Table 6.24**) addresses specifically the relationships of stakeholders across borders. Most of the existing cross-border social capital was based on the dynamics between communities, especially between Bolivian producers and CECOVASA. This relationship was reinforced by the CAN with the PRA and the INPANDES project in 2014. However, INPANDES struggled in connecting public authorities. The little interest and capacities of provincial/district municipalities, the distance between them, and the intensification of trade barriers reduced the intensity of these flows.

Table 6.24. Analysis Chart of Connectedness Void 01 (Author's elaboration)

Void N°01	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[+] The CAN's cross-border institutionality. [-] CAN Reengineering [+] ALT's Binational capacities	[+] Institutional articulation between CAN, EU, ALT, chancelleries, and executing/operating agencies. [-] Weak participation of Bolivian authorities.	[-] Difficult in public CBC due to their own institutional arrangements. No interrelation with other coffee-related stakeholders.
Subregional	[-] No contact between Peruvian and Bolivian authorities due to distance. [+] Commonwealth-based cross-border articulation of coffee dynamics. [-] Legal obstacles on shaping a binational commonwealth.	[+] The project promoted integration between authorities of Sandia and Apolo. [-] Lack of participation of provincial/local authorities & No establishment of bilateral agreements.	[-] ALT is not part of cross-border dynamics in the area. [-] No contact between Sandia authorities and Apolo ones due to distance. [+] Informal contact of SPPP and Apolo authorities with Bolivian communities. [-] No interconnection between Peruvian and Bolivian public officers (not knowledge of peers) between themselves or with coops.
Cross-Border	[+] Bolivian producers were associated to CECOVASA's grassroot cooperatives. [+] Previous coffee CBVC project (PRA) in cross-border territory under the CAN-AECID cooperation (MMAP, MMNPT, CECOVASA).	[+] CAN continuing previous project with more resources. [+] The project promoted integration between producers from both sides. Participation in events.	[-] Most Bolivian producers are not associated to CECOVASA or its grassroot cooperatives. [-] No more interaction between Peruvian and Bolivian producers. [-] No relationship between CECOVASA and APOCOM. [+] Recent approach (2022) from CECOVASA to Bolivian communities to reestablish relationships.
Void Evaluation	**Medium presence**	**Targeted? Avg. Efficiency? Low**	**High presence (Increased)**

Shaping a stronger cross-border social capital would benefit not only by reducing the existing voids that affect CV01, but also by identifying and connecting with other stakeholders that were not considered in the project and that have cross-border relationships, such as the Coop64 or the WCS.

CV02: No Institutional Mix

The analysis on CV02 (**Table 6.25**) highlights the presence of a variety of stakeholders that are acting and contributing to the CBR. At a provincial and CBR level, the main stakeholders related to coffee production have been the public sector (municipalities and national agencies), cooperatives, and producers, but with weak articulations between them. INPANDES introduced a variety of actors such as the CAN, the ALT, the JNC, financial institutions, other national agencies, and more. This was an essential characteristic of the project to promote binational technical groups that can sustain over time.

However, a great number of coffee-related stakeholders from both sides were left out and with the end of the project, this diversity disappeared.

Currently, there is a persistence weak especially between municipalities and cooperatives, and between them and other organizations located in national capitals – and that are important for the CBVC. The poor capacity to sustain a mix of stakeholders reveals first, the need of considering the inclusion of more coffee-related actors (as in the Expanded Stakeholder Mapping in **Figure 6.27**), and second, the need of better horizontal and vertical integration.

Table 6.25. *Analysis Chart of Connectedness Void 02 (Author's elaboration)*

Void N°02	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] Failed (Peru) or none (Bolivia) articulation of national coffee stakeholders and subnational/local actors.	[-] Little to no participation of Bolivian national authorities. [-] No participation of JNC, ANPROCA, FECAFEB in the project (although some alliances were expected). [-] No participation of other coffee related stakeholders (e.g., exporting companies, supply companies, etc.).	[-] Weak articulation between national coffee stakeholders (public & NGOs) from both countries with coops and local governments.
Subregional	[+] Municipalities offer processing services to producers. [-] Weak relationship between governments and cooperatives. [-] Low penetration of coffee companies in Puno. [+] Some interinstitutional cooperations have happened (local, national, cooperative) as in the SPPP's Specialty Coffee Program.	[+] MPS as operating agency. [-] Weak articulation with public entities (e.g., sharing infrastructure or supplies with INPANDES team). [-] No participation of civil society working in the area (WCS, academia, etc.). [-] Low participation of Bolivian stakeholders (e.g., financial entities, technical agencies, producers, etc.). [+] Stakeholder mix in coffee binational technical groups (e.g., producers, regulatory agencies, cooperatives, etc.) and updating development plans.	[-] Persistent weak articulation between CECOVASA, public agencies/governments, and producers. [-] No regional/local articulation of coffee stakeholders. [-] No more commonwealths.
Cross-Border	[+] Informal articulation between CECOVASA and APOCOM. [-] Weak articulation of Bolivian communities with Apolo or SPPP.	[-] No participation of civil society apart from producers. [-] Horizontal articulation between local actors, but not vertical articulation (civil society as mere receptors).	[-] Persistent isolation of Bolivian communities. [-] Producers from both sides were interested in knowing and be involved in the budget allocation for the project or future ones (but did not happened).
Void Evaluation	**High Presence**	**Targeted? Avg. Efficiency? Low**	**High Presence (Similar)**

CV03: Weak Cross-Border Governance & Joint Management Capabilities

Table 6.26. *Analysis Chart of Connectedness Void 03 (Author's elaboration)*

Void N°03	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[+] Bilateral cross-border institutionality supported by the communitarian legal framework. [-] Bilateral tools with low incidence (e.g., Peru-Bol ZIF). [-] Due to the CAN reengineering, INPANDES was going to be the last cross-border intervention.	[+] CAN and EU's good role on monitoring and supporting (not management). [+] EU administrative framework incentivized budget execution. [-] CBG with high dependence to external funding. [-] No involvement of Bolivian national government. [+] INPANDES as a CBG initiative determined by CAN/EU.	[-] Short period to sustain intervention. [-] No more funding to sustain or continue the CBVC intervention. [-] Presidential Meetings with low interest in this CBVC. [-] Bilateral tools with low incidence (e.g., 2018Plan) and no CAN structure. [-] INNOVACT did not articulate with INPANDES.
Subregional	[+] ALT as only binational agency that can operate at subregional level (IWRM system). [+] MMAP& MMNPT's project: commonwealth-led cross-border governance. [-] No interaction between subnational governments (apart from energy coop). [-] No interaction between Sandia/SJDO/SPPP and Apolo.	[+] The project had three managers and the 'Amazon integration manager' focused on CBG processes. [-] Executing agency (ALT) and operating agency (MPS) far from the cross-border territory. [-] Bolivian institutions (SENASAG and mayors) participated as attendees, not project planners. [-] Difficulties between executing and operating agencies (e.g., first time interacting, first time of this type of project). [-] Municipalities could not achieve bilateral agreements. [-] No incorporation of commonwealths. [+] Formation of the coffee binational technical groups. [+] This CBVC initiative provided several benefits (technical assistance, infrastructure, equipment, etc.) to empower productive capacity to local public officers, cooperatives, and producers.	[-] No post-project monitoring from ALT (under restructuration). [-] MPS: Political changes did not give continuation to the project. [-] Initiatives or proposals that emerged during the project (e.g., the Binational Coffee Institute) were not pursued anymore. [-] CBG out of the scope of subnational governments (Puno and La Paz). [-] No interaction between Sandia/SJDO/SPPP and Apolo. [-] No continuation of binational technical groups. [+] Incentives between cooperatives (CECOVASA and ANPROCA) for better cross-border cooperation.
Cross-Border	[+] Cross-Border Informal Trade dynamics between CECOVASA and Bolivian producers (directly or through middlemen).	[+/-] INPANDES intervention partially continued the PRA project. [+] Technical assistance with participation from both sides.	[-] Cross-border informal trade dynamics are mainly driven by middlemen's participation. [-] Producers were not part of the cross-border governance (Decision makers) but beneficiaries.
Void Evaluation	**High/avg. Presence**	**Targeted? Avg. Efficiency? Low**	**High Presence (Increased)**

The analysis on CV03 (**Table 6.26**) refers to the formal and informal cross-border governance models that are present in the CBR. While the cross-border informal trade (CBIT) of coffee was the most common dynamic, it barely represented an 'act of governing' the CBVC – it was more an articulation of relationships (Second stage of the formation of cross-border governance (Wong Villanueva, Kidokoro and Seta, 2023)). The first attempt to build a CBG model started with the PRA model and the official articulation of the CAN, commonwealths and CECOVASA, where most actors did not have a previous contact with the CBR reality before. INPANDES represented an evolution of this model, reproducing similar benefits (e.g., more actors, more resources, better project) and similar setbacks (e.g., temporal intervention, top-down execution, poor participation of local actors).

The case study showed that funding and leadership (from the INPANDES team) were the main components for the sustainability of the project. Due to the CAN reengineering, the macroregional cross-border institutionality became inoperative, so no funding could be attracted, and no new project –the traditional mechanism to shape CBG in this area– was formulated. In addition, this area and this type of project was not in the ALT jurisdiction, and there were not previous paradiplomacy relationships between local municipalities and that the project could not shape them. Thus, no local institution (especially from the public sector) sustained the cross-border governance scheme.

INPANDES represented a top-down assemblage of cross-border governance rather than just facilitating bottom-up processes, and this assemblage was at subregional level rather than cross-border one: the executing and operating agencies did not have previous contact with the CBR, collaboration agreements were preestablished by the project planning, coordination meetings were at the provincial and national capitals, and more. Thus, the project tried to shape cross-border local institutionality in a short time, with low certainty that the involved stakeholders would continue it.

To shape CBG in this area is a complex task as the shaping public-public articulation is limited by the distance of the nearest stakeholders with public capacities: while SPPP is near the border, there is no connection with Apolo municipality. Since CBG is desirable only if it supports CBVC and not as a goal in itself, options other than paradiplomacy should be considered. First, while the ALT has the legal capacities but not the jurisdiction, a change in its statute to open a special technical committee for this CBR can promote that articulation. Second, to establish under the CAN umbrella a policy that allows the creation of cross-border agencies or groups that can act at this local scale. And third, to rebuild the idea of binational commonwealth by harmonizing both legal systems. While those three options have its pros and cons, probably the first one is the most feasible and can allow not only cross-border cooperation at local but also subregional level. In any of those options, local actors must take a more participative role rather than beneficiaries.

CV04: Lack of Dialogue & Decision-Making Spaces

The analysis on CV04 (**Table 6.27**) refers to the formal and informal dialogue and decision-making spaces are present in the CBR. Previous the project, there were not dialogue or decision-making spaces apart from the one already existing within cooperatives, that discussed more about organizational issues rather than local development planning.

Table 6.27. *Analysis Chart of Connectedness Void 04 (Author's elaboration)*

Void N°04	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[+] CAN's GANIDF as space to discuss cross-border initiatives.	[+] INPANDES as a good concertation outcome at communitarian and bilateral levels. [-] Supervision/Monitoring required international travels from Lima to La Paz or the CBR.	[-] The Andean Platform for Cross-Border Cooperation (PACTF) did not operate. [-] Presidential Meetings do not discuss coffee CBVC issue.
Subregional	[-] No mechanism for subregional articulation of stakeholders.	[-] Coordination meetings with ALT in La Paz (far from CBR). [+] Two Coffee binational technical groups as integration space (stakeholder mix). [-] Meeting Events far from CBR (in Sandia, Apolo, Caranavi, etc.) [+] Learning spaces through international visits (officers, technicians, and producers). [+] International fairs and contests as externalization spaces (selling products). [-] No dialogue exchange between coffee and alpaca team.	[-] Binational technical groups were discontinued. No follow up of consensuses. [+] Desire for cooperatives (CECOVASA and ANPROCA) for cross-border spaces (e.g., contests, joint training, etc.)
Cross-Border	[+] Coffee collection day (Saturday mornings) as meeting space between coffee producers and grassroot cooperatives or CECOVASA. [+] Cooperatives (CECOVASA & APOCOM) as meeting spaces for their own producers.	[+] Meeting spaces for local authorities (Peruvian Lieutenants & Bolivian General Lieutenants and Bartolinas). [+] Cross-learning spaces between producers. [+] Training spaces located in border territories. [-] Low interaction between Peruvian and Bolivian producers in training spaces. [-] No spaces for articulating local opinion with the project (no ownership, mainly reception).	[-] Spaces for coffee collection are for Peruvian producers. [-] No more cross-border meeting spaces (especially with producers). [-] No meeting spaces between Puerto San Fermin and Cocos Lanza since project finished.
Void Evaluation	**High presence**	**Targeted? High Efficiency? Low**	**High presence (Similar)**

INPANDES proposed several spaces for socializing information, discussing, and taking decisions. The most relevant mechanisms were the binational technical groups, with a high variety of stakeholders, especially producers. However, these events were hold far from the CBR, even in Caranavi, further than La Paz. Despite INPANDES tried to build other mechanisms such as the Andean Platform for Cross-Border Cooperation (PACTF), all of them did not continue after the project due to the lack of public capacities (to call meetings, carry cross-border projects, etc.), political will, and long distances.

INPANDES was a project to promote cross-border development and productive articulation by engaging several actors in spaces where they can take joint decisions. However, these spaces were more a project goal rather than a means to deploying joint actions (although this was desirable). The project design did not involve local actors that can be part of the decision-making process (e.g., decide the purpose or location of those discussion spaces). While INPANDES executed what would be considered as desirable (spaces considering CV01, CV02, CV03, and CV05), this might differ or even oppose from local desires. Thereby, there is a need of more ownership of local actors to reclaim these spaces, and instrumentalize them for their own benefits. As previous CBG experiences shows (Wong Villanueva, Kidokoro and Seta, 2022) the evolution of those spaces is a long-term process, starting with a basic agenda and few actors that can later expand to conferences a several technical groups that are shaped according to new needs.

2.7.2. Stakeholders Voids

CV05: Lack of Businesses or Nodes in the Cross-Border Value Chain

The analysis on CV05 (**Table 6.28**) addresses who owns and/or where are the productive capacities within the territory. As analyzed in Phase 1.1, the CBR is focused on primary production (from cultivation to collection), Juliaca holds post-harvesting (milling and packaging), and Lima-Callao is used for logistics. Despite that the number of cooperative associates has reduced throughout time, CECOVASA and Coop64 are still the main producers and exporters in Puno region and have already established a good network with suppliers, logistics services, and international buyers. At producers level, while Peruvian side has already installed capacities (good management of cultivation and above average in post-harvesting), Bolivian side is still far behind, with very empirical knowledge and capacities in cultivation.

Table 6.28. Analysis Chart of Connectedness Void 05 (Author's elaboration)

Void N°05	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] Most national production in both countries is exported as green coffee. [+] Low associativity in Peru (35%) and Bolivia (18%), but larger and stronger cooperatives in Peru. [-] Ancillary services outside the subregion or countries (e.g., both CECOVASA and ANPROCA buys coffee bags from Lima). [-] The roya reduced 70% of production in both countries affecting economies of scale.		[-] Similar conditions as before the project. [-] ANPROCA exports coffee to other countries or Peruvian regions. [+] Countries are recovering from roya impact. [-] Weak relationship of coffee cooperatives (CECOVASA, APOCOM) with coffee NGOs at national level (JNC, ANPROCA).
Subregional	[-] Subregional production (Puno & La Paz) represents ~20% of binational production. [+] Municipalities in Sandia offer several services for coffee production and processing coffee derivates (e.g., making sultana liquors based on coffee husks). [-] No articulation between cooperatives/associations within their country (e.g., CECOVASA & APOCOM, ANPROCA & FECAFEB & APCA) or across the border. [-] Variety of brands within the same geographic space (dispersion of volume). [-] Weak articulation with other coffee stakeholders (e.g., knowledge centers, financial entities, governments, etc.). [+] Two cooperatives, Coop64 and CECOVASA collect almost all export coffee of Sandia and the CBR, directly (association) and indirectly (middlemen). [+] CITE CECOVASA as quality control node in the area.	[+] The project has a 'coffee chain business manager' to focus on CBVC linking. [-] Most coffee (both Peru and Bolivia) is exported as green coffee (primary processing). [+] INPANDES focus on coffee transformation (roasting). [+] Acquiring industrial roasting machine for CECOVASA (Juliaca). [-] CECOVASA and ANPROCA still need more knowledge, especially on coffee transformation processes (roasting, packaging). [+] Promotion of certain articulations (e.g., financial entities supporting producers), but in the Peruvian side.	[-] No exports of roasted coffee from any cooperative or association (CECOVASA, ANPROCA, SJDO, FECAFEB). [-] Persistent difficulties in roast coffee traceability in coffee GVC. [+/-] Persistent difficulties in articulating cooperatives and with other coffee stakeholders (especially within their countries), but partial progress. [+] Desires from ANPROCA and CECOVASA to establish cross-border partnership (e.g., higher volume, cross-learning, contests, attract funding, etc.).
Cross-Border	[-] The number of collecting centers reduced due to the roya. [-] Roasting capacities in CBR limited due to utility scarcity. [*] Washington stations tend to be located near farmlands. If not, some cooperatives provide that service.	[+] Construction of Tech Innovation Centers (available technologies for communities). [-] Chancelleries informally agreed to facilitate APOCOM export to CECOVASA.	[-] Roasting capacities still limited, especially in Bolivian communities. [-] APOCOM is currently deactivated (no joint activities between Bolivian communities). [-] Low installed productive capacities in Bolivian side.
Void Evaluation	**Average presence**	**Targeted? High Efficiency? Avg.**	**Average Presence (Similar)**

INPANDES project supported CECOVASA and producers by training in cultivation (from nurseries to transplanting, not the whole process), adding transformation capacities (purchasing roasting machine), and commercialization (binational brand). This positioned CECOVASA with the best roasting potential in the subregion (and among the best ones in Peru). However, since it only exported roast coffee once. Since 2018, CECOVASA has not increased its exports (95% of sales) and could be said that they have slightly reduced.

The cooperatives have had an important role to develop and consolidate cross-border value chain nodes in the CBR, Juliaca, and the port. However, as the main productive players, they also embed the main risks: removing them from the value chain disconnect thousands of producers from the CBVC. The weakening of cooperatives (lower associativity) has disarticulated the cross-border economy of scale, especially in primary production. In addition, there is not cooperation between cooperatives (within and across borders), or other coffee-related stakeholders to promote stronger CBVC nodes. The lack of technical (e.g., roasting expertise), professional (e.g., business & marketing planning) and market knowledge (e.g., potential markets) have affected its upgrading process to penetrate in the roast coffee market. At producers level, as most of the coffee comes from the Peruvian side, productive processes are developed, if not optimally, in very good conditions until post-harvesting, when they later deliver to the cooperatives. However, Bolivian communities do not have installed capacities, having still difficulties even in cultivation (they could not transplant the coffee seedlings from INPANDES to their farmlands).

To increase local productive capacities, there are several recommendations. Considering cooperatives as the main mechanism to push this strategy, they need a higher concentration of producers (including from the Bolivian side), and if possible, increase cooperation with the other cooperatives. A cooperation at subregional level with ANPROCA (main Bolivian coffee association) can opened the opportunity to process a good portion of Bolivian national production. Higher volume should be supported by 1) consolidating and accessing a better position in the green coffee market by improving coffee traceability, 2) planning the insertion in the roast coffee market (especially in the domestic and neighboring countries), and 3) exploring direct commercialization (digitalization, coffee bars). For individual producers or small producer organizations, CECOVASA can offer maquila services but mainly, specialized programs according to their needs are required to ensure a good transfer of knowledge and develop productive capacities.

CV06: Lack of Leaderships & Participation of Key Actors

The analysis on CV06 (**Table 6.29**) refer to key actors that broker relationships or leaders within the CBR and INPANDES projects. Traditionally, cooperatives and cooperative leaders have hold several leadership figures, motivating cooperativism and local production.

Table 6.29. *Analysis Chart of Connectedness Void 06 (Author's elaboration)*

Void N°06	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[+] The CAN had a strong technical team in CBI&D.	[-] INPANDES team had struggles in its team relationships and management.	[-] Most CAN officers that participated left the institution due to the reengineering.
Subregional	[+] ALT is the only entity with bilateral jurisdiction (can execute bilateral investments). [-] Strong dependence of leaders' role in cooperative governance (weak institutions). [-] Short duration of leaders in coffee cooperatives (one year in Peru). [+] The WCS promoted events to articulate the commonwealths. [+] Commonwealths as key actors for promoting local development projects. [+] Coffee cooperatives as key actors for promoting local development (especially CECOVASA).	[+] ALT selected as executing agency. [-] ALT did not count with experience on CBVC projects. [-] Initially, ALT had issues managing the project (IGO's bureaucracy, change of general manager). [+] CECOVASA, the leading cooperative in Puno, considered as key partner (same manager that participated in the PRA project). [+] Participation of municipal and cooperative leaders in the project's main events. [-] Around half (4/8) of the grassroot cooperative leaders participated in the events. [-] Difficulty bringing municipal leaders into joint agreements. [-] No direct participation of commonwealths (but of some team members).	[-] The CBVC was out of the scope of ALT's responsibilities according to its statute (no continuation, follow-up). [-] Change of *de jure* leaders from municipalities and cooperatives undermined continuity of agreed policies or development plans (not even knowledge about the project). [-] Difficult relationship between leaders of coffee cooperatives/ associations in their respective areas.
Cross-Border	[+] The CBR counted with several producers as role models or brokers (model used in the PRA project).	[+] Coffee international winners and key producers (from Peru) participated as productive examples and cross-border teaching. [+] High involvement of Bolivian community coffee leaders. [+] Participation of local authorities from both sides.	[-] Divided leadership in APOCOM.
Void Evaluation	**Average presence**	**Targeted? High Efficiency? Low**	**High/Average presence (Increased)**

Since the PRA and INPANDES, more leadership figures appeared at different levels, especially the CAN articulating national and international actors (attracting technical and financial resources), the ALT executing the project at subregional level (bilateral articulation of stakeholders and resources), and Peruvian coffee winners and Bolivian community leaders within the CBR (promoting cross-learning and motivating other producers). However, after the project, leadership at top levels banished, municipality authorities changed without continuation, and at local level, the ACOPOM leadership divided, disabling the cooperative.

This case study showed that promoting CBVC initiatives based on the de jure leaders rather than de facto leaders undermine sustainability. The administration change in municipalities and in CECOVASA, and the low relationship of the ALT with this region removed most *de jure* leaders from the equation. While there are *de facto* leaders, most of them are producers from both sides with low impact on the CBVC governance. This reveals the existence of weak institutions susceptible to political changes that still depends on individual leaders rather than in their capacities.

To increase leadership requires to 1) strengthen existing local key actors, and 2) introduce public entities with more durable commitment. While the first one is more feasible in this case study (involve cooperative leaders and devoted producers), the second depends on the harmonization of legal frameworks and public capacities to conduct cross-border cooperation. While INPANDES idea of cross-border agreements was an interesting idea to reduce these problems, they were not achieved nor consolidated within the institutions. As leadership is not desired as a goal but as a means to promote CBVC, those public authorities should first ensure long-term commitment by improving the political transition process, so the desire for CBVC improves rather than decay. Considering a cross-border agency (proposed in CV03) would also represent a great contribution.

CV07: No Presence of Development Partners

The analysis on CV07 (**Table 6.30**) addresses the presence and participation of key actors that deploy special amount of technical and financial resources in the CBVC initiatives. While the Bolivian side did not have a specific development partner (and there was any until the CAN), the Peruvian side counted with two important actors: CECOVASA and DEVIDA. Historically, CECOVASA was a key actor for developing Sandia Valley, not only in terms of access to the coffee GVC, but also constructing community centers, education facilities, local roads, etc. DEVIDA, the Peruvian national agency for coca eradication, also involved in infrastructure construction, but its main support has been in terms of funding (especially to municipalities from Sandia to SPPP) and providing technical/professional support (e.g., as the latest evaluations on associativity capacity).

During INPANDES, more development partners were involved, especially the CAN and EU as technical and financial providers. Considering CECOVASA and APOCOM as key partners of the project, the focus was to connect them with other potential development partners such as the national coffee organizations (Peruvian JNC and Bolivian FECAFEB). While the CECOVASA-JNC alliance was achieved, this was not feasible with Bolivia, and the end of the project represented the end of financial and technical support from international organizations.

Table 6.30. *Analysis Chart of Connectedness Void 07 (Author's elaboration)*

Void N°07	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[+] The CAN as the most prepared regional actor to promote cross-border initiatives. [+] Long relationship of EU Peru delegation brokering relationships within EU to partner with the CAN in CBI&D initiatives. [+] The JNC has a long relationship with CECOVASA. It provides market information, technical support, and funding.	[+] Involvement of CAN technical team. [+] EU as technical and financial support [+] CAN & EU focused on creating capacities in executing and operating agencies. [+] Promoting an alliance between the JNC and CECOVASA (16 months) for cooperative strengthening.	[-] No more communitarian know-how on CBI&D. [-] EU budget reoriented to other development projects (not cross-border ones).
Subregional	[+] DEVIDA as the main (and even only) supporting agency promoting coffee production as part of coca eradication plan. [-] DEVIDA's intervention might not be suitable for targeting coca eradication or coffee production correctly. [+] Peruvian cooperatives (especially CECOVASA) as key development partners for the producers. [+] Other NGOs and IGOs promote coffee development in Peru and Bolivia (e.g., WCS, FFF FAO, etc.). [-] Low availability of coffee development partners in the subregion.	[-] Low interaction between INPANDES technical team and DEVIDA (only through SJDO municipality). [-] Difficulty interconnecting FECAFEB and APOCOM.	[+] DEVIDA's action (funding) continues in Puno region cooperating with municipalities, cooperatives, and producers. [+] DEVIDA's current approach to strengthen cooperative's associativity capacity. [+] Other public agencies (SSE, AGROIDEAS) starting shaping relationships (technical & financial support) with grassroot cooperatives and CECOVASA.
Cross-Border	[+] CECOVASA arrives to Peruvian border communities through organic program.	[+] INPANDES brought support to the communities through MPS.	[-] Not so many associates from CECOVASA in border areas and few technical visits (one/two per year).
Void Evaluation	**High/Avg. presence**	**Targeted? Avg. Efficiency? Low**	**High/Avg. presence (Similar)**

The CAN and EU as development partners had a great capacity to call other stakeholders, technical resources (e.g., international consulting services), and financial ones. While the incorporation of CECOVASA was a good strategy, it did not play a strong role of provider (only through some of their producers but not the whole entity), but of beneficiary. Most interviewees in the case study mentioned the role of DEVIDA as it is the main financial provider and has linked its coca eradication program with coffee development. In addition, this institution has generated trust and work with municipalities, cooperatives, and producers, even in SPPP or SJDO where the relationships between those stakeholders have failed (e.g., poor relationship between municipalities and cooperatives, low trust between producers and cooperatives).

While the presence of development partner is not a 'must', it surely represents an advantage to facilitate growth. INPANDES is the result of the interest of development partners, and at the same time, it tried to attract others to be involved in the CBR. However, the complex geographical characteristics to access the CBR (e.g., FECAFEB was too far from APOCOM), and the lack of motivation of potential key actors to approach have been constraints for partners to arrive the area and stay there.

A strategy to improve the participation of development partners starts by identifying potential actors that 1) are motivated to invest in the area, and 2) can provide technical and/or financial resources that support local development correctly. Considering DEVIDA in future initiatives would be a great asset as financial provider, although it would represent an inconvenient for bilateral investment as public budget cannot be executed in Bolivian side. This implies the need of partners from both sides, or that have projects in both sides simultaneously such as the WCS (International NGO with national park project in both sides). However, both sides need knowledge or R&D partners (e.g., DEVIDA has been criticized due to its old-fashioned projects), that are mostly present in national and subnational capitals. If no public agency can take that role, bringing civil society actors such as NGOs or companies with good social responsibility programs (this can be more suitable for Bolivia as its legislation restricts the participation of NGOs) can be beneficial for the area as they can have a more 'permanent' role than governments (Wong Villanueva, 2019).

CV08: Absence of Intermediation Functions

The analysis on CV08 (**Table 6.31**) refers to the impact and role of actors that fulfill intermediary functions that exist to facilitate between producers and consumers (e.g., logistics companies, wholesalers, roasting companies, cooperatives, etc.). Following the VCA from Section 2.5, intermediaries can be divided in domestic and global ones. In this case study, at domestic level, cooperatives and middlemen play a relevant role to connect the CBR with Callao port, and at global level, CECOVASA has already logistic providers and buyers (wholesalers and retailers) to sell. While

the cooperative facilitates several intermediation functions (from collecting to global logistics) connecting to foreign markets, middlemen or *compadres* play a local role, especially in the CBR, collecting coffee from the Bolivian side. Despite most of this coffee arrives to the cooperatives (CECOVASA and Coop64), the most affected are local producers, as they can lose around 15% to 60% of their profits. INPANDES had the implicit goal to eliminate these middlemen and increase producers' income by improving production quality and connecting CECOVASA and APOCOM. However, middlemen were not eliminated and with the intensification of trade barriers (CECOVASA asking for tax invoices), they represented the only channel for Bolivian producers to access markets.

Table 6.31. *Analysis Chart of Connectedness Void 08 (Author's elaboration)*

Void N°08	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] Coffee cooperatives cannot arrive in foreign markets without intervention of several intermediaries (roasting, logistics, commercialization).	[-] During the INPANDES project, the fact about formalizing the CBIT and reducing the influence of local middlemen was ignored by national governments.	[-] ANPROCA exporting green coffee through intermediaries in the region. [-] CECOVASA exports green coffee through logistic intermediaries and wholesalers [-] Difficult access to roast coffee market due to current intermediaries' preferences.
Subregional	[+] CECOVASA and Coop64 has a good positioning in Puno region to eliminate middlemen. [-] Controversial role of middlemen (demonization and *compadrazgo*/godfathering). [-] Middlemen are still an option for producers in both sides due to fast cash flow. [+] CECOVASA & ANPROCA sell to domestic markets (supermarkets in capitals). [+] JNC financed three/four cafeterias for key Peruvian producers (direct local sales).	[+] Letter of Intention to Purchase from Kaffee Siddhartha (German wholesaler).	[+] Trade relationship with Kaffee Siddhartha is still on-going (2022) and expanded to other CECOVASA brands. [-] An INPANDES II would create CECOVASA cafeterias (direct sales) but was not fulfilled.
Cross-Border	[+] Bolivian producers could associate with CECOVASA's grassroot cooperatives, directly selling their coffee. [+] Use of double nationality or blood kindship to sell coffee to CECOVASA (local collection). [+/-] Middlemen as means to 'legalize' export.	[-] Difficulties of APOCOM finding a coffee intermediary (failed with APCA).	[-] High presence of middlemen in cross-border coffee dynamics with Bolivian producers (coffee goes to CECOVASA or Coop64). [-] Middlemen offer differentiated price to producers (50% or less than from cooperatives). [-] Few 'Bolivian' producers (double nationality) sell to CECOVASA officially. [+] 2022: CECOVASA board approached Bolivian communities to reestablish contact with producers.
Evaluation	**Average presence**	**Targeted? Avg. Efficiency? Low**	**High/Average presence (Increased)**

INPANDES considered indirectly measures to tackle middlemen as improving product quality or connecting cooperatives. However, it did not target the main bottleneck: the trade barriers that restricted Bolivian producers to sell legally. Middlemen worked as means to legalize those exports, transport coffee from farmlands to collecting centers, evaluating quality, or fulfilling more social functions. While reducing intermediaries is desirable, the intermediary functions should be absorbed by the involved stakeholders. Some strategies to promote this starts by reducing trade barriers (e.g., customs at border crossing) and formalize the informal trade. This can be achieved by a higher presence of border authorities (better detail is provided later) or a direct trade scheme between CECOVASA and Bolivian producers, that can facilitate legal trade.

At domestic level, the focus should be in the path between farmlands and collecting centers, where middlemen 'legalize', transport, and control coffee quality, fulfilling several of the voids in the CBR at a high price. They should be perceived as (informal) entrepreneurs, considering the alternative to regulate them (implying the harmonization of legal systems), or to absorb their functions by promoting formal entrepreneurs that connect producers to cooperatives (e.g., local/rural logistics systems or companies). However, it is required to understand more the social function of middlemen and their relationship with producers (e.g., some of them are relatives or have a long relationship with producers). At a global scale, while CECOVASA has a connection with buyers, it has the potential to achieve more sophisticated markets and better prices, but it lacks the market knowledge to connect them without less intermediaries.

CV09: Limited Capacities of Public Institutions

The analysis on CV09 (**Table 6.32**) highlights the capacities of public institutions, especially the most related to the cross-border reality (district and provincial governments). In this case study, Bolivian communities have been practically isolated from any public intervention, except from the military presence. In the Peruvian side, provincial and district municipalities, as well as national agencies, have participated in the coffee development of border areas, but with a clear absence of regional government. INPANDES increased the involvement of these entities from both sides, but only the ALT (as a public IGO) and the MPS had a role executing the project, showing several capacity gaps. The Peruvian chancellery had a role articulating actors, but the Bolivian one was absence. Regional governments did not participate (Puno and La Paz governments), and provincial and district ones went to some events, trainings, and joint sessions with their peers. However, there was no public-public cooperation across borders (no cross-border agreements), nor within the country (no coordination between government levels) that led to the continuation of the INPANDES project after if finished.

Table 6.32. Analysis Chart of Connectedness Void 09 (Author's elaboration)

Void N°09	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[*] Traditional role of governments to directly intervene in local areas (at all levels).	[-] Bolivian authorities did not participate in the coffee CBVC. [+] Strong involvement of Peruvian chancellery and other national agencies.	[-] Decentralization and transfer of capacities (budget, projects, etc.) is still an on-going task (more than a decade in Peru). [-] Lack of clear coffee datasets (at all levels). [-/+] Interinstitutional vertical cooperation exists but still weak and sporadic (not planned). [-] Both countries have different institutional arrangements for decision making.
Subregional	[-/+] ALT has still administrative-financial processes to improve as a binational IGO but can carry on binational projects. [-] In both countries, low vertical articulation between subnational, provincial, and district governments. Sandia forgotten by Puno govt. [*] Local authorities live in their respective jurisdictions. [-] In public entities (all levels in both countries), lack of professionals to formulate projects and high personnel turnover (especially in provincial and local govts). [+] Municipalities associations as platforms to promote policies at national level. [+] Commonwealths as mechanisms to concentrate funding for small govts. [-] Difficult relationship between governments and cooperatives. [-] In Peru, traditional role of municipalities and national agencies in supporting locals through technical assistance, but with weak interventions.	[-/+] ALT procedures and bureaucracy delayed execution. But could finish the project. [-] Lack of experience from ALT and MPS articulating and executing CBVC projects. [-] The MPS did not articulate with district governments. [+] INPANDES counted with the participation of national agencies' officers (e.g., SENASA-Peru, SENASAG-Bolivia) to facilitate training of local officers. [+] Exchange of experience between local authorities and cooperative officers (SPPP, SJDO, Sandia, Apolo, APOCOM, CECOVASA) to strengthen local public capacities on binational dialogue and CBVC articulation. [-] The public-public articulation through international internships did not lead to preserving created cross-border mechanisms. [+] The participation of Apolo mayor led to the articulation with the national government to construct the highway.	[-] MPS capacities and motivation on CBVC disappeared with the following administration (high turnover). [-] No funding from subnational or local govts to continue INPANDES. [-] Provincial and district governments have coffee projects, but they are not articulated (vertical, horizontal, nor cross-borderly). [-]Subnational and local governments do not have legal capacities to establish cross-border projects. [-] In Peru, municipal support goes to producer associations but not cooperatives. [-] Puno government is very weak (three governors in the last years). [+] New effort from national agencies (SSE, AGROIDEAS) to cooperate with CECOVASA. [+] DEVIDA financed coffee projects for provincial and district governments. [-] Persistent shortage of professionals and budget in municipalities. [-] COVID-19 pandemic reduced government capacities.
Cross-Border	[-] Total disarticulation of Bolivian communities with Bolivian governments (due to lack of connectivity). [+/-] Public assistance to Bolivian communities driven by political motivations.		[-] Support from Bolivian governments to border communities is scarce. [+] SPPP municipality has a coffee program with DEVIDA financing.
Evaluation	**Average presence**	**Targeted? Avg. Efficiency? Low**	**Average presence (Similar)**

Most of the problems that public institutions face were created by themselves and the lack of interinstitutional articulation: weakness of institutions in the face of political changes, lack of legal frameworks to support cross-border cooperation (e.g., no binational SNIP), protectionism and/or paternalistic behaviors embedded in trade barriers, financial constraints due to lagged decentralization processes, low knowledge of cross-border reality in the national governments (e.g., ADEMAF security approach), and more. While several voids can be pointed, the main ones in this case study could be pointed as the lack of motivation to improve cooperation, the long distances between governments, and the lack of professionals to promote cross-border cooperation and productive articulation. Summed with the low public capacities, these problems lead to low incentivized to reduce cooperation and trade barriers (e.g., no formulating the cross-border policy agreements), and low instability in front of political changes, leading to the discontinuation of cross-border strategies.

Formulating strategies to fill this void begins by questioning the role of government within the CBVC. In the case study, the range of services that provincial and local municipalities provide starts from funding and territorial marketing, to direct technical support and provision of maquila services for roasting. The provision of 'public' productive services almost for free might be a disincentive for SME development, even more in border areas where businesses and entrepreneurs face more constraints, but this is another discussion topic. Privatizing or outsourcing agricultural extension projects or maquila services can improve public efficiency as they would not need to update their own product/business knowledge but audit the companies that already have know-how and are constantly working in these topics. While this option represents an opportunity, there are some pre-conditions that should be fulfilled to have success (Kidd *et al.*, 2000; Labarthe and Laurent, 2013).

In any of the possible scenarios, interinstitutional articulation (vertical, horizontal, and cross-border) is required to reduce the voids created by public institutions. The case study showed that there are financial resources, even bigger than led to the project to be executed, but it is required motivated institutions to enable them and reduce cooperation barriers. Political will might be the most crucial void as, although the project did not achieve a direct articulation with Bolivian national government, it was because the Apolo mayor met the Bolivian border reality that he articulated with the Bolivian President and started the construction of the highway to those communities. Thus, INPANDES contributed significantly, but indirectly, to increase connectivity to the Bolivian border.

2.7.3. Knowledge Voids

CV10: Lack of Business Knowledge & Skilled Professionals/ Stewardship

The analysis on CV10 (**Table 6.33**) addresses the business/professional knowledge and capacities that CBVC stakeholders have. Considering this in terms of business capacities and project development & management ones, the former refers to the cooperatives and the second one to public actors and IGOs. CECOVASA, as the central of eight cooperatives, had several capacities (marketing, business development, funding capture, etc.), but more empirical rather than planned. APOCOM, just created few years before INPANDES, was very weak and in the process of consolidating its association board. By the side of public institutions, the CAN counted with a good experience in cross-border cooperation projects, and the ALT had experience executing several bilateral projects. In terms of municipalities and national agencies, while most of them required updating their agricultural extension programs, the MPS had a good professional team with previous experience in a previous bilateral project in the area (the commonwealth team that participated in the PRA).

The INPANDES project had as objective to improve professional capacities in municipalities and cooperatives. Although there were some inconvenient during the project execution due to the lack of expertise (e.g., first time for the ALT and MPS working in such a project, team management issues in INPANDES team), the project executed the respective trainings. However, these trainings did not generate long-term benefits as the changes of administrations in municipalities and even cooperatives led to the change of most professionals working in those institutions.

Lack of professionals in business planning, marketing, business relationships, project development, etc. is a lagging problem in this CBR and even the realization of the project. In this case, the weakness of public institutions (ALT, MPS and other municipalities), the lack of funding for cooperatives (especially CECOVASA), and low adaptation to new challenges (e.g., reactive responses rather than planning their business) have been the main voids affecting the improvement of those capacities. This is also limited by the scarcity of professionals in the area and the cost of bringing them. The challenge is even higher for independent producers, that not only require technical skills but also professionals to run their production as entrepreneurs.

