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Impacts of the Child Cash Grant on Consumption in Nepal Focusing on the Importance of Rural Infrastructure

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1. Introduction

Child malnutrition remains a challenge in the low- and middle- income countries in spite of the unremitting efforts by various stakeholders for decades, and Nepal is no expectation. Ministry of Health and Population (MoHP) reported the severe situation that 35% children of 6-59 months old were suffering from stunting, 29% from underweight, 11% from wasting in Nepal across the whole country (MoHP, Nepal 2018). All these anthropometric scores stay far behind the global standard, and Nepal is one of the countries with highest proportion of malnourished children. Government of Nepal places this issue in the forefront of Nepal's Sustainable Development Goals.

To address this problem of malnutrition, government of Nepal have launched the Child Cash Grant (CCG) policy, which could be classified as the unconditional cash transfers. The CCG offers grants to households with child under five, expecting to improve the situation of child health and nutrition for poor and highly backward families (Ministry of Finance 2009). Some papers proved empirically that CCG have improved child nutritional outcomes and its underlying determinants such as food security and water hygiene (Renzaho et al. 2019).

They also found considerable heterogeneity in the treatment effects between districts. The problem of heterogeneous impacts of the cash transfers has been discussed for years and have become more important because of the further expectation on the basic income program in the developing countries. Such a universal policy has a coverage wide enough to include recipients who could not realize its full potential, that brings about heterogenous impacts and reduces total effectiveness of the policy. The CCG policy in Nepal have, moreover, started to expand recently into the national coverage to emphasize the aspect of social protection, while the actual cause of difference has not been examined sufficiently.

This thesis mainly focuses on the rural infrastructure and related geographical characteristics as causes of these distinct impacts. These factors could bring various cost for beneficiaries and decide the usages of the additional income: recipients with poor infrastructure could be forced in limited utilization. These fixed factors are rarely appreciated in the impact evaluation schemes because they would be deleted for securing unbiasedness. Thus, in this thesis, I aim to clarify the relationship between the CCG policy and infrastructural situations around the beneficiaries, using the household-level data combined with regional indicators from Geographic Information System (GIS).

Employing the doubly robust estimation method, I find that status of infrastructure can harm the target population of the CCG in two ways before and after they receive the grants. First, I find the evidence that poor rural infrastructure and the remoteness of residence certainly affect the possibility for eligible household to receive the CCG. Second, even after they got this

additional money, I find that the impacts of the treatment on the dietary consumption decrease for the beneficiaries who live with the inconvenient conditions due to the geographical features. These results indicate the possibility to complement and enhance the CCG with other policy and the suitable refinement of policy design. I also suppose the direction of intervention and following survey that reflects actual costs and difficulty from the viewpoint of recipients.

In a further