Table 6.33. Analysis Chart of Connectedness Void 10 (Author's elaboration)

Void N°10	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] CAN: Unknowledge of local reality and lagging constraints while planning project.	[+/-] INPANDES team: initial team and management problems. Replacement of managers improved teamwork. [-] The INPANDES project: It was not designed under technical criteria but political demands (short duration, limited budget, etc.). It incorporated several elements for CBVCs but did not delve on them. [+] CAN & EU supervision	[-] Rotation of professionals is susceptible to political changes (at all level).
Subregional	[+] MMNPT: Skillful team with experience in international cooperation projects. [+] MMNAP: Skillful team transferred to the MPS. [-]National agencies: dev plans limited by shortage of professionals (geographical dispersion of personnel). [-] Cooperatives in both sides tend to have weak executive and management boards (low professional knowledge). [-] Access to funding is limited by the presence of good professionals (in cooperatives or govts.) to apply to them. [+] DEVIDA evaluating associativity levels on CECOVASA and its grassroot cooperatives to organize plans for better cooperative growth. [+] Despite the several improvement points, CECOVASA counts with a high degree of specialization (one of the few central cooperatives at national level).	[-] ALT: Supervision and monitoring was weak (no skillful personnel, no visits, etc.). [-] ALT & MPS: No previous experience on CBVCs. [-] INPANDES team: low number of professionals (three), each oriented to a project objective, but with low knowledge about the whole coffee value chain. High rotation due to low salary. Focus more on integration rather than productivity. [+] INPANDES focus on improving CECOVASA professional team (client relationship, accountability, etc.).	[-] In both countries, cooperatives tend to need several professional services that they cannot afford by themselves. [-] CECOVASA: Rotation of manager and President (need to re-learn), no planning tools or clear business/ marketing strategies, low international sales capacities (e.g., no English proficiency), etc. [-/+] CECOVASA: New admin. focusing on strategic partners, but without clear strategies to relate with them. [+] In Peru, rotation of professionals/ technicians tends to happen within institutions from the same geographic area (SPPP – Juliaca corridor). [-] Hiring professionals from Puno or Juliaca for more specialized services is more expensive (e.g., travel expenses, higher salary). [+] Municipalities: some support from municipalities to producer associations in prof. knowledge (e.g., legal support service).
Cross-Border	[-] APOCOM: founded in 2014, still with several limitations in associativity/ business knowledge.	[+] INPANDES focused on improving legal, business, production knowledge in APOCOM (but limited due to initial capacities).	[-] APOCOM: Limited professional knowledge and split management (difficult coordination between both communities). [+] SPPP as local urban center of available professionals.
Void Evaluation	**Average presence**	**Targeted? Average Efficiency? Low**	**Average presence (Similar)**

Proposing strategies to solve this void implies 1) to connect and train local professionals, or 2) to pay the additional costs that represent to bring professionals from outside the CBR. Any of those options require investment that, with a low change mindset, would be difficult to succeed. To support CBVCs, municipalities (or public institutions) should improve their skills to develop project proposals to earmark existing budget (e.g., the Sandia highway has not been accepted yet for almost a decade due to poor technical dossiers) and better project design & execution to target local needs (e.g., low effectiveness of agricultural extension programmes). In terms of cooperatives, both cooperatives need a business plan and while APOCOM requires something simpler (focus on legal processes and standards), CECOVASA requires more capacities in terms of organizational development (cooperative governance), upgrading strategies (financial and marketing planning), and business development (customer relationship management or CRM with producers, potential partners, and new buyers).

CV11: Lack of Productive Knowledge & Skilled Technicians

The analysis on CV11 (**Table 6.34**) addresses the technical/productive knowledge and capacities that CBVC stakeholders have. For this case study, this knowledge can be subdivided in primary production (cultivation, post-harvesting, collection), and transformation (roasting). In the coffee production area, most Peruvian producers have good knowledge about primary production and CECOVASA implements good collection practices. The Bolivian side has a wide technical gap as no government ever arrived to promote productive training. INPANDES focus on leveraging technical capacities of producers. While technical training had a higher impact on Bolivian producers, they did not take advantage of those trainings as Peruvian ones. Moreover, trainings focused on the first steps of production and could not arrive to transplant the seedlings from the nurseries to the farmlands. Technical trainings were not exactly oriented to cooperatives, although they required, specially CECOVASA to make a better use of the new roaster.

INPANDES project itself presented several problems that municipalities, cooperatives and producers face when trying to acquire technical knowledge: lack of funding (e.g., hiring four technicians for 140 producers, with low salaries) or long distance to technicians (especially for Bolivia), the poor design of the technical programmes (e.g., INPANDES project was not precisely designed to meet technical requirements), and the weak knowledge transfer mechanisms to fix taught skills (e.g., technicians not arriving to farmlands, producers did not know how to transplant the coffee plants). This lack of technical training and technicians in this CBR leads to weaker quality control systems (e.g., CECOVASA has two technicians to monitor 900 producers), lower coffee volume (e.g., producers faced limitations improving productivity and protecting from plagues), and difficulties adopting new technologies (e.g., using the roaster).

Table 6.34. Analysis Chart of Connectedness Void 11 (Author's elaboration)

Void N°11	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[+] Technical knowledge, especially on post-harvesting, increases quality.		[-] Rotation of technicians is susceptible to political changes (at all level). [+] Bolivian PNC involves personal evaluation of producers (accomplishment of goals).
Subregional	[-] The roya affected CECOVASA's capacity to hire technicians. [-] Harvesting season demands skilled personnel (most of the time other producers of the area). [-/+] Municipalities and national agencies count with more technicians than cooperatives and their logistics requirements for technical support (both countries), but there is low cooperation. [-] Old-fashioned technical programs or projects: Local technicians are more focused on primary production rather than post-harvesting (both countries). [-] Local roasting maquila services require more knowledge. [+] Despite the several improvement points, CECOVASA counts with a high degree of specialization (the only CITE specialized in coffee at national level).	[+] INPANDES counted with a great variety of technical trainings throughout the coffee value chain stages. [-] Despite of the industrial roasters, CECOVASA did not have the roasting knowledge. [-] INPANDES: Hired local technicians, but low number of them (four for 140 Peruvian and Bolivian producers). Two in charge of nurseries, the other for the visits. Logistics issues to arrive in the communities (e.g., weather, transport, no bridges, etc.). Low remuneration. [+] INPANDES: Two technicians worked in the previous PRA (know-how on CBVCs). International internships included INPANDES technicians (learnings from Colombia).	[-] CECOVASA: low number of technicians for inspections (two for 900 producers), low roasting knowledge, low knowledge on transformation technology, etc. [+] CECOVASA and ANPROCA, especially the former, have good cupping scoring/ quality control technicians. [+] In Peru, rotation of professionals/ technicians tends to happen within institutions from the same geographic area (SPPP – Juliaca corridor). [-] Knowledge level of local technicians might not be at the most optimal level (especially for post-harvesting and following processing stages). [-] Few local technicians specialize in coffee. [-] INPANDES technicians did not continue activities in the intervention areas (lost knowledge/ know-how). [-] Producers' children are not usually part of technical aspects of the farmlands. [-/+] Producers have knowledge on good practices, but do not implement due to other related factors (e.g., how to buy and carry dozens of organic fertilizer bags from the road to the uphill farmland?).
Cross-Border	[-] In border areas, especially in Bolivia, producers count with no or very traditional/ empirical experience on coffee production. [+] CECOVASA used to have a relevant role in monitoring and training Peruvian producers (to include them in the organic program). [+] Training assistance from Peruvian governments and national agencies. [-] Lack of technicians in the Bolivian communities.	[+] Cross-learning internships for Bolivian producers to learn from Peruvian key producers. [-] Due to project timeline limitations and coffee calendar, INPANDES training did not provide knowledge beyond transplanting seedlings to farmlands (initial step of primary production). [-] Low frequency of technician visits (once/ twice per month), for one day, and most of the time, not personalized and not arriving to producers' lands (group teaching). [-] Trainings' benefits were not equally distributed: producers with	[-] No technical assistance (even from CECOVASA) to Bolivian communities. [-] Still persistent technical knowledge gaps in Bolivian communities, no more technical assistance since INPANDES.

(Continued)

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		more knowledge (often Peruvian) took more advantage of INPANDES trainings. Bolivian producers, especially from Cocos Lanza, did not benefit from trainings. [-] Low transplant ratio in Bolivia: 33% in San Fermin, 0% in Cocos Lanza. [-] INPANDES tried to train local technicians in Bolivia but was not successful.	
Void Evaluation	**Peru: Average/Low Bolivia: High**	**Targeted? High Efficiency? Low**	**Peru: Average/Low (≈) Bolivia: High (≈)**

Planning technical improvement starts by considering the local supply of technicians. In Sandia, as a traditional coffee productive region, there are several technicians or producers with enough knowledge to be training facilitators. However, current local human resources should be standardized and leveraged (train or re-train technicians), especially in post-harvesting (a critical stage that defines coffee quality).

A second point to consider is what to teach: most producers in the Peruvian side, if they are associates of CECOVASA or Coop64, they know how to produce and have and average to high knowledge on primary production. In this case, what they most need is supervision and evaluation to progressively upgrade. The case is different with Bolivian producers as they need constant training to develop basic technical capacities. Not meeting those basic knowledges or preconditions was one of the factors that influenced low knowledge transfer during INPANDES.

Cooperatives and municipalities do also need more technical knowledge, especially to design programmes or upgrading in the value chain. CECOVASA needs technical knowledge on roasting to have a better use of the roasting machine (the current technician learned by trial and error with the new equipment, but more could be achieved with specialized training) and skillful technicians on primary production to implement better quality control systems and more visits. In terms of municipalities, while a similar solution applies, outsourcing is also an alternative, even more using cooperatives that already have good know-how but lack financial resources to hire more technicians. Furthermore, cooperatives already know who a good or dedicated producer is, knowing how to target each subgroup or how each can benefit most from what. In this scenario, municipalities should focus more on having better monitoring systems and collecting data on each producer that benefits from this PPP.

CV12: Weak Marketing Information Systems

The analysis on CV12 (**Table 6.35**) highlights the need of market-related data to design better strategies based on the assessments on markets, the business, and the territory.

Table 6.35. *Analysis Chart of Connectedness Void 12 (Author's elaboration)*

Void N°12	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] Governments (at all levels) do not have clear datasets on coffee production or measuring systems		[-] Need of better technological approaches to measure, generate data, and instrumentalize it.
Subregional	[-] Lack of market knowledge to upgrade processes (e.g., what kind of roasting is expected for determined country/ market). [-] Lack of knowledge about GVC competitors (especially at regional level). [-] Lack of knowledge on the territorial capacities for coffee production (e.g., mapping coffee profiles, productivity per parcel/sector/area, etc.). [-] Lack of data to forecast production and promote better business plans or sales. [-] No marketing services to collect data due to the lack of private sector incentives in Puno region. [-]the dissemination of information to local actors is still very rudimentary (spoken). [+] CECOVASA has compiled coffee profiles according to its altitude levels, zones, and organoleptic characteristics. [+/-] CECOVASA collects information of organic producers in physical record books.		[+] DEVIDA collects data and evaluate associativity capacities of each cooperative (facilitates strategies to support them). [-] Lack of data/knowledge is a persistent issue, especially to arrive international markets, upgrading production, and coffee technology (equipment). [+] Cooperatives have certain knowledge on domestic markets as they already penetrated in the capitals. [+] Producers' children become in a source of market information.
Cross-Border	[+] Producers from both sides manage basic concepts about market.		[+] Bolivian producers are interest in market demand of cooperatives (prices) and consumers (how to reach them directly).
Void Evaluation	**High presence**	**Targeted? No Efficiency? NN**	**High presence (Similar)**

In this case study, INPANDES did not have a direct or related intervention, and there was evident change in this category. In the Sandia valley and CBR, there has been a very rudimentary marketing information system (MKIS), most of the time based on personal relationships or previous experiences, with a lack of companies related to market research. Cooperatives, and especially municipalities, have also weak systems to gather field data. However, CECOVASA keeps registers of coffee collection to facilitate the creation of its georeferenced brands.

The rudimentary MKIS in this CBR has as main causes 1) the lack of stakeholders that can provide with this type of information (e.g., little relationship with the JNC or no market research company in the area), and 2) the low capacities to collect and instrumentalize information from their businesses and territory – although CECOVASA and municipalities already generate production data. However, the little data that is processed and used, was useful to launch its georeferenced brand and have a better market penetration.

Improving MKIS in this CBR has a long journey ahead. First, the cooperatives and municipalities should strengthen their data collection systems. For example, CECOVASA gives a record book to each producer in its organic program, and technicians check this book in every visit (once or twice a year). This book, that stays with the producer, contains a detailed record of productive activities, the use of supplies, tools, and equipment, and even the existence of other plants and animals in the farm. Systematizing this book (digitalizing, taking photos and sending it periodically, etc.) can, not only organize provide information to when realize technical visits, but ensure coffee traceability (tracking coffee from the farmland) of coffee production per producer, and use this data to generate credibility or bargain better prices.

Second, improving MKIS starts by sharing information between those stakeholders that collect, e.g., CECOVASA with its production quality, municipalities with its register of lands and producers, and DEVIDA with associativity reports. Sharing just this existing information can help to associate new producers, update productive programs, and more. Third, with proper market specialists, local actors can decide what information they need to achieve their business plans and articulate with development partners or other actors that can provide it or sell it (e.g., CECOVASA articulating with the JNC to get information about market profiles and calibrate their upgrading strategy).

2.7.4. Product Voids

CV13: Operational Instability: Small & Inconsistent Supply/Volume

The analysis on CV13 (**Table 6.36**) refers to the availability of coffee volume/supply and how consistent it is to plan the business and project sales. CECOVASA used to have a good coffee volume, collecting most production of Sandia and being top 6 exporter in Puno after mining. However, since 2012, one of the biggest constraints in the Sandia valley and CBR, was the proliferation of the coffee leaf rust or roya, that reduced coffee production in a 70% to 90%. The roya encouraged coca production, that was more profitable than coffee, affecting total production even more. Lack of productive knowledge to tackle this disease and improve productivity was not available, and CECOVASA profits reduced to around 10% its pre-roya volumes. Scarce financial resources were also a problem, as the cooperative did not have enough budget to run their collecting campaigns and pay producers.

While the commented voids might be the most important bottlenecks that led to lower coffee volume, the increase of sales in Coop64 in 2019 and 2020 (even generating more profits than CECOVASA), implies the existence of other possible reasons behind the current low supply, such as fewer cooperative associates, but there are no reliable data sets (e.g., reliable information on coffee production in the Puno region) to confirm or deny it or the reasons behind.

Planning strategies to increase volume start by considering one of the most important competitive advantages of Sandia production: high-quality coffee. Increasing quantity of this coffee start by increasing efficiency (higher amount of exportable coffee), ensuring funding for collecting campaigns (ensure payment to producers), and expanding coffee volume by 1) attracting more producers that meet the standards, 2) investing in the ones with potential, and 3) promote cross-border or subregional cooperation. The field study revealed that the Bolivian communities could increase in 5% the CECOVASA's total coffee volume, but the highest opportunity would be with ANPROCA and its interest to collaborate and sell its production to the Peruvian cooperative, which has the productive capacity to process even all Bolivian production. Finally, yet importantly, R&D on coffee varieties to resist roya but with high cupping quality can remove one of the most important bottlenecks of coffee volume, what could lead to a steady coffee production growth.

Table 6.36. Analysis Chart of Connectedness Void 13 (Author's elaboration)

Void N°13	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] Collected volume reduced significantly (70%-80%) in both countries due to the roya. [+] By 2014, CECOVASA used to export even more than half of all Bolivia's exports. [+] Economies of scale: higher volume reduces production costs (for producers and cooperatives). [*] According to the coffee VC, coffee production needs of inputs such as supplies (Seedlings, bags, etc.), utilities (water, energy), infrastructure (post-harvesting, collecting, transforming), and (saws, nests). [*] Arabica coffee production follows a coffee calendar that depends on land altitude (harvest conditions are shorter in lowlands).		[-] Bolivian exports are 40% of what they used to export before roya. [+] ANPROCA has 60%-70% of national production. [*] Exportable coffee volume is around 70% of collected coffee volume (~20% parchment, ~10% defects). Coffee flaws are reduced with higher primary production quality.
Subregional	[-/+] The Puno-La La Paz subregion represents ~20% of binational exports. [+] CECOVASA used to produce and export most coffee in Sandia/ Puno. [-] The coca decreased available farmland to cultivate and manpower to harvest, reducing available coffee supply. [+] CECOVASA branding, and products allow bigger collection (more options they can choose to sell to the cooperative). [-] Collecting capacity of cooperatives is limited by their financial constraints (cannot pay producers).		[+] Most coffee production and export in Puno region is concentrated in CECOVASA (~60%) and Coop64 (~40%). [-] CECOVASA exports are 10% of what they used to export before roya. [+] Coop64 increased exports even during the roya. [+] CECOVASA has the processing capacity (+1800Ton) to handle current Bolivia's exports (~1400Ton). [-] CECOVASA is still under its breakeven point of coffee collection to achieve financial sustainability. [+] Around 75% of CECOVASA producers are part of the organic program. [-] Producers do not give entirely their production to CECOVASA as they can earn more from other channels (keeping 10% to 40%).
Cross-Border	[+/-] There used to be several collecting centers in the CBR. [+] Peruvian and Bolivian producers deliver coffee on Saturday mornings. [-] Due to the coca and roya, total coffee volume decreased at producer level.	[+] Implementation of six production pilot centers (collecting centers with equipment).	[+/-] Coffee collection is centralized in SPPP. Coffee collecting cluster in that city. [+/-] Production in Bolivian communities is low but may increase CECOVASA collection up to 5% (Cocos Lanza: ~2%, San Fermin: ~3%). [-] Producers still make around 30% of what they used to do before roya.
Void Evaluation	**High presence**	**Targeted? Low Efficiency? Low**	**High presence (Similar)**

CV14: Market Access Instability: Fluctuating Demand & Price

The analysis on CV14 (**Table 6.37**) refers to the facility/difficulty to access markets facing fluctuations in the demand and prices. At global scale, the price of conventional coffee is determined in the commodity market, presenting several risks to exporters. However, both Peru and Bolivia specialize in specialty and organic/certified coffee market, focusing on higher quality to achieve better prices. This is the case of CECOVASA, that 95% of its sales are export of certified organic green coffee. This cooperative has capitalized the high quality of its coffee by standardizing production, and developing a series of marketing channels (certifications, georeferenced brands, participation in international fairs, etc.). At producers level, the CBR coffee demand is in the Peruvian side, offered by CECOVASA, Coop64, the grassroot cooperatives, or independent buyers. While Peruvian producers can sell their coffee to several buyers depending on their bargaining skills, Bolivian producers are limited by the trade barriers and the long distance to Bolivian coffee markets in Apolo city, La Paz city, Caranavi.

INPANDES tackled this void indirectly by improving CECOVASA marketing channels (bilateral brand, international fairs). The greatest success during the project (not exactly because of the project) was that CECOVASA got a Letter of Intention to Purchase from Kaffee Siddhartha, a German wholesaler. By the moment, CECOVASA still has this buyer, sending four shipments in 2019 and 2022 equivalent to 55Ton of coffee (green and parchment) for $246K. Meanwhile, the increase of trade barriers implemented by CECOVASA to Bolivian producers reduced their alternatives where to sell, reducing their market access (only possible through middlemen). This led to lower bargaining capacity, and the reduction of motivation to produce.

Strategies to better market access in front of fluctuating demand and price can be divided two groups. For CECOVASA, the idea is to capitalize on its current progress, by improving its marketing and sales strategies to have higher bargaining capacity (e.g., developing a marketing plan, English-speaking salesman, tracking coffee traceability). Another strategic line is related to developing downstream markets: roasting, commercialization and consumption, either by increasing domestic sales (Lima wholesalers, Puno retailers, coffee bars), or international ones (starting by penetrating in Latin America or Global South). For producers, especially Bolivian ones, access to market and higher prices highly depends on selling formally their coffee to Peru as the cost-benefit to sale to Bolivia is still high (long distance and bad experiences selling there). However, the construction of the Apolo highway can change trade dynamics, with the risk of decreasing or eliminating coffee flow from Bolivian communities to Peruvian cooperatives (although Apolo and Caranavi would be still far from Cocos Lanza or San Fermin).

Table 6.37. Analysis Chart of Connectedness Void 14 (Author's elaboration)

Void N°14	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] Coffee price is determined at global scale and is sensitive to external factors. [+] Peru has a good positioning in specialty and organic coffee (top 1 organic coffee exporter), accessing to more profitable markets.		[+] COVID-19 pandemic increased global coffee price.
Subregional	[+] Puno (Sandia) coffee has already positioned in global market as specialty/organic coffee. [+] CECOVASA has the quality standards & certifications to penetrate high-standards foreign markets. [-] Prices offered by middlemen may not cover production costs. [-] Lower global coffee price undermined cooperatives' capacities to buy coffee from producers by offering good price. [*] CECOVASA pays producers in two times: collection moment, and after the foreign sale (~one year after collection). First payment based on statute. The second payment is based on coffee quality.	[+] CECOVASA closed the contract (Letter of Intention to Purchase) with Kaffee Siddhartha (German wholesaler).	[*] CECOVASA products have good reception in international markets (especially Germany). Around 95% is exported (eight international clients). [+] CECOVASA sold Frontera Coffee in 2019 and 2022 (four shipments). [-] CECOVASA has not penetrated in the roast coffee market. [+] Bolivia has not focused so much on export as Puno (Bolivia oriented to domestic market). ANPROCA exports 50% (five international clients). [+] Currently, CECOVASA and Coop64 are offering good coffee prices to producers. [+] CECOVASA offers several options for producers to sell (e.g., honey coffee, sultana, etc.). [*] Access to market and higher prices as some of the producers' main drivers to select where to sell (even preferring other buyers instead of CECOVASA).
Cross-Border	[*] Bolivian producers used to sell to CECOVASA grassroot cooperatives or middlemen. [*] The selection of cooperatives where to sell depends on several factors related to price (amount, payment schedule, etc.) or extra benefits (e.g., distance). [*] Domestic market demand is in the Peruvian side and covered by CECOVASA, Coop64, grassroot cooperatives, and independent buyers.	[-] The project implied a direct sale to CECOVASA for Bolivian producers, but it did not last for so long. [-] (Global) Coffee price was low when the project was finishing, hindering producers' capacities to cover production costs (especially from Bolivia).	[-] Bolivian communities are interested in direct channel to consumers but do not have a market where to sell (only middlemen). [-] Middlemen offer differentiated price to producers, especially Bolivian (50% or less than from cooperatives). [+] Bolivian producers are interested to reconnected with CECOVASA grassroot coops.
Void Evaluation	**Peru: Average/Low** **Bolivia: High**	**Targeted? No directly** **Efficiency? High**	**Peru: Average/Low (↓)** **Bolivia: High (↑)**

CV15: Low Product Quality & Standardization

The analysis on CV15 (**Table 6.38**) highlights the impact of product & productive process quality and standardization. As reported before, one of the most important competitive advantages is the high quality of Peruvian coffee from Sandia due to: the geographical location and environmental conditions for coffee plantations (land-based), and the technical knowledge and capacities on coffee primary production to standardize processes & supervision (technical visits, organic program), and good coffee varieties and equipment, especially the milling machine (although this might be more related to processing large amounts of volume). However, the proliferation of coca production had an impact on coffee quality, directly (pesticide pollution), and indirectly (land deterioration). INPANDES project focus on improving quality indirectly (training on primary production, manuals for producers), but also directly, especially in the formulation of a plan for ensuring coffee collection standards & traceability. However, after the project, the coca expansion near coffee lands has produced cross-pollution, undermining quality, and putting in risk the organic certification – a failure that could cost up to $500K in exports.

Coffee quality began as a local strategy to address (or avoid) local problems (small farmlands, low market access, low bargaining capacity, etc.), closely tied to the history of the cooperative movement in Sandia. The strong relationship between high quality standards, marketing channels (especially international certifications), and local development, constructed throughout the evolution of CECOVASA, is nowadays the cornerstone of the coffee & quality culture in the Valleys of Sandia and its main competitive advantage in the coffee Global Value Chain. The case study reveals that overcoming local problems and the reduction of connectedness voids is – for this particular case – a medium to long term process that is 'sealed' in the socioeconomic fabric by embedding the practices for better quality in their daily productive activities. Getting the letter of purchase during INPANDES was not exactly an outcome of two years of work, but of decades of local specialization in coffee quality development.

Table 6.38. Analysis Chart of Connectedness Void 15 (Author's elaboration)

Void N°15	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[+] Good post-harvest processing increase quality. [*] Peru has positioned in the organic and certified global markets (top1 organic exporter, fair trade leader). [-] Growing and producing high quality coffee is sensitive to several factors (diseases, bad practices, pesticides, etc.).	[-] Due to the time constraints, the project was not so oriented to promote coffee quality but to consolidate the mechanisms that can achieve it (cross-border governance).	[+] Bolivian national agencies also strive for high quality coffee (agroforestry, certifications, etc.).
Subregional	[+] Geographical and soil conditions promote good organoleptic characteristics (high quality conditions). [-] Small parcels (~2ha) force producers to focus on quality (good primary production, agroforestry systems, etc.). [+] CECOVASA has constructed a coffee/quality culture oriented to high standards (e.g., international winners, organic coffee, etc.). [-] Middlemen's trade affect coffee quality (it can reduce cooperative's collection quality). [+] The CITE CECOVASA (Productive Innovation and Technology Transfer Center) focuses on technical training, certification, quality control, etc. [+] CECOVASA handles good quality control systems from the farmland to processing. ANPROCA has also good one. [-] DEVIDA: the 'catimorization' of production to resist the roya reduced coffee quality and pay according to it (cupping-based refund). [*] CECOVASA pays producers in two times: collection moment, and after the foreign sale (~one year after collection). First payment based on statute. The second payment is based on coffee quality.		[+] Puno and Bolivia have similar competitive advantage in the C-GVC: low volume with high quality. [-] 2021: CECOVASA was about to lose the certification due to lower quality standards (presence of pesticides due to coca production). [+] Municipalities use the concept 'best coffee in the world' as territorial branding. [-] Production quality standards for organic certification might be high for several producers (even more for producers outside cooperatives). [-] Public agencies do not have good quality control systems to monitor production. [-] There are several brands at Puno and La Paz level with variable quality (not matching high quality standards).
Cross-Border	[+] Bolivian producers also understand and share coffee culture quality. [-] Coffee from lowlands (usually borderlands) has lower quality, matures faster (less time to harvest), more defects, etc.	[+] INPANDES long-term goal was to increase Bolivian coffee quality through technical assistance (training, manuals) so they could sell to CECOVASA. [+] Developing of the coffee collection plan to ensure quality & traceability.	[+] Good practices, especially in harvesting (selective harvesting) and post-harvesting, increase coffee quality, even from lowlands.

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		[-] The project gave catimor to producers. [+] INPANDES trained women to improve quality control (coffee sorting ladies, coffee tasters).	
Void Evaluation	**Peru: Average/Low Bolivia: High**	**Targeted? Low Efficiency? Low**	**Peru: Average/Low (↑) Bolivia: High (≈)**

While the producer and cooperative have been highly benefited by the land conditions, there is still a large room to implement better standardization of coffee production processes in cultivation, post-harvesting, and collection. For cooperatives, this requires internal evaluations to observe in more detail the gaps in technical skills, supplies, tools, and equipment that producers have, and develop comprehensive plans and productive standards so producers can access them (e.g., cooperatives providing better supervision, buying & selling supplies to producers, offering credits, etc.). This should be accompanied with stronger policies on coca eradication to eliminate or reduce cross-pollution (as it happened in the Bolivian side, but this is a topic that should be later discussed in more detailed).

For Peruvian producers, if they are not part of cooperatives, accessing those benefits is more difficult. Municipalities can improve their programs by investing in updating their current programs, or outsourcing. In front of this issue, cooperatives could sell their services to outsiders, generating more benefits. Even though, standardizing quality standards (rather than having different organic programs as it happens between SPPP and CECOVASA) could promote an overall increase of local quality and facilitating the process of training technicians. For Bolivian producers, the challenges are higher, and without a proper highway, the only possibility is by informal access of quality upgrading services in Peru (difficult due to the lack of funding), or by other CBVC initiative in the area.

2.7.5. Resources Voids

CV16: Lack of Productive Supplies, Equipment & Infrastructure

The analysis on CV16 (**Table 6.39**) addresses the needs for more suitable productive conditions based on supplies, equipment, and infrastructure. As a coffee production area since its formation, the Sandia Valley counts with several assets that were very active before the roya: several collecting centers throughout the area (and the CBR), logistics storage in Lima/Callao, and the CECOVASA Headquarters/Plant (main offices, collecting yard, industrial equipment, CITE, and more) in Juliaca. Lower coffee volume due to the roya represents that there was not so much demand to use the existing infrastructure, but the direct impact came from the reduction of financial resources, that led to closing collecting facilities (no personnel to use them) and selling the port storage and half of the Juliaca plant.

At producers level, this has been very variable, with some of them having invested even in post-harvesting infrastructure, solar panels, and imported supplies (e.g., GainPro bags, solar tents, etc.) – difficult to get them in Juliaca as providers are in Lima or abroad (low connectivity).

Table 6.39. *Analysis Chart of Connectedness Void 16 (Author's elaboration)*

Void N°16	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] Productive supplies such as coffee bags with valves, GainPro bags or solar tent netting should be purchased from Lima or abroad. [+] Better equipment reduces production costs. [*] Organic production limits the use of fertilizers, pesticides, or chemicals. [*] Catimor coffee variety is resistant to roya but has a low cupping quality.	[-] Due to the budget constraint, cooperative/ communitarian benefits (roaster, collecting centers) were prioritized rather than individual ones (productive tools).	
Subregional	[+] CECOVASA plant was constructed progressively (1st floor: JICA, 2nd floor: CITE). [+] CITE CECOVASA is certified for coffee cupping. [+] ANPROCA has the biggest coffee plant in Bolivia. [-/+] CECOVASA used to purchase supplies for producers (seedlings, fertilizers, etc.), but stopped due to financial constraints. [-] Lack of productive tools (e.g., humidity gauge) or equipment (e.g., optical sorters) limits better practices and quality control (for producers and cooperatives). [-] After the roya, CECOVASA has not been in the best financial conditions (selling Lima port storage, half of Juliaca coffee plant, closing collecting centers to save costs).	[+]Purchase of 25kg PROBAT semi-industrial roaster machine for CECOVASA according to the needs of the cooperative. One of the most sophisticated roasters in Peru. [-] Grassroot cooperatives wanted the PROBAT roaster to be in SPPP, but there is no triphasic energy connection nor good road conditions. Located in CECOVASA plant due to the energy capacity and connectivity of Juliaca. [+] Infrastructure improvement of CECOVASA main collecting centers. [-] At the beginning, technicians did not have logistic equipment (bikes, trucks) to do the visits.	[+] The CECOVASA roaster is in certification process. [-] The CECOVASA roaster does not operate frequently due to harvesting period (once a year), low volume, and low demand of roast coffee. [-] CECOVASA: need of more equipment to standardize production, quality, and logistics. [+] CECOVASA has better infrastructure and equipment (more digitalized) than ANPROCA (optic sorter vs sorting ladies). [-/+] DEVIDA provides equipment to grassroot cooperatives. [*] With the slowdown of the roya, more profitable coffee varieties can be cultivated, but they grow slowly.
Cross-Border	[+] Roasting maquila capacity: There are small roaster from Puno to SPPP owned by cooperatives, municipalities, or private businesses. [+] The PRA project gave productive infrastructure, equipment, and tools to Bolivian communities.	[+] Installation of demonstrative parcels and nurseries to train producers. More than 20ha were installed. [+] Installation of post-harvesting modules, quality control modules, collection center. [-] Cocos Lanza did not do make the place design nor construction budget for the collecting center.	[-] The equipment oriented to Bolivian communities are not in operation due to the lack of electricity. [-] Low benefit for Cocos Lanza: The equipment never arrived (stayed in San Fermin) and the collection center was constructed in San Fermin (non-operational). [-] Most seedlings from Bolivian nurseries were discarded as there

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	[-] Lower supply reduced the number of collecting centers, centralizing them in SPPP.	[+] Installation of equipment such as coffee dryers, small roasters, scales, and more. [+] Reception of productive tools (saws, fertilizers, etc.). [-/+] The project gave three coffee varieties, Geisha, Bourbon, Catimor, but the latter was mainly used in Bolivia due to their low-level productive systems. Peruvian producers could cultivate the formers as they had more installed capacities. [-] Not enough seedlings for all producers in Bolivian communities.	was low transplant ratio and no monitoring. [-] Most Bolivian producers did not have the equipment or infrastructure (e.g., solar tents for post-harvesting processing) to carry out learnings. The installed one were for demonstrative purposes (not in their lands). [-] Productive tools were for the whole community (not individual) or for few producers and were non-operational after a short time. Bolivian producers felt more benefit with the PRA project. [+] Some productive tools (e.g., collecting nests, saws) are still used by Peruvian producers.
Void Evaluation	**Peru: Average Bolivia: High**	**Targeted? High Efficiency? Average**	**Peru: Average/Low (↓) Bolivia: High (≈)**

INPANDES project did focus on this aspect: from giving supplies (seedlings to coffee producers), tools (chainsaws, moisture detectors), infrastructure (community nurseries, collecting centers), and equipment (scales, roaster machines). The most important contribution was the 25kg PROBAT semi-industrial roaster machine for CECOVASA, one of the best in the global market. Most benefits were oriented to the cooperatives, few of them were individual benefits. Although 41.8% of the budget was oriented to cover this void, the impact was not exactly as expected: it was not possible to sow good coffee varieties in Bolivian communities due to very little installed capacities, reducing coffee quality. Lack of energy did not allow Bolivian producers to use the equipment. Lack of technical knowledge and low knowledge transfer undermine the use of the CECOVASA roaster machine.

As INPANDES showed, deploying infrastructure and equipment has preconditions: Peruvian producers had already more installed capacities (applied knowledge), so they could take more advantage of the equipment as they knew how to use and take care of the chainsaws (while in Bolivia, they are already in poor conditions), or how to transplant seedlings to farmlands (low transplant ratio in Bolivia), as well as the lack of funding, utilities, and providers. Tackling the already identified voids can lead to unleash the potential of the existing productive activities and processes (CV05). Taking in consideration the economy of scale of cooperatives, they can partner with providers from Lima or abroad, facilitating the access of producers to them. Entrepreneurship of supply/tools manufacturers or intermediaries in the region can also fulfill this issue.

CV17: Lack of Access to Financing Sources

The analysis on CV17 (**Table 6.40**) refers to the financial resources, and funding mechanisms that entities and individuals have access to invest in their productive activities or upgrades. Municipalities, cooperatives, and producers, face the same issue but from different perspectives. Municipalities in Sandia can apply for public funds but need professionals to formulate good project dossiers. Cooperatives as CECOVASA and the grassroot ones are limited by their collecting volume and market access, as well as the presence of funding opportunities from financial partners. Producers, also constrained by similar voids to those of cooperatives, access to credits is limited by their financial credibility (or trust into and distance to the financial entities. This last case was problematic for Bolivian producers, far from the banks or financial agencies of Apolo and La Paz, and with low credit history to access credits.

Table 6.40. *Analysis Chart of Connectedness Void 17 (Author's elaboration)*

Void N°17	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] The CAN did not achieve an efficient cross-border financing scheme (just investing each country by its own side). [+] Coffee cooperativism in Peru was developed based on international sales (warranties) and foreign banks (credits). [-] Bolivian organizations have legal constraints to receive foreign funding.	[*] Project under EU funding, but not so much for a productive project (€450k per component). [-/+] The administrative and financial framework of EU's international cooperation has its advantages (e.g., more auditing) and disadvantages (e.g., difficult to adjust budget). [+] Counterparty scheme to promote project ownership from executing/ operating agencies.	[-] Risk of welfarism: dependency to international cooperation (from national governments) and to public funding (from local actors). [-] There is a decapitalization of coffee industry due to the rise of costs. [*] Both governments have earmarked funds for coffee productive development. Only Peruvian government has done it for border development. [+] Bolivia's PNC works with producers under counterparty scheme (70/30). [-] Bolivian legal framework limits funding from abroad. High welfarism from central govt. [-] No funds for binational projects due to the legal restrictions.
Subregional	[+] As binational entity, the ALT could finance in both currencies. [-] MPS manages its own budget but has very slow and bureaucratic procedures to disburse it. [+] DEVIDA works by giving funding to municipalities. [-] Public-funded projects have low effectiveness (financing old-fashioned agricultural extension programs).	[-] ALT had some initial issues managing and transferring between different currencies (euros, soles, bolivianos). [+] Most funding stayed in ALT and some transferred. The MPS preferred full transference, but it was relative slow compared with the ALT disbursement system. [-] Difficulty reducing costs (e.g., buying cheaper or better bikes from China or Japan) due to EU framework (EU Rules of Origin).	[-] Most productive and cross-border dynamics stopped when the budget flow stopped. [-] Budget is still one of the main constraints for cooperatives' performance. [+] Peruvian national agencies have financing, but CECOVASA does not a structured financial plan according to them (disagreements for tentative budget allocation). [-] Financial support from municipalities mainly goes to

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	[+] Historically, CECOVASA used to be a financial provider to Sandia (constructing roads, community centers, etc.), and good catching international cooperation fundings. [+] CECOVASA has invested in its certification process, improving equipment, branding, and more. [-] After the roya, CECOVASA has not been in the best financial conditions (selling Lima port storage, half of Juliaca coffee plant, closing collecting centers to save costs). [-] Coffee-dependent producers, as they receive payment during harvest system, need to administrate it throughout the year. [-] Monoculture represents a higher income risk: diseases or coffee price variations may tumble incomes under production costs. [-] Middlemen are still an option for producers in both sides due to fast cash flow. [-] Coca production represents a higher income source for coffee producers and workers (coca wage: 100soles, coffee wage: 40 soles).	[-] Remuneration for INPANDES professionals and technicians was very low.	producer associations, in lower scale to cooperatives. [-] CECOVASA stills need to ask for credit to start its collecting campaign and pay producers. Low financial capacity to reinvest. [+] Cooperatives offer competitive prices to producers, even more for higher quality (cupping-based). [-] CECOVASA is still under its breakeven point of coffee collection to achieve financial sustainability
Cross-Border	[-] Due to subsistence farming and transaction costs, producers do not have high financial capacity to reinvest in themselves (e.g., buying new seedlings, paying cooperative fee, etc.) or even for daily expenses. [*] Producers' access to credits is low due to income, bad credit history, debts, property rights, and more.	[+] Agrobanco collaborated with credits to Peruvian coffee producers: 39/63 applications were approved (62%). [-] No Bolivian financial agency participated as Agrobanco did.	[-] Producers from both sides were interested in knowing and be involved in the budget allocation for the project or future ones (but did not happened). [-] Most producers prefer donations rather than counterparty systems (as they would not need to pay).
Void Evaluation	**Average presence**	**Targeted? High Efficiency? Whole project**	**Average presence (Similar)**

INPANDES represented the largest financial flow to the CBR (€450K), particularly high for Bolivian producers that never received support before, but low for the Peruvian side. The analysis of all voids would be a better picture of the effectiveness of this funding by the moment (Objective 3). In addition, as part of the INPANDES activities, 39 Peruvian producers could access to Agrobanco credits (62% of applicants). The case study revealed that (Peruvian) producers were interest on accessing credits, but lack of information or trust in financial entities limit their approach and INPANDES could

match this supply/demand of financial resources. However, there were no financial institutions from Bolivia to replicate the same with that side.

Strategies to improve access to financial resources start by addressing the existing voids and can be improved by increasing public capacities (reducing bureaucracy, faster disbursement, binational SNIPs, etc.), associativity (financial planning, CRM to catch more funding, offering credits to producers, etc.), and financial education for producers (manage savings, reduce middlemen opportunism, reinvesting capacity). Another strategy would be promoting PPP especially between municipalities and cooperatives and even producers, diversifying production (reducing risk of coffee dependency), or promoting the counterparty system (involving producers that are motivated enough to invest in themselves).

CV18: Lack of Marketing Channels

The analysis on CV18 (**Table 6.41**) refers to the existence of marketing channels or strategies of producers or cooperatives to arrive to the consumers namely certifications, branding, digital means, etc. Focusing this discussion on CECOVASA, this cooperative has several certifications, georeferenced brands, participation in fairs, and stories (international winners) that have let it to achieve a good positioning at foreign markets and represent the most important assets to generate profits. INPANDES worked on that progressed and delivered Frontera Coffee, brand that was easily sold by CECOVASA during the SCA international fair. It represented a high success as this binational brand (although had troubles to be registered in Bolivia) could be sold representing the joint identity of the CBR. From this perspective, Frontera coffee was not only the brand of the binational coffee, but the brand of the binational project, as most interviewees mentioned it when pointing the main outcomes of INPANDES.

The case study interviews reveal that, because of the market access created by the certifications (an externally recognized proof of coffee quality) they came to represent one of the main elements that hold all grassroot cooperatives, producers, and farmlands in a single cohesive assemblage. However, while CECOVASA has achieved several marketing successes, they have not been part of a long-term planning or organized marketing plan, but on temporal innovation processes that could be rapidly capitalized. The successful marketing channels (except from Frontera coffee) have more than 15 years, but taking them away, CECOVASA has poor social media, no useful website, and weak CRM. In addition, having marketing channels is not the only requirement, but a factor that increase bargaining capacity when accessing markets.

Table 6.41. Analysis Chart of Connectedness Void 18 (Author's elaboration)

Void N°18	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[+] Peru as top exporter in organic and fair-trade coffee. [*] Coffee certifications are expensive and complicated processes for individual producers.		[+] Peru working on carbon zero coffee as country and in partnerships: Binational PPP initiative to promote carbon zero coffee between Peru and Ecuador. [-/+] ANPROCA is initiating several marketing channels (consolidating brands, paying certifications). The most successful is the Presidential Coffee Cup Tournament (allied with national government).
Subregional	[+] CECOVASA has several marketing channels such as georeferenced branding, certifications, videos, producers' stories, etc. [+] CECOVASA georeferenced brands: each brand: collecting an organizing coffee according to its geolocation and quality. [+] CECOVASA coffee counts with several certifications and recognitions: Organic (EU, USA, Japan), Fair Trade, SCA 2010, Rainforest Alliance, etc. [-/+] Tunki coffee has already penetrated in international markets and domestic one, but still needs more work (certifications, traceability, protocols, etc.).	[+] Frontera Coffee: geo-branding coffee from the cross-border region (direct profit to border producers). Average cupping score of 82-83 points (specialty coffee, very good). [+/-] Frontera Coffee was registered in Peru but not Bolivia. [-] CECOVASA social media was upgraded but not under good standards. [+] MPS officers, INPANDES technicians, and key producers participated in local and national coffee fairs under Tunki brand. [+] CECOVASA using SCA fair as platform to sell Frontera Coffee and could arrange sale.	[*] Public incentives for the proliferation of local brands. [-] CECOVASA was about to lose the certification due to quality irregularities. [-/+] Frontera Coffee has not had a yearly production but is still in production (sales in 2019 and 2022). Coffee is not collect from Bolivian side. Still has difficulties penetrating the market. [+] The CECOVASA roaster is in certification process. [-/+] CECOVASA is still positioning in international and domestic markets. Risks of impostors using Tunki bags. [+] MPS focused on coffee promotion: fairs, social media, festivals, facilitating coffee bags to producers, etc. [+] MPS's 'Sandia, the route of the best coffee in the world' selected as top 100 green destinations (2021). [-] Puno jungle and its cities still have a low positioning to be a strong marketing channel for their products.
Cross-Border	[+] CECOVASA (and Coop64) marketing channels (especially certification) are the only means for local producers to export.	[-] The coffee that Bolivian producers gave for Frontera coffee was not the one cultivated during the project.	[-] Some producers did not know about Frontera coffee.
Void Evaluation	**Average/Low presence**	**Targeted? Average Efficiency? High**	**Average/Low (Decreased)**

At producers level, due to the high cost of certification and high transactions costs for exporting, most of them opt for domestic market, applying similar conditions as explained in CV14 (especially for Bolivian producers). However, with the support of municipalities and DEVIDA, many Peruvian producers –and municipalities such as SPPP and Sandia– have been developing their own brands or coffee bars. This proliferation of individual brands represents higher profits for individual producers,

but it also put on the table if public budget on coffee promotion should be earmarked to the producers, cooperatives, or municipalities themselves.

Strategies on improving marketing channels start by addressing the present voids and capitalizing on the current assets. Good progresses have been made from municipalities by focusing on territorial marketing and pushing the concept of eco-tourism corridor with the 'Sandia, the route of the best coffee in the world'. However, there should be more public-public cooperation to consolidate it and position it at international and domestic level, and to anchor more concrete ideas on how to generate more profits from this strategy.

CV19: Low Connectivity and Trade & Transport Logistics Performance

The analysis on CV19 (**Table 6.42**) highlights the connectivity of the CBR in terms of 1) the distance and quality conditions of routes connecting to the case study, and 2) the logistics services that facilitate the transport of goods (and services). The analysis on Section 2.6 showed that complexity of the territory, especially for Bolivia. In addition, it showed the CECOVASA role connecting from SPPP to Juliaca, and then Lima/Callao and the international buyer. While the Sandia highway presents a risk on coffee logistics, the highest risk or burden on the value chain is the distance from the farmlands in Peru and Bolivia to the collecting center in SPPP as it can discouraged producers and be more susceptible to middlemen. INPANDES did not target the low connectivity, but it suffered from its consequences: difficulties meeting between themselves, carrying equipment to the area, or reducing the participation of actors. However, as previously mentioned, the participation of Apolo mayor in the project was the initial step for constructing the future highway to the Bolivian border communities (indirect outcome of INPANDES).

In terms of Peruvian infrastructure, the poor public capacities to design highway projects have been the main obstacles as there are national funds to cover them. While the Bolivian side is in construction, the other relevant element is the possibility of a binational bridge, but current legal frameworks complicate this process (no binational SNIP). In terms of logistics, cooperatives need financial resources to purchase trucks, and producers need them to buy small vehicles to transport their coffee.

Improving connectivity starts by providing infrastructure covering the voids, but also rethinking how logistics can reduce the investment of constructing roads. Using small trucks designed for mountain trails can help increasing connectivity from the farmlands to the collecting center. Thus, fostering entrepreneurship on rural logistic systems or sharing vehicles can be very useful to cut the need of producers to purchasing trucks (some current middlemen could be formalized to provide those

services). For the Bolivian side, while an international bridge is not even an idea of the municipalities, implementing a cable ferry, pontoon boat cargo platform or cargo ropeway can be possible ideas to transport not only coffee, but all kind of goods and people without using rafts or boats. Although the possible Apolo highway might change trade dynamics, it will probably take 6 to 7 hours arrive to Apolo, and around 11 hours more to La Paz, while SPPP is one hour away after crossing the river.

Table 6.42. *Analysis Chart of Connectedness Void 19 (Author's elaboration)*

Void N°19	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] The distance from Juliaca to Callao Port is two long (+20h truck), taking two days to arrive by highway. [-] Bolivia exports through Arica (7.5h) due to logistics constraints in Matarani Port (Peruvian land concession). [-] In general, low connectivity (longer distances, rugged roads) increase transaction costs and limits access of technology, equipment, training, partners, etc. [-] Geographical dispersion demands more personnel to arrive to further places. Particular more difficult in Peru and Bolivia due to the Andes, Amazon, and location of farmlands in high jungle. [-] Historically, producers used to carry coffee on donkeys. Problems: sweat contaminates coffee, donkey needs rest, etc.	[-] Long distances between main actors and areas (CAN/EU in Lima, ALT in La Paz, MPS in Sandia, and the intervention area in the CBR) hindering administrative processes and project actions.	[-] Matarani Port is relatively close to Juliaca (6h) and El Alto (9h), but port logistics is not enough to compete with Callao or Arica. [-] COVID-19 pandemic led to delays on maritime transport (delaying sales and payments). [+] During COVID-19, Bolivian PNC took advantage of the digital boom to connect individual producers with consumers (sales via WhatsApp), reducing the relevance of middlemen from the value chain. [-] Maritime shipping takes between 15 to 45 days to arrive the other country (without considering customs processing time). Roast Coffee quality starts decaying after one-two months.
Subregional	[-] Sandia is the only province in Puno without proper highway. The conditions of the PE34H Highway (Juliaca – Sandia – SPPP) progressively decreases while entering to the high jungle and to the CBR. [+] Good interconnectivity of Juliaca with Puno and other regions. Similar case of El Alto with La Paz and other Departments. [-] PE34Highway problems: high risk of landslides, rammed roads getting muddy in rainy seasons, accidents on one-way roads, not possible to use high-ton trucks, trucks need special coverage above (from rain) & below (from mud), etc.	[-] Complex logistics was a factor to decide where to locate the roaster: First, to carry it to SPPP was difficult with that highway. Second, transporting roasted coffee through the highlands requires good coffee bags and conditioned trucks (moisture freezing leads to coffee solidification). [+] The participation of Apolo authorities in the project incentivized them to start the bidding process to construct the highway. [-] Low connectivity between Sandia and Apolo (only possible to travel through Desaguadero) led to reducing the meetings between stakeholders.	[-] Projects to improve PE34H highway have not been approved (expedition review phase). [+] 'The Apolo – Cocos Lanza – San Fermin' Highway is in construction and expected to be completed by mid/end 2022 (expected travel time: six hours). The road opens the possibility to sell coffee to APCA or Caranavi. [+/-] CECOVASA has its own vehicles to transport coffee, but still needs trucks and bikes for better supervision and collecting from farmlands.

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	[+] Historically, CECOVASA and DEVIDA had a role to promote the construction of roads and trails in the area. [-] No road from Apolo to Bolivian communities (two/three-days walking through jungle). Bolivian producers from the CBR need to go through Desaguadero. Carrying coffee is too difficult. Lack of contact between APOLO and APCA. [-] Middlemen fulfill a logistics function by sweeping-buy local production and carrying to cooperatives.		
Cross-Border	[-] Lanza river divides the Bolivian communities from Peru, but it is their nearest market to access goods and services (and sell coffee). Difficult to cross in rainy seasons (even more with coffee and high volume). The river is also used to transport people and coffee. [-] Puerto San Fermin: no bridge, transport by motorized boats, easy access to PE34H highway. [-] Cocos Lanza: no bridge, transport by rafts, rugged trail to Palmerani before arriving to the highway. [*] Puerto San Fermin is more connected to Peruvian system than Cocos Lanza. [-] Going from Puerto San Fermin to Cocos Lanza is easier through Peru (Through Bolivia: walking six hours/ half day). [-] In both countries, arriving to the farmlands is complex: from the main roads, a one-hour trip uphill on trails in the high jungles (difficult to use trucks or bikes, even more to transport coffee). Peruvian trails are in better conditions. [-] Telecommunication: Border areas and their farmlands have low mobile/internet signal, especially in Peru. Communication happens every time a producer leaves their farmlands to the city a signal spot (approx. every week).	[-] Initially, INPANDES technicians did not have transport means to do the technical visits. ALT bought bikes. Technicians were living in SJDO or SPPP cities. [-] Accessibility deteriorated with weather (muddy roads, higher river flow), reducing the number of technical visits. [-] To take seedlings from the coffee nurseries (located in the city) to communities or farmlands, would take one/two hours. Most seedlings did not arrive to their targeted areas. [-] Official meetings or technical visits used to arrive more to San Fermin than Cocos Lanza. [-] Delivery of equipment happened in SPPP. Bolivian communities needed to approach there.	[-] The 'San Fermin International Bridge' project has not been prioritized by national governments and present several legal and financial constraints. [+/-] Trails' conditions from farmlands to main roads have improved, especially in Peru. However, coffee transport is still a challenge (rugged paths, producers without trucks, etc.). [+/-] Cocos Lanza community opened the Palmerani trail across the riverbank to have better access to Peru. However, the trail is susceptible to landslides and needs improvements. [-] Getting to higher lands for better coffee quality means building new trails uphill (more logistic problems to transport coffee).
Void Evaluation	**High/Average presence**	**Targeted? No Efficiency?**	**High/Average presence (Decreased)**

CV20: Utility Scarcity

The analysis on CV20 (**Table 6.43**) refers to the lack of utilities: water and electricity. Due to the environmental conditions, coffee production in the area does need irrigation, just the seasonal raining. Although post-harvesting requires large amounts of water, this was also not reported as a high inconvenient due to the existence of creeks or water veins in the mountains (post-harvesting is usually done in the same farmland). However, in terms of energy, this represents a constraint for using equipment. In the Peruvian side, the lack of triphasic energy was a reason to not moving the PROBAT roaster to SPPP, but small roasters are okay. The Bolivian side does not count with energy supply, apart from small solar panels for daily use. They do not have energy for productive activities and not even triphasic energy for more sophisticated equipment. INPANDES project initially considered a power generator, but this was removed from the budget, and replaced with the verbal (informal) commitment of SPPP municipality to connect at least San Fermin with the Peruvian public lighting system –although this has not happened yet.

To solve this void, the most cost-effective solutions would demand articulation of both national governments to supply with energy to the Bolivian side, or funding decentralized energy sources such as mini-grids or a weir (small overflow dam). In addition, both municipalities should start considering the impact of climate change on irrigation, as well as the impact of post-harvesting wastewater on the environment.

Table 6.43. *Analysis Chart of Connectedness Void 20 (Author's elaboration)*

Void N°20	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] Washed arabica coffee requires large amounts of water for post-harvesting processing.		
Subregional	[*] Due to the geographical conditions, coffee production does not need irrigation (based on rain and agroforestry systems).	[-] Power generators were cut from the budget.	
Cross-Border	[-] Bolivian communities do not have access to basic services (water and energy). Small supply from wells/tubes and solar panels. [-] Peruvian communities have more access to utilities although it has complications. [-] SPPP has good access to utilities but does not count with triphasic energy.	[-] The INPANDES team needed to deliver the equipment despite there was no energy to make it work. [-] Verbal agreement of SPPP to provide electricity to Bolivia.	[-] Equipment did not work due to the lack of triphasic energy, and no generator was provided.
Void Evaluation	**Peru: Avg./Low** **Bolivia: High**	**Targeted? No** **Efficiency? NN**	**Peru: Avg./Low (≈)** **Bolivia: High (≈)**

2.7.6. Context Voids

CV21: Poverty & Demographic Decline

The analysis on CV21 (**Table 6.44**) addresses the local socioeconomic conditions and the retention of youth in rural border areas. Being a coffee producer, access to market and good profits are the main elements to avoid falling into poverty. While this aspect is targeted by the CBVC itself, discussing on youth migration is crucial for the sustainability of this value chain. The high and fast profits from gold mining and coca production are strong push factors, that move youth out of the cities or coffee productive activities. This is more common in the Peruvian side, as coca eradication was strong in the Bolivian one. This has led to elders carrying out most productive activities and the main decision makers inside cooperatives. INPANDES focused on training some young producers to be technicians. However, only three participated from Bolivia, and 17 from Peru, and there was no certification at the end – a factor that motivates youth within coffee production.

INPANDES did what would be expected to promote youth participation in the coffee CBVC, however, no data was collected to confirm if those technicians are offering services to the communities (although that depend on the motivation of producers to pay them as they were not hired by the municipalities or cooperative). Although youth rural migration is a worldwide problem (Brown, 2021), a deeper understanding of their motivations – beyond fast revenue –can help to turn them into drivers of change and innovation and replace traditional rudimentary practices with a more 21st agriculture production.

Table 6.44. *Analysis Chart of Connectedness Void 21 (Author's elaboration)*

Void N°21	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] National trend (Peru): Approx. 5% of youths want to work on primary production. More youth are interest in agri-export or agriculture extension.		[*] Due to COVID-19 pandemic, many youths went back to their lands, retaking agriculture activities. [+] The Alto Tambopata Action Direct Plan consider Sandia border districts such as critic border zones, with the possibility of receiving national funds for development. [+] Bolivia incentives agriculture diversification to reduce single-crop risks and provide income throughout the year.

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Subregional	[-] The cost-of-living increases as you go deeper into the Amazon (even more at the CBR). [-]Puno is the region with the lowest percentage of young people with access to the financial system. [*] Most population in Sandia (92%) and Apolo (69%) is rural population.		[+] ANPROCA promotes youth internships to train university students (producers' children) in coffee agriculture extension (focus on post-harvesting). [-] Cooperative boards are composed by elders with low schooling level. Low generational rotation does not allow cooperatives to improve. [+] Youth represents an innovation opportunity to upgrading coffee value chain (technology, management, etc.). [+] Educated children become the main access of producers to market information, technology, financial opportunities, etc.
Cross-Border	[-] This CBR is characterized by low HDI index, especially in Bolivia. Most producers live under subsistence agriculture (family-based). [-] Bolivian communities do not have access to social services and infrastructure (utilities, health facilities, etc.). They need to cross to access them. [+] SPPP is the largest city in Sandia, offering a broad variety of services (if not, the nearest center is Juliaca). [-] Youth migration to urban centers (mainly Juliaca or La Paz) or more profitable economic activities (mining, coca) lets coffee production to elder producers. [-] Elders' physical conditions limit their activities in primary production. [-] Most young producers from Peru have left CECOVASA. Mainly elders want to be associates. [-] Many producers count with low schooling level (especially in terms of business or financial education). [-] As coffee harvesting happens once per year, coffee producers need to administrate their savings throughout the year.	[-] Mostly elders participated in INPANDES activities. [-] The project intended to train technicians and some youths were interest, but they did not receive any certification.	[-] Difficult relationship between elder and youth: the former questions the trust/ loyalty of the latter in terms of continuing coffee production. [-] Youth strives for economic activities that 1) produces faster retribution of benefits, 2) superior education, both not directly connected with coffee primary production. [-] Training elders does not represent a good investment (e.g., they forget trainings, cannot execute in their lands, etc.). [-] Coffee monoculture, especially in Peru, still represents a risk for family economies.
Void Evaluation	**High/Average presence**	**Targeted? Average Efficiency? NN**	**High/Average presence (similar)**

CV22: Low Access to Secure & Quality Land

The analysis on CV22 (**Table 6.45**) highlights the land-related issues: size, fertility, and ownership. For this case study, altitude is an important factor as lower lands – as in the border areas, generate more quality defects (low volume), has shorter harvesting periods (lower volume if not collected fast), and has lower cupping quality. Thus, just by having lands near the borders they are in disadvantage. However, as shown by the Peruvian producers, good productive practices (based on good technical knowledge) and occupying higher lands have been the main strategies to couple this problem. Nevertheless, producers need to invest and purchase land to achieve a minimum of 3ha so they can have a good quality of life. INPANDES had little intervention on this issue, mainly as part of the Good Practices Program for Bolivian producers or as part of the trainings on land fertility and organic fertilizers. However, there were little in-situ training (going to the producers' farmlands to teach them).

Table 6.45. *Analysis Chart of Connectedness Void 22 (Author's elaboration)*

Void N°22	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] Land size for coffee production is different in Peruvian territory: the north counts with larger extensions (5-10ha), than Puno (0.5-2ha). [-] Land size is larger in Bolivia than in Peru (higher land atomization/ parcellation). [-] In Peru, land tenure and formalization are a lagging problem, especially for women. [-] In Bolivia, producers have land use right but not land property rights (land cannot be used as an asset for credits). [-] One of the main triggers of Bolivian production decay was production decrease due to old plantations (+30 years) . [*] Producers need at least 3-5ha to live based on coffee production. Under this, it is just subsistence agriculture. [*] For coffee, quality is positively correlated with altitude (better conditions). This conditions also limit the coffee variety that can grow (higher altitudes allow better coffee varieties).		[-] Climate change is making lowlands (under 1200m) unsuitable for coffee production. Weather change increases plagues, affect quality, and increase coffee defects. By 2030, Peru would lose 30% of land suitable for coffee production. [+] Bolivian PNC focused on renewing old coffee plantations. [+] Peruvian PNA-CAFÉ focused on renewing old coffee plantations and formalizing land tenure by giving property rights, especially for female producers.

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Subregional	[+] Puno-La Paz subregion counts with similar altitude floors and ecosystem (subregional coffee corridor: 800masl – 2500masl). [-] SPPP & SJDO are in the buffer zone of Bahuaja Sonene Park, and Apolo is in the buffer area of Madidi Park. This location hinders the expansion of productive activities. [-/+] The local climate conditions do not require to irrigate. However, it requires to harvest fast as rains can precipitate the coffee and waste it. [+] SJDO and Apolo share similar altitude (above 1200masl), ecosystem, and soil composition. They deliver similar coffee quality and varieties. [-] Producers in Sandia has small land extensions (less than 2ha). La Paz producers have 20ha, but only 3-5ha dedicated to coffee production. [-] Land atomization and difficult geography hinder mechanization and scaling.		[-] Land fertility has decayed due soil ageing and coca production, decreasing productivity (quantity and quality). [+] The opening of the new highway in Apolo represents an opportunity to access to fertile lands with good altitude.
Cross-Border	[-] Border areas (CBLs) from both countries are in lowlands (from 700/800masl – 1200/1300masl) compared with SPPP or even SJDO. Lowlands are warmer and produces lower coffee quality. Harvesting season is shorter, and land decays faster. [-] Producers from the Bolivian communities do not have large land extensions (around 2ha). Most of them are abandoned. [-] In both countries, arriving to the farmlands is complex: from the main roads, a one-hour trip uphill on trails in the high jungles (difficult to use trucks or bikes, even more to transport coffee). Peruvian trails are in better conditions.	[+] The Good Practices Program & trainings for Bolivian producers also had some recommendations for land fertility and organic fertilizers.	[-] Good primary production increases productivity and coffee quality even from lowlands. [+/-] There are vast extensions of land near Bolivian communities (+26,000ha), but they do not have the manpower and technical knowledge to do it. [-] Getting to higher lands for better coffee quality means building new trails uphill (more logistic problems to transport coffee). [-] Expanding coffee lands demands more work to produce in productive systems where the family is the main source of manpower.
Void Evaluation	**Average presence**	**Targeted? Low Efficiency? Low**	**Average presence (similar)**

While land size issue was address by focusing on quality rather than quantity, altitude is a more complex factor to solve: to occupy higher lands requires more investment and distance to arrive them. However, during cultivation and harvesting seasons, producers usually stay in their farmlands most weekdays and go down on weekends to deliver coffee and buy groceries. Thus, the main problem is not to stay in those lands, but the connectivity to the city. Another issue is related to how to improve

farmlands: technification in the mountains is limited by the impossibility of mechanizing production. However, if they follow organic production practices such as selective harvesting, they do not need machines but skillful manpower and therefore, financial resources to pay them fair wages. In other words, improving this void is closely linked with the producers' investment capacity. In addition, future actions should consider climate change adaptation strategies as it is expected a loss of 30% of lands, especially lower lands, as their environmental conditions will change (getting hotter, more plagues), making coffee production non-viable.

CV23: High Environmental Degradation

The analysis on CV23 (**Table 6.46**) points the impact of productive activities on environment, as well as environmental problems have over production. This section also considers the impact of pests and integrated pest management strategies. The roya plage (Hemileia vastatrix or coffee leaf rust) is considered in this void as it has a long-term impact on coffee plants, directly (risk of destroying the plant), and indirectly (due to pesticides). While this plague penetrated the Sandia Valley and CBR a decade ago, it was a huge problem that affected coffee volume (reduction of 70% to 90% of production), and producers' motivation (destruction of their investments and heritage). This was particularly serious in border areas as the warmer conditions of lowlands were the conducive environment for the roya growth (Zambolim, 2016). The latter led to the expansion of coca production as the coca always existed in the region but generalized after the roya as an economic alternative. In addition, the use of coffee varieties that are resistant to the roya (such as catimor coffee) can lead to lower cupping quality, pushing producers out of the business due to even lower profits.

INPANDES project focused on promoting agro-forestry systems through their trainings. However, as explained in CV11, those activities had low impact. Currently, the situation with the roya has improved, but not because of the project. Even though, as producers commented, coffee production is still low (harvesting around 30%-40% of previous capacity). For producers, coffee was a source of identity (coffee as symbol of the Sandia Valleys and recognized worldwide), financial security (able to make a living based on their efforts, continuous payment), and acceptance (the cooperative as their circle of socioeconomic relationships). Thus, the effect of roya on the producer's Psyche was particularly high: to keep doing something that 'failed them' while having in front of them the high profitability of coca production had a serious impact on coffee production. Volume is still low, and in front of climate change affecting Amazon areas (the roya has been identified as an early indicator of warmer temperatures (Avelino *et al.*, 2015)), good environmental practices are fundamental.

Table 6.46. Analysis Chart of Connectedness Void 23 (Author's elaboration)

Void N°23	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] Coffee monoculture has been widely practiced for the last 30 years in Peru [+] Focus on environment-friendly certifications (Rainforest Alliance, Bird Friendly, etc.) and organic has been a common strategy in both countries. [-] Coffee production (pulping and washing) generates great amounts of wastewaters that need to be treated before disposal. [+] Good technification and agro-forestry practices has the impact to reduce the effect of roya.	[+] The project team considered that coffee plagues and diseases (such as the roya was) were a cross-border environmental risk: There is a need to take care of them jointly.	[-] Climate change is making lowlands (under 1200m) unsuitable for coffee production. Weather change increases plagues, affect quality, and increase coffee defects. By 2030, Peru would lose 30% of land suitable for coffee production. [+] Peru working on carbon zero coffee as country and in partnerships: Binational PPP initiative to promote carbon zero coffee between Peru and Ecuador. [+] Bolivia incentives agriculture diversification to reduce single-crop risks and provide income throughout the year.
Subregional	[-] Sandia used to be under coffee monoculture. Due to the roya and coca, people changed to other crops, but monoculture is still strong. [+] Old non-ecological practices (e.g., slash-and-burn agriculture) have been replaced by more ecological ones. [+] Agroforestry systems are widely practice in La Paz and Puno (especially SJDO and SPPP). Investing in trees is a [+] Organic-oriented production avoids the use of pesticides and other chemicals. [-] Rainforest deforestation reduces rainfall, undermining coffee production. [-] The roya has generated a long-term damage on coffee plants, especially the ones that give good to high quality (vastly planted in this area). It drastically reduced production in the subregion and affected producers' motivation. [-] Coca production has generated deforestation, and land degradation based on pesticides and chemicals.	[+] The project was executed in the buffer zone of two National Parks, incentivizing an ecological approach: fauna & flora conservation, agroforestry systems, shadow management, and more.	[-] Puno cooperatives still have a traditional approach based on coffee monoculture. [-] There is still more technical knowledge to promote good practices for environmental conservation (e.g., using incorrect trees for shadows can destroy production). [-/+] Producers have knowledge on good practices, but do not implement due to other related factors (e.g., how to buy and carry dozens of organic fertilizer bags from the road to the uphill farmland?). [-] The roya is still a reality in the coffee production of the subregion and CBR, although its impact has reduced throughout the time.
Cross-Border		[+] Technical assistance focused on giving pro-ecological practices. [+] No chemical-based fertilizers were given in the project.	
Void Evaluation	**High presence**	**Targeted? Low Efficiency? Low**	**High/Average presence (Decreased)**

Strategies for reducing the impact of roya starts by increasing technical knowledge on early warning systems (fast detection) and agro-forestry systems (frequent cleaning, native shadow management), although these measures reduce the risk but not eliminate it, while it requires good training to reduce other threats (e.g., using the wrong trees for shadows can destroy land fertility and crops). Other option is coffee breeding (genetically improved coffee varieties), as crossing species can offer good cupping quality while they are still resistant to the plague. By the moment, this is considered the best long-term solution for the roya management (Avelino *et al.*, 2015), but it demands investment in R&D.

CV24: Gender Inequity

The analysis on CV24 (**Table 6.47**) refers to the impact of gender inequity or low role of women into the coffee CBVC. During the field study, this was the least commented topic (5/+1400 quotes) because, although women are an essential part of the traditional coffee value chain (to evaluate coffee grain), this process was replaced by the CECOVASA milling machine with optical sensor. As the main role of women is in primary production, studies in Puno have revealed the importance of gender equity to improve knowledge transfer of organic technical knowledge as they increase the probability of chemical-free production (Olarte Calsina and Gouvea, 2013). However, the gender equity agenda in Peru is still in construction. Bolivian legal framework empowers women more than Peruvian one: The Bartolina Sizas are the women associations in each community of Bolivia, with representation at department and national level. This was quite evident in the greater participation of Bolivian women than Peruvian one in the INPANDES trainings (while in male training more Peruvian participated).

INPANDES project considered gender equity to promote fairer dialogue in the binational technical groups, and to improve knowledge transfer, especially in improving coffee quality (sorting and cupping). While there is no report about the impact of these trainings on women, as most coffee sorting/cupping ladies were from Bolivia and production there almost disappeared due to the roya and coca, most of them did not have job to do (focus on primary production).

Strategies to increase gender equity and role of women in coffee production starts by addressing their main constraints in public policies. As example, the Peruvian PNA-CAFÉ has considered to give land property rights to women to reduce the land access gap. As technological improvement will displace the women role on quality control, while training them on cupping quality is an option (as the project did), it would have more impact to train them on cultivation and good organic practices as they oversee the farm, the crops, and the family while men are not in the field or are traveling to sell their coffee. However, INPANDES also did not understand the gender dynamics in border rural areas, as the

female participation decayed over time. Thereby, if programs want to consider a gender equity approach, more specialists and applied research are required to understand women role and dynamics.

Table 6.47. *Analysis Chart of Connectedness Void 24 (Author's elaboration)*

Void N°24	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[+] Bolivia has promoted gender parity in the Constitution and in several institutions (e.g., Bartolinas Siza).		[+] Women participation can help in agriculture diversification to provide food nutrition for the family (not only coffee).
Subregional	[-] Men are considered as the main coffee actors, although females play a relevant role in coffee production (they oversee the lands and family while men are not there). [-] Men are mostly invited to trainings, low participation of female producers. Thus, trainings might not effective. [-] Most cooperative leaders are male (CECOVASA: only 20% of the board has been female). [*] Female plays a relevant role in coffee quality control: the role of sorting ladies to evaluate grain quality in the milling process.		[-] Upgrading technology implies to reallocate the role of women in coffee value chain (what could sorting ladies do if replaced?).
Cross-Border		[+] The project trained female producers to be part of quality control process. [+/-] The INPANDES events incentivized the assistance of female producers, but this was low (10%-30%). Some of them dropped the trainings. [+] INPANDES promoted female-oriented events and trainings, especially for one binational technical group, and the trainings for coffee sorting and cupping. [+]There was more participation of Bolivian female producers: 20 female coffee tasters were trained: 15 Bolivian, 5 Peruvian.	[-] As coffee production stopped in Bolivian communities, female producers mainly focused on cultivation rather than quality control (sorting, not cupping). [+] The project showed that female producers are interested and participated in the events. However, as they oversee their families, more understanding of how to reach them is required so they do not dropped the activities.
Void Evaluation	**Peru: High** **Bolivia: Avg./Low**	**Targeted? High** **Efficiency? NN**	**Peru: High (≈)** **Bolivia: Avg./Low (≈)**

2.7.7. Borders Voids

CV25: Informality of Cross-Border Economies

The analysis on CV25 (**Table 6.48**) points the existence of cross-border informal dynamics in terms of labor, production, and trade. The presence of trade barriers (e.g., no regulatory agencies, no customs, no cross-border commuting permits, etc.) does not allow Bolivian communities to formally buy and sell goods and services from Peru, although these dynamics happen at a little scale (population is low): Bolivian producers crossing to work as day workers during harvesting season, crossing with coffee to roast it, or selling their coffee to the Peruvian buyers. The latter is the most common dynamic, corresponding to cross-border informal trade (CBIT) and were Bolivian producers sell to their cooperatives or middlemen/ compadres. Before the project, Bolivians could associate to the grassroot cooperatives and the CECOVASA, but this changed with the intensification of trade barriers, being only possible to sell through the middlemen, but most coffee would arrive to the cooperatives at the end. INPANDES started conversations about legalizing the coffee flow, but no measures were taken by chancelleries.

The CBIT was mostly a one-direction flow, with a high dependence of Bolivians to Peruvian economy. In the practice, with low technical knowledge applied in their production, and low-quality control procedures from middlemen, low quality coffee used to arrive to the cooperatives, undermining the evaluate of the whole batch. While the only solution to CBIT is its formalization by reducing the trade barriers, the project until a certain point, represented an 'informal formalization' of the CBIT into a CBVC as chancelleries allowed it to happen temporarily. Discussing what is 'cross-border' in these dynamics is especially important to reduce trade barriers. Although this can be a long discussion, proposals in CV29 will shed some lights on this topic.

Table 6.48. Analysis Chart of Connectedness Void 25 (Author's elaboration)

Void N°25	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational		[-] During the INPANDES project, the fact about formalizing the CBIT was ignored.	
Subregional	[-] There are only two official border crossings throughout the border. Cross-border informal trade (CBIT) is part of daily life in most part of the border (even Desaguadero). [-] CBIT or smuggling has become in one of the main economic sources for many local entrepreneurs. [*] Change of direction of regional informal coffee trade: at subregional level, coffee CBIT flows used to be from Peru to Bolivia (Caranavi) via middlemen. This was reversed with the weakening of Bolivian production.		[+] CECOVASA has been part of the CBIT dynamics and participated in both CBVC projects (PRA and INPANDES).
Cross-Border	[-] No official border crossings (everything would be CBIT). [-] Bolivian communities need to use Peruvian goods and services for daily life. They do not use Bolivianos, only Soles. [+/-] Bolivian communities can only sell their coffee to Peru via Peruvian middlemen or cooperatives: they add value by 'nationalizing' the coffee. [+] Bolivian producers used to belong to CECOVASA grassroot cooperatives and sell their coffee in SPPP. [-/+] Collection from both sides used to be in local collecting centers. After roya, it was centralized in SPPP coffee cluster. Collection happens every Saturday morning. [+] Bolivian producers work as temporal have worked for Peruvian producers during harvesting season. [+] Producers with double nationality have previously been the nexus for Bolivian producers to sell to the cooperatives.		[-] With the aggravation of trade barriers, Bolivian producers could only sell their coffee through middlemen. The coffee finally arrives to the Peruvian cooperatives. [-] Middlemen offer differentiated price to producers (50% or less than from cooperatives). [-] Informally traded coffee can undermine general coffee quality, putting in risk cooperatives' quality standards & certification. [-] Few 'Bolivian' producers (double nationality) sell to CECOVASA officially. [+] 2022: CECOVASA board approached Bolivian communities to reestablish contact with producers. [+] Cocos Lanza community opened the Palmerani trail across the riverbank to have better access to Peru through a Peruvian producer's farm.
Void Evaluation	**Avg/High presence**	**Targeted? No Efficiency? NN**	**High presence (Increased)**

CV26: Presence of Illegal Flows

The analysis on CV26 (**Table 6.49**) remarks the impact of illegal economies and their flows on the CBVC. While there are several illegal dynamics occurring in this section of the border (e.g., gold mining in rivers, traffic of endangered species from National Parks, etc.), the most relevant activity is coca production. Despite the coca has been a fundamental element of the Andean cosmovision and local indigenous culture, a competitive exclusion principle (Hardin, 1960) applies between coca and coffee: both products cannot coexist as they compete for identical resources such as land, cultivation conditions, and manpower.

First, border areas are perfect for coca due to its low altitude (good environmental conditions for its growth), so coca and coffee compete for the same space and in multiple cases (as observed in the case study), half land is for coca and the other for coffee. Second, coca monoculture decrease soil fertility, causes landslides, and destroy biodiversity (Jacob, Lohse and Milz, 2018), making inviable to growth coffee in a land that was already used for coca.

Third, as coca crops are next to coffee ones, the use of pesticides or synthetic fertilizers for coca production generates cross-pollution, undermining organic production and affecting coffee quality. Finally, as Section 2.4 shows, coca used to be ten times more profitable than coffee, with better wages for day workers (2.5 times higher). Upgrading downstream processing to produce cocaine paste or cocaine would increase profits up to 250 to 500 times more, respectively (Alvarado Santillana, 2011).

Table 6.49. *Analysis Chart of Connectedness Void 26 (Author's elaboration)*

Void N°26	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] While coca leaves are a key element in the Andean cosmovision, more than 2/3 of its production goes for cocaine production. [*] Peru: coca eradication was not strong in terms of military intervention but through development programs (DEVIDA). [*] Bolivia: coca eradication has been carried through military intervention, and some development programs.		[+] The coca global price has decreased, so many producers have moved to other economic activities.

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Subregional	[-] Gold mining happens in riversides, especially in SJDO and Yanahuaya. [-] Coca production was always present in the subregion, especially in Bolivia. Coca grows in similar conditions to coffee, especially in average and lowlands (800masl – 1600masl). [-] When the roya attacked, coca production intensified in Puno, increasing insecurity, and living standards (from SPPP to Juliaca). [-] Many coffee producers became coca producers or practice both simultaneously, as it was a good profit throughout the year (coca stabilizes income fluctuations). [-] Coca production is more profitable than coffee and gives four harvests per year. Competes with coffee for land, and workforce. [-] Coca production represents a higher income source for coffee producers and workers (coca wage: 100soles, coffee wage: 40 soles). [-] Coca production, as it happens next to coffee one, generates cross-pollution (pesticides, chemicals), reducing coffee quality and organic conditions.		[-] Mainly youth are involved in coca production due to its fast redistribution of profits. [-] The use of pesticides for coca production has been one of the main bottlenecks to ensure organic coffee certification in both countries, but especially for CECOVASA. [-] Many productive assistance programs go to coca producers, and they use the free supplies (fertilizers, tools, etc.) for coca production.
Cross-Border	[-] In Peru, coca production is more concentrated in SPPP (lower lands) and reduces as you move away from the CBR. [-] The borders have high presence of narcoterrorism groups, increasing insecurity. [-] The San Ignacio aerodrome (SPPP border area) was previously used for coca transport, before it was closed.	[-] In Cocos Lanza, most producers were coca producers, so only few producers involved in INPANDES were devoted to coffee production.	[+/-] Coca eradication from Bolivia military has been strong. Coca production continues in the Bolivian communities but in very small parcels. Peru has not had this kind of interventions. [+] The reduction of coca price has been an incentive for local producers, especially Bolivians, to retake coffee production.
Evaluation	**High presence**	**Targeted? No** **Efficiency? NN**	**Peru: High/Average (↓)** **Bolivia: Average/Low (↓)**

While the INPANDES project did not target this issue, it clearly dealt with coffee producers that were coca producers simultaneously – a factor that discouraged their participation in the project, especially Bolivians. Strong interventions on coca eradication would come later with the Bolivian military, while Peru had a softer approach through DEVIDA and its coffee development programs to replace the illegal crops. Nowadays, as the coca global price has dropped, many producers have moved to other economic activities, leaving their coca fields.

Literature on coca eradication indicates that crop substitution and community-based coca control are promising strategies that can be implemented (Moreno-Sanchez, Kraybill and Thompson, 2003; Grisaffi and Ledebur, 2016). However, as this has been the Peruvian approach with low effectiveness, there is a need to review current policies and improve them. This begins by exploring in more detail producers and workers' motivations and how they can earn more profits based on legal crops.

2.7.8. Legal Voids

CV27: No Harmonization of Border Policies & Policies at the Borders

The analysis on CV27 (**Table 6.50**) refers to the presence of border policies, laws, and regulations (or sector policies in the borders) in 1) Peru, 2) Bolivia and 3) if there is compatibility between both systems. A fourth element could be add: the presence of cross-border integration & development (CBI&D) policies or plans, although they might require the previous three conditions. As the comparison presents, Peru has developed more tools for border development than Bolivia, that still has a more protectionist policy. However, Peru and Bolivia has the ALT, that represents the most progressive agency to conduct bilateral integration at subregional scale, but it still has flaws. INPANDES project had as a specific objective to shape cross-border governance, so it had special interest on shaping cross-border development policies between municipalities. However, low participation in decision-making spaces (due to distance and time), low motivation of municipalities (low incorporation of discussion outcomes), and political changes (changes of administration) led to very low efficacy. After the project, Peru had more progresses in CBI&D with its Policy Framework (2018), and the funding for border municipalities or FIDT (2022).

Strategies for better cross-border policies begins by increasing the motivation of Bolivian national government and changing its security approach on border for a development one. A second step is to improve the current bilateral institutionality, especially the ALT. Despite of the problems of this institution, it could carry the project and finished it. The ALT and its current process of restructuration represent an opportunity to expand its capacities: establishing special committees or sub-agencies that can articulate specific areas of the border can reduce several complications such as calling for periodical meetings with all government levels (greater convening power), financing other coffee CBVC, constructing binational bridges, and more. In case this would not be possible, and no other bilateral agency can be created, it is required other bilateral mechanisms as a binational SNIP.

Table 6.50. Analysis Chart of Connectedness Void 27 (Author's elaboration)

Void N°27	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] National border policy for Peru is oriented to development (e.g, Directorate for Border Integration & Development), while Bolivia still focused on security (e.g., ADEMAF). [*] The convergence of different sector policies should be further studied in border areas for better integration and development.		[*] Peru continued making progresses on border policy (Policy framework 2018, FIDT funding), while Bolivia has not. [+] The MMPNPT study on legal compatibility for CBC shows that it is possible to generate more comprehensive legal frameworks under the CAN umbrella. [-] Lack of a binational SNIP.
Subregional	[+] ALT is the only binational agency that has jurisdiction in the binational IWRM system. It is the only institution that can carry out binational projects without legal inconvenient. [-] There is no articulation of development plants between governments of their own country, and across them.	[+/-] The ALT was selected as the executing agency due to its legal capacities, although CBVC is not under its responsibilities. [+] Despite the initial administrative-financial struggles, the ALT could finish the project. [-] INPANDES tried to include cross-border components into the development plans but did not progress. [-] The INPANDES team tried to elaborate the Cross-Border Policy Agreement between municipal officials and producers but there was low predisposition (no time, long distances).	[-] The ALT is under restructuration due to problems in its administrative-financial processes. [-] The ALT has the legal capacity to conduct other binational projects, but it only oversees IWRM issues. Thus, there is a need for a more comprehensive legal framework for binational initiatives.
Cross-Border			[-] Implementation of border policies at local level is still a problem. The FIDT started to solve but has not been operational until 2022. [-] Binational projects such as the 'San Fermin International Bridge' have many legal barriers, especially from the SNIPs.
Evaluation	**Average presence**	**Targeted? High Efficiency? Low**	**Average presence (Decreased)**

CV28: No harmonization of Business/Industrial Development Policies

The analysis on CV28 (**Table 6.51**) is very similar to CV27 but oriented to productive, business, or industrial development policies, laws, and regulations. In terms of the coffee industry, both countries do not have a full set of regulations on coffee, lack of national policies, but do have national mechanisms as the Peruvian PNA-CAFÉ and the Bolivian PNC (although they have started in the recent years). While Bolivia government is not present in the coffee development of its border, Peruvian government lacks multi-level and horizontal articulation for coffee development in the Sandia Valley, but with agricultural extension programs that should be improved as previously commented. Other policies that

could promote industrial development are related to FDI, cooperatives, and commonwealths, but there is no compatibility in these three aspects. The INPANDES project also tried to push cross-border governance in terms of productive articulation but faced similar constraints as in CV27.

Constructing a bilateral coffee institutionality is still a far objective but the new national mechanisms are a progress on their individual agendas, and they share similar strategies in common (renovation of old plantations, coffee R&D, provision of supplies, etc.). Articulating between actors for coffee development is not an impossible challenge, but a matter of motivation: In May 2022, Peruvian and Ecuadorian actors started a binational PPP initiative to promote a carbon zero coffee program. This is composed by associations of municipalities, universities, technical schools, multistakeholder platforms, and NGOs.

Based on the presented voids, starting better productive articulation requires a strong leader institution(s) in the Peruvian side of the CBR, with convening power to organize local actors in decision-making spaces: district and provincial municipalities, national agencies, cooperatives, producers, and other related stakeholders. In Bolivia, this remains difficult due to the distance from their own district capital, but including Bolivian producers in Peruvian meetings, even informally, represents an option against total isolation. This should help the formulation of suitable local coffee development programs.

Table 6.51. *Analysis Chart of Connectedness Void 28 (Author's elaboration)*

Void N°28	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] In both countries, there has been a lack of institutionality to achieve consensus on a coffee policy agenda (it is vertically disarticulated). In addition, there is no cross-border productive integration between countries/peers. [-] Peru does not count with national technical regulation on coffee's primary production, but it does for roasting. Bolivia also does not count for primary production. [-] Commonwealth legislation is different between Peru (public entity) and Bolivia (private entity). [-] Bolivian organizations have legal constraints to receive foreign funding.		[+/-] It is possible to register a binational brand under the Andean Designations of Origin (Decision 483), but there are still bottlenecks to facilitate that process for the intellectual property offices of each country. [+] There are some similitudes between Peruvian PNA-CAFÉ and Bolivian PNC in terms of R&D, provision of supplies, renewal of old plantations, etc. [-] The countries have not target the roya apart from technical assistance and supplies. [-] Peru nor Bolivia have national policies for coffee development (only plan and program respectively). [*] Different approaches for eliminating middlemen: Peru through cooperatives, Bolivia through e-business and individual brands.

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			[+] Cooperative law has improved recently in Peru (longer periods for executive board members, easier access to credits, etc.), but Bolivian one still needs improvement. [-] There are still several constraints for more accurate rural policies and programs in both countries. [-] Associating businesses across the borders is still complex, even with the existence of an Andean framework that promotes it.
Subregional	[-] The MMAP and MMNPT tried to join efforts in a binational commonwealth, but it was not possible due to incompatible legal frameworks. [-] Productive projects have not been priority from subnational and local governments (long-term investment, not politically effective). [+] The SPPP's Specialty Coffee Program articulated the municipality with DEVIDA and CECOVASA to improve local productive standards. [-] DEVIDA's 'catimorization' promoted more resistant plants, but also low cupping quality (more difficult to sell at a good price). [-] Peruvian cooperatives do not receive funding from municipalities, but from national agencies.	[+/-] INPANDES included components for coffee sector development in the development plans of the Peruvian municipalities (Sandia, SPPP, SJDO), but there was not reply from Apolo. [-] INPANDES could not achieve bilateral agreement in common coffee production vision and policies (only Sandia and SDJO). [-] The Frontera Coffee was only inscribed in Peru because Bolivian process was bureaucratic and slow.	[-] Cross-border policies were not continued due to the change of municipal administrations. [+] Bolivian PNC promoted varieties with average cupping quality. [-] CECOVASA is starting to articulate with national agencies' funding opportunities. [-] There is a non-alignment/ mismatch between different programs (public and non-public) in the area (e.g., SPPP program differs from CECOVASA one). [-] Coffee technical assistance programs are not updated (DEVIDA & traditional agri-extension projects). [*] DEVIDA, provincial and district municipalities in Sandia, have earmarked public incentives for the proliferation of local brands.
Cross-Border			[-] Bolivian producers cannot access to the benefits of Peruvian coffee campaigns.
Void Evaluation	**High/Avg. presence**	**Targeted? High Efficiency? Low**	**High/Avg. presence (decreased)**

CV29: Presence of Trade Barriers

The analysis on CV29 (**Table 6.52**) highlights the presence of tariff and non-tariff barriers in the CBR. Lack of motivation of national governments, especially from regulatory agencies, and the long distances to the border (even more from Bolivia) are the main reasons to not establish border crossings in the area. This problem leads to a poor market access, where Bolivian can only sell their products through informal trade to middlemen, and receiving low prices for their coffee that eventually, would lead to a demotivation of producers. INPANDES did not have outcomes on this topic, although chancelleries had a verbal commitment to discuss the issue. As commented, the intensification of barriers led to less market access, pushing out many Bolivians from their productive activities.

Table 6.52. Analysis Chart of Connectedness Void 29 (Author's elaboration)

Void N°29	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] Anti-competitive behavior between national trade-related or border-related agencies. [-] The Andean FTA has not been effective promoting bilateral trade between Peru and Bolivia due to protectionist measures (tariff and non-tariff barriers). [-] Higher non-tariff barriers (e.g., SPS measures, certification requirements) makes more difficult to penetrate foreign markets such as EU, USA, or Japan.	[-] During the INPANDES project, the fact about formalizing the CBIT was ignored to continue with the execution of the project.	[-] It is needed more studies on the requirements and incentives for entrepreneurs/ producers/ businesspersons to formalizing their cross-border flows. [+] The MMPNPT study on legal compatibility for CBC shows that it is possible to generate more comprehensive legal frameworks under the CAN umbrella.
Subregional		[+/-] In the first technical group, chancelleries agreed to promote a better coffee export system between CECOVASA – APOCOM, but this was not possible due to administrative issues.	
Cross-Border	[-] Lack of border crossings and incentives to promote one in this area. As cross-border flows are low/ micro, regulatory agencies do not want to be present. [+] Bolivian producers could associate with CECOVASA's grassroot cooperatives, directly selling their coffee, but informally or through a producer with double nationality.		[-] After the project, CECOVASA started demanding tax invoices (only available for Peruvians). Thus, Bolivian producers could not directly sell their coffee, only via Peruvian middlemen. [*] Middlemen as means to 'legalize' export.
Void Evaluation	**High/Average presence**	**Targeted? No Efficiency? NN**	**High presence (Increased)**

The presence of trade barriers was an initial (Bolivian) argument against INPANDES: technically, the project was going to support the coffee CBIT. However, as commented in Section 2.2, as Bolivia got its water resource project and the coffee flow was microscopic, Bolivia accepted the Peruvian proposal. Nevertheless, under a more 'hopeful reading', both governments raised the importance of a cross-border territoriality (local people matters) over national interests (from States that are absent).

To formulate a better reduction of those trade barriers, is required to understand where (or what) the 'cross-border' is in this cross-border informal economy or value chain. Three answers are suggested based on three different readings of the case study.

First, ‘cross-border’ as a spatiotemporal event: the main cross-border activity is during collection, and when the Bolivian used to belong to the cooperative, this transaction did not only have a place, but specific time. Bolivian producers (as well as Peruvian ones) needed to go to SPPP coffee cluster every Saturday morning to sell their product, leaving their lands by 3/4am to arrive to the cooperative and sell it while it was opened from 8am to 12m. This opportunity also was useful to buy local groceries. This interpretation reduces the ‘cost’ of reducing trade barriers, as governments do not need to establish offices in the border, but to send regulatory agency officials during harvesting season (April – June/July), and only one morning every week – leading the possibility to even consider digital customs to realize inspections. Similar solutions have been provided in the Peru-Bolivian border, in the San Lorenzo – Extrema informal crossing (Section 2.1) (Wong Villanueva, 2019).

Second, ‘cross-border’ as historical contingency (Fukami, 2015): CECOVASA has been the ‘origin’ and the ‘destiny’ of coffee trade even before the Bolivian communities were established. Peruvian associates of CECOVASA were the first colonizers of Bolivian border, and after they left, basic productive activities were already installed and retaken by Bolivian producers. As the nearest market, the Central was the only possible destiny to sell, directly or indirectly. In addition, CECOVASA was a strategic partner of both CBVC projects, the PRA and INPANDES. Thus, this cooperative has promoted not only the historical contingency of ‘assembling’ the CBIT even before trade was with Bolivians, but also involving in its ‘formalization’ attempts. Considering a direct trade scheme or PPP agreement between governments, the cooperative(s) and the Bolivian producers, it would be possible to facilitate trade and even the provision of other services such as technical supervision and credits to those producers. Similar experiences have been realized in the world as in the tea CBVC between Yunnan (China) and Phongsaly (Laos) (**Chapter 2**) (L111).

Third, ‘cross-border’ as a non-human interaction. Using Latour (2005)’s concept of actant (“the one that realize an act”), coffee is a non-human actor that defines what is cross-border or not in its interaction with the border (another non-human actant). Without coffee, there is no cross-border interaction, and the same happens without a border or better said, without the border effect. This matters when producers have double nationality, a case where they do not need to interact with the border as the main legal barrier for the coffee arrive to CECOVASA is the possession of a Peruvian nationality to generate a tax invoice. While double nationality is a practical answer to trade barriers, other options such as a border identity card (e.g., like the MERCOSUR TVF card that facilitates mobility of goods mentioned in **Chapter 5**) or improving the CAN framework/ Andean FTA can reduce trade barriers even more.

2.7.9. Intangible Voids

CV30: Lack of Trust, Transparency & Accountability

The analysis on CV30 (**Table 6.53**) refers to a first set of intangible resources related to shape social bonds and/or contractual relationships namely as credibility, trust, transparency, and accountability. There are three main relationships that matter in this CBR: public entities & cooperatives, cooperatives & producers, and cooperative & buyers. Due to the traditional economic independence of CECOVASA, the Central did not have to cooperate with the government. Furthermore, under a reading on territoriality – the use of the territory with political, social, and economic purposes (Agnew and Oslender, 2010), the cooperative 'was the State' in an area where one municipality (SJDO was the only municipality for the border area until SPPP was created in 2005) could not cover the public demand by providing roads, community centers, productive supplies, etc. Currently, provincial, and local municipalities perceive cooperatives as private sector actors (ignoring its social component) with little credibility, leading to no motivation to cooperate with them.

In the cooperative & producers relationship, weak associativity in CECOVASA and its grassroot cooperatives (bad managements, failed payments, perception of corruption, etc.) has led to a decrease of associates, reducing the economies of scale provided by cooperatives. Simultaneously, cooperatives have focused more on the 'quality of producers' (e.g., fulfilling their coffee quotas, reporting their production activities correctly) rather than their quantity, removing several of them from the cooperative. In the relationship between cooperative & buyers, credibility to complete transaction is mostly covered by ensuring traceability or certifying the good quality of processes and products, as the organic certifications do. In terms of unfair trading practices (delayed payments, not exact amounts, etc.), this has not been reported by CECOVASA, but by APOCOM. INPANDES did not work on these topics, although the meeting of stakeholders in the different spaces was expected to promote better relationships between them – although this not happened.

While there are many other relationships that could be studied in more detailed (e.g., municipalities & producers, financial entities & producers), the main three relationships for the CBVC are articulated to how well CECOVASA manages its relationships, that means, how its associativity capacity has translated in partners & customer relationship management. Even though, the scenario is not so rough as CECOVASA has tied relationships with some public entities (DEVIDA), producers (devoted associates), and clients (loyal buyers). However, there is still room for improvement with strategies for better Customer relationship management (CRM), ensuring coffee traceability, and promoting discussion spaces with clear accountability from both parties.

Table 6.53. Analysis Chart of Connectedness Void 30 (Author's elaboration)

Void N°30	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] Anti-competitive behavior between national trade-related or border-related agencies. [+] International certifications promote credibility with international buyers/ consumers.		[-] While certification promotes trust from buyers to sellers (cooperatives), there are still issues ensuring volume/payment between both parties (e.g., not exact amount, no payment from international buyer).
Subregional	[-] The relationship between CECOVASA and producers have deteriorated due to failed payments, bad managements, perception of corruption, hidden information, feeling of betrayal, etc. [-/+] Dichotomy in producers-CECOVASA relationships: between broken transactions and cooperative love. [-] Due to CECOVASA's traditional individual role, it is perceived as isolated or suspicious by public entities (e.g., not giving information about their status, not recognizing errors, having a Wishlist rather than a plan). [*] Cooperatives focusing on quality of producers rather than quantity. [-] Weak credibility from subnational and local govts. [-] ANPROCA has had issues keeping relationships with other cooperatives (sense of betrayal, low credibility).	[-] The ALT was having struggles with the compliance of supervisions (e.g., no field visits), generating credibility issues with the INPANDES team.	[-] The persistent weak communication, no transparency and lack of accountability between CECOVASA board and its producers has reduced associativity, leading to lower number/retention of producers. [-] CECOVASA trying to shape new partnership relationships, especially with national agencies, but still having difficulties to create institutional trust. [+] DEVIDA has generated trust relationships with municipalities, cooperatives, and producers based on its intervention in the area.
Cross-Border	[-] Some producers have issues building financial credibility.	[+] As the INPANDES technician worked in the PRA project, there was already trust with the producers, especially with the community/coffee leaders.	[-] Several initial commitments of INPANDES were not fulfilled at the end (e.g., no collecting center for Cocos Lanza), generating a feeling of abandonment. [*] The relevance of in-field relationships, especially between 'technicians-producers' and 'key producers-normal producers', should be included in productive projects. They are important for expectation setting, change of mindset, motivation, etc.
Void Evaluation	**Average presence**	**Targeted? No Efficiency? NN**	**Average presence (similar)**

CV31: No Motivation for Cooperating/Producing

The analysis on CV31 (**Table 6.54**) refers to the motivational factors behind deciding to cooperate and/or produce. While several actors can be included in this analysis, there are four 'motivations' to highlight: A) municipalities' motivation to cooperate between themselves, B) municipalities' motivation to cooperate with cooperatives, C) producers' motivation to produce coffee, and D) producers' motivation to associate. The first one could be considered as one of the main factors why INPANDES attempts for cross-border articulation did not work, and why the project was not continued by the municipalities. The main reasons behind this were no more non-reimbursable funding (they needed it to pay by themselves an INPANDES 2), no previous cross-border articulations (never cooperated before), and the long distance between municipalities. The second motivation is closely related with CV30: weak relationships with CECOVASA due to lack of transparency, leading to weak articulation and especially, no funding transfer to the cooperative.

Table 6.54. *Analysis Chart of Connectedness Void 31 (Author's elaboration)*

Void N°31	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] Welfarism and alms culture is strong in productive/rural projects.	[+] INPANDES non-reimbursable funding (€45k) motivated all involved actors to execute the projects. [-] No involvement of Bolivian authorities in the coffee & alpaca CBVC. [*] The counterparty was transferred from national governments to the executing/ operating agencies (non-monetary compensation).	[-] Low political will to promote binational integration in terms of projects and investment (binational SNIP scheme). [+] The fall of coca global price has reduced incentives for coca production, while coffee global prices have increased. [+] Bolivian government has worked on motivating producers (individually) to producer more and better. [*] Counterparty scheme as a strategy to quantify motivation of organizations and individuals.
Subregional	[+] The coffee quality culture in Sandia has been a source of motivation and identity for local producers, incentivizing them to compete in international contests, sell in foreign markets, promote their own development etc. This reduced the alms culture of associated coffee producers. [+] Devoted coffee producers are aware of their needs and strengthens, take advantage of opportunities, and expect good outcomes from their coffee.	[-] CECOVASA was not interest in receiving support in terms of planning (improving marketing & strategic plans), but equipment & infrastructure (purchasing the roaster, improving collecting centers). [-] Low salaries for INPANDES professionals and technicians increased personnel turnover. [-] There was not so much support from local authorities apart from their participation in the events (no consolidation of agreements, or policies).	[-] Low motivation/ political will from municipalities to continue the project due to change of administration (new officers and technicians), and no more funding. [-] Subnational and local authorities are not so interested in productive projects or cross-border cooperation. Resistance to support cooperatives (mainly associations or individuals). There is more predisposition from national agencies. [-] Low salaries in CECOVASA boards leads to demotivation and low commitment to the cooperative.

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	[-] Devoted producers might not want to provide all their production to the cooperatives (or even associate with them) as they do not receive special/ differential treatment (e.g., receiving more for better coffee, having special branding, etc.). [-] The roya demoralized producers, that were attracted by illegal activities (coca). [+] The PRA initiative was driven by the motivation of the commonwealths to cooperate.		[+] CECOVASA still has a very loyal number of producers that have been keeping the cooperative running. [-] The roya is still a problem. [+] Motivation from CECOVASA and ANPROCA to establish cross-border cooperation.
Cross-Border	[+] CECOVASA coffee culture is also shared by Bolivian communities.	[+] The project motivated producers, especially the Bolivian ones as they did not received any support from their government before. [+] Bolivian producers realized that selling to CECOVASA they can earn more than through middlemen. [-] Low participation. While the official documents revealed that 140 producers participated in the trainings (136 Peruvian, 14 Bolivian): around 30 to 35 Peruvian producers participated, only 3 from Cocos Lanza, and a few more from San Fermin. [+/-] San Fermin had more devoted producers and local coordination than Cocos Lanza (most were coca producers), getting more benefits from the project. [+] Technicians were crucial to motivate producers (although this is widely ignored in productive projects).	[-] As the project stopped, there was a feeling of abandonment especially from Bolivian producers (no more technicians, no possibility to sell coffee to CECOVASA, etc.). [-] CECOVASA stopped receiving coffee from Bolivian producers, discouraging coffee production, and strengthening to coca one. [-] Low prices offered by middlemen disincentivize to continue coffee production. [+] Due to the coca eradication, Bolivian producers see coffee production as means to have a good quality of life (interest on technical knowledge, re-join CECOVASA cooperatives, what they can sell to CECOVAS, etc.). [*] Producers' motivational sources? Producers, especially Bolivian, needs to see that they can earn a living based on coffee, that means 1) access to market, and 2) higher prices. Other motivational sources are stable clients, lower productive requirements, cooperativism, etc. [-] Most producers prefer donations rather than counterparty systems (as they would not need to pay).
Void Evaluation	**Average presence**	**Targeted? No Efficiency? NN**	**Average presence (Decreased)**

In terms of producers (C and D), the roya and coca were the main factors that demotivated Peruvians to continue coffee production. For Bolivian ones, on the previous two must be added the lack of market access. Finally, as commented in CV30, the low transparency from both parties leads to weaker cooperatives and less coffee collection. In terms of the INPANDES project, there was not direct intervention to increase motivation, but the non-reimbursable funding of €450K motivated all stakeholders (except the Bolivian national government). However, after the project and without the financial stimulus, motivation decayed.

As another intangible resource, discussing on motivation is a complex issue to weight and calculate its impact on development projects. While the four motivations indicate negative connotations, justifying the low motivations for cooperating and producing, the picture would not be complete without considering 1) the better motivations due to less impact of roya and coca, and 2) the coffee quality culture of the Sandia Valleys and the devoted producers, as explained in Section 2.4. While this research has tried to delve on these motivations, more studies are needed to understand how to solve the voids affecting them, and how to capitalize them based on the existing potentialities (e.g., producers' need of recognition, youth's professional aspirations, new administrations in municipalities and cooperatives).

What is clear from this project is that funding, as an exogenous factor, led to a temporal motivation that kept all elements assembled into a cohesive initiative while cash was flowing. However, it also works from the opposite way: Research on the MAP Initiative (Peru-Brazil-Bolivia triborder) revealed that, with strong motivation to cooperate, cross-border actors would make a more efficient use of their financial resources, and promote their initiatives, being this fundraising a result of endogenous capacities (Wong Villanueva, 2019; Wong Villanueva, Kidokoro and Seta, 2022, 2023). However, determining whether the sustainability of cross-border initiatives is better driven by funding or motivation is another research question. Regardless the answer, both should aim to strengthen the activities that assemble and are assembled by the cross-border 'social' – quoting Latour (2005)'s interpretation of the social.

CV32: No Clarity of a Joint Identity

The analysis on CV32 (**Table 6.55**) discussed about joint identity based on the 1) Territorial Synergies (Cross-border flows that nourish the CBR), 2) Shared Issues (Common problems in both border sides), 3) Common Externalities (Negative cross-border spillovers) (as developed in Chapter 2). While several sociocultural practices and characteristics exist across borders (e.g., Spanish-speaking populations, sharing Aymara to Quechua ethnicity, the fact of being Andean migrants in the jungle, common cultural practices such as Carnivals or coca rituals), interviewees did not mention them (around 15/+4700 quotes) as much as their relationship with coffee, as discussed in Section 2.4. The productive articulation within the Sandia Valley promoted a coffee quality culture that became not only part of the identity of the Peruvian side, but also part of the Bolivian border. However, due to the lack distance to Apolo city, this cultural identity is not shared beyond the Bolivian communities. INPANDES instrumentalized this joint identity into the Frontera Coffee brand but working on reinforcing a joint culture was not a project of the target. Even more, the field study in Cocos Lanza and Puerto San Fermin revealed that some producers were not aware of the Frontera Coffee (but they were about the "binational project").

Although more detailed ethnographic studies are needed to understand about the cross-border identity(-ies) of this area, the present research sheds lights on the coffee quality culture as a cohesive factor with even more impact than ethnical linkages. These impressions are perhaps due to the limited scope of this research (focused on the coffee CBVC), or because this coffee culture has been a historical and cultural construction based on the existing ones and it is typical of this territory, becoming into a source identity and differentiation from other Amazon territories or Andean subcultures. As other researchers have identified the positive influence of common culture on cooperation in CBRs (Konrad and Nicol, 2011; Balogh and Pete, 2018), it is recommended to study them and the interaction with other voids (especially geographical distance) and how to capitalize them to strengthen CBVC initiatives.

Table 6.55. *Analysis Chart of Connectedness Void 32 (Author's elaboration)*

Void N°32	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[+] The South of Peru and North of Bolivia was populated by common Andean cultures, especially the Quechuas and Aymaras that experimented similar historical construction. [+] The Andean culture(s) was the basis for promoting integration through the CAN.		
Subregional	**Territorial Synergies** [+] The subregion has a cross-border relationship since the 1930s with the colonization of the Valleys of Sandia: Bolivian producers from Caranavi promoting coffee production in Sandia, Peruvian producers settling in Bolivian border, etc. [+] Due to CECOVASA, the traditional alms culture became a coffee quality culture, revaluing their origins (Andean, indigenous, etc.) and limitations (low access, difficult geography, etc.). This is shared in the Bolivian border. [*] Change of direction of regional informal coffee trade: at subregional level, coffee CBIT flows used to be from Peru to Bolivia (Caranavi) via middlemen. This was reversed with the weakening of Bolivian production. **Shared issues:**	[-] The project tried to link Sandia and Apolo, two places that, due to the geographical distance between, have not had common history.	[+] Commonalities: A coffee culture oriented to high quality is shared in Puno and La Paz, creating possibilities to cooperate rather than competing. [-] The predominance of elder producers and youth migration (to other economic activities or out of the subregion) can undermine the coffee culture, passion for the cooperative, and the coffee production itself.

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	[-] The Andean migration represented the replication of agriculture practices, such as monoculture, from the highlands to the jungle (not suitable for that system), difficult to change. [+] In both sides (Sandia, Caranavi), cooperatives have had a role to promote technical upgrade, moving from traditional practices to more systemized coffee production. [-] Difficult access with weak highway infrastructure to coffee production areas. **Common externalities** [-] CBIT or smuggling has become in one of the main economic sources for many local entrepreneurs. [-] The coca production network shares a similar spatial configuration as the coffee one.		
Cross-Border	**Territorial Synergies** [+] The common coffee culture is more notorious than ethnic relationships (SPPP is Aymara and San Fermin & Cocos Lanza are Quechua). [+] Certain social relationships between border communities across borders (e.g., football matches, cross-border labor). **Shared issues:** [-] Border populations are poor with low HDI. [-] The roya and coca affected coffee production (the main economic activity). **Common externalities** [-] The roya and other coffee diseases are cross-border risks. [-] Coca production has led to the appearance of cross-border mafias.	[+] Frontera coffee branding used the cross-border space as a marketing strategy to connect sales with cross-border local development.	[+] Commonalities: In terms of coffee, there are more possibilities to cooperate rather to compete due to the dependance of Bolivian coffee to Peruvian market, and the low volume from both sides.
Void Evaluation	**Average/Low presence**	**Targeted? No Efficiency? NN**	**Average/Low presence (Similar)**

CV33: Low Bargaining Power

The analysis on CV33 (**Table 6.56**) refers to another intangible resource that refers to the capacity of CBVC stakeholders to bargain in a transaction when they behave as suppliers or as buyers. The case study explored this capacity in terms of the cooperatives and producers and how they can access to better markets and higher prices. Considering CECOVASA, a Central of cooperatives representing almost 5000 producers, its high coffee quality and good marketing channels were the main factors to bargain better prices. However, the lack of C-GVC information, low skillful sellers, and its reduction of coffee volume have affected their capacity to look for other potential buyers. During INPANDES, as mentioned in CV14 and CV18, the sale to the German wholesaler in a brief time showed that, when improvements are introduced within a good environment, it is possible to capitalize more benefits. However, as mentioned in CV29, the case was not the same with Bolivian producers that only had middlemen with whom they could negotiate.

Table 6.56. *Analysis Chart of Connectedness Void 33 (Author's elaboration)*

Void N°33	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] C-GVC reproduces the global coffee dynamics established between 17th and 18th century, where Global South (Coffee belt countries) were oriented to coffee primary production, and Global North were the main markets and processing industries (EU, USA, Japan). [-] Certified coffees have 9% of global market. Despite the higher market entry barriers, there has been an oversupply and market saturation.	[+] As a communitarian framework, the CAN had a good position to bargain and reduce EU's funding requirements (working with ¾ countries, non-monetary counterparty scheme, extension of project timeline).	[-] C-GVC: more than 90% of coffee is traded as green coffee. Primary producers retain between 5% to 20% of the final coffee value. GVC dominated by roasters (four companies: 40% roast market, two companies: 70% instant market) and traders (five companies: +50% logistics market). Consumption market is led by two companies (Starbucks, Costa Coffee), with a share of 43% of global sales. [+] Digitalization (e-commerce) and South-South-Cooperation (lower entry barriers) can link producers with consumers without so many intermediaries.
Subregional	**Power as suppliers** [+] Grassroot cooperatives in Sandia Valley were founded to increase bargaining capacity at domestic level. Their union in the Central was oriented to export (higher volume, standardization of processes, access to certifications, etc.). [-] Traditionally, exports have been driven by coffee volume, quality, and certifications.	[+] INPANDES promoted several marketing channels to connect CECOVASA with foreign buyers (participation in fairs, branding, etc.), and this was achieved with the sale to the German wholesaler. [-] INPANDES strategy to increase bargaining power of CECOVASA in the roasted coffee market was limited to the provision of equipment.	**Power as suppliers** [-] Based on CECOVASA experience, high quality is not translating into higher prices: having an international certification is a requirement to access foreign markets and get good prices, but not the only one. [-] Bargaining capacities are weak (low volume, no marketing plan, no English proficiency, no MKIS, etc.). [+] Cooperation between CECOVASA and ANPROCA can

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	[+] CECOVASA has several marketing channels such as georeferenced branding, certifications, videos, producers' stories, etc. [+] Other strategies such as environmental or good labor practices also increase bargaining power on buyers. **Power as buyers** [-/+] Cooperative governance is weak and volatile, driven by coffee volume, leaders personality, and unsettled quarrels. Despite some grassroot coops have tried to leave, they have not succeed (exporting is not so easy). [-] Devoted producers might not want to provide all their production to the cooperatives (or even associate with them) as they do not receive special/ differential treatment (e.g., receiving more for better coffee, having special branding, etc.). [+] Diversification: CECOVASA buys several coffee subproducts (honey coffee, parchment coffee, husks, etc.).		promote a subregional economy of scale (especially export volume), increasing bargaining power.
Cross-Border	**Power as suppliers** [-] Lack of market access, strong associations, and spatial connectivity have been the main inhibitors of Bolivian producers to sell their coffee. [+/-] Border producers had some options where to sell (CECOVASA, Coop64 and middlemen). However, producers do not share good MKIS, getting differentiated prices. [+] Market demand is in the Peruvian side, and Peruvian producers can access it depending on coffee quality, bargaining capacities, market channels, selling their coffee for even better prices than when selling to cooperatives. **Power as buyers** [/-+] Middlemen, as entrepreneurs, cover the local voids and connect producers with consumers, but retaining +50% of possible profits for producers.	[-] INPANDES implicit objective was to cut the middlemen by connecting APOCOM producers with CECOVASA, but without reducing trade barriers, this was not sustainable.	**Power as suppliers** [-/+] Producers have been selling their coffee through middlemen, but the recent approach from CECOVASA opens a new opportunity for them to bargain better prices, either through the cooperative organic program, or by renegotiating prices with middlemen.
Void Evaluation	**Peru: Average/Low** **Bolivia: High/Average**	**Targeted? No directly** **Efficiency? High**	**Peru: Average/Low (≈)** **Bolivia: High (↑)**

While recommendations to increase bargaining power begin by addressing its voids –and this has been already explained–, plenty literature on bargaining power has been written in buyer-supplier relationships and under different models of GVC (Dowlatshahi, 1999; Crook and Combs, 2007; Dallas, Ponte and Sturgeon, 2019; Grabs and Ponte, 2019). This highlights the need to reviewing the impact of more dynamics at global level (the global geography of production, typology of consumption, distribution of income along the chain, and more) as well as at a more domestic or local one (coffee volume impact on cooperative governance, distribution channels, access to suppliers, etc.).

2.7.10. Capacities Voids

CV34: Low Change Capacity

The analysis on CV34 (**Table 6.57**) refers to strategies to upgrade along the value chain (scaling-up, business expansion), optimize production (R&D), and adaption & resilience (risk management). Focusing this discussion in CECOVASA, the cooperative has made several innovations since late 1990s. These progresses are summarized in three pillars: organic coffee production, georeferenced brands, and the only Productive Innovation and Technology Transfer Center (CITE) in Puno. Referencing **Table 6.14**, these three strategies focused on product upgrading, channel upgrading, and process upgrading. Other initiatives like its diversification of supply (buying coffee husks, honey coffee, etc.) or using coffee bags with valves would be considered as intersectoral upgrading and functional upgrading respectively.

In relation to business expansion, CECOVASA moved its headquarters from the valleys to Juliaca due to its geographical position and bought an office in Lima and logistics storage near the Callao port. In terms of R&D, to develop its georeferenced brands, the cooperative studied and collected information about its producers, farmlands, and processes per valley, determining altitudinal floors, coffee varieties, harvesting time, and coffee volume per brand. Finally, when the roya crisis reduced its incomes, the cooperative could survived by administrating its assets and centralizing operations. Although the case study did not reveal so much detailed on how the innovation processed has happened in the last decades (already several administrations boards have passed), comparing with the other studied cooperatives (Coop64 and ANPROCA), CECOVASA shows a good change capacity, where its associativity capacity –as the cooperative brought most innovations to the valley–, and periodic leaderships have been two key factors.

After consultations with the cooperative, INPANDES project focused to leverage the cooperative by promoting downstream processing by investing in roasting technology (functional

upgrading). However, as mentioned, the lack of knowledge (technical, business, market) and poor knowledge transfer did not allow to achieve this type of upgrading.

Although CECOVASA has shown good to high change capacity, the chronology of events suggests that these innovations/changes have been more sporadic/eventual rather than planned. However, while in the early 2000s this process has been faster, in recent years it has been slowing down. As changing (upgrading, R&D, adapting) is very transversal to other voids, most of the recommendations already presented could be under a proactive change management approach. However, further recommendations should be considered on the recent progresses. In terms of upgrading: 1) functional upgrading by penetrating in the roast coffee at domestic level, regional (Latin America), or in any South-South Cooperation scheme, 2) channel upgrading by fostering digitalization (website, social media, etc.) to integrate all marketing strategies, and 3) channel upgrading on traceability (capitalizing coffee quality). R&D should be oriented on new coffee varieties, articulating with a business plan to provide them to all producers and elaborating volume goals per year.

***Table 6.57**. Analysis Chart of Connectedness Void 34 (Author's elaboration)*

Void N°34	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[*] Colombia and Brazil have invested more in R&D and are references of coffee innovation in the region.	[-] INPANDES was a short project, even too short to achieve a long-term change.	[-/+] Bolivian PNC had innovation strategies but were not fully achieved (R&D requires more time and budget). [-/+] Peruvian PNA-CAFÉ has some innovation strategies (6% budget) but does not show further detailed. [+] The JNC is piloting new coffee germplasms that is resistant to roya, mitigate climate change, and has high productivity.
Subregional	[+] In 1997, CECOVASA started its organic program with 17.7K quintals from 1458 associates. [+] In the 2000s, CECOVASA started testing coffee quality to ensure high quality coffee (+85 points). [+] In 2005, CECOVASA started its branding strategy and registered them in the Peruvian IP agency. [+] In 2015, CECOVASA qualified as coffee CITE for Puno region (Productive Innovation and Technology Transfer Center). Selected by the Ministry of Production. [+] Branding R&D: collecting information about its producers,	[+/-] INPANDES focused on developing downstream processing by investing in roasting technology, although there was not plan beyond purchasing the roaster.	[-] No research on new coffee varieties with high resistant and high quality has been conducted (neither by government nor cooperatives, mainly buying new germplasm). [+] Youth represents an innovation opportunity to upgrading coffee value chain (technology, management, etc.). [+] Provincial and local municipalities have been upgrading their strategies to promote coffee development (territorial marketing, coffee subproducts, etc.). [-] CECOVASA still does not have a proper strategy to penetrate new markets.

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	farmlands, and processes per valley. [+] Diversification: CECOVASA buys several coffee subproducts (honey coffee, parchment coffee, husks, etc.). [+] Despite the several struggles (bad investments, roya/coca, low supply, etc.), CECOVASA could adapt and deal with the problems by centralizing operations, selling properties, focusing on certification processes, etc. [-] Public coffee projects follow the traditional formula of agriculture extension projects (technical assistance + supplies/ tools). [-] Cooperatives still have a strong monoculture mindset, linked with the Aymara/ Quechua idiosyncrasy.		
Cross-Border	[-/+] Producers have knowledge on good practices, but do not implement due to other related factors (e.g., how to buy and carry dozens of organic fertilizer bags from the road to the uphill farmland?).		[*] There is a need to understand more the producers' mindset (especially devoted ones) and what are their drivers of change.
Void Evaluation	**Average/low presence**	**Targeted? Avg. Efficiency? Low**	**Average/low presence (similar)**

CV35: Low Associativity Capacity

The analysis on CV35 (**Table 6.58**) examines associativity capacity based on DEVIDA's 'Organizational Status Assessment' (VEO) tool that measures associativity in five dimensions: 1) human development, 2) business & services, 3) administration & management, 4) heritage, 5) democracy & participation. Starting with APOCOM, as it started in 2014, it was still in an initial stage of institutionalization when INPANDES started. The project proposed a program for transferring capacities from CECOVASA to APOCOM. However, the expected changes in operational and organizational capacities did not happen due to the large gap between both cooperatives. After the project, as the APOCOM president was in San Fermin and the vice-president in Cocos Lanza, there were miscoordination, distrust and conflicts between both communities, leading to the division of cooperative leadership.

In the Peruvian cooperatives, DEVIDA's VEO tool gave CECOVASA a score of 45%, while to other three cooperatives their score was around 50%. While INPANDES trained some cooperative officers and leaders (as explained in CV10), the recent CECOVASA administration change (2021) of

President (every year) and Manager (every five years) has rebooted the learning process. Considering the complex relationship with producers (CV30) and the problems with continuity of leadership, both CECOVASA and APOCOM suffer from similar issues despite of their capacity difference. However, CECOVASA still provides several benefits, especially the articulation of production and services for the Sandia Valleys, and access to foreign markets.

Strategies to improve the cooperatives have been discussed along this research. However, some points can be highlighted. For APOCOM, better discussion spaces are needed to consolidate leadership. If they are not possible, separating them into two organizations can even improve their functioning at the cost of reducing their collecting volume. CECOVASA is a more complex issue, but four main suggestions: improving top management (include skillful professionals), strengthening cooperative governance (better statute, transition plan, decision-making spaces), and articulating with grassroot cooperatives (optimize resources and capacities).

Table 6.58. *Analysis Chart of Connectedness Void 35 (Author's elaboration)*

Void N°35	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[+] CECOVASA used to be one of the best central cooperatives in Peru. ANPROCA had a similar position in Bolivia. [-] Associativity is low in Bolivia (18% of producers are associated) compared with Peru (35%). [-] No Bolivian national agency that promotes associativity. In Peru, there are several agencies (e.g., DEVIDA, AGROIDEAS), but there is not one that oversee cooperatives specifically.		[-] Peru has a more orientation to cooperatives (e.g., new cooperative law, fundings, etc.), while Bolivia focuses on individual producers (e.g., promoting e-business sales, individual coffee brands, etc.). [-] Bolivia has issues promoting associativity due to the resistance of producers (lack of credibility, conflicts, etc.). [+] The new Peruvian cooperative law (2021) expects to increase associativity, the institutionality of cooperatives, and facilitate access to credits.
Subregional	[+] CECOVASA used to have a predominant role in the local development of the Valleys of Sandia. It used to have a strong cooperative model offering several services and creating opportunities for producers and the community (e.g., creating the MMAP, constructing infrastructure, exporting to profitable markets, georeferenced brands, etc.). **Human Development** [-] The relationship between CECOVASA and producers have deteriorated due to failed	[+] One of the INPANDES specific objectives was to promote civil society participation by boosting associativity from CECOVASA (the Central and the grassroot cooperatives) and APOCOM. [+] Participation of municipal and cooperative leaders (Central and four grassroot cooperatives) in the project's main events. [-/+] Most collective benefits (infrastructure, equipment, branding, etc.) were oriented to the cooperatives, especially CECOVASA. Producers mainly receive trainings and some supplies.	[-] DEVIDA's evaluation on CECOVASA (2022) reveals an associativity score of 45/100 measured in five dimensions: 1) human development (4/25), 2) business & services (11/25), 3) administration & mgmt. (9/15), 4) heritage (8/15), 5) democracy & partcipat. (13/20) This means low number of skillful professionals and technicians, poor provision of services for producers or community, lack of planning, and poor governance. However, it counts with own infrastructure & equipment, clean tax/finance, strong

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	payments, bad managements, perception of corruption, hidden information, feeling of betrayal, etc. [+] CECOVASA had clear statutes to define membership & leadership, and the role of producers (produce), grassroot coops (collect), and the executive board (processing, management, & export). [-] Grassroot cooperatives have had problems with their status, limiting their access to funding, donations, etc. [-] Low number of professionals and technicians in the Central and grassroot cooperatives. No articulation between them. **Business & Services** [-] Roya and coca had a great impact on the grassroot cooperatives and CECOVASA exports which fell by 90%, and which has not yet recovered. [-] Coca production brought cross-pollution of coffee production, undermining its organic quality and certification. [-] There is a geographical dispersion between associates from each grassroot coop., limiting the way how they can provide them with benefits. It is easier to apply them through CECOVASA **Administration & Mgmt.** [-] Executive board members last for a year before they change (difficult to bring continuity). [-] Aversion to long-term investments/ planning due to the annual change of board members (need fast results). [+] Despite the several struggles (bad investments, roya/coca, low supply, etc.), CECOVASA could adapt and deal with the problems by centralizing operations, selling properties, focusing on certification processes, etc. [-/+] Low capacity to relate with other entities (especially from the public sector). Certain success attracting foreign funding. **Heritage** [-] CECOVASA financial conditions weakened due to the roya, & bad managements, having		primary production (especially collection), and periodic meetings. [-] The associativity score of many grassroot cooperatives is higher than CECOVASA score (San Jorge: 54%, San Ignacio: 48%, San Isidro: 53%). However, all of them have a great room for improvement. [-/+] The new CECOVASA board does not have knowledge about INPANDES apart from the roaster and Frontera coffee, however the manager approached to the Bolivian producers to reestablish their relationships. [+] Currently, CECOVASA focuses on 1) certification (organic-oriented technification), 2) financing (for collection), and 3) market (increase clients). [*] There is a need for new cooperative governance mechanisms to promote 1) increase competitivity, 2) credibility with producers, 3) provision of multiple services, 4) build alliances.

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	to sell Lima port storage, half of Juliaca coffee plant. [-] Several collecting centers closed due to the lack of supply. **Democracy & Participation** [-/+] Cooperative governance is weak and volatile, driven by coffee volume, leaders personality, and unsettled quarrels. Despite some grassroot coops have tried to leave, they have not succeed (exporting is not so easy). [-] No governance plan to promote better articulation with grassroot cooperatives (vertical) or between them (horizontal).		
Cross-Border	[+] Even Bolivian producers used to be part of CECOVASA grassroot cooperatives. [+] In 2014, the PRA project facilitated the process to create APOCOM by bringing together the producers from San Fermin and Cocos Lanza.	[-] The capacity transfer program from CECOVASA to APOCOM was not successful due to the large difference of capacities. [+] The number of producers in APOCOM increased during the project. [-] APOCOM was not effective to distribute equally the benefits from the project between both communities (San Fermin was more beneficiated). [+/-] The project increased sense of unity within communities, not between them.	[-] APOCOM has failed to link producers from both communities, and there is an increasing desire to shape two separate cooperatives. [-] APOCOM has weak institutionality in all categories.
Void Evaluation	**Peru: Average** **Bolivia: High/Average**	**Targeted? Avg.** **Efficiency? Low**	**Peru: Average (≈)** **Bolivia: High (↑)**

CV36: Difficulty in Knowledge Transfer

The analysis on CV36 (**Table 6.59**) refers to the mechanisms to transfer knowledge or install capacities to ensure effective knowledge acquisition. Comparing with the municipal agricultural extension projects with low effectiveness or the one/two technical visits from cooperatives per year, INPANDES was very innovative bringing several learning modalities: international trainings, technical visits, internships, bilateral meetings, coop-coop capacity transfer, technical manuals, Good Practices programs, and more. However, as commented previously in each void analysis, most mechanisms have not been so effective due to the impossibility to meet (long distances), weak motivation of public authorities and political changes, actors that did not meet required knowledge preconditions, weak associativity, or even low youth participation. This led to a low efficient retention of knowledge and weak installation of capacities in municipalities and cooperatives. The most evident and representative misfortune would be with the Bolivian producers of Cocos Lanza that could not transplant their seedlings, nor maintain the nurseries or tools, nor consolidate a good leadership in their cooperative.

Table 6.59. Analysis Chart of Connectedness Void 36 (Author's elaboration)

Void N°36	Before Project (~2015)	INPANDES Project (16/18)	After Project (2018-now)
Binational	[-] Critique on the International Cooperation logic: 'the producer does not know, we need to teach them, but… why cannot they learn?' [-] Public policies also do not understand the logics in the field, especially rural areas.	[-] There was not exchange of experiences between the six interventions of INPANDES. There was not even exchange between the coffee & alpaca components.	[-] The Andean Platform for Cross-Border Cooperation (PACTF) did not operate.
Subregional	[-] Public coffee projects follow the traditional formula of agriculture extension projects (technical assistance + supplies/ tools). Poor outcomes.	[+] Participants in the PRA project (1st CBVC project) were also involved in INPANDES. [-] Low participation of municipal authorities from both sides. [-] INPANDES team: low number of professionals (three), each oriented to a project objective, but with low knowledge about the whole coffee value chain. [-] INPANDES: Hired local technicians, but low number of them (four for 140 Peruvian and Bolivian producers). Two in charge of the technical visits. [+] INPANDES promoted several spaces for knowledge transfer (exchanging good practices between producers, technical visits, international internships, etc.). [-] Despite of the industrial roasters, CECOVASA did not have the roasting knowledge.	[-] No development of capacities in the municipalities to continue the CBVC. [-] Political will of municipalities on CBVC disappeared with the following administration. [-] Most trained officers and technicians during the project are not working in their institutions (although many have stayed in the area). [-] CECOVASA still has struggles positioning its roast coffee in domestic and foreign markets.
Cross-Border	[-/+] Several producers from both sides were working under traditional systems. CECOVASA associates improved primary production with the cooperative trainings and visits. [-] During the PRA, it was not possible to hire Bolivian technicians due to tax issues. It was only possible to hire from Peruvian side.	[+/-] Knowledge transfer from Peru to Bolivia at cooperative level (adapting CECOVASA model in APOCOM) and producer level (Peruvian role models to Bolivian producers). [-] Low frequency of technician visits (once/ twice per month), for one day, and most of the time, not personalized and not arriving to producers' lands (group teaching). [-] Low participation. While the official documents revealed that 140 producers participated in the trainings (136 Peruvian, 14 Bolivian): around 30 to 35 Peruvian producers participated, only 3 from Cocos Lanza, and a few more from San Fermin. [-] Trainings' benefits were not equally distributed: producers with more knowledge (often Peruvian) took more advantage of INPANDES trainings. Bolivian	[-] Producers perceived that they mainly received trainings and tools from the project. [-] Most seedlings from Bolivian nurseries were discarded as there was low transplant ratio and no monitoring. [-] Bolivian producers did not get enough knowledge to use and maintain the received tools. [+] Producers with previous knowledge (mainly Peruvians) could value the quality of the trainings (e.g., the Colombian outline, the collecting nests, etc.) as it built on what they learned from CECOVASA. [-] The large difference between cooperative models between CECOVASA and APOCOM led to little knowledge transfer. [-/+] Producers have knowledge on good practices, but do not implement due to other related factors (e.g.,

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		producers, especially from Cocos Lanza, did not benefit from trainings. [-/+] The project gave three coffee varieties, Geisha, Bourbon, Catimor, but the latter was mainly used in Bolivia due to their low-level productive systems. Peruvian producers could cultivate the formers as they had better systems.	how to buy and carry dozens of organic fertilizer bags from the road to the uphill farmland?). [*] The relevance of in-field relationships, especially between 'technicians-producers' and 'key producers-normal producers', should be included in productive projects. They are important for expectation setting, change of mindset, motivation, etc.
Void Evaluation	**High/Average presence**	**Targeted? High Efficiency? Low**	**High/Average presence (Similar)**

For the INPANDES project, '*the devil was in the details*': Despite its educational innovation, the knowledge transfer mechanisms did not have the expected outcomes due to its several intersections with the existing voids. And even if some beneficiaries could learn (mostly in the Peruvian side), another difficulty was to capitalize this knowledge acquisition into concrete actions: As commented by some Peruvian producers, although they found the shared knowledge interesting and potentially useful (e.g., need of organic fertilizer), implementing it was not feasible for them as they faced other voids (e.g., too expensive to buy organic and too heavy to carry uphill to the farmland). Thus, it is a prerequisite for effective knowledge transfer, to have an idea of those voids, to consider the best learnings methods and training topics that would be more useful under their circumstances.

This case study sheds light on some lessons and opportunities to consider for this void. First, despite the recent quality misdoings, CECOVASA has ensured pretty good quality standards considering its large number of associates. How the cooperative has achieved this level of professionalism throughout the years (directly and/or indirectly), even with producers facing several voids such as the lack of highways, productive tools, supplies, etc., is a success that should be further studied. In other words, there are transfer capabilities already installed by CECOVASA that could be beneficial, not only for improving current cooperative programs but upgrading the public ones too.

Second, as INPANDES showed, due to the difference level of knowledge between Peruvian and Bolivian producers, it was easier for the former to apply the new acquired learnings. Although the project had a similar curriculum for both sides, producers need differentiated/tailored programs, or even better, trainings based on a competency development model or comprehensive educational programmes. This leads to the third point: technicians or instructors not only need to manage its field of knowledge, but also teaching skills, evaluation methods, reward & recognition mechanisms, and more (Roberts and Dyer, 2004). Moreover, as the case study revealed, producers are the most direct link with producers and in most cases, the ones in charge to build rapport. Thus, technicians have a multifaceted role as educators, motivators, change promoters, and more. A Train-the-Trainers program for them would be beneficial to standardize their level and reduce risks.

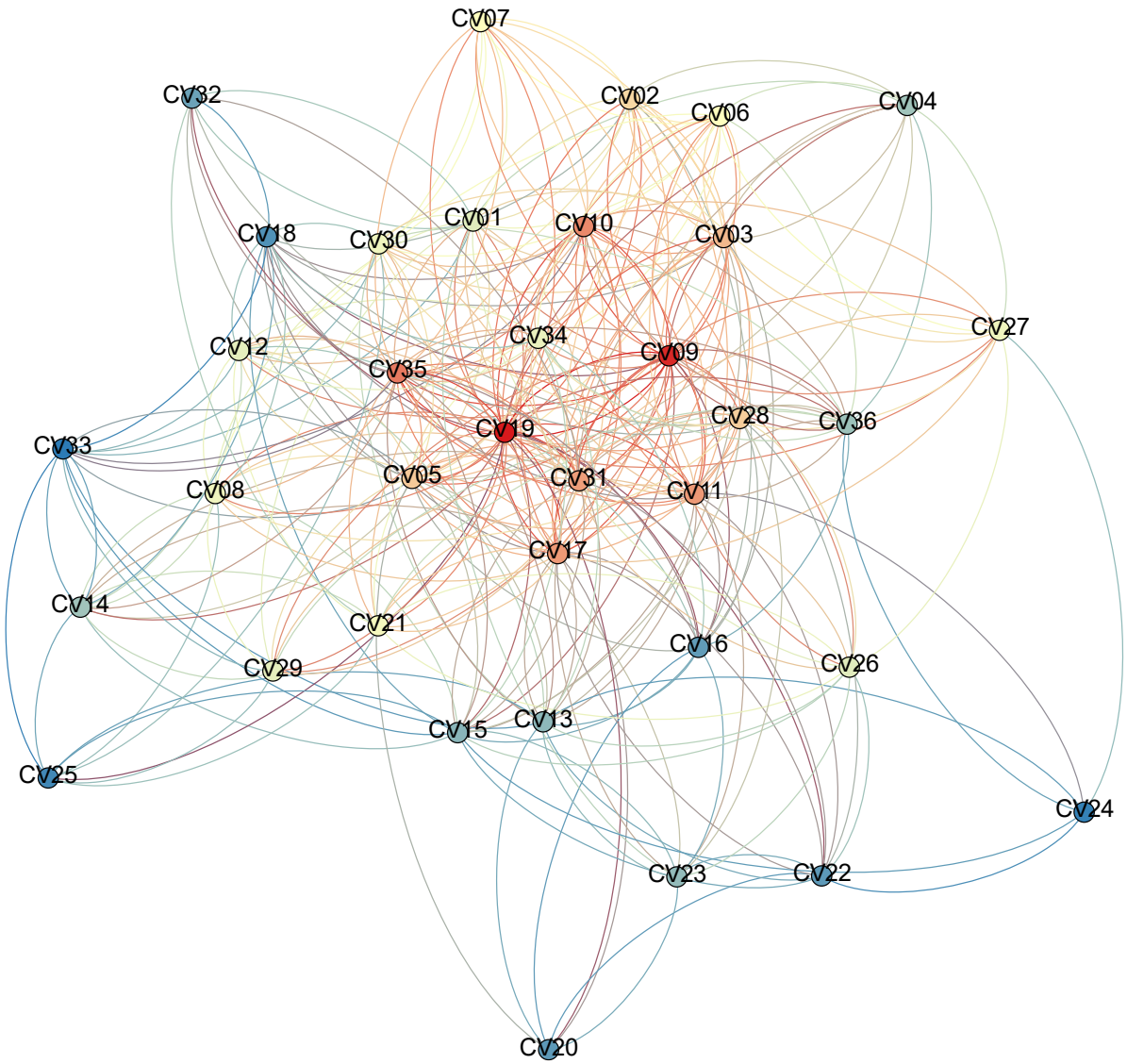
Finally, transferring knowledge to officers from municipalities and cooperatives has a high risk of failure coming from organizational issues (e.g., political changes, personnel turnover, etc.) to more individual ones (e.g., non-applying learnings due to leadership style, dilemma between priority & importance, etc.). While several ideas can emerge to solve this problem, if the organization itself does not have a transition plan or if there is resistance to apply it, a developing partner can intercede in its application: in other to ensure the continuity of other CAN project, the CAN and chancellery called the political candidates and the entities commented them about the cross-border initiative, the joint progress, and the importance of continuing it if they were elected (Wong Villanueva, 2019). However, as there is no one-size-fits-all solution for knowledge transfer, more research would benefit the development of future initiatives.

2.8. Phase 1.3. Causal Graph Model (CGM)

Table 6.60 shows the causal relationships expressed in matrix arrangement, based on the causality evaluation between connectedness voids charts (**Appendix 16**). **Figure 6.32** shows the CGM of the case study based on the 432 identified causal relationships, equivalent to the 34.3% of possible relationships between the variables. The analysis of the graph is conducted in Objective 2 (comparing with the theoretical framework), and Objective 3 (to evaluate the main voids that affected the project). Finally, we organize those identified relationships using the clusterization of the theoretical framework, calculating the weight within each cluster (**Table 6.61**), their interrelationships (**Figure 6.33**), and how they interact in the simplified model (**Figure 6.34**). The next section evaluates how the divergence between the case study and the theory from three approaches.

Table 6.60. *Adjacency Matrix of Causal Relationships from the Case Study (Author's Elaboration)*

CVs	CV01	CV02	CV03	CV04	CV05	CV06	CV07	CV08	CV09	CV10	CV11	CV12	CV13	CV14	CV15	CV16	CV17	CV18	CV19	CV20	CV21	CV22	CV23	CV24	CV25	CV26	CV27	CV28	CV29	CV30	CV31	CV32	CV33	CV34	CV35	CV36	TOT
CV01	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	**8**
CV02	1	0	1	1	1	0	0	0	0	1	1	1	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**12**
CV03	1	1	0	1	1	1	0	0	1	1	1	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	**14**
CV04	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	**5**
CV05	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	1	1	1	1	0	0	**13**
CV06	1	1	1	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	**11**
CV07	1	1	1	0	0	0	0	0	0	1	1	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	**10**
CV08	1	0	0	0	1	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	**9**
CV09	1	1	1	1	1	1	1	0	0	1	1	1	0	0	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	0	1	0	0	1	1	1	**23**
CV10	0	0	1	0	1	1	1	0	1	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	1	1	0	1	1	1	1	**17**
CV11	0	0	0	0	1	1	0	0	0	1	0	0	1	0	1	1	0	1	0	0	0	1	1	1	0	0	0	1	0	1	1	0	0	1	1	1	**16**
CV12	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	**9**
CV13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	1	0	**5**
CV14	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	**5**
CV15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	**5**
CV16	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**
CV17	0	0	1	0	1	0	0	1	1	1	1	0	1	0	0	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	1	1	0	**16**
CV18	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	**4**
CV19	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	0	0	1	1	1	0	0	1	0	0	0	1	0	1	1	0	0	1	1	**24**
CV20	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**
CV21	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1	1	1	**10**
CV22	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
CV23	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	**5**
CV24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	**3**
CV25	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	**4**
CV26	1	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	**8**
CV27	0	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	**9**
CV28	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	1	1	0	0	0	1	1	0	0	1	0	0	0	1	0	1	0	1	1	1	**14**
CV29	1	0	0	0	1	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	1	**9**
CV30	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	1	1	**9**
CV31	1	0	1	1	0	1	0	0	1	0	0	0	1	0	1	0	0	0	0	0	1	1	0	0	0	1	1	1	1	0	0	0	0	1	1	1	**16**
CV32	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	**3**
CV33	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
CV34	0	0	0	0	1	1	0	0	0	1	1	1	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**10**
CV35	1	0	0	0	1	0	1	1	0	0	1	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	1	**18**
CV36	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**5**
TOT	**14**	**7**	**12**	**7**	**19**	**9**	**5**	**7**	**10**	**10**	**13**	**8**	**14**	**10**	**14**	**12**	**15**	**13**	**9**	**3**	**5**	**9**	**6**	**3**	**5**	**5**	**4**	**7**	**3**	**9**	**18**	**6**	**12**	**12**	**14**	**13**	**342**



*Nodes distributed in Yi-Fu Proportional configuration. Nodes are colored based on harmonic closeness centrality (+central to -central = red-yellow-blue scale)

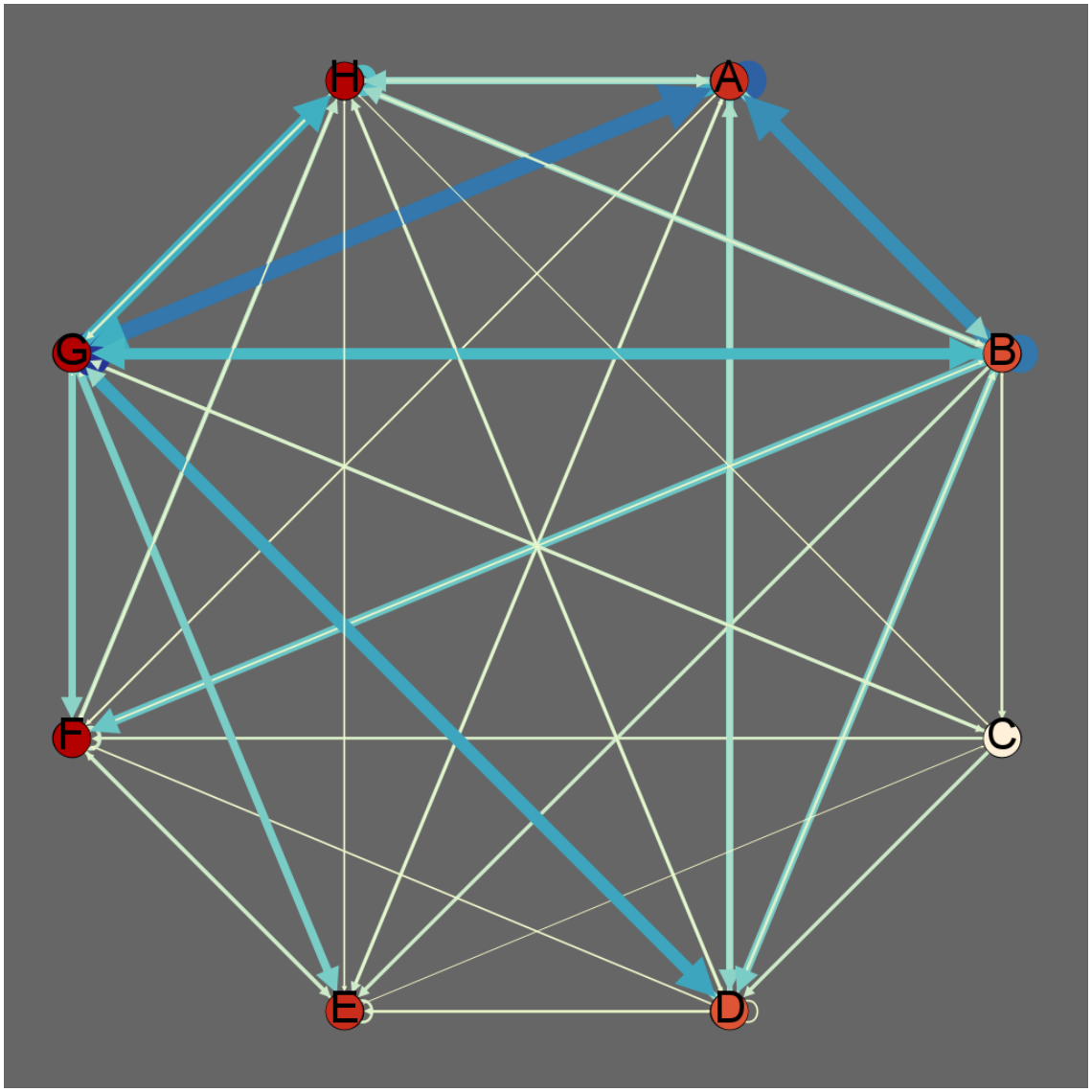
Figure 6.32. *Causal Graph Model of the Coffee Case Study (Author's elaboration)*

Table 6.61. *Interrelationships between the voids of the Case Study under the theoretical framework clusterization (Author's elaboration)*

	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	
A	20	8	0	8	4	2	13	8	**63**
B	16	18	3	9	4	10	12	7	**79**
C	0	1	0	4	0	3	4	1	**13**
D	6	3	0	2	3	2	7	4	**27**
E	2	0	1	1	3	3	2	1	**13**
F	1	2	0	0	4	4	1	5	**17**
G	18	12	3	14	9	8	24	13	**101**
H	5	3	1	2	2	2	3	11	**29**
	68	**47**	**8**	**40**	**29**	**34**	**66**	**50**	**342**

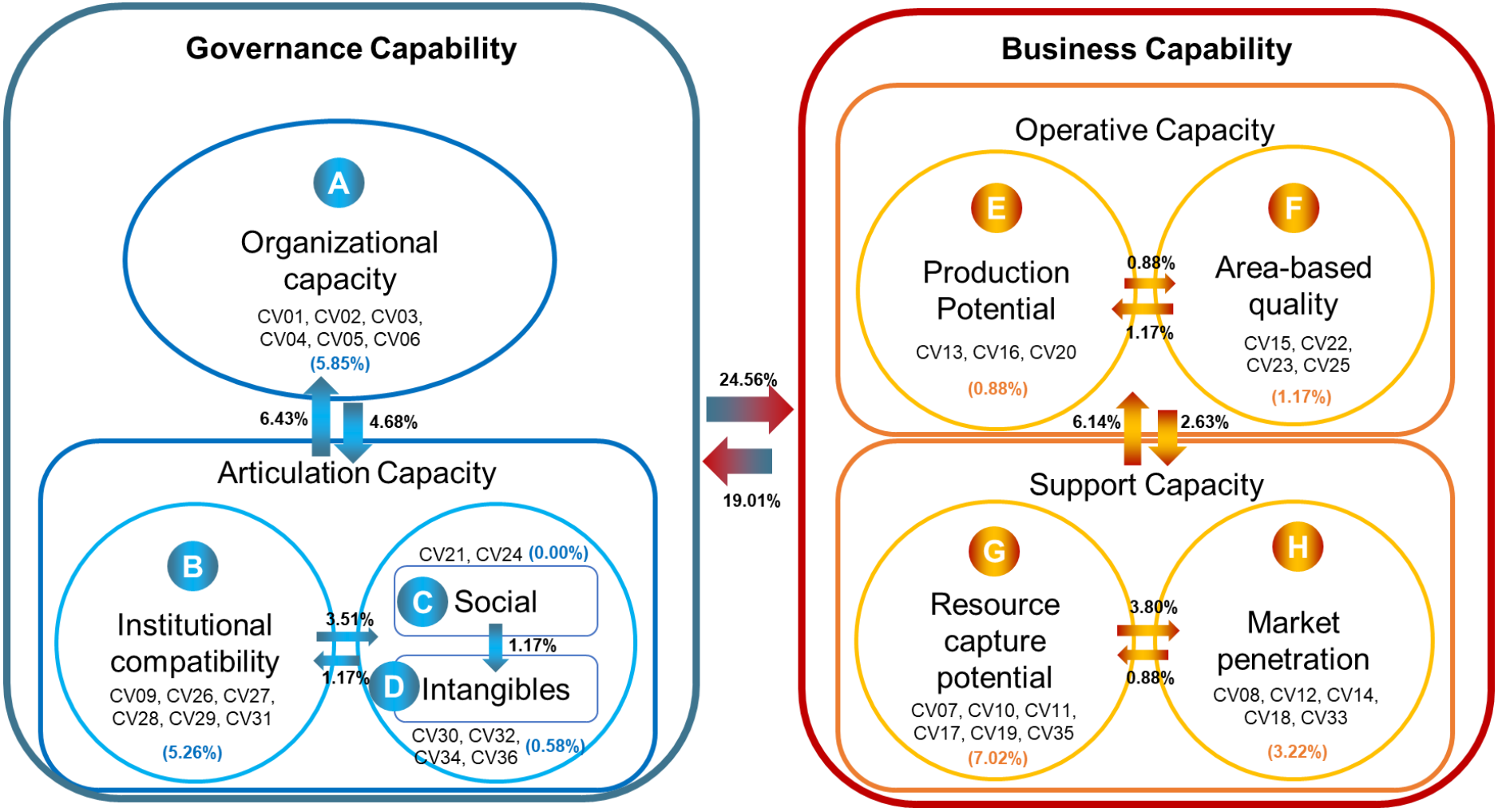
*Clusters (vertices):
-A= CV01, CV02, CV03, CV04, CV05, CV06
-B= CV09, CV26, CV27, CV28, CV29, CV31
-C= CV21, CV24
-D= CV30, CV32, CV34, CV36
-E=CV13, CV16, CV20
-F= CV15, CV22, CV23, CV25
-G= CV07, CV10, CV11, CV17, CV19, CV35
-H= CV08, CV12, CV14, CV18, CV33

*** Total number of relationships: 342(100%)
Grouping the interrelationships between connectedness voids using the clusterization of **Table 2.9**



*Intensity/Weight of edges are in blue scale (+weight = +blue), and weight of nodes in red scale (+Weight = +red).

Figure 6.33. *Interrelationship between Case Study's voids using the theoretical framework clusterization (Author's elaboration)*



*Percentages out of 342 (total number of causal relationships)

Figure 6.34. *Case Study: Interrelationships of connectedness voids using the theoretical framework clusterization (Author's elaboration)*

3. Objective 2: Validating Theoretical Framework based on CGM Comparison

The present section is composed by three phases: 1) confusion matrix, 2) network clustering analysis, and 3) direct observation of casualties.

3.1. Phase 2.1. Confusion Matrix

Table 6.62. *Confusion Matrix summary & metrics (Author's elaboration)*

Confusion Matrix Summary	
True Negative (a)	912
False Positive (b)	42
False Negative (c)	103
True Positive (d)	239
Total	**1296**
Confusion Matrix Metrics	
Recall/ Sensitivity (TPR)	69.88%
False Positive Rate (FPR)	4.40%
True Negative Rate/ Specificity (TNR)	95.60%
False Negative Rate (FNR)	30.12%
Accuracy (ACC)	**88.81%**
Error Rate (ERR)	11.19%
Precision/ Positive Predictive Rate (PPR)	85.05%
Matthews correlation coefficient (MCC (φ))	**70.03%**
Fowlkes–Mallows index (FM)	**77.10%**

The confusion matrix metrics (**Table 6.62**) were calculated analyzing both matrices (theoretical and case study). The comparison of both matrices shows three important results about the performance of the theoretical framework. First, the theory has an accuracy of 88.8% (ratio of correctly classified values), positioning in the upper range of 'good accuracy' (good: 70%~90%, very good: above 90%) (Allwright, 2022). Second, according to the MCC (Pearson correlation for matrices), we got a strong positive correlation with a 70.0% (strong: 60%~79%, very strong: above 80%) (Akoglu, 2018). Finally, the FM index indicates that there is a 77.1% of similarity between clusters. Based on these three measures, it is possible to say that **the theoretical framework can be useful to study case studies with good accuracy, strong correlation, and similar clusters.**

3.2. Phase 2.2. Network-Clustering Analysis

While the confusion matrix evaluated each of the 1296 possibilities one by one, this section focuses on analyzing the convergence/divergence of the theoretical framework with the case study by analyzing their networks and clusters. **Table 6.63** considers the most important network and statistical metrics obtained in the software Gephi.

Table 6.63. *Comparison of Network metrics (Author's elaboration)*

Network metrics	Theoretical Framework	Coffee Case Study	%Error
#Edges	281	342	17.6%
Average Degree	7.806	9.500	17.6%
Network Diameter	5	4	-25.0%
Graph Density	0.223	0.271	17.7%
Clustering Coefficient	0.461	0.558	17.4%
Avg. Clustering Coef.	0.306	0.366	16.4%
Avg. Path Length	2.066	1.894	-9.1%

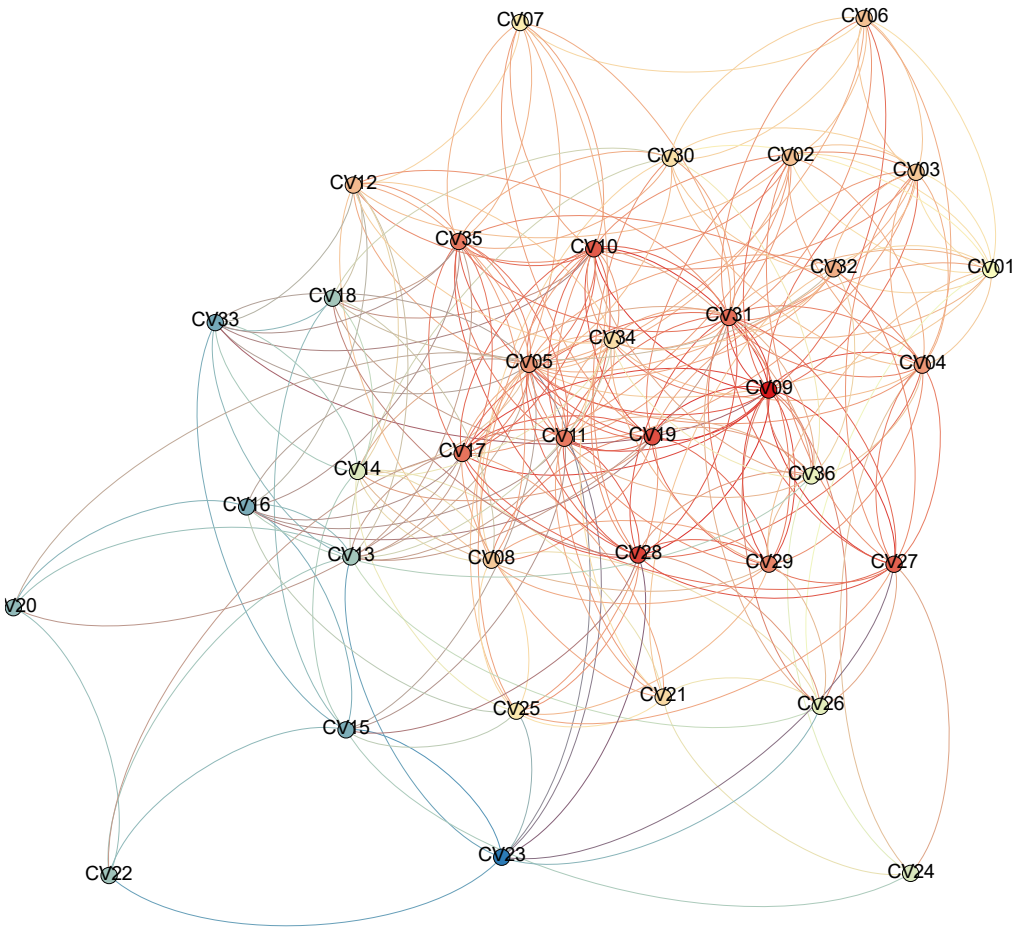
The calculated metrics show that the case study provided more causal relationships, generating a denser graph (lower network diameter, higher graph density). Other measure to highlight is the clustering coefficient (how well connected the neighborhood of a node is, 0<Coef.<1) that shows that both cases are partially clustered (around 0.5). In terms of the average path length (how far apart are most nodes in average), They presented similar average distances (around 2). The main issue to address is the percentage error that is around 18% in most metrics. While it is debatable whether this error is acceptable or not –even more so when the confusion matrix results yielded favorable results–, it is needed to highlight the difference of 61 causal relationships more in the case study rather than theoretical framework.

There are two main explanations for this divergence. The first one is that as there was not enough information from the case study to justify the theoretical claim, either because the case study did not present that problem in particular, the dynamic that happens in other CBRs was not present in the case study, or it was not possible to measure the determined relationship. In other words, the case study had a particular context that did not allow to test the framework. The second reason lies on the theoretical gaps in our proposed theory. As there are 1260 possible relationships, it is complex to analyze the existence of all of them based on sixteen sources implying that it is needed more bibliographic references –especially from more CBVC studies– to complement the framework. That said, Phase 2.3 would clarify this issue and determine the reasons behind this error.

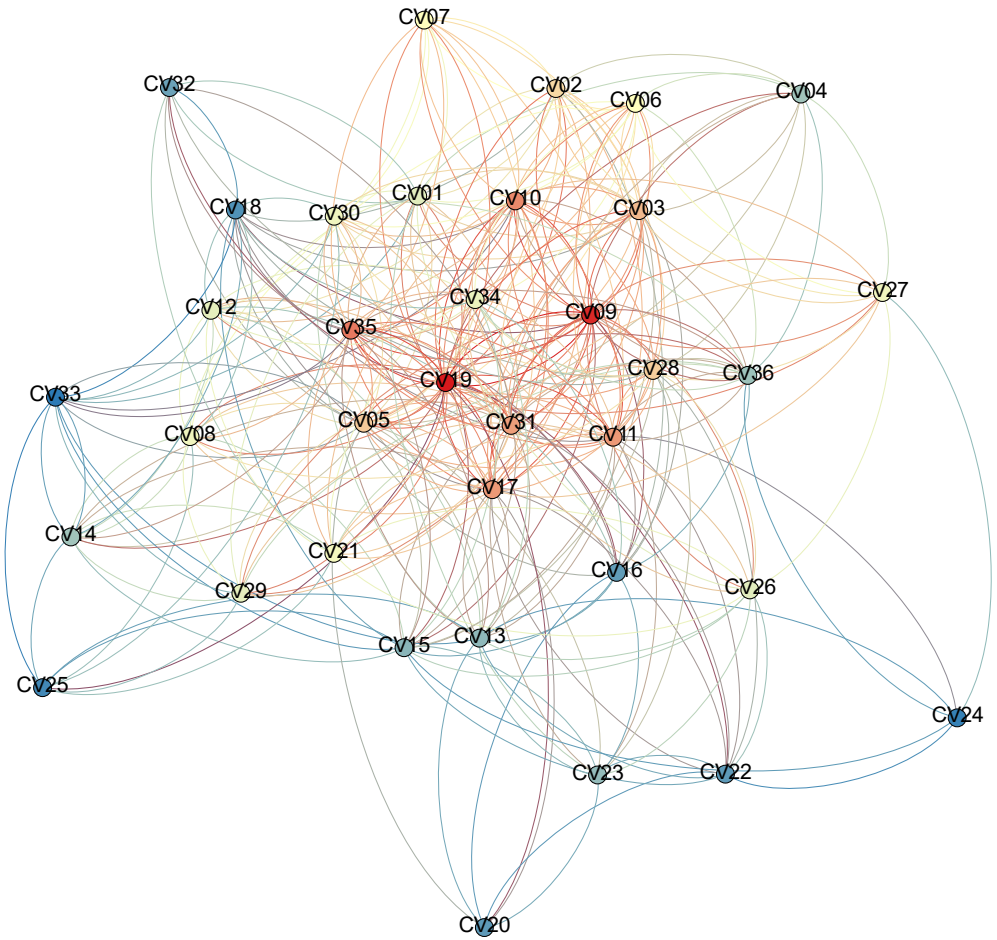
Our following analysis lies on evaluation our CGMs (**Figure 6.35**) under four types of centralities:

- Degree centrality (**Figure 6.36**) represents the number of indegree and outdegree linked to a node. Based on this analysis, we can see that the theoretical framework considers three central nodes (CV05, CV31, CV09). This are repeated in the case study, but the latter includes other nodes such as CV19, CV17, or CV35 that had a high-average role in the former. We can also see that the bottom of the network contains similar voids, with slight variations but no abrupt change in their positions.
- Betweenness centrality (**Figure 6.37**) measures how often a node appears as a bridge on shortest paths between nodes in a network. Three main nodes are highlighted in the first network: CV05, CV31, and CV17. Although the case study only matches one of them (CV31), the other two still have a high centrality within its network. Most voids have low centrality in both cases.
- Closeness centrality (**Figure 6.38**) is related to the average distance of the shortest path from each node to every other node in the network. We can identify that, in both network arrangements, CV09 and CV19 have a central role but with slight variations. However, the theoretical framework contains more 'central' or interconnected nodes than the case study. At the bottom of the graphs, there are several coincidences (CV18, CV33, CV16, CV20). Despite of the differences, most voids have relatively the same position in both graphs.
- Eigenvector centrality (**Figure 6.39**) measures the influences of a node in a network based on a node's connections. It is possible to perceive similarities in both networks. CV05 has a central role, followed by other voids such as CV31, CV34, CV11 and CV13. The middle section has several coincidences and in the bottom one too (CV07, CV02, CV24, CV20, etc.), although there are some variations.

The study of these four centralities reveals that both networks have a similar behavior despite of the small differences. Although there are some expected variations, the most and least central voids are shared between the theoretical graph and the case graph. This supports the results obtained in the confusion matrix indicating that the proposal can resemble and model the connectedness voids within a CBVC.

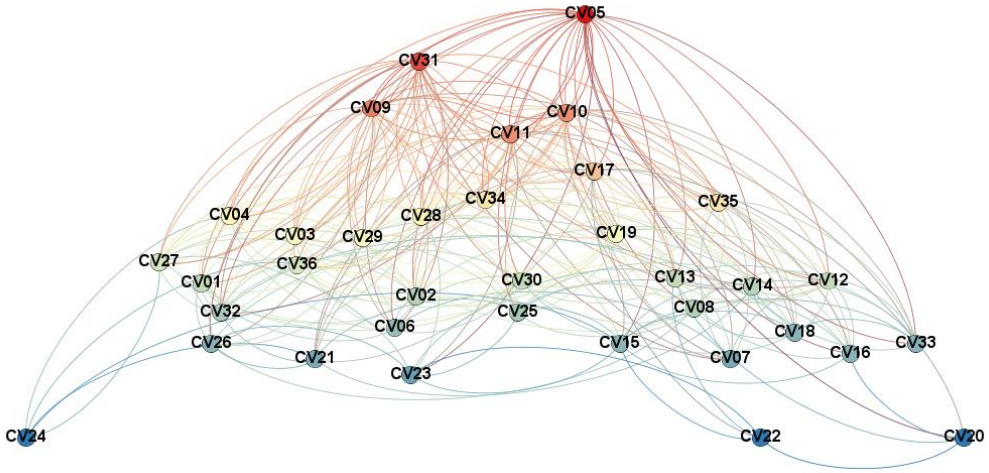


Theoretical Framework

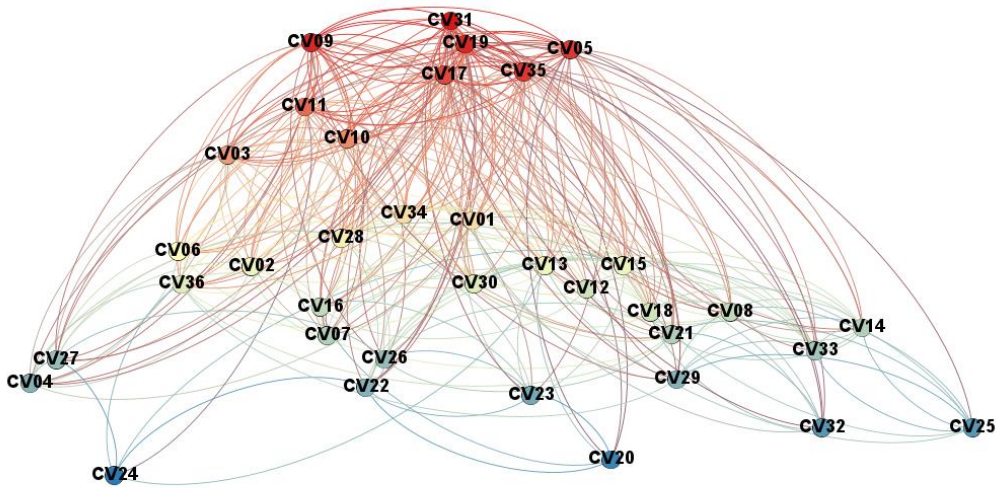


Coffee Case Study

Figure 6.35. *Causal Graph Models under Yifan Hu Proportional displacement of nodes (Author's elaboration)*

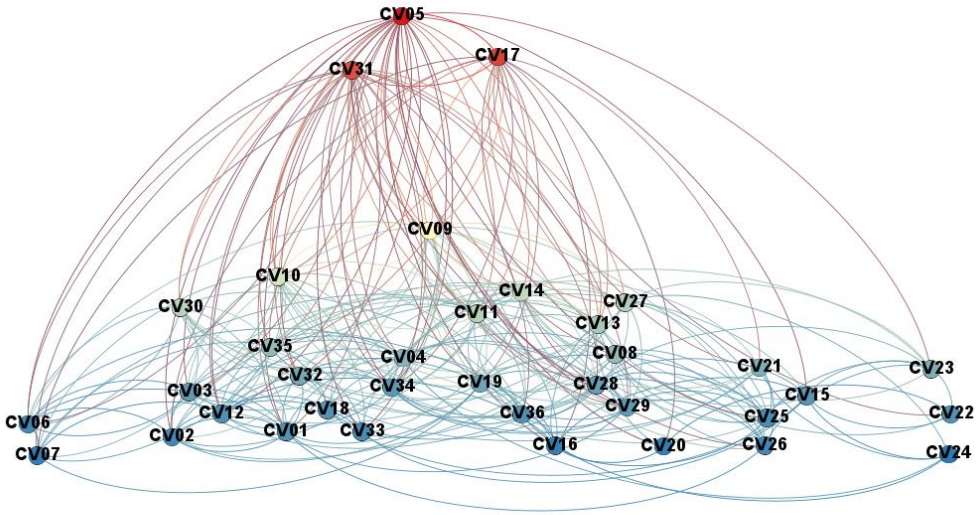


Theoretical Framework

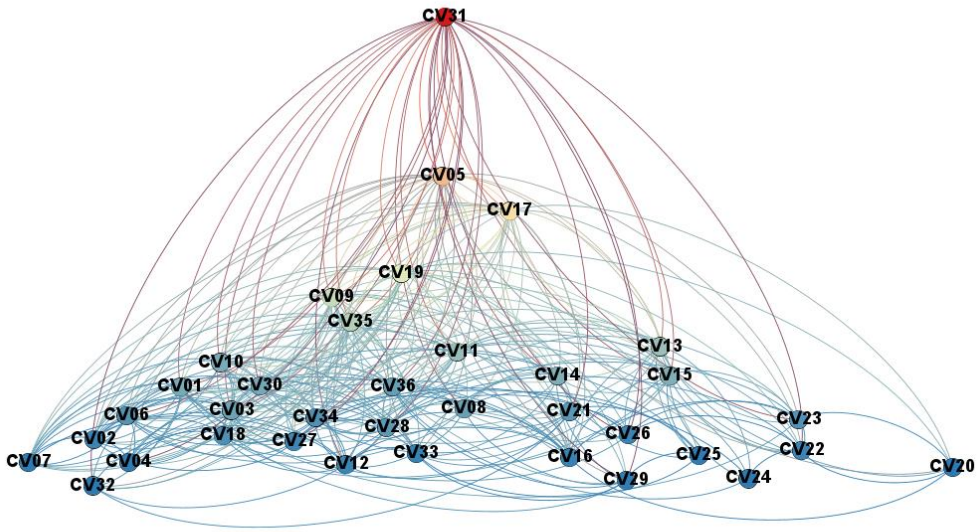


Coffee Case Study

Figure 6.36. *Visualizations of CGMs under Degree Centrality (Author's elaboration)*

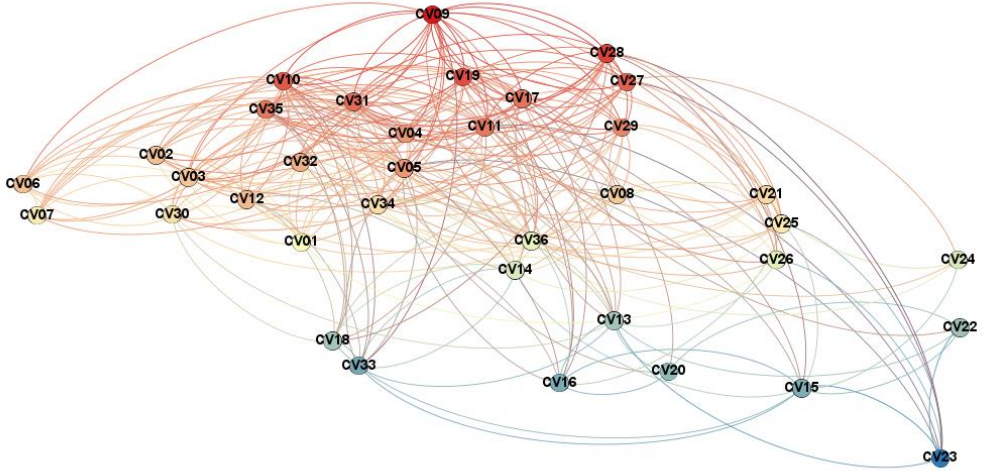


Theoretical Framework

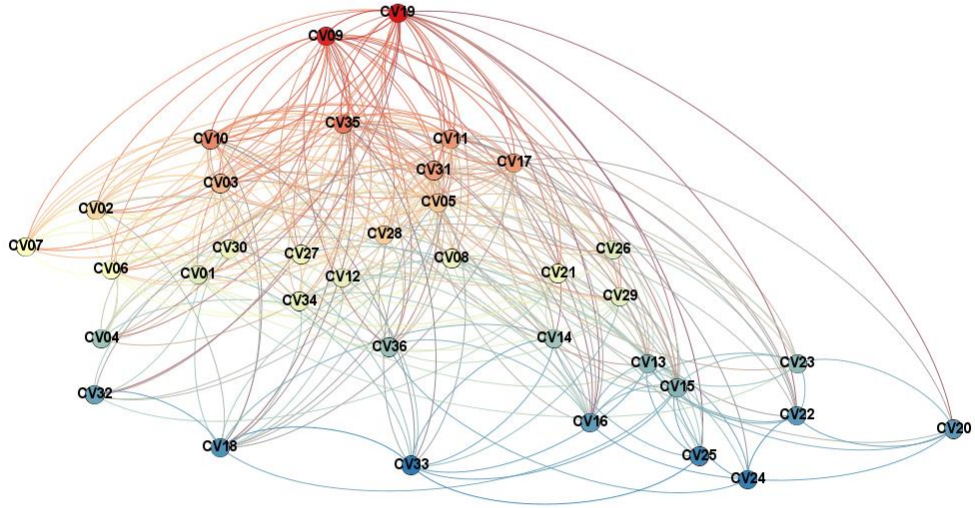


Coffee Case Study

Figure 6.37. *Visualizations of CGMs under Betweenness Centrality (Author's elaboration)*

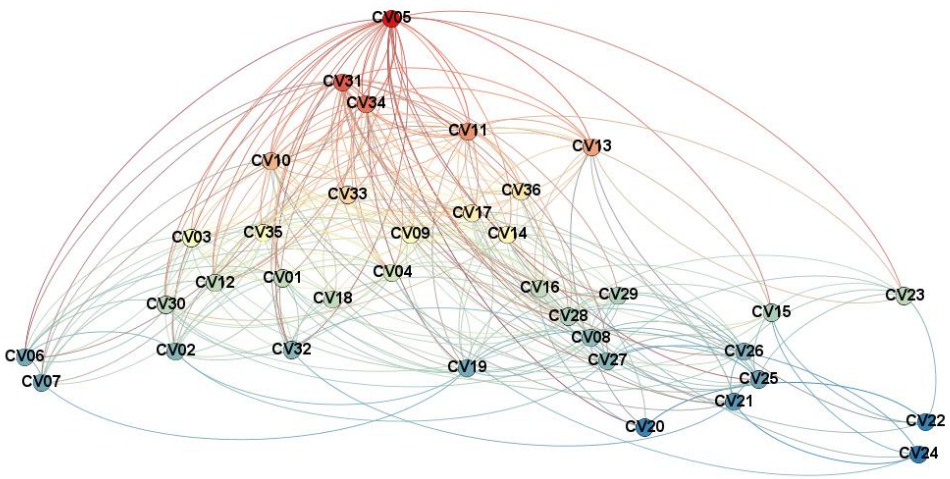


Theoretical Framework

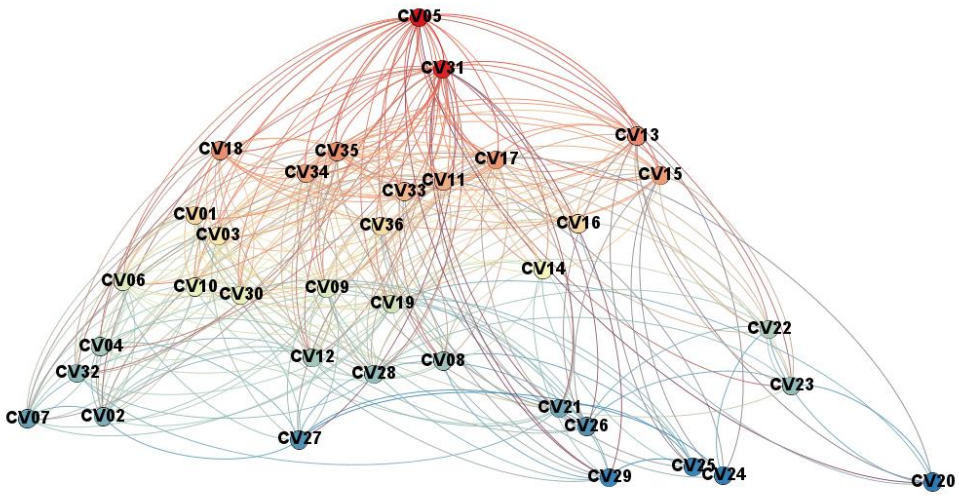


Coffee Case Study

Figure 6.38. *Visualizations of CGMs under Closeness Centrality (Author's elaboration)*



Theoretical Framework



Coffee Case Study

Figure 6.39. *Visualizations of CGMs under Eigenvector Centrality (Author's elaboration)*

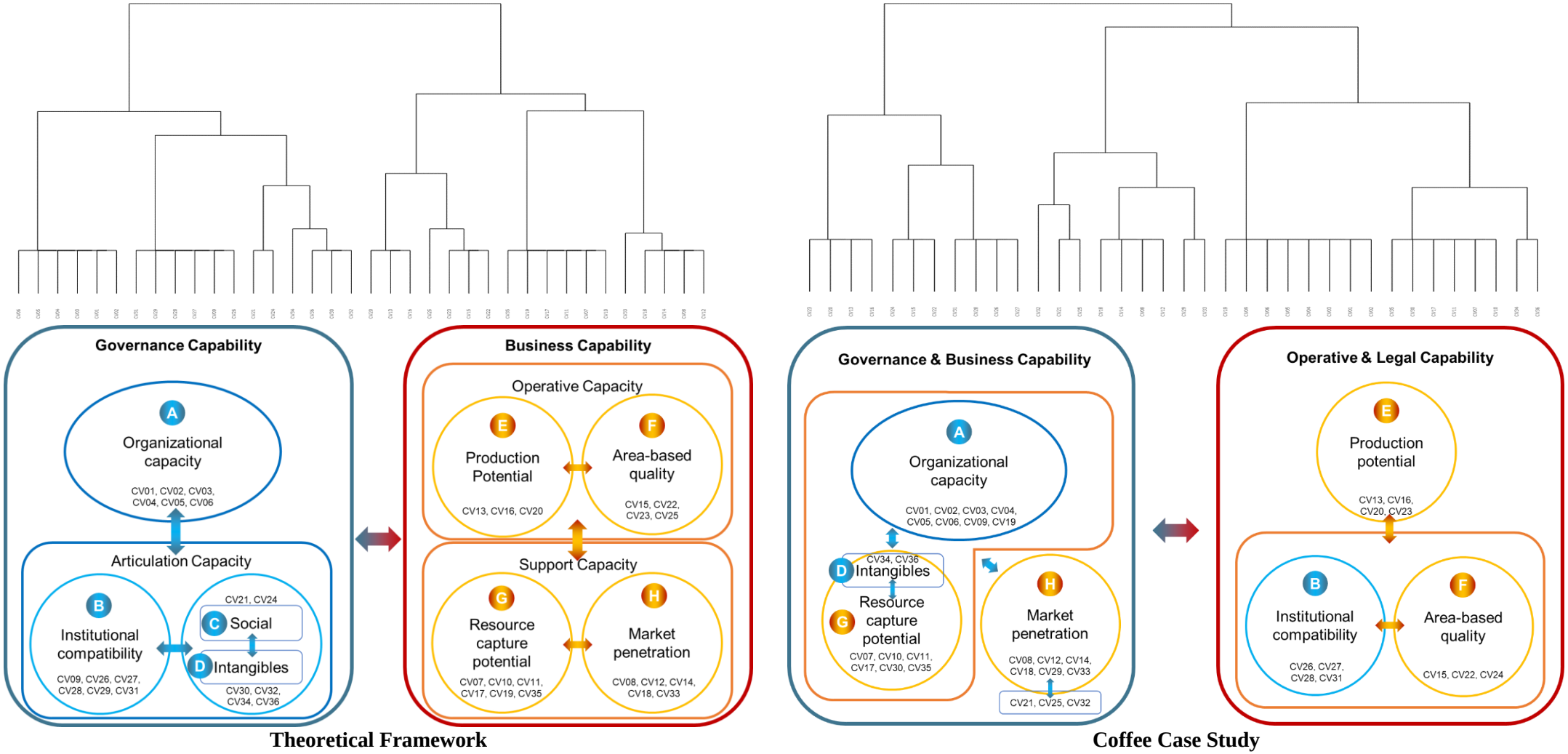


Figure 6.40. *Comparison of dendrograms & qualitative conceptualizations (Author's elaboration)*

We have taken two approaches to analyze the clusters. The first one is based on the analysis of the resulting dendrograms and their qualitative interpretations (**Figure 6.40**). In plain sight, we need to address that the case study clustering does not match exactly to the theoretical one, especially within the large groups. This is an expected result as the change of the position between voids implies a change of relationship between clusters. Thus, the main analysis relies on the change of structure within the 2nd/3rd level clusters (A, B, E, F, G, H). Although, there are slight variations within them (± 1 or ± 2, that represents a 15-33% variation), most clusters have the same elements and they still fit under the qualitative interpretation of each subcluster (except from cluster C that spread to others). In addition, the clusters A, G, and H (organizational capacity, resource capture potential, and market penetration) were the less affected and attracted other voids to their arrangements. This comparison led us to conclude that the selected clusters (A, B, C, D, E, F, G, H) are good references to understand the CBVCs, although their cluster interrelationship might change, requiring further studies to clarify this issue.

The second approach to analyze the clusters is by inserting the case study data into the theoretical clusterization (presented in **Table 6.61**, **Figure 6.33**, and **Figure 6.34**). Comparing these results with the ones obtained in **Chapter 2** (named as **Table 2.9, Figure 2.10,** and **Figure 2.11**), it is possible to draw some conclusions. Comparing their matrix arrangements, **Table 6.64** reveals the changes within and between clusters, with red values with a -100% error, blue values with +100% error, and green values near 0% error. Despite the additional 61 edges (the 18% obtained **Table 6.63**), most values are in the green spectrum implying that they have been well distributed: four red (6.3%), four blue (6.3%), 21 zeros (33%) and the rest are green tonalities. Most red and green values (5/8) are related with cluster C and D that, as perceived in **Figure 6.40**, are relatively small and were not exactly preserved in the case study clusterization.

Table 6.64. *Percentage errors in the comparison between both clusterizations (Author's elaboration)*

	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	
A	0%	0%	0%	0%	75%	0%	31%	50%	**17%**
B	6%	-22%	67%	0%	50%	30%	17%	43%	**11%**
C	-100%	0%	-100%	25%	0%	33%	25%	100%	**15%**
D	-33%	-67%	0%	-150%	33%	100%	29%	25%	**-4%**
E	0%	0%	100%	0%	0%	33%	50%	0%	**23%**
F	0%	100%	0%	0%	25%	-25%	-100%	0%	**6%**
G	56%	25%	67%	50%	11%	63%	13%	23%	**34%**
H	40%	-33%	0%	-50%	0%	50%	33%	0%	**7%**
	15%	**-4%**	**50%**	**10%**	**28%**	**35%**	**20%**	**24%**	**18%**

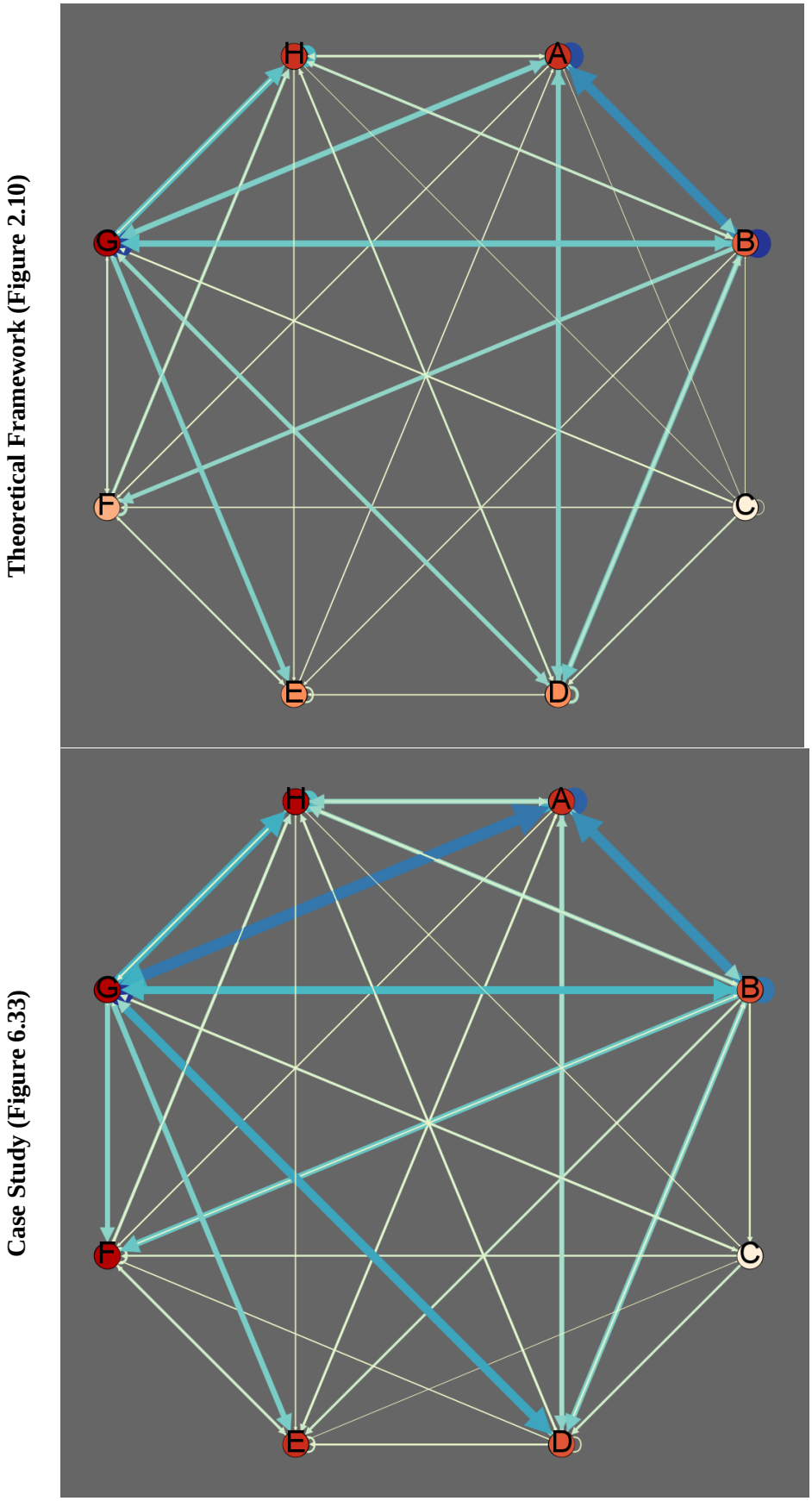


Figure 6.41. *Comparison of the interrelationships of clusters (Author's elaboration)*

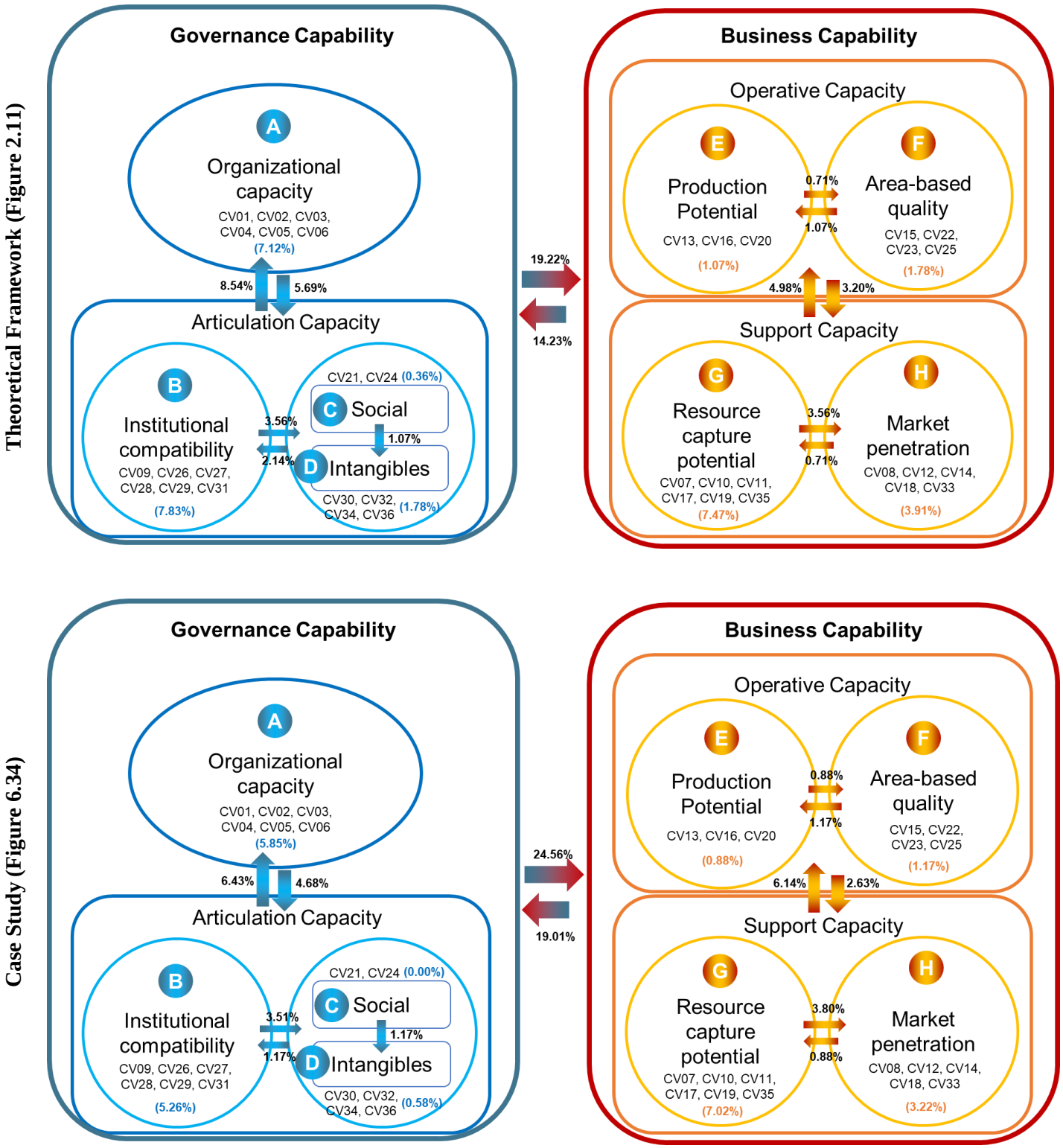


Figure 6.42. *Comparison of clusterization models (Author's elaboration)*

The last two comparison brings additional insights in our analysis. Observing **Figure 6.41**, we can observe a higher density inside the nodes of the case study (more self-loops in the clusters), especially in F,G and H. In terms of the relationship between clusters, the case study reveals higher density in the G→A pair, G→B, and G→D, implying that the case study revealed how cluster G (resource capture potential) had more relevance in the development of other clusters. **Figure 6.42** provides a comprehensive visualization of the clusterization models. At first sight, the biggest difference is in cluster C as it has been reported by the moment. However, it is possible to highlight that the direction of the relationships between clusters did not change (the predominant flow between clusters did not change in any of the identified relationships), although the probabilities of each relationship (arrows) or cluster (circles) did slightly change (understandable from **Table 6.64**).

From these network and cluster analyses, we can conclude that, although the case study presents some differences in the role of some nodes or clusters within the network due to the higher number of edges, **the theoretical framework has well modeled the main central nodes in each centrality analysis, the location of most voids within each cluster, and the orientation of the cluster relationships in the conceptual interpretation.** That said, despite of the divergence in some elements, the theoretical framework can replicate the behavior of the case study as a network and as a cluster arrangement.

3.3. Phase 2.3. Direct Observation of Causalities

This section focuses on qualitative described the outcomes from phase 2.1 and phase 2.2 based on the direct observation of the causal relationships. **Table 6.65** summarizes the main reasons behind the difference between indegrees (IN) and outdegrees (OUT) between the framework and the case. As pointed in phase 2.2, the divergence lies in 1) the particularities of the case study, 2) lack of sources to saturate the theoretical framework.

Analyzing the percentage errors from **Table 6.65**, we can highlight that most indegrees and outdegrees links are positive variation (green tonalities), that is deductible from the higher number of edges/causalities in the case study that were not found in the theoretical framework (**false negatives** in **Table 6.62**). The main reason behind these results is the higher number of particularities in the case study: the relevance of not having a highway (CV19), the impact of land issues on other voids (CV22), and the higher role of some actors providing services (CV35, CV06, CV09, etc.).

Table 6.65. *Direct Observation of the causal relationships (Author's elaboration)*

CVs	Theoretical Framework (TF)				Case Study (CS)				%Error & Analysis			
	IN	OUT	SUM	OUT/IN	IN	OUT	SUM	OUT/IN	IN%	OUT%	SUM%	Reasons
CV01	9	6	15	0.67	14	8	22	0.57	35.7%	25.0%	31.8%	The CS revealed how articulating more actors in CV01 had a direct effect on other OUT-voids not considered in the TF.
CV02	6	8	14	1.33	7	12	19	1.71	14.3%	33.3%	26.3%	The CS revealed how more stakeholder mix had an impact on other void (+resources) not considered initially.
CV03	10	8	18	0.80	12	14	26	1.17	16.7%	42.9%	30.8%	INPANDES had a huge role providing several benefits that the CBR was lacking, increasing the OUT-voids.
CV04	9	10	19	1.11	7	5	12	0.71	-28.6%	-100.0%	-58.3%	Due to the low duration of the project, it was not possible to observe the potential of cross-border decision-making spaces (less IN/OUT).
CV05	21	11	32	0.52	19	13	32	0.68	-10.5%	15.4%	0.0%	Almost precise match between TF and CS. The cooperatives are the main actors intervening in this void.
CV06	3	9	12	3.00	9	11	20	1.22	66.7%	18.2%	40.0%	The CS showed several voids that affect leadership at all levels, adding more IN-voids.
CV07	4	6	10	1.50	5	10	15	2.00	20.0%	40.0%	33.3%	In the CS, development partners have had strong participation in the area with positive effect in more OUT-voids.
CV08	6	8	14	1.33	7	9	16	1.29	14.3%	11.1%	12.5%	The CS and TF have a good match. The CS adds more details complementing the TF.
CV09	10	16	26	1.60	10	23	33	2.30	0.0%	30.4%	21.2%	The CS revealed a higher impact of public institutions (more OUT-voids) due to their traditional role of providers in the border areas.
CV10	12	13	25	1.08	10	17	27	1.70	-20.0%	23.5%	7.4%	The CS expanded the impact of professionals (especially those working in INPANDES/ALT/MPS) perceived in the TF.
CV11	13	12	25	0.92	13	16	29	1.23	0.0%	25.0%	13.8%	The CS and TF have a relatively good match. The CS adds more details based on the particularities of the area.
CV12	6	9	15	1.50	8	9	17	1.13	25.0%	0.0%	11.8%	The CS matches with the TF (only one IN-Void of difference).
CV13	12	3	15	0.25	14	5	19	0.36	14.3%	40.0%	21.1%	The high-volume decline in Sandia revealed more IN- and OUT-voids that were not considered initially in the TF.
CV14	10	4	14	0.40	10	5	15	0.50	0.0%	20.0%	6.7%	The CS matches with the TF (only one OUT-Void of difference related to the impact of the cooperative).
CV15	7	4	11	0.57	14	5	19	0.36	50.0%	20.0%	42.1%	The CS pointed more factors that can affect coffee production quality due to the particularities of the area (coca, coops, etc.).
CV16	8	3	11	0.38	12	4	16	0.33	33.3%	25.0%	31.3%	The CS revealed the existence of more IN-voids that affect the correct use of equipment & infrastructure.

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CV17	11	11	22	1.00	15	16	31	1.07	26.7%	31.3%	29.0%	The CS complements the TF and adds more details that match literature but was not presented in detail.
CV18	7	4	11	0.57	13	4	17	0.31	46.2%	0.0%	35.3%	The CS showed more IN-voids due to the participation of more cross-border actors.
CV19	4	14	18	3.50	9	24	33	2.67	55.6%	41.7%	45.5%	The CS revealed a higher impact of the lack of highways into the studied area.
CV20	1	4	5	4.00	3	4	7	1.33	66.7%	0.0%	28.6%	The CS reported two more IN-voids not considered initially in the TF.
CV21	3	7	10	2.33	5	10	15	2.00	40.0%	30.0%	33.3%	The TF did not provide so much information about the role of youth as the CS did based on the current youth migration issue.
CV22	2	3	5	1.50	9	3	12	0.33	77.8%	0.0%	58.3%	The CS revealed more IN-voids (seven more) that impact land and that were not so explored in the TF.
CV23	7	2	9	0.29	6	5	11	0.83	-16.7%	60.0%	18.2%	As the CS considered the roya as an environmental risk, it increased the OUT-voids.
CV24	1	4	5	4.00	3	3	6	1.00	66.7%	-33.3%	16.7%	The CS reported how other IN-voids affected gender equity (e.g., lower volume, no job for women).
CV25	6	7	13	1.17	5	4	9	0.80	-20.0%	-75.0%	-44.4%	Due to the low population, there were little cross-border dynamics to evaluate all voids in the TF with the CS data.
CV26	6	5	11	0.83	5	8	13	1.60	-20.0%	37.5%	15.4%	The CS revealed more OUT-voids due to interviews with coca producers.
CV27	4	12	16	3.00	4	9	13	2.25	0.0%	-33.3%	-23.1%	Due to the law legal compatibility in the CS, it was not possible to study the OUT-voids from the TF.
CV28	5	14	19	2.80	7	14	21	2.00	28.6%	0.0%	9.5%	The CS revealed more IN-voids affecting the development of common productive policies.
CV29	7	11	18	1.57	3	9	12	3.00	-133.3%	-22.2%	-50.0%	Due to the law compatibility of trade barriers in the CS, it was not possible to study all the voids reported in the TF (low CS data).
CV30	8	7	15	0.88	9	9	18	1.00	11.1%	22.2%	16.7%	The CS present slightly more voids than the TF.
CV31	17	12	29	0.71	18	16	34	0.89	5.6%	25.0%	14.7%	The CS gave more insights about the possible impact of +/- motivation in other voids.
CV32	4	9	13	2.25	6	3	9	0.50	33.3%	-200.0%	-44.4%	The CS and the TF partially differed as the expected cross-border local culture did not match the project geographical scope).
CV33	9	2	11	0.22	12	2	14	0.17	25.0%	0.0%	21.4%	The CS revealed the existence of more IN-voids that complement the TF.
CV34	13	7	20	0.54	12	10	22	0.83	-8.3%	30.0%	9.1%	The CS and the TF slightly differed.
CV35	9	11	20	1.22	14	18	32	1.29	35.7%	38.9%	37.5%	The CS revealed a high role of CECOVASA cooperative on reducing (or increasing) voids, elevating IN/OUT-voids.
CV36	11	5	16	0.45	13	5	18	0.38	15.4%	0.0%	11.1%	The CS revealed more IN-voids to consider in knowledge transfer.
SUM	**281**	**281**	**562**	**1.00**	**342**	**342**	**684**	**1.00**	17.8%	17.8%	17.8%	The CS shows a higher density of relationships. It does not contradict the TF but expand it.

Another reason behind the higher number of positive errors is due to the limitations on justifying all 1260 causalities with sixteen references and some additional sources considered in the theoretical framework. However, **the additional causal relationships found in the case study does not contradict the framework, but elaborates on it, indicating that a more exhaustive and meticulous literature review could reduce the gap**. The opposite case also happened: the case study lacked the data or dynamics to explain some of the voids that have been widely reported in the literature (**false positives** from **Table 6.62** or negative errors in **Table 6.65**). For example, the impact (outdegrees) of discussion spaces (CV04), cross-border economies (CV25) or joint identity (CV32) were not so evident in the studied CBVC. A last point to consider is that some causal relationships could be **true positives**, but the lack of data in both, the framework and case, could not allow to verify their role in the CBVC dynamics and they stayed as true negatives (e.g., the possible role of trade barriers on bargaining power).

The case study revealed a high participation of two actors in the local and cross-border local dynamics: the cooperative CECOVASA, and the Peruvian local municipalities. The Central cooperative provided several services, even constructing highways, influencing in the reduction of several voids. This is also perceived in the municipalities that played a more interventionist role by providing even productive services (e.g., maquila services for roasting coffee). In addition, the CBG model promoted by INPANDES had a similar behavior: it provided several resources activities, or services that are usually not expected from governance schemes in the related literature. Inferring from these facts, it is possible to affirm that, **due to the lack of actors and opportunities in this border area, the cross-border actors tend to have a more interventionist approach to solve problems**. That said, **rather than focusing on shaping relationships, they tend to incorporate additional capacities and provide them by themselves**. Thus, the number of causal relationships increased in the case study.

As a closure for this section, we can say that Phase 2.1 revealed that there is a strong correlation between both, the theoretical framework and case study, and while there is not an exact match, the behavior of the nodes and clusters within the networks are very similar (Phase 2.2). That said, further studies are required to determine permissible range of errors. Phase 2.3 showed that this mismatch is not due to contradictions between both, but due to the particularities of the case study and the need of further specific literature to saturate all causalities. However, despite of the discrepancies, the developed analyses reveal that **the proposed framework can model and reflect the reality of CBVCs, validating its use for analysis**. The next section focused on the implementation of this model to analyze the INPANDES project, determine its effectiveness, explain the reasons behind it, and develop policy recommendations to better interventions in this area.

4. Objective 3: Instrumentalizing the CGM for Project Evaluation

The present section is composed by three phases: 1) evaluation of the INPANDES project, 2) explaining the reasons behind the project results (Δvoids), and 3) the formulation of policy recommendations.

4.1. Phase 3.1. Connectedness Voids for Project Evaluation

As mentioned in **Chapter 3** (Section 5.2), we conducted the case study based on two types of variables:

- Independent Variables: INPANDES project attributes (funding, actions)
- Dependent Variables: Connectedness voids + indicators ($\Delta income, \Delta exports, Proy_{Satisfact}$)

To facilitate this conversation, **Table 6.66** summarizes the INPANDES projects in terms of the determined parameters: budget (euros, percentage, expenses summary), and the interventions (what actions were executed during the project). The table disaggregates those parameters per connectedness void. Based on the analysis conducted in **Objective 1** – Phase 1.2: Connectedness voids analysis, we could determine the impact of the project in each void with an Outcome-Based Evaluation (OBE) methodology. **Table 6.67** summarizes those results pointing the result of each intervention, its efficiency, and the Δvoids. Discussing on the obtained results sheds light whether the influence of the project in the improvement of worsening of the conditions per void.

Table 6.66. *Independent variables: Parametrization of INPANDES project (Author's elaboration)*

CVs	Budget (€)	Budget (%)	Budget (Summary)	Intervention
CV01	0.0	0.0%		INPANDES improving previous efforts (PRA project)
CV02	0.0	0.0%		Attraction of several national, subnational, local stakeholders related to coffee development.
CV03	46,924.9	10.4%	1) Auditing costs, 2) project marketing, 3) other costs	INPANDES multi-level governance structure & role of ALT.
CV04	5,215.0	1.2%	meeting training session costs	Meetings spaces, especially the Binational Technical Groups
CV05	0.0	0.0%		(Via 11, 16, 18) Activities in cultivation (training), transformation (roasting), and commercialization (branding)
CV06	0.0	0.0%		Involving Leaders and key actors from different levels & training them.
CV07	0.0	0.0%		Connecting cooperatives with JNC (agreement) and FECAFEB (failed)

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CV08	0.0	0. 0%		Objective: elimination of middlemen by connecting CECOVASA and APOCOM, increasing product quality.
CV09	0.0	0.0%		Involving municipality authorities & training public officers.
CV10	104,550.6	23.2%	1) Project coordinator, 2) managers 3) basic equipment (laptop, printers, etc.), 4) coffee production consulting services	Improve professional capacities of municipalities and cooperatives.
CV11	47,706.9	10.6%	1) Two technicians, two promoters 2) training material	Technical training for producers
CV12	0.0	0.0%		---
CV13	0.0	0.0%		Improving collecting centers
CV14	0.0	0.0%		(Via 18) Frontera Coffee + International Fair (led to Purchase Letter)
CV15	8,000.0	1.8%	1) vegetal health surveillance	(Via 11, 16) + Collection Plan & Traceability
CV16	188,732.9	41.8%	1) Roasting machine, 2) equipment, 3) tools, 4) productive infrastructure, 5) supplies (insecticide, nitrogen, acidifying)* need to know more if they were organic	Provision of several supplies, tools, equipment and infrastructure to cooperatives
CV17	0.0	0.0%		INPANDES coffee component (€450K), Agrobanco credit for Peruvian
CV18	22,404.9	5.0%	1) Brand register, 2) Fair trade certification, 3) national fairs, 4) international fairs	Frontera Coffee branding. Starting Fair Trade certification
CV19	11,446.1	2.5%	1) Two motorbikes, 2) Logistic expenses of professionals and technicians (flights, combustible), 3 Logistics of technicians	---
CV20	0.0	0.0%		Verbal commitment of Peruvian municipalities to provide energy to Bolivia
CV21	0.0	0.0%		Training some youth to be technicians
CV22	0.0	0.0%		Good Practice Program & training for Bolivian on land fertility
CV23	0.0	0.0%		Training on Agroforestry systems
CV24	0.0	0.0%		Training coffee sorting/cupping ladies
CV25	0.0	0.0%		(Via 3) INPANDES as an informal formalization (CBIT→CBVC)
CV26	0.0	0.0%		---
CV27	0.0	0.0%		Dialogue on cross-border policies, vision, and policy agreement
CV28	0.0	0.0%		Dialogue on cross-border productive articulation
CV29	0.0	0.0%		Verbal commitment of national governments to discuss the topic
CV30	0.0	0.0%		(Via 4) Discussion spaces
CV31	0.0	0.0%		(Via 17) funding as motivation
CV32	0.0	0.0%		(Via 18) Frontera Coffee
CV33	0.0	0.0%		(Via 18) Frontera Coffee + International Fair (led to Purchase Letter)
CV34	0.0	0.0%		(Via 16) Functional upgrading (transformation: roasting)
CV35	0.0	0.0%		Transferring CECOVASA cooperative model to APOCOM. Train coop officers.
CV36	16,324.0	3.6%	1) exchange internships	(Via 10, 11) + Several mechanisms: trainings, technical visits, internships, bilateral meetings, etc.
Total	**451,305.2**	**100.0%**		

Table 6.67. *Outcome-based Evaluation per void (Author's evaluation)*

CVs	Before	Targeted?	Intervention result	Efficiency?	After/now (Δvoids)
CV01	Average	Average	Further cross-border articulations were discontinued	Low	High (increased)
CV02	High	Average	Stakeholders left after the project finished.	Low	High (similar)
CV03	High/Avg.	Average	No CBG structure to support CBVC.	Low	High (increased)
CV04	High	High	No more bilateral technical groups or other space.	Low	High (similar)
CV05	Average	High	Delivered roasting potential & promoted new coffee brand.	Average	Average (similar)
CV06	Average	High	No more involved leaders at all levels.	Low	High/Avg. (increased)
CV07	High/Avg.	Average	None of the added stakeholders during the project remained in the territory.	Low	High/Avg. (similar)
CV08	Average	Average	No cooperation between CECOVASA and APOCOM. Low quality improvement.	Low	High/Avg. (increased)
CV09	Average	Average	Public capacities did not stay for long in the municipal administrations.	Low	Average (similar)
CV10	Average	Average	Few training, low participation, and professionals changed with next administration.	Low	Average (similar)
CV11	Avg./Low (PE), High (BO)	Average	Technical trainings have differentiated impact of producers (Peruvian ones learning more than Bolivian)	Low	Avg./Low (≈)(PE), High (≈)(BO)
CV12	High	No	---	NN	High (similar)
CV13	High	Low	Most centers were improved in Peruvian side, only one in Bolivia.	Low	High (similar)
CV14	Avg./Low (PE), High (BO)	No directly	Indirect: CECOVASA sale to German wholesaler	High	Avg./Low (↓)(PE), High (↑)(BO)
CV15	Avg./Low (PE), High (BO)	Low	Targeting collection & infrastructure, but not so much used	Low	Avg./Low (↑)(PE), High (≈)(BO)
CV16	Average (PE), High (BO)	High	Most budget was oriented to this aspect, but several limitations constraint their operationality.	Average	Avg./Low (↓)(PE), High (≈)(BO)
CV17	Average	High	39 Peruvian accessing credits (62%). Bolivian: 0%	NN	Average (similar)
CV18	Average/Low	Average	Frontera Coffee was sold. No Fair Trade.	High	Average/Low (decreased)
CV19	High/Avg.	No	Indirectly: the construction of Apolo highway.	Ind: High	High/Avg. (decreased)
CV20	Avg./Low (PE), High (BO)	No	No provision	NN	Avg./Low (≈)(PE), High (≈)(BO)
CV21	High/Avg.	Average	No formal training (certification) of youth	NN	High/Avg. (similar)
CV22	Average	Low	Little in-situ (farmland) training	Low	Average (similar)
CV23	High	Low	Low impact of trainings as mechanism	Low	High/Avg. (decreased)
CV24	High (PE), Avg./Low (BO)	High	No data, but most production disappeared after the project (no job)	NN	High (≈)(PE), Avg./Low (≈)(BO)
CV25	High/Avg.	No	---	NN	High (increased)
CV26	High	No	---	NN	High/Avg. (↓)(PE), Avg./Low (↓)(BO)
CV27	Average	High	Low insertion in concerted plans. No cross-border policy agreement.	Low	Average (decreased)
CV28	High/Avg.	Low	No progress.	Low	High/Avg. (decreased)
CV29	High/Avg.	No	No progress.	NN	High (increased)
CV30	Average	No	No progress.	NN	Average (similar)
CV31	Average	No	No motivation after no funding.	NN	Average (decreased)
CV32	Avg./Low	No	---	NN	Avg./Low (Similar)
CV33	Avg./Low (PE), High/Avg. (BO)	No directly	Indirect: CECOVASA sale to German wholesaler	High	Avg./Low (≈)(PE), High (↑)(BO)
CV34	Avg./Low	Avg.	No penetration in roasting coffee market	Low	Avg./Low (Similar)
CV35	Average (PE), High/Avg. (BO)	Avg.	APOCOM did not have the preconditions for the transfer	Low	Average (≈)(PE), High (↑)(BO)
CV36	High/Avg.	High	Low effectiveness of mechanisms.	Low	High/Avg. (similar)

Table 6.66 tells how the project was implemented and what kind of actions were taken to cover all voids. Before analyzing the impact of the project, we must address the budget distribution of the project. The budget expenditure was focus on the provision of equipment, infrastructure, and supplies (41.8%), followed by the cost of professional knowledge services (23.2%), and technical one (10.6%) – three essential budget items in agricultural projects. Despite the budget was concentrated in nine voids (25%), the project incorporated several actions to fill the voids directly (23 voids or 63.9%) or indirectly (10 voids or 27.8%), **targeting 33 of the 36 in the list (91.7%)**. In other words, the project was a very complex intervention that cannot be summarizes as a typical agricultural extensionist project, but it was clearly oriented to improve cross-border value chains. The only CVs that were not considered were CV12 (marketing information systems), CV19 (connectivity and TTF), and CV26 (illegal flows). The first one escaped from the project scope that was oriented to improve primary production of the CBVC, and the other two are not exactly possible to cover with a project of this type.

Despite of the budget limitation (€451k) and time constraint (two years in the field), INPANDES interventions ranged from promoting primary production, to articulating border municipalities and promoting a cross-border coffee brand. This last outcome was an achievement for the CAN because although the project was oriented to basic production (as stipulated by the EU funding), they could bargain to promote activities for commercialization, that were later capitalized by CECOVASA that sold it to an international buyer. Thus, **the project can be considered as a flagship initiative to build CBVCs and should be further studied** (not only the coffee experience but also the rest of them). The fact that INPANDES covered 33/36 voids also reaffirmed the interventionist approach pointed in **Objective 2**: initiatives tend to include several resources, activities, capacities by themselves rather than promoting the participation and involvement of actors – that was expected as an outcome but not achieved. Thereby, despite of the multiple details that the project involved; this does not imply that all results were positive.

While the main part of the project analysis has been conducted in Phase 1.2 (review from **Table 6.24** to **Table 6.59**), **Table 6.67** synthetizes the Δvoids including the effectiveness of the project interventions. INPANDES had no impact (NN) in 11 voids (30.6%), a low efficiency in 19 of them (52.8%), average outcomes in two casualties (5.6%), and high impact in 4 of 36 voids (11.1%). In most **cases were the project had no impact** (CV12, CV17, CV20, CV21, CV24, CV25, CV26, CV29, CV30, CV31, CV32), the voids did not changed or increased, leading to a worse situation. **Most of them were not directly targeted by INPANDES, and the ones that were (such as funding – CV17, or gender equity – CV24), were not sustainable.** There were only two improvements: the reduction of illegal flows (CV26) due to the lower price of coca in the global market, and the increase of motivation to produce (CV31) as producers (Peruvian and especially Bolivian ones) did not find coca as a profitable product and showed favorable to restart producing coffee. **Thus, the reduction of these voids did not depend on the project but on contextual factors.**

In terms of the voids **where INPANDES had a low efficiency** (CV01, CV02, CV03, CV04, CV06, CV07, CV08, CV09, CV10, CV11, CV13, CV15, CV22, CV23, CV27, CV28, CV34, CV35, CV36) despite some of them were priorities and highly targeted during the execution of the project. The study on these issues determined that most voids were still the same of increased by the moment that the field research was conducted, and only few cases evidenced a decline – three to be more specific: environmental degradation – CV23 (producers more aware of agroforestry practices), border policies – CV27 (Peruvian government promoted border policies and funding), and productive policies – CV28 (both countries started coffee programs at national/local level). **Looking these improvements, none of them was directly affected by the INPANDES project but rather by public initiatives and producer's perception on the coffee market.**

The project had an **average efficiency in two voids**: CV05 (CBVCs nodes), and CV16 (productive equipment, infrastructure, tools, and supplies). Both were highly related to the provision of equipment, especially the industrial roaster machine for CECOVASA as it created the opportunity for functional upgrading and expand the business into the roast coffee market. The biggest investment was oriented for this roaster and other equipment and installations. However, **although this provision represented a slight reduction of CV16, it did not have the expected impact on promoting downstream expansion (CV05) due to the lack of knowledge (professional, technical, and market related) and weak cooperativism.**

Finally, **the project had a high efficiency in four voids** (CV14, CV18, CV19, CV33) that paradoxically, it had average or no direct intervention. CV14 (market access & appropriate price), CV18 (marketing channels), and CV33 (bargaining power) are related to how the project developed the 'Café Frontera' (border coffee) and was sold by CECOVASA to the German wholesaler. While the product was developed by the INPANDES team, how it was inserted into the market highly depended on CECOVASA's capacities and the participation in international events. Although it is difficult to draw a line, it is possible to say that INPANDES had a supportive role in CECOVASA insertion. However, while the Peruvian side benefited from this event, the Bolivian was not. Due to the increase of trade barriers, Bolivian producers were disconnected from the cooperative, losing their main market channel (CV14) and bargaining power (CV33) as their only option was to sell to middlemen. That said, to adjudicate cross-border development based on the improvement of those three voids, trade barriers (CV29) must be overcome first. Thereby, **evaluating the Frontera coffee's impact in the Peruvian side, it has been a successful bottom-up facilitation of local processes, sustained for the last five years (CECOVASA sold again to the same buyer in 2022). However, evaluating it from a cross-border perspective (especially the impact on Bolivian communities), INPANDES did not lead to a reduction of those voids.**

The last void to consider is CV19 or connectivity and Trade & Transport Facilitation. INPANDES project did not have any direct intervention on these issues beyond the provision of motorbikes for conducting technical visits. However, the field interviews reported that it was because of this project that the Bolivian mayor of Apolo could meet the cross-border reality of the Bolivian communities. Due to its connections with the Bolivian national government, it was during its period that the highway proposal to connect those territories was approved and nowadays is in construction process. Thus, **INPANDES boosted connectivity, although not across borders.**

Summarizing, one question remains: **did the project lead to the reduction of voids and promoted local economic development in the cross-border region?** Given the facts, **it can be concluded that INPANDES had limited impact on reducing the voids across borders, as the outcomes of its activities either affected one side only or faded over time due to other voids.** This is supported on the non-increase in the profits of the producers, the non-increase in exports of roasted coffee, or the low satisfaction with the project that the producers commented during the field research. However, it does not mean that macroregional cross-border mechanisms do not have the potential to close the gaps. Our ex-post evaluation has been done after five years that the project finished and while **Table 6.67** presents the results, it does not consider what the project achieved while it was in execution.

Considering the INPANDES's coffee CBVC as a temporal assemblage or network, it represented the meeting and articulation of actors, resources, capacities, and activities to promote cross-border productive integration. The flow of non-reimbursable capital (CV17), knowledge (CV10, CV11), and participation of supranational entities such as the CAN and EU (CV07) increased the motivation (CV31) and participation of national and local entities (CV09) and other variety of actors not normally included in agriculture projects (CV02, CV06, CV17, CV21, CV24, CV35), the formulation and establishment of cross-border relationships, spaces and agreements that did not exist before (CV01, CV03, CV04, CV27, CV28, CV32), the development of productive capacities in the cooperative and especially in the Bolivian side (CV05, CV10, CV11, CV13, CV15, CV16, CV20, CV22, CV23, CV30, CV34, Cv35, CV36), or the strengthening of marketing channels and articulation with market (CV14, CV18, CV33) – all of them oriented to promote development through the cross-border value chain to eliminate the high costs of middlemen (CV08) and increasing producers' profits (CV17, CV21). While the project was in execution, there was even a tacit agreement between national entities to ignore that the coffee flow was an informal one, temporally 'legalizing' this cross-border informal trade into a cross-border value chain (CV25, CV29). And as commented, it even led to the promotion of highway projects to connect communities historically disconnected (CV19). That said, **despite the project outcomes were not sustainable, they were considerably reduced or in a good path to be reduced while INPANDES was in operation**. **Thus, the 'project as a temporal assemblage' contributed to building the institutions for cross-border territorial development**.

4.2. Phase 3.2. Explanatory Potential of CGMs

The discussion in Phase 3.1 revealed that the situations of most voids barely improved after the project execution – despite INPANDES could reduce them temporally. This leads to our next question: **what were the reasons behind the no-reduction of voids?** Despite all possible causal relationships were determined in the CGM, it does not mean that all of them affected the project results: only some of the causal relationships had a meaningful impact in reducing or increasing the impact of the INPANDES outcomes. To answer the question, we elaborate on the built CGM (**Figure 6.32**) and Connectedness Void charts (from **Table 6.24** to **Table 6.59**) and track the indegree links (what affects a specific void) and the outdegree links (what the presence or absence of a void led to) per category. **Table 6.68** synthesis these findings.

Before interpreting the analysis, we need to clarify that finding a 'unique root cause' might not be a correct approach to target connectedness voids. For example, the lack of connectivity (CV19) has high impact on the lower interaction of the cross-border social capital (CV01) because it also affects the motivation of public institutions to cooperate (CV31) or even locate in the area (CV09) –other two causes for increasing CV01–, leading to believe that solving this issue will have a direct positive impact and indirect one by reducing CV09 and CV31. However, when the INPANDES project was executed and the 'geographical' distanced shortened by putting all stakeholders within the same place (CV19), public entities were still reluctant to sign cross-border policy agreements (CV31) or did not have the capacities to do it (CV09). That said, it is not recommended to take a reductionist approach but to identify the main issues and target them together – as INPANDES project tried to execute.

Analyzing the results from **Table 6.68**, we need to highlight first **the intersectionality** of the voids: one is affected by several of them depending on the contextual situations: the lack of business or productive activities (CV05) in the CBR depends on a mix of voids such as lack of knowledge, capacities, and equipment (CV10, CV11, CV12, CV16). Second, **voids are actor-oriented** as cross-border stakeholders can experience the same void differently and therefore, affected by different sets of causes. For example, public entities experience weak cross-border social capital (CV01) differently from Bolivian producers. While the formers were affected by the lack of connectivity (CV19) or the absence of their peers at the borders (CV09), the latter lost their articulation with the Peruvian side when trade barriers increased (CV29). Third, **voids are context-based** as a cross-border actors can experience a void differently depending on the specific context or relationship. As Section 2.7.9 indicates for CV31 (lack of motivation to produce/cooperate), the motivation for municipalities to cooperate with their peers across the borders has different causes (CV17, CV19, CV31) than their motivation to cooperate with cooperatives (CV30, CV35).

Table 6.68. *Main voids that affected the project (IN-voids), current situation (OUT-Voids) (Author's elaboration)*

CVs	Main IN-voids affecting (indegrees)	Current scenario & OUT-Voids affected (outdegrees)
CV01	[-] No interest, no capacities and long distance between public institutions (9, 19, 31). Intensification of trade barriers (29).	[-] Little cross-border articulations (2,3,4). Productive disarticulation with Bolivian side (5).
CV02	[-] Weak leadership and CBG mechanisms did not sustain involved stakeholders (3, 9). Long distance (19).	[-] Weak productive articulation (5). Lower technical and financial resources (10, 11, 17).
CV03	[-] Lack of continuous funding (17), and leadership/public institutions (6, 9) to continue the initiative. No more CAN involvement (7).	[-] As the project is a temporal mechanism, most benefits disappeared at its end (2, 4, 10,11, 17).
CV04	[-] No interest, no public capacities and long distance between public institutions (9, 19, 31).	[-] No more discussion on CBVC, and eventual isolation of Bolivian communities (5).
CV05	[-] The weakening of CECOVASA cooperative (35) and lack of capacities and knowledge to upgrade in the GVC (10, 11, 12, 16).	[+/-] CECOVASA still concentrate most local volume (13) and good market access (14), but not because of the project.
CV06	[-] Weak motivation (31), low resilience to political changes (9), and weak binational statute to support the ALT (27).	[-] Weak cross-border articulation (1, 2, 3, 4) and low attraction of development partners (7).
CV07	[-] Complex geographical access to arrive the CBR (19) and lack of motivation of potential key actors (6, 35).	[-] There are still financial providers but only for Peruvian side (17). No strong knowledge providers (10, 11).
CV08	[-] Presence of trade barriers for Bolivian producers (29), lack of market knowledge to reduce intermediaries for cooperatives (12).	[-] Middlemen reduce the market and price alternatives to Bolivian producers (14).
CV09	[-] Lack of motivation to promote cross-border cooperation (31), long distance between institutions (19), lack of CBC knowledge (10).	[-] National governments did not reduce cooperation barriers (27, 28, 29) nor promoted CBG/CBVC (3, 4, 5).
CV10	[-] Weakness of public entities (9), lack of financial resources (17) or distance to professionals (19), and low adaptation (34).	[-] Weak public capacities to formulate projects and apply to funding (19). Weak coops to plan their own growth (35).
CV11	[-] Lack of funding (17), poor design of technical programmes (10), and weak knowledge transfer mechanisms (36).	[-] Lower coffee volume (13), limited quality control systems (15), hindering the implementation of technologies (16).
CV12	[-] No market information providers (2, 7), and low capacities to collect this type of information (10).	[+/-] CECOVASA gathers data for its branding (18), but better MKIS can be used to bargain/access markets (14, 33).
CV13	[-] The impact of roya & coca (23, 26), lack of funding for collecting campaigns (17) and, probably, less cooperative associates (5, 35).	[-] Lower profits based on coffee sales (17)
CV14	[+] PE: High/good quality, marketing channels, and bargaining skills (15, 18, 33). [-] BO: trade barriers & distant markets (29, 19).	[+] Profits for CECOVASA & producers (14, 21) [-] Bolivia: more middlemen (8), less motivation & bargaining capacity (31, 33).
CV15	[+] Good land position/quality (20), technical knowledge and coffee varieties & equipment (11, 16). [-] Impact of coca production (26).	[-] Risk of losing organic certification, valued in $500K in profits (18). [+] Quality as basis of local identity (32).
CV16	[-] Lack of financial capacities (17), low connectivity (19), utility scarcity (20), low technical knowledge transfer (11, 36).	[-] Lower coffee production in quantity and quality (13, 15). No operationalizing roasting process (5).
CV17	[-] Mun: no prof. (10). Coop: Low volume & market access (13, 14), no fin. partners (7). Prod: low credibility & distant banks (30, 19)	[+/-] Not so much financial resources to reinvest (10, 11, 12, 16, 34). Bolivian producers with poverty risk (21).

(Continued)

(Continued)

CV18	[+] High coffee quality (15) and marketing innovation (34), joint identity for Frontera coffee (32). [-] No market plan nor data (10, 12)	[+] More bargaining capacity (33) & market access (14), reduction of intermediaries (8).
CV19	[-] Poor public capacities to design infrastructure projects (9, 10), poor legal harmonization (27), low funding for logistics (17).	[-] Low connectivity led to difficulties articulating, and accessing services (1-11, 14, 16, 29).
CV20	[-] Long distances to areas with power lines (19), and lack of funding for generators (17).	[+] No need of irrigation due to environmental conditions (22). [-] No energy for equipment & upgrading processing (16, 5).
CV21	[-] Poverty: Market access and low profits (14, 17). Youth migration: high/fast profits from coca production (26).	[-] Youth & coca: increase illegal flows (26), undermine coffee practices (32), and weaken coops & innovation (34, 35)
CV22	[-] BO: lack of technical training (11), distance to higher lands (19), and financial resources to achieve min. land size (17).	[-] Border areas (lowlands) can lead to lower quantity (+defects, faster harvesting) and quality (13, 15).
CV23	[-] Lack of tech. knowledge in agroforestry systems (11) and non-resistant coffee varieties (16).	[-] Still low coffee volume (70%~90%less) (13), high impact on producers' motivation (31).
CV24	[-] PE: national framework does not empower women as Bolivian does (27). BO: Lower volume did not demand sorting ladies (13).	[-] Women are not usually considered in technical training, reducing knowledge transfer efficiency (36).
CV25	[-] Presence of trade barriers for Bolivian producers (29), high presence of middlemen (8).	[-] Entry of Bolivian coffee with low quality standards to cooperative's collection (15)
CV26	[-] Coca production reduce land fertility & env. conditions (22, 23) and undermine coffee quality & quantity (13, 15).	[+] Slight improvement due to governments' interventions (9, 27) and more coffee motivation as coca price dropped (31).
CV27	[-] Ineffective dialogue spaces (4), low motivation of governments (especially BO) (31), and political changes (9).	[-] Fragile ALT & CBG institutionality (6, 3). [+] Peru has special funding for border municipalities (17).
CV28	[-] Ineffective dialogue spaces (4), low motivation of governments (31), and political changes (9).	[-] Public entities providing weak agricultural extension programmes (11, 15, 16, 17)
CV29	[-] Low motivation of governments (especially regulatory agencies) (31), and long distance to the borders (19).	[-] BO: low access to market and fair prices (14), demotivation of producers (31), proliferation of middlemen and CBIT (8, 25)
CV30	[-] The three main relationships depend on the cooperatives' capacity to deal with partners & customers (35).	[-] No motivation to cooperate (17), less funding opportunities (17), weaker social capital & productive articulation (1, 5).
CV31	[-] (A) No more free funding, no previous contact & long distances (17, 31, 19). (B) weak associativity (35) & credibility (30), (C) the roya & coca (23, 26), and weak market access (14) (D) low transparency (30) [+] coffee quality culture [32]	[-] Weak cross-border articulation & governance (1, 3, 4), no funding transfer (17), less production (13), weaker coops (35)
CV32	[+] Productive articulation of coffee stakeholders & processes in Sandia & CBR (5) [-] Long distance to Apolo (19).	[-] Weak cross-border social capital if considering Apolo (1), weak motivation to cooperate (31). [+] Frontera Coffee (18)
CV33	[+] Central of coops (35), high coffee quality (13, 14), marketing channels (18) [-] Low market info (12), no prof. sellers (10), lower coffee volume (13). BO: Trade barriers (29)	[+/-] CECOVASA got a new buyer in a short period (during project). Bolivian receiving what middlemen offered (14).
CV34	[+] Higher associativity & cooperative leadership (35, 6). [-] Poor knowledge to develop roasting (10, 11, 12, 36)	[+/-] Process & product & marketing upgrading (11, 15, 18). Business expansions/downstream processing (5).
CV35	[-] Weak leadership, fast administrative changes & distrust between producers/leaders (6, 10, 30).	[+] Productive articulation (5, 8, 15, 16), market access (14, 18, 33). [-] Low volume (13), few services for producers (11, 17).
CV36	[-] Long distances (19), weak public & coop capacities (9, 35), no fulfilling preconditions (10, 11), no motivation (31).	[-] Weak efficiency developing capacities (9, 10, 11, 16)

A last point that needs to be addressed –and that is linked to the next section– relates to the 'value' or priority on solving a void: What has more importance, to buy more equipment or reduce trade barriers? Is it more relevant to upgrade the value chain or increase connectivity with the other side? Are these decisions important for what or for who? That said, **voids are subjectively valued** and the value behind them depends on who determine it. For example, cooperatives would value more investments in their productive capacity rather than cross-border public cooperation. Although an alternative to this issue is to quantitatively evaluate the 'weight' of each void considering all involved stakeholders, what would happen if there were no consensus? Bringing the analysis on project satisfaction that we mentioned in this chapter (Section 2.2.5. – Project Appraisal – ii) Project satisfaction), there was no consensus on the project success with the officials valuing the project almost twice as much as the producers because each of them perceived the project value from different angles. Thus, to classify the most relevant voids, it is necessary to first address the problem of 'subjective weighting'. While there are qualitative methods (e.g., Q methodology) that could help to solve this problem (Hermans and Thissen, 2009) this goes beyond the scope of our research. However, we intent to 'prioritize' the voids in terms of how many times they affect other voids. In other words, to calculate the degree centrality based on its repetition in **Table 6.68**.

Table 6.69. *Summary of the positive and negative impact of voids (Author's elaboration)*

CVs	#CVs Affecting			Being affected by #CV			CVs	#CVs Affecting			Being affected by #CV		
	(-)	(+)	SUM	(-)	(+)	SUM		(-)	(+)	SUM	(-)	(+)	SUM
CV01	0	0	**0**	5	0	**5**	**CV19**	15	0	**15**	1	0	**1**
CV02	1	0	**1**	4	0	**4**	**CV20**	1	1	**2**	0	0	**0**
CV03	1	0	**1**	6	0	**6**	**CV21**	0	0	**0**	1	1	**2**
CV04	2	0	**2**	6	0	**6**	**CV22**	1	0	**1**	0	1	**1**
CV05	1	1	**2**	10	1	**11**	**CV23**	3	0	**3**	0	0	**0**
CV06	3	1	**4**	2	0	**2**	**CV24**	0	0	**0**	0	0	**0**
CV07	3	0	**3**	2	0	**2**	**CV25**	0	0	**0**	1	0	**1**
CV08	1	0	**1**	3	2	**5**	**CV26**	4	0	**4**	1	0	**1**
CV09	10	0	**10**	2	1	**3**	**CV27**	3	0	**3**	1	1	**2**
CV10	11	0	**11**	6	0	**6**	**CV28**	0	0	**0**	1	0	**1**
CV11	6	1	**7**	9	1	**10**	**CV29**	5	0	**5**	2	0	**2**
CV12	5	0	**5**	1	0	**1**	**CV30**	3	0	**3**	0	0	**0**
CV13	4	1	**5**	6	1	**7**	**CV31**	9	0	**9**	4	1	**5**
CV14	3	1	**4**	6	4	**10**	**CV32**	1	1	**2**	1	1	**2**
CV15	1	2	**3**	6	2	**8**	**CV33**	0	1	**1**	2	2	**4**
CV16	2	1	**3**	6	1	**7**	**CV34**	1	1	**2**	2	0	**2**
CV17	10	0	**10**	9	1	**10**	**CV35**	6	2	**8**	3	0	**3**
CV18	0	2	**2**	2	4	**6**	**CV36**	3	0	**3**	1	0	**1**

While **Table 6.68** answer the question with which we started this discussion, **Table 6.69** summarizes how the situation of each void (noted in **Table 6.67**) affects and is affected positively or negatively by other voids. These results differ from the developed adjacency matrix[24] (**Table 6.60**) because the matrix comprises all the possible relationships that can exist based on the analysis of several territorial dynamics in the area for several decades. Under the lenses of Assemblage Theory, this matrix resembles to a 'phase diagram', a graphical representation of the relationships between different elements or components of an assemblage that shows the different possible states or configurations that this assemblage can take[25] (DeLanda, 2016). Thus, the Causal Graph Model is a phase diagram of the possible causal relationships that have happened or can happen based on the analysis conducted in **Objective 1**. From this perspective, the first two (+)(-) columns from **Table 6.69** are the main voids (indegree centrality) that positively and negatively affected the outcomes from INPANDES (reported per void in **Table 6.68**). The next two (+)(-) columns refer to how the situation after the project let to positive or negative impact in the reduction of other voids (outdegree).

According to the table, CV19 (low connectivity) represents the main obstacle for overcoming other voids, as it affects other fifteen ones. This is followed by the lack of professionals or professional knowledge (CV10), the lack of public capacities (CV09), and lack of financing (CV17). The case study also revealed that the situation in some voids were not so severe and could also let to positive outcomes. Such is the case of the marketing channels (CV18), product quality (CV15), and cooperativism (CV35) that had positive influence in reducing two voids each of them.

Simultaneously, after the results achieved by the project, some voids are more affected than others (higher intersectionality). CV05 (CBVC nodes) is at the top of the list with ten voids, followed by the lack of technicians or technical knowledge (CV11), and the lack of financing (CV17). This means that these voids might require more effort to be solved than others – an input that needs to be considered for policy recommendations. However, because of the project (and more because of the local conditions), some voids have been reduced (positively affected) by others. That is the case of market access (CV14) and marketing channels (CV18) as the development of georeferenced brands, international fairs, quality standards, etc.

This analysis of **Table 6.69** sheds light on the crucial role of financing (CV17) that was one of the main reasons that kept the assemblage/network articulated, and the importance of the marketing channels (CV18) from CECOVASA to create opportunities for the CBVCs (such as the coffee sale to the German wholesaler) and capitalize the local productive capacities (good land, high quality, etc.).

[24] For each void, the first two (+)(-) columns of **Table 6.69** represent the rows of the matrix (**Table 6.60**), and the next two (+)(-) columns are the columns of the matrix.
[25] DeLanda (2016) describes a phase diagram by taking the example of water: this element can be in liquid, solid, or gaseous state depending on the parameters of the moment (temperature and pressure). However, in a specific moment, the water can only be in one of those states.

4.3. Phase 3.3. Predictive Potential of CGMs & Policy Recommendations

As commented in the previous section, prioritizing is an essential step for budget & political capital allocation, but weighting is a subjective challenge that can get different results based on the selected criteria. Although this issue goes beyond our research scope, we want to contribute to this discussion by focusing on the Connectedness Voids Analyses (Phase 1.2) and the current scenario of the CBVC (**Table 6.68**). **Table 6.70** summarizes the policy recommendations per void. This section elaborates on them to propose a development plan for this cross-border region based on CBVCs.

The case study revealed that the INPANDES project was a complex set of solution proposals executed in a short time and limited budget. This experience revealed that one measure can target several voids simultaneously (directly or indirectly as indicated in **Table 6.66**). For example, the training sessions where Peruvian top/key producers taught some coffee production techniques to Bolivians was an innovative learning space (CV36) for increasing technical knowledge (CV11). However, these sessions can serve also as a dialogue space to discuss local agendas (CV04), reinforce trust between them (CV30), reinforce the role of local leaders or key actors (CV06), or increase the articulation of the cross-border social capital (CV01). That said, the present list is not an isolated set of to-dos, but they interconnect and can be targeted jointly. Therefore, not only the type of policy action matters, but the way in which it is implemented has a great impact on the expected results.

In addition, solutions for cross-border challenges should be spatially and progressively (temporally) implemented as recommended in Wong Villanueva, Kidokoro & Seta (2022). First, our spatial analysis of the CBVC (this chapter, Phase 1.1. Mixed-Methods Spatial Analysis, especially **Figure 6.29**, **Figure 6.30**, and **Figure 6.31**) brings us a possible spatial configuration in how to improve the CBVC. Second, the idea of causality (one event leading to another) gives us a sense of temporal order, so the voids that generate more issues (higher indegree centrality) should be preferably overcome first (the first three columns per void in **Table 6.69**). Based on the coffee calendar, we consider 4 year time horizons. Finally, practitioners and policymakers can benefit from our theoretical/conceptual claims and the case study. **Chapter 2** considers that cross-border territorial development is achieved by the construction of capacity-building institutions that promote value creation and capture within the cross-border region –interpreted as filling the connectedness voids. The case study revealed that ownership was expected from the executing and operational agencies, but as producers commented, they also wanted to be part of the decision-making rather than just beneficiaries. Thus, CBVC proposals should be the result from a multi-scalar/multi-stakeholder conversation to build and promote those institutions through governance practices, training programs, value chain upgrades, etc.

Table 6.70. *Policy recommendations (Author's elaboration)*

CVs	Recommendations for Policymaking
CV01	Identify and link more stakeholders in the cross-border region (other coops, NGOs, etc.).
CV02	Need of more horizontal & vertical articulation considering Expanded Stakeholder Mapping (Figure 6.27)
CV03	CBG should reflect local actors' articulation and get support from an agency with the legal capacities.
CV04	Need the involvement of local actors to start shaping own cross-border agenda & spaces.
CV05	Need to concentrate more producers and associations, focus on traceability, and plan roast market insertion.
CV06	Strengthen existing local key actors, involve institutions interested in CBVC, and improve political transition process.
CV07	Attract financial providers from both sides, and knowledge providers from private sector and civil society.
CV08	Eliminate trade barriers, address the middlemen-producer relationship, and more market knowledge for cooperatives.
CV09	Interinstitutional cooperation (↕, ↔, CB), involve motivated institutions, and consider outsourcing productive services.
CV10	Need of funding to hire professionals for better project formulation (municip.) and accurate business plans (coops).
CV11	Leverage local technicians, implement differentiated training & supervision programs, PPP between municip & coops.
CV12	Strengthen current data collection systems, exchange info, examine data gaps, and articulate with actors to fill them.
CV13	Increase efficiency & funding, attract new producers, promote subregional & cross-border coop., R&D on roya.
CV14	Coop: better marketing strategies & increase bargaining capacity. BO producers: need to reduce trade barriers (or highway).
CV15	Funding for comprehensive plans to upgrade associates' coffee quality. PPP for local quality standards. Coca eradication.
CV16	Better knowledge transfer programs, provision of utilities, partnering with providers.
CV17	Increase public capacities to enable funds, financial planning of cooperatives, and financial education. Budget allocation & planning per void. Others: PPP, diversification, counterparty.
CV18	More developed MKIS and marketing plans, public cooperation on territorial marketing.
CV19	Improve highway conditions, SMEs on rural logistics systems, and river interconnection (floating cargo platform).
CV20	Interinstitutional cooperation to provide energy, decentralized energy supply, climate change strategies on water resources.
CV21	Deeper understanding of youth motivations to reduce migration and involve them in coffee production & coops.
CV22	Investment capacity to purchase higher lands, fair wages & technification (organic, fertility, climate change), & better mountain trails.
CV23	Good agroforestry practices, R&D for developing new coffee varieties (+resistance, +quality).
CV24	Better public policies & programs with gender approach, more understanding of gender dynamics.
CV25	Need of eliminating trade barriers and formalize CBIT.
CV26	Improve current coca eradication policies. Understanding producers' motivation & legal mechanisms for earning more.
CV27	More involvement of Bolivian national government, increase ALT capacities (e.g., subagency for CBVC), and/or binational SNIP.
CV28	Need of local leader institution (PE), new dialogue spaces & institutional mix to develop suitable local coffee dev. programs.
CV29	Temporal border crossings, digital customs, local PPP/ direct-trade, border citizen card, improving Andean FTA.
CV30	Customer relationship management (CRM), coffee traceability, and discussion spaces with clear accountability from both parties.
CV31	Need of better understanding of motivational factors & how to capitalize them.
CV32	Need more ethnographic studies to capitalize the coffee quality culture & local identities into the CBVC relationships.
CV33	Review and consider more details that affect bargaining power in global and more local coffee value chain.
CV34	Proactive Change Management in terms of value chain upgrading, R&D, and adaptation (risk management).
CV35	Improving top management, planning cooperative governance, articulating with grassroot cooperatives.
CV36	Research on CECOVASA knowledge transfer experience, Competencies Development Model for producers, Train-The-Trainers program, innovative transition plans.

Table 6.71. *Spatiotemporal Planning of the Cross-Border Value Chain proposal for the Coffee Case Study (Author's elaboration)*

Clusters & CVs		Centrality CV	Centrality Cluster	Objectives & Goals	Short-Term (0-4y) CBLs/CBR	Short-Term (0-4y) Subregional	Short-Term (0-4y) Binational	Medium-Term (4-8y) CBLs/CBR	Medium-Term (4-8y) Subregional	Medium-Term (4-8y) Binational	Long-Term (9-12y) CBLs/CBR	Long-Term (9-12y) Subregional	Long-Term (9-12y) Binational
A	CV01	4	10 (7.4%)	Identify/ attract/ create, articulate, and concentrate actors in the coffee CBVC	Concentrate producers & key actors (technical groups).	Phase 1: Articulation of cooperatives & subnational govs. in CBVC initiative.	Articulate with national coffee stakeholders (especially knowledge centers).	Common body & Consultation forums.	Phase 2: Subregional cooperation agreement (CECOVASA &ANPROCA).	Consolidate Expanded Stakeholder Mapping at domestic level.	Phase 3: institutionalization. Joint subregional/cross-border agency (legal entity) & Coffee Technical Chapter (cross-border policy agreement). CBVC initiative.		Strong alliances with GVC players.
	CV02	2											
	CV03	2											
	CV04	1											
	CV05	1											
	CV06	0											
B	CV09	10	31 (23%)	Include & motivate public actors. Interinstitutional cooperation (↕, ↔, CB), harmonize inteventions	Reactivate Amazon CIF & temporal crossings. Research on coffee motivation & inclusion & coca.	Cross-border contract for training & purchase (CECOVASA with Bolivian producers).	Binational agenda: Cross-border Cooperation & Bilateral trade (FTA).	Border Citizen Card (local export-oriented).	Aligning subnational and/or local coffee policies.	Cross-border integration strategic line in Presidential Meetings or CAN.			Promote more appropriate CAN mechanisms for CBI&D.
	CV26	9											
	CV27	5											
	CV28	4											
	CV29	3											
	CV31	0											
C	CV21	0	0 (0%)	Gender & Age diversity		—	—	Inclusive coffee program.		—	Formulate joint CBR/subregional programs for innovation R&D, value-chain upgrading, etc. (Phase 3: innovation & specialization).		—
	CV24	0											
D	CV30	3	10 (7.4%)	Research & capitalize intangible resources	Business & resource planning (phase 1: optimization). Focus on coffee traceability & transparency. Improve local R&D/training programs. Political transition mechanisms.		Boost national R&D programs (indivually). Binational coffee initiative for climate change & risk management.	Competencies Development Models for Producers & Cooperatives (maturity stages for VC upgrading).		Articulate coffee R&D programs in cross-border/ multilevel PPPs.			—
	CV32	3											
	CV34	2											
	CV36	2											
E	CV13	5	10 (7.4%)	Optimize production (inputs, processes, volume)				Full availability of supplies, utilities, equipment, etc. (phase 2: economy of scale & downstreams exploration).					—
	CV16	3											
	CV20	2											
F	CV15	3	7 (5.2%)	Promote good products, practices & standards				Establishment of CBR/SR coffee quality standards.			Delimitate CBR/Subregion economic space to allocate funds, legal instruments, etc.		—
	CV22	3											
	CV23	1											
	CV25	0											
G	CV07	15	54 (40%)	Increases capacities to capture resources & deploy them properly	Floating cargo platform. Customized programs for producers, coop. & public officers.	Focus on cooperative governance & management. Pilot micro-credits.	Binational team to attract funding & resources.	Competencies Development Models linked to Training program & Microcredit program. PPP for rural logistics. (PE) Highway improvement.		Binational SNIP & Joint fund.	International bridge.	Binational Cooperative.	Port logistics. Binational & CAN funding mechanism for CBI&D.
	CV10	11											
	CV11	10											
	CV17	8											
	CV19	7											
	CV35	3											
H	CV08	5	13 (9.6%)	Streamlining transactions	Promote local MKIS.	Marketing plan for cooperatives. Phase 1: Initiate roast coffee expansion (domestic).	Eliminate non-tariff barriers (e.g., digital customs, temporal crossings).	—	Phase 2: Consolidate roast coffee in domestic market (coffee bars). Explore Latam, SSC, traditional GVC markets (direct-trade agreements).		Digital/electronic border-crossing (customs).	Phase 3: Foster Commer. & Consumption of roast coffee in Latam/ Global South. Direct commerc. in EU/USA/Japan.	
	CV12	4											
	CV14	2											
	CV18	1											
	CV33	1											

Although planning a cross-border value chain would give different priorities in each spatial scale (cross-border, subregional, binational) and temporal scale (short, medium, and long-term horizon), resources might be limited. Thus, we start this proposal by analyzing the indegrees centrality of **Table 6.69** (summarized in **Table 6.71**). From this analysis, the top 20 percentile (seven voids) only contains connectedness voids from cluster G and B: low connectivity (CV19, affecting fifteen voids), lack of professional knowledge (CV10, eleven voids), poor public capacities (CV09, ten), lack of financing sources (CV17, ten), no motivation to cooperate/produce (CV31, nine), low associativity/cooperativism (CV35, eight), and lack technical knowledge (CV11, seven). If we consider the total sum of indegrees (135) as 100%, this top 20 percentile represent 52% of the void interrelationships. Thus, especial consideration should be given to these points.

Table 6.71 is a representation of some of the most important strategies to consider for planning a CBVC in this coffee case study divided in the mentioned spatial and temporal scales (a more detailed explanation could be found in Section 2, Phase 1.1). From a broad perspective, this proposal is divided in three horizons: short-term or preparation (articulate and optimize local resources), medium-term or consolidation (build on local capacities and enhance them), and long-term or scaling-up (convergence, institutionalization, and expansion). Simultaneously, priorities were divided at cross-border level (focus on primary production and border issues), subregional level (institutional articulation and business planning), and binational level (legal convergence and streamlining GVC). Finally, although this proposal is divided by clusters, compacting the strategies, we can divided them in three dimensions: governance & integration (A, B, C, D), business development (C, D, E, F, G), and market penetration (B, D, G, H) – building on the strategic lines of INPANDES.

In terms of **governance and integration**, due to the lack of Bolivian authorities in the borders, most initiatives (especially related to its institutionalization) have been considered at subregional level – but this does not mean the absence of articulation mechanisms at cross-border level. In fact, there is a need for stronger technical and decision-making spaces that serve as leveraging mechanisms for projecting producers' voices into the CBVC plan design. Each phase lasts four years, creating the possibility to occupy more than one municipal administration and facilitate transition and continuation (political change happens every four years). Thus, phase 1 orientates to articulate and shape periodical meeting spaces and start a dialogue on harmonizing both systems (especially in terms of trade barriers). Thereby, there is a need of a special team like INPANDES (could it be binational or macroregional) but with higher participation of national governments. This happens because the poor condition of the macroregional governance of the CAN (**Chapter 5**), demands more effort from central governments.

The 2nd phase should witness the more complex agreements, especially an economic cooperation between –at least– the largest cooperatives of Puno (CECOVASA) and La Paz (ANPROCA). An alliance at this level would allow a higher economy of scale that would attract more

stakeholders and resources and would allow a better articulation of the cross-border production (anchoring cross-border dynamics into subregional flows). This should be accompanied by a better conversation between national governments and the elevation of needs to the highest decision-making space: the Presidential Meetings. Finally, in a long-term horizon, phase 3 strives to institutionalize the previous eight years of cross-border work, either through the creation of an independent cross-border agency (such as the ALT, a binational commonwealth, or a subgroup in the CAN), or as a special Division or Chapter from the ALT (the only bilateral international organization between both countries). The creation of this institution represents the delimitation of the cross-border region or subregion for this Amazon section. However, it is needed to consider what other services or products apart from coffee could be anchored under this initiative to be more 'politically profitable' or explore regional sustainability from a broader perspective.

Business development focuses on creating value by developing productive capacities and business potential at the three levels: cross-border (primary production), subregional (transformation), and binational (trade, commercialization & consumption). For this section, INPANDES is a great reference as it approaches in a similar way and with different knowledge transfer mechanisms. However, more emphasis should be given in the customization and duration of the trainings. Each phase matches with the coffee calendar (three-four years), so producers would be accompanied from zero to post-harvesting – and would allow the articulation of new producers in the following phases. Thus, phase 1 should be oriented to business planning to maximize the current capacities and reduce operative bottlenecks, while at the same time, promoting R&D programs and upgrading proposals for the next phase. In addition, cooperative governance has a high relevance as it is the main articulator of productive relationships in the area and CBVC governance should promote the attraction and concentration of resources.

Phase 2 elaborates on the learnings from the previous one and strives to consolidate them with competencies development models: frameworks for identifying, developing, and assessing the competencies (skills, knowledge, and capacities) of 1) producers, 2) cooperatives (as DEVIDA executed) and cooperative personnel, and 3) local public officers and extensionist technicians. This should be accompanied with higher quality/quantity standards, provision of productive equipment/infrastructure to expand downstream, and articulating cross-border R&D initiatives. A critical step to be achieved is the consolidation of a binational SNIP (National System of Public Investment) to finance cross-border projects or initiatives. The last phase links with the new CBVC governance by fixing joint funding, programs, regulations, initiative to the new cross-border economic zone. This zoning strategy should be the umbrella for promoting international infrastructure or grouping cooperatives across borders in a cross-border or binational cooperative.

The last strategic line, **market penetration**, strives to capture value from the international value chains. As commented in the analysis, while CECOVASA counts with several marketing channels and good penetration in the green coffee market, there is a need for a more comprehensive long-term marketing plan – fed back by more detailed MKIS. Phase 1 elaborates on those needs to consolidate green coffee market but to explore and expand in the roast coffee market at domestic level (in Peru and Bolivia). Here it is included the elimination of non-tariff barriers for the Bolivian producers. The CV29 analysis in Section 2.7.8 revealed that interpreting cross-border dynamics from different approaches (as a spatiotemporal event, as a historical contingency, or as a non-human interaction) can promote innovative solutions to the existing problems: 1) weekly visits of regulatory agency officials to SPPP, 2) PPP agreement between CECOVASA, Bolivian producers, and the municipalities or Chancelleries, 3) a Border Citizen Card to facilitate exports or improve the CAN framework/ Andean FTA.

Phase 2 focuses on consolidating the position in the domestic roast coffee market by commercializing with wholesalers and retailers, and promoting consumption in main urban centers with, if possible, coffee bars or barista events. In addition, the cooperative(s) should have a stronger penetration in foreign markets that would require more information and contacts that know about the GVC. While the most profitable markets are in EU, USA, and Japan, they are at the same time the ones with the highest barriers in terms of standards, certifications, consumers' preferences, and more. Thus, it would be easier to focus the expansion strategy for markets in Latin America or cooperate with other countries in the Global South (South-South Cooperation). Phase 3 would focus on the expansion in those created market opportunities and adventure more sophisticated ones. This should be linked with the innovation strategy on product diversification.

This spatiotemporal planning of CBVCs intends to be a blueprint for future interventions in the coffee case study. However, further studies are required to delve into the details of each void and implementing the measures, as well as promoting long-term ownership of this initiative from producers to national and international officers.

5. Discussion

The present chapter has focused on answering the three questions that would let us to evaluate the hypothesis from this dissertation. Thus, the micro-level analysis was conducted through a case study that focused on evaluating the impact of the coffee cross-border value chain between Peru and Bolivia that was developed during INPANDES, the last macroregional cross-border mechanism from the Andean Community. This section summarizes the procedures, main findings, and further steps that should be taken to delve into the Multi-Scalar Regional Relationships in this case study.

- ***Question 1: What are the voids and their causal relationships in this case study?***

The objective of this question was to build a Causal Graph Model (CGM) that could map the possible causal relationships between the connectedness voids in this case study. Thus, Phase 1.1 started with four descriptive analyses that explored the governance components of the cross-border region and subregion between Peru and Bolivia (Analysis N°1 & N°2), and the business components of the coffee cross-border value chain (Analysis N°3 & N°4). Then, these results are further explored with a Value Chain Analysis (VCA) and Mixed-Methods Spatial Analysis (MMSA) to understand how the CBVC interacts with the GVC. From this examination, we discovered that under the current position of producers in the global coffee market, for each cup of coffee at ¥400, producers earn between ¥1.8 and ¥4 depending on their productive capacities. Thereby, better quality of life based on coffee production demands producers in the cross-border region to specialize until post-harvesting, and cooperatives to expand their productive activities in the roast coffee market to connect this site to the logistics networks.

Phase 1.2 uses all generated results to analyze void per void with the Connectedness Voids Analysis (CVA) – an adaptation of the Outcome-Based Evaluation (OBE) methodology to explore the situation before, during, and after the implementation of INPANDES by reviewing the cross-border relationships and the project. Thus, the study of INPANDES became a radiography of the coffee cross-border value chain that could allow to examine the change of voids (Δvoids) and the reasons behind. Phase 1.3 focused on establishing the causal relationships from this case study and expressing them into a directed adjacency matrix, it was possible to construct the causal graph. Thus, qualitative analyses were parametrized and converted into quantitative data. This was furtherly analyzed with *Gephi* and *R*, to explore its network and clustering to be later compared with the theoretical framework.

The Causal Graph Model represents a 'phase diagram' of the connectedness voids in this case study: a representation of the possible relationships and configurations between different elements or components of an assemblage – that may be active or not in a determined moment. The evaluation of the 1260 causal relationships should not be perceived as a final evaluation, but as the beginning of an exploration to unravel the causal roots behind development. There are more than 36 variables or voids to consider behind this issue and increasing their number would lead to a higher definition of the final picture. However, it also increases exponentially the number of relationships to be explored (36^2 to 37^2 to 40^2…), making it more complex or even unviable to be researched. Thereby, our exploration is a good starting point on bringing causal and network topography studies in cross-border and regional development studies.

- ***Question 2: Can the theoretical model (Chapter 3) reflect the Cross-Border Value Chain reality (Chapter 4)?***

This question focused on validating the theoretical proposal by comparing with the CGM from the case study. Having both matrices, Phase 2.1 conducted a confusion matrix to compare both arrangements and evaluate the performance of the theoretical framework, revealing that it can be useful to study case studies with a good accuracy (89%), strong correlation (70%), and relatively high cluster similarity (77%). Phase 2.2 focused on evaluating this difference between both matrices from a network and cluster approach. Using *Gephi* and *R*, we analyzed the behavior of the nodes and clusters within the networks, arriving to the conclusion that despite of the mismatch, they have very similar patterns. However, further studies are required to determine permissible range of errors in this type of analysis.

Phase 2.3 explored the reasons behind this mismatch to find if there were contradictions between both arrangements. Through a direct observation of the causalities, we discovered that the higher number of relationships in the case study was due to the particularities of the case study and the need of further specific literature to saturate all causalities. Thus, the results of our study can be added to the literature review on cross-border value chains and contribute to discuss and improve the theoretical framework. Even though, despite of the discrepancies, the three phases revealed that the proposed theoretical framework can model and reflect the reality of CBVCs, validating its use for analyzing, explaining, and designing cross-border value chains.

- ***Question 3: Did the INPANDES project promoted local development based on the outcomes and their effect on the existing connectedness voids?***

The last question oriented to instrumentalize the CGM for project evaluation, causal analysis, and CBVC planning. Phase 3.1 answered our research question by evaluating the impact of the project in promoting economic development in the CBR (positive change in the connectedness voids): INPANDES had limited impact on reducing the voids across borders, as the outcomes of its activities either affected one side only or faded over time due to other voids. However, despite the project outcomes were not sustainable, they were considerably reduced or in a good path to be reduced while INPANDES was in operation. Thus, the 'project as a temporal assemblage' contributed to building the institutions for cross-border territorial development. This reveals that macroregional cross-border mechanisms have the potential to address local economic development in cross-border regions while they are in operation, although this has not been possible in INPANDES and therefore, in the Andean Community due to the lack of continuation.

Phase 3.2 explored what were the reasons behind the results that we evaluated in the previous phase. Using the CGM and CVAs, we explored the main causes per connectedness void and the effects that they had in other voids. Our analysis clarified that voids may not have one root cause but an intersection of several causes, that interact and undermine jointly their improvement. Apart from their intersectionality nature, voids are also actor-oriented, context-based, and subjectively valued, that make difficult their prioritization. Although this goes beyond our research scope and further studies are necessary to weight the relevance of voids, we delivered an analysis based on its degree centrality: low connectivity, lack of professional knowledge, no financial resources, and poor capacities or presence of public actors were highlight as voids that impact several others. These 'central' voids belonged mainly to cluster G (potential to capture resources), and cluster B (institutional compatibility). The provision of non-reimbursable funding and the role of the CAN were two of the main catalysts to dilute those central voids and bring a temporal solution to others within the INPANDES assemblage – despite of the lack of a 'real' commitment from public agencies. This explains why, although the project brought several technical and financial resources to the coffee CBVC (cluster G), it could not lead to a sustainable outcome due to the lack of cross-border public cooperation (cluster B).

Phase 3.3 integrates the previous results to propose a spatiotemporal planning proposal for our coffee cross-border value chain. While policy recommendations emerged from Phase 3.2 and the CVAs, Phase 1.1 helped to contextualize them within the most appropriate spatial and temporal scale. Thus, policy recommendations and cluster priorities could be summarizes in three strategic lines: governance & integration, business development, and market penetration. This proposal resembles INPANDES formulation, highlighting the need of a long-term approach to capitalize local governance & productive capacities into more efficient institutions (cross-border agency, joint economic space, binational cooperative, etc.). Further measures should take advantage of the 'cross-border' nature of the cross-border value chain: while the current dynamics focus on increasing volume and INPANDES expanded it with other proposals (cross-learning, joint agreements, binational contests, etc.), there is a plenty variety of innovations that could help to 'fix'(attach) productive capacities to the cross-border territory and 'fix' (solve) cross-border issues. That said, cross-border regions as 'international localities' tend to be an interesting hook for scholars, practitioners, and developing partners that can contribute to reduce the connectedness voids.

This chapter sheds light on the potential of causal graph models in exploring development problems. While we focused our case study in cross-border value chains, the concept of connectedness voids could be adapted to other cross-border issues –not only for the provision of goods, but also services such as cross-border tourism, health networks, environmental & risk management, and more. Furthermore, this research can be a reference for exploring other territorial issues beyond borders such as rural productivity, peripheral economies, or lagging regions.

Chapter 7 Final Comments

Chapter 7. Final Comments

1. Conclusions

This dissertation started by addressing one relevant question for spatial planning in cross-border regions: **Do macroregional integration schemes promote local economic development in cross-border regions? If so, how?** Six chapters later and focusing on the experiences in South America, we can answer that it has not been possible by the moment, although some efforts like INPANDES were in the correct direction. This section synthetizes and discusses how we arrived at this conclusion by reviewing chapter by chapter and their role to answer the research questions (**Table 1.3**).

Chapter 1 starts by exploring the theoretical framework on Multi-Scalar Regional Relationships (MSRRs) to address the territorial inequalities that appear within supranational regional integration. More specifically, it focuses on the relationships between Macroregions and cross-border microregions and how they intertwine around the world, with the most representative cases coming from the European Union. However, they have been poorly studied due to the need of more interdisciplinary studies and theoretical, methodological, and conceptual tools to conduct the respective research.

Our dissertation focuses on providing those tools on the way to answer if macroregions can promote local economic development in cross-border regions. **Chapter 1** and **Chapter 2** contribute to the theoretical tools to study MSRRs and cross-border value chains, **Chapter 3** reviews the methodological instruments to conduct macro-level and micro-level analysis, and **Chapter 4** provides the concepts to understand macroregional cross-border mechanisms. **Chapter 5** and **Chapter 6** put into practice the developed tools to respond to our research concern. Simultaneously, each chapter contributes to answer the proposed research sub-questions. **Table 7.1** summarizes those results.

Table 7.1. Research Questions & Answers (Author's elaboration)

Research Questions & Answers	
Q1 (Chapter 2)	**How to understand and evaluate the articulation of cross-border local production (cross-border value chains) with international value chains?**
	CH2 reveals that the lack of capacity-building institutions (connectedness voids) hinders cross-border regions from cooperating, producing and accessing foreign markets. By understanding their relationships through causal networks, it's possible to evaluate the effectiveness of cross-border value chains.
Q2 (Chapter 3)	**How to evaluate the impact of macroregional cross-border institutionality in the articulation of cross-border value chains?**
	CH3 presents two analyses scales: The macro-level (**CH4**&**CH5**) identifies the macroregional cross-border mechanisms and selects the CAN project (Coffee CBVC) as the best implemented instrument. The micro-level (**CH6**) examines this project through the theoretical framework (**CH2**) and measure its effectiveness in reducing voids. Thus, the analyses link institutional & economic connectedness to cross-border development.
Q3 (Chapter 4&5)	**How to understand and evaluate macroregional cross-border institutionality?**
	The global assessment of macroregions (**CH4**) identified the existing macroregional cross-border mechanisms and the most relevant regions that implemented them. Thus, five analytical categories (**CH5**) were instrumentalized to analyze and compare those mechanisms in the most successful South American macroregions (CAN & MERCOSUR).
Q4 (Chapter 6)	**What are the voids and their causal relationships in this case study?**
	Based on the case study of the CAN project, the Connectedness Voids Analysis Charts identified the situation per void before, during and after the project. The analysis of 1260 causal relationships served to design a causal network to explore, evaluate, and propose solutions.
Q5 (Chapter 6)	**Can the theoretical model reflect the Cross-Border Value Chain reality?**
	The case study's causal network of voids validated the theoretical framework for modeling cross-border reality, using confusion matrix, network & cluster analysis, and direct observations. This confirms the usefulness of the framework for analyzing CBVCs and provides a good opportunity for policy analysis and design.
Q6 (Chapter 6)	**Did the studied intervention promote local development based on its outcomes and effects on the existing connectedness voids?**
	The study of the coffee CBVC revealed that the intervention was not effective nor sustainable. However, the role of the CAN and its funding had a temporal positive effect in reducing the impact of several voids while the project was in operation.
General Question	**Do macroregional integration schemes promote local economic development in cross-border regions? If so, how?**
	From the South American experiences, the research reveals that the implemented macroregional cross-border mechanisms have had low impact on promoting local economic development. However, they have the potential to achieve it if improved and sustained over time.

Economic connectedness in MSRRs is embedded in the idea of connecting local production to international markets, a strategy for cross-border regions to own the means for their local economic development. This is especially relevant and critical in lagging areas where most of the population is oriented to the production of a single or few crops or products. This concept has been named with different labels such as cross-border production networks or value chains, but with little clarity on their characteristics at cross-border level.

Chapter 2 [Q1] conducts a Systematic Literature Review and understand Cross-Border Value Chains as spatial-economic configurations that promote cross-border productive articulation. However, creating and capturing value across border demands the participation of not only private sector and productive communities, but also public entities. Thus, CBVCs become a political-economic initiative with local social impact. This complexity carries out a high number of burdens or pitfalls that question whether this strategy is the most ideal to target local development. However, in some cases –as in the Bolivian communities of San Fermin and Cocos Lanza, it is the only means to break long-lasting cycles of poverty.

The Systematic Literature Review on CBVCs elaborated on these obstacles or better said, connectedness voids: the absence of institutions that can develop local capacities to create and capture value from international value chains. The lack of knowledge, connectivity, marketing channels, and other factors compose a list of 36 connectedness voids that undermine cross-border regions to benefit from global trade flows. Addressing these issues is another policy problem as the interconnection of these voids increases the complexity of the situation. Thus, the theoretical framework explores the 1260 relationships and interprets them graphically in a causal graph model, and qualitatively in its cluster representation. This attempt to open the Pandora's Box of Development surely increases the complexity of its analysis, but at the same time, it is an effort to close it by encapsuling this chaos into a comprehensive model. In this way, a cross-border value chain represents the territorialization of economic connectedness by marrying the relationality of value chains, with the fixity of development at a cross-border local scale through the institutional approach of connectedness voids.

While the previous chapter established the relationship between economic connectedness and local development, **Chapter 3** [Q2] raises the methodological tools to delve into the institutional connectedness and its impact on the economic one. Due to the nature of our research, the analysis is divided at macro- and micro- level, developing tools for each of them. At macro-level, we have the analytical framework to compare the macroregional cross-border institutionality between macroregions. At micro-level, we instrumentalize the causal graph models as a tool to parametrize data, analyze it, forecast results, and support the design of proposals. By considering a common case study (the INPANDES coffee CBVC from the Andean Community), we connect both levels, and link institutional connectedness with economic one.

Chapter 4 [Q3] addresses the need or better conceptual tools for studying institutional connectedness and what is exactly a macroregion and its border and cross-border mechanisms. This leads to the analysis of 100 macroregions and they interpret and reinterpret the role of borders as internal boundaries within them. The statistical analysis revealed positive correlations between border mechanisms and cross-border mechanisms, inviting to further research on the topic. However, the most important contribution of this chapter is the classification of macroregions in four groups –non-engaged, cooperative, supportive, and interventionist– according to their position towards cross-border development and integration. We delve in the last group, 28 macroregions that have developed eight mechanisms that promote cross-border cooperation from research groups and projects to funding mechanisms, zoning strategies, or exporting their model to other regions. Among those regions, macroregions from West Europe, West Africa and South America were highlighted due to the number of mechanisms that they have developed. This analysis echoes and elevates our initial discussion in **Chapter 1** by placing borders at the center of supranational regional integration.

Chapter 5 [Q3] builds on the previous one and focuses on comparing the Andean Community (CAN) and MERCOSUR to contribute to the non-Eurocentric studies of macroregional cross-border mechanisms. Based on the methodology explained in **Chapter 3**, the present analyzes and then compares both macroregions in five categories, highlighting that both took two different –and even opposite– approaches to construct their macroregional cross-border institutionality. This discussion is thoroughly conducted in the 4th category, policy systems, that compares the mechanisms from both macroregions and reveals that this apparent opposition could be translated into a complementarity as both have developed different sets of tools – and even thrived where the other failed. This subtly claims for a higher cooperation between both macroregions since applied knowledge is already present in the regional (South American) experiences. The comparison provides numerous suggestions for enhancing cross-border integration strategies in both the analyzed macroregions and others. This analysis also highlights the importance of considering the CAN and its latest intervention, the INPANDES project.

Chapter 6 [Q4, Q5, Q6] conducts the micro-level analysis by taking as case study the coffee cross-border value chain between Peru and Bolivia, carried out under INPANDES. Thus, this chapter has a triple purpose: to analyze and parametrize the collected data from the field research, to validate the theoretical proposal of **Chapter 2**, and to evaluate the impact of the project. The causal graph model of the case study tested the accuracy of the theoretical framework, validating its use for this kind of analysis and shaping the pieces to analyze the coffee CBVC: INPANDES had limited impact on promoting local economic development in that cross-border region, but it has the potential to achieve it. Building on this experience, we propose a cross-border value chain strategy that contest the connectedness voids of this case study.

2. Macroregional Mechanisms for Cross-Border Productive Integration: Do They Promote Local Economic Development?

The results on Q4, Q5, and Q6 lead us to further discuss and provide an answer to our research question: "Do macroregional integration schemes promote local economic development in cross-border regions? If so, how?" While **Chapter 6** focused on answering it with the case study, reviewing the previous chapters could allowed us to expand this conversation and evaluate the potential to generalize its results for South American macroregions.

Chapter 2 identified that a CBVC emerges as a cross-border productive articulation strategy for cross-border regions with low density of productive actors, lack of public entities, and emerging agroindustry and/or basic manufacturing – highlighting their potential for Latin America and South & Southeast Asia. However, what is the relationship between CBVCs and macroregions?

Among the sixteen sources identified in the Systematic Literature Review, four of them (25%) were research or reports sponsored or developed by macroregions, such as CELAC (L208), SICA (L68, L170), or CAN (L215), for their own cross-border regions – some of them produced in cooperation with the European Union. In fact, EU participated in the elaboration of three of those sources (L208, L211, L215), highlighting its role of promoting cross-border productive articulation in Latin America. Other groups of sources were elaborated by independent consultants or researchers that referred to CBVCs as tools for further macroregional integration in ASEAN (L117, L118), CAN (L79), MERCOSUR (L1), or other Latin American macroregions (L70). Thus, **more than half of the gathered literature (62.5%) imply directly or indirectly a relationship between CBVCs and macroregions**. Rather than perceiving this as a coincidence, we can infer that **CBVCs are becoming a common macroregional tool for cross-border integration.** Whether these CBVCs are promoted directly (projects & programs) or indirectly (policies to support local CBVCs) by macroregions is a question that can be explored in the next chapters.

Chapter 4 identified 28 interventionists macroregions, although it was not discussed whether they involved in cross-border productive integration. Based on the conducted analysis (**Appendix 6**), seven macroregions (25%: PROSUR, CE, MRU, CEN-SAD, OTCA, LGA, AU) did not target productive goals in cross-border regions. Three African macroregions (11%: EAC, COMESA, CEMAC) focused on cross-border articulation by promoting cross-border local trade to reduce transaction costs. Four other macroregions (14%: UNASUR, ASEAN, ECCAS, UEMOA) aim to foster productive collaboration, but it remains unclear if they have been successful in promoting these efforts. Finally, the remaining half (50%: EU, CAN, MERCOSUR, BENELUX, CIS, ECOWAS, USMCA, SICA, SADC, NORDEN, IGAD, V4, MRC, CEPGL) have targeted cross-border productive integration either through CBVCs, economic zones, tourism projects, maquiladoras, and more. That said**, most**

interventionist macroregions have established cross-border mechanisms to promote different aspects of productive integration. Comparing these mechanisms holds great potential for cross-learning. However, whether other macroregional measures have had an indirect impact on their CBVCs (e.g., formulating FTAs to reduce trade barriers – CV29) should be further studied.

The findings presented in **Chapter 4** not only justify the comparison between CAN and MERCOSUR in terms of their macroregional cross-border mechanisms, but also because **they are the only South American macroregions that have implemented tools for productive integration**. **Chapter 5** compared the mechanisms of the CAN and MERCOSUR and discovered that most of their efforts did not yield the desired results, or it is too soon to gauge their impact. But which of these two macroregions primarily focus on fostering local economic development through productive articulation?

The CAN's cross-border projects and ZIFs stand out as the most targeted towards the goal of local economic development based on productive articulation. In the MERCOSUR, the cross-border projects, the FOCEM, and the LFVs also contribute to this objective. The mechanisms in both macroregions are interrelated, with the ZIFs and FOCEM playing a supportive role in improving productive initiatives. However, in MERCOSUR, such mechanisms were limited in number, with 90% of the budget being allocated to infrastructure. Only two initiatives oriented to productive improvement, although both had setbacks: the PAMA was a subregional public-private partnership with limited monitoring, and the ESSIR was a project for cooperatives located on the Uruguayan side. The approval of the LFVs came in 2019, just a few months before the outbreak of the COVID-19 pandemic, making it challenging to evaluate their impact.

In the CAN, the ZIFs had more impact at subregional scale rather than cross-border one, although it served as a framework to develop the Andean cross-border projects: the PRA, CESCAN I, CESCAN II, and INPANDES. Of the 21 implemented projects, the INPANDES projects stood out as the most advanced, not only in terms of promoting cross-border integration and development, but also in terms of their methodology for designing cross-border value chains in the CAN (more than ten years of experience). Based on **Chapter 5** analysis and interviews with the CAN officers, the coffee CBVC from INPANDES was considered the most successful case in the Andean Community in terms of projects & programmes. Thus, **the coffee CBVC emerges as a flagship initiative for promoting cross-border productive articulation**, although **Chapter 6** revelated that its impact on local economic development was not the expected.

This analysis suggests that although other CAN projects could be evaluated further, they have not been as successful as the coffee CBVC (e.g., the cacao CBVC was not exactly cross-border, the alpaca CBVC was not sustainable). These findings indicate that the overall impact of the CAN cross-border mechanisms has been limited. Similar results were observed in MERCOSUR, though further

studies could be conducted on the PAMA or LFVs. Articulating with the previous chapters, it can be concluded that **none macroregional cross-border mechanism in South America have effectively promoted local economic development through cross-border productive integration strategies**. Considering the previous discussions on **Chapter 1** and **Chapter 4** about these mechanisms around the world, the poor success in their operationalization, the scale of the interventions not targeting directly the cross-border reality, and the weak conceptualization to promote local development suggest that most experiences outside Europe have not been effective in promoting local economic development. However, further research is required to corroborate it.

3. Future Lines of Research

Based on the obtained results, we want to display possible lines of research based on the outcomes, scope and limitations per chapter. Echoing the claims from **Chapter 1**, there is a need for even further theoretical discussions on the MSRRs and connectedness between macroregions and cross-border regions. The developed instruments strive to support this exploration, especially top-down relationships by analyzing more comprehensive case studies. However, bottom-up relationships –how cross-border regions affect macroregional integration– is another research proposal that deserves to be further study.

The analysis of MSRRs should not only be limited to two scales as considering others can benefit future analyses. For example, ASEAN and African macroregions could benefit from considering the interrelation with subregional arrangements (the Greater Mekong Subregion, the Maputo Corridor, etc.) and with the dynamics at cross-border level. Furthermore, exploring the MSRRs in less institutionalized regions and networks can enrich the links between scalar relationality and development planning.

In terms of **Chapter 2**, the complexity of working with 36 variables and their 1260 causal relationships can represent a high burden to be operationalized –even more with the possibility of adding more variables to have a better comprehension of territorial dynamics. In addition, the need of more case studies and theoretical works to saturate edge by edge demands a collective commitment to improve our model. However, this approach strives to debunking the idea of 'simple solutions to complex problems' in policymaking; an ode to embrace the chaotic nature of overcoming territorial inequalities based on analytical representations. That said, complexity is not a synonym of confusion, but the opportunity for emerging practices that can be instrumentalized by existing approaches (Cognitive Edge, 2010). Causal networks could be further systematized with shared platforms, UX technologies, data banks, or other strategies to not only involve scholars but also policymakers. Their

interaction can help to complement causal network analyses and metanalyses with field data and perceptions, or even quantify and weight qualitative criteria to answer the dilemma of subjective weighting.

By its own side, **Chapter 3** has submitted several contributions for studying MSRRs. Among them, our description on how to conduct a case study in cross-border regions is an interesting blueprint for analyzing different phenomena in these areas. Mixing several methods and own experience in field research, the expressed recommendations can be adapted to other border studies. However, this can be further reviewed and improved.

Chapter 4 opens several lines of research for delving into institutional connectedness. The correlation analysis of macroregions points the high correlation between macroregional border mechanisms –related to security and accessibility– and macroregional cross-border ones. Thus, an emerging hypothesis from these results calls for analyzing whether the institutional spaces for coordinating common security programs or economic corridors were the antechamber to initiating a discussion on cross-border integration and development within the macroregion.

The classification of macroregions and the list of macroregional cross-border mechanisms invite scholars to explore and compare them. **Chapter 5** focuses on this expected comparison, that can be furtherly benefited by considering macroregions from other parts of the world especially from the Global South. Learning from these experiences –where institutions are still in a process of consolidation– can serve to develop more feasible solutions to promote cross-border cooperation.

Chapter 6 explores the coffee CBVC from INPANDES, a set of six interventions with several components that represent the zenith of the Andean cross-border institutionality. Studying the other Andean experiences can help to retrieve the regional know-how on promoting cross-border integration & development after these efforts have currently ceased in the CAN. Finally, encoring the suggestions for **Chapter 2**, CGMs have a great potential to:

- modeling and forecasting reality to propose better planning proposal,
- mapping the impact of phenomena (what voids does this event affect and how?),
- reducing uncertainty/risk by targeting development more precisely,
- locating where to allocate resources and actors to improve local capacities, or
- comparing solutions by examining their possible outcomes in their interaction with the connectedness voids.

That said, the instrumentalization of a Causal Graph Model is an attractive alternative to methodologies for the design & evaluation of development projects such as the Logical Framework Approach, Goal Oriented Project Planning, Objectives-Oriented Project Planning, among others.

Finally, it is important to note that although this research has attempted to provide a comprehensive answer for each research question, further studies are necessary, particularly in terms of additional case studies. Four recommendations emerge from this proposal:

- Given that most macroregional cross-border mechanisms have been implemented in South America, Western Africa, and Western Europe, a non-Eurocentric approach would be advantageous when evaluating cross-border mechanisms as a means for improving conditions in borderlands between developing countries.
- Further research is needed in macroregions outside of South America, Western Africa, and Western Europe, such as Central America, Sub-Saharan Africa, the Middle East, Eurasia, and Central/South/East Asia. The lack of macroregional mechanisms or cross-border cooperation in these areas calls for a more in-depth examination of foreign policies, bilateral and multilateral relations, and how they impact the development of cross-border cooperation policies.
- Successful cross-border initiatives in the EU and other regions should be studied in more detail to understand how they addressed the connectedness voids. Analyzing the implementation of these initiatives, particularly in scenarios with significant economic disparities across borders, can provide valuable insights for better policymaking.
- While this research focus on cross-border productive articulation, macroregions have targeted several sectoral goals as in health, environment conservation, cross-border public administration, and more. For example, the CAN and MERCOSUR developed several health-oriented tools for networking health access across borders, promoting food security and animal health, or COVID-19 mitigation strategies. Examining the results of cross-border policies in sectors beyond the productive one could provide opportunities for inter-sectoral comparisons and reveal specific conditions that lead to more effective policy implementation.

4. Recommendations

To conclude with this dissertation, there is a last question to answer: What recommendations could we address for improving cross-border integration & development? Based on this research, we answer this inquire from two levels and its 'transition'.

3.1. The Macro-Level Approach

Our exploration in **Chapter 4** and **Chapter 5** provides us a comprehensive explanation and strategic recommendations for developing the eight macroregional cross-border mechanisms. How can macroregions promote CBI&D? While **Chapter 5** – Section 6 detailly explains about them, here we outline general ideas about them.

Formulating MRCB is a medium-term process that consolidates in a long-term horizon by overcoming governance, financial, and technical limitations. In terms of the former, a progressive institutionality demands political will for a governance transfer from the Westphalian system to a more decentralized one, where bilateral or macroregional institutions add more flexibility to cross-border management. An adaptative approach and flexibility in policymaking are recommended to take advantage of own resources, institutions, and political waves. That said, MR-CBR concertation mechanisms are elemental to include subnational and local actors in decision-making and reduce risks.

The access to financial resources is a key element for CBI initiatives and developing cross-border regions. Thereby, own macroregional fundings should be prioritized over international cooperation ones. This strategy is addressed not only to reduce the risk of external conditions, but also as an indicator of political will and commitment from national governments. In addition, this fund for cross-border interventions should be independent and separated from other funding needs (e.g., sponsoring highways with little impact at cross-border local level). To avoid it, local actors should apply for them and come under the scrutiny of clear technical guidelines.

This leads to the need to address the technical limitations starting by 1) empowering local actors and develop their capacities to apply for funding opportunities, 2) identifying the existing cross-border networks, their capacities, and potential for further cooperation, 3) diversifying spatial configurations to address specific rights and/or interventions for border actors, and 4) articulating zoning strategies at different scales to properly address development.

3.2. The Micro-Level Approach

Chapter 2 and **Chapter 6** outlined some recommendations that can be executed at micro-level, independently if there is support from the macroregional institutionality. We highlight some recommendations for cross-border integration by highlighting the potential of cross-border value chains.

Cross-border value chains are political economic initiatives with social impact and are recommendable for most borders in the Global South. Despite of the several other spatial-economic configurations to develop the borders (e.g., economic corridors, cross-border economic zones, cross-border clusters, cross-border regional innovation systems, etc.), this dissertation has discussed those alternatives and highlighted that CBVCs are especially beneficial for borders from developing countries with weak institutions, isolated CBRs with low density of potential actors, and with an emerging primary industry (agriculture production). Our theoretical framework serves also as a guideline to promote them and develop local governance and business capabilities that could be the basement for more complex interventions – as the already mentioned configurations.

Cross-border value chains are spatiotemporal assemblages where actors, tangible and intangible resources, and sites are articulated by their flows across borders. That said, it demands the identification of the actors, spaces, and time horizons that are more suitable for each intervention. Due to the multi-stakeholder, multi-scalar, and multi-dimensional nature of CBVCs, this 'identification' is a key process as it defines what capacities and liabilities they bring to the table to targeting the existing connectedness voids. Furthermore, as observed in the case study, there are crucial elements or sets of them that keep those assemblages in a becoming process: the coffee transactions, the coffee quality culture, or the INPANDES funding are examples of institutions that keep everything as a cohesive whole, and which removal can lead to negative consequences. Understanding these 'assemblages within assemblages' with the causal networks can help to capitalize on the positive ones (e.g., how to properly invest in CBVC initiatives), and eliminate the negative ones (e.g., addressing the multiple effects of regional oligopolies in local production networks).

Finally, one last recommendation is clear from our work: there is a need to bring visibility to cross-border realities. The PRA and INPANDES interventions were the only support that the Bolivian communities of Puerto San Fermin and Cocos Lanza ever received, despite of the high presence of military at the borders; and they were the only interventions that the communities had since then. Either with complex cross-border projects or exploratory research as the present one, it is important to bring visibility to cross-border regions as they are often isolated from political powers and economic networks. Thus, the first step for any CBVC is to bring to light the local dynamics and highlight how they justify the need of a cross-border intervention.

3.3. The Transitional Approach

Returning to the fundamental essence of what it means to be 'cross-border,' it is necessary to delve into the ‘borders’. Étienne Balibar (2002)'s assertion that "borders are everywhere" serves as a reminder that borders are not just physical boundary lines but are also social and cultural divides that shape almost every aspect of modern society. This idea challenges us to think beyond the traditional notion of borders as fixed or impermeable lines, and to consider the ways in which borders are constantly being negotiated and redefined by various actors. It also encourages us to recognize the complex and multifaceted nature of borders, that they are ’sutures’ (Salter, 2012) or points of connection and convergence that can serve both as a means of exclusion and division, and as a means of inclusion and integration. In this sense, borders can be seen as a kind of metaphorical transition, or a means of gradually improving and strengthening relationships between different groups or regions.

The present theoretical and practical exploration on Multi-Scalar Regional Relationships aims to promote regional development in areas that have been historically disadvantaged due to continuous cycles of poverty and weak connectivity to production networks. Echoing the nature of borders, our analysis and solution proposals suggest that ‘filling the voids’ is also a gradual process. Thus, the notion of ‘Gradual Geographies’ represents an opportunity to address subdevelopment in cross-border regions through three transitional approaches: 1) ‘scalar relationality’ which focuses on the hierarchy of scales and the relationships between them to interpret the geographies of development, 2) ‘spatial-economic configurations’, which aim to enhance local capabilities over time, and 3) ‘Integration Driven Development’, which advocates for an incremental approach to building complex systems as an alternative to shock therapies. Together, these strategies provide a means of promoting sustainable and equitable development in disadvantaged regions and empower their communities to break free from the constraints of poverty and reach their full potential.

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Appendices

Appendices

This section contains all the appendices for the dissertation, which provide additional details, data, and supporting information for the research presented in the main body of the text. You can access the appendices directly by clicking on the **File Name** or by copying the URL.

Directory Dissertation File Directory (All Research Materials)

https://drive.google.com/drive/folders/1ecTtlzm3flI3Y8Ing_U0nfF1FWDtoMKM?usp=share_link

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Appendix 01 List of Quotes from Systematic Literature Review for building Connectedness Voids.

https://drive.google.com/drive/folders/1yvamGOwLDraOI7682WjH3EhyImrHpKSP?usp=share_link

Appendix 02 List of Quotes to justify Causal Relationships from Theoretical Framework.

https://drive.google.com/drive/folders/1hTIy3am1H-0anuely4YE0VNGu-RDGiSv?usp=share_link

Appendix 03 Clustering Coding in RStudio.

https://drive.google.com/drive/folders/1aNj2-TNk105JFehA5nJ0ITGxoNJeprq_?usp=share_link

Appendix 04 Summary of Connectedness Voids.

https://drive.google.com/drive/folders/1440sP4f6fka1G1kudgwGkzTvJvDkKJck?usp=share_link

Appendix 05 List of Macroregions.

https://drive.google.com/drive/folders/1EvzS5thOW1uAjuXRnig8xS3hKmmYQ0P7?usp=share_link

Appendix 06 List of Interventionist Macroregions and their MRCB Mechanisms.

https://drive.google.com/drive/folders/1CJF5IaEmhPL1tyEYwnNuiP5vBFMKst_Q?usp=share_link

Appendix 07 List of Conducted Interviews.

https://drive.google.com/drive/folders/1WOLu6SUWURna_cvYjAQh4CZt7R4Pr8k0?usp=share_link

Appendix 08 Field Research: Itinerary & Budget.

https://drive.google.com/drive/folders/13yREl5qDwGP7Q8HJX0WdrnGBmCmb40k2?usp=share_link

Appendix 09 Field Research: Visual Media (Photos & Videos) & Collected Materials.

https://drive.google.com/drive/folders/1t_Gbixvkg4TWZZVDHtPVBU80ZPKNnsvO?usp=share_link

Appendix 10 Research Tool 1: List of institutions.

https://drive.google.com/drive/folders/1zuWcKT7J9R8Pu8E832BDtN7fVx0xo518?usp=share_link

Appendix 11 Research Tool 2: List of Referential Questions.

https://drive.google.com/drive/folders/1q9JdwTu1b9fiWc_3ZfOYVYe0nr0NcO7e?usp=share_link

Appendix 12 Research Tool 3: Maps for the Cross-Border Region and Subregion.

https://drive.google.com/drive/folders/1pmx3zmHE0phALwIKVI5VRJTa3cVz0NCd?usp=share_link

Appendix 13 Audio Recordings.

https://drive.google.com/drive/folders/1WxuM-ieaDuxyRGixezub5sBxqsfBwRKT?usp=share_link

Appendix 14 Audio Transcripts.

https://drive.google.com/drive/folders/1ZBw8RaDInWbKBC1BMpOY72jiQ12Lm3Ma?usp=share_link

Appendix 15 List of Quotes for the Connectedness Voids Analysis.

https://drive.google.com/drive/folders/1H2D19tdeddvwddCEZ7QDsd2BMLpptRbp?usp=share_link

Appendix 16 List of Quotes to justify Causal Relationships from Case Study.

https://drive.google.com/drive/folders/1vq-9oRt0qCIOHJMleSLtAZ7h2FJmxyuE?usp=share_link

Appendix 17 Citation References for Descriptive Analyses 2.1 & 2.2.

https://drive.google.com/drive/folders/1i0nI8DWuK_XnLVkpNhucKjTuuAU3eNYh?usp=share_link

Appendix 18 Citation References for Descriptive Analyses 2.3 & 2.4.

https://drive.google.com/drive/folders/1eewLX1P44W9ZOGIShgTUc0bAilqGm2jf?usp=share_link

Appendix 19 List of producers associated to CECOVASA located in the border margin.

https://drive.google.com/drive/folders/1JYtMVA2YFCjXM8nFlGi1n2yUhe58Cd1Z?usp=share_link

Appendix 20 List of clients from CECOVASA.

https://drive.google.com/drive/folders/13hDL0GpIFG_ArCBzE8aikzV8IUdMcNHU?usp=share_link

Appendix 21 Defense Presentation.

https://drive.google.com/drive/folders/1a8-mZACoYtsIja5gdcMoGHZ4jBetK3Mu?usp=share_link

Appendix 22 Other Materials & References.

https://drive.google.com/drive/folders/1QefvMGHagCJ3VwUncwuedrmnJiSSuEBK?usp=share_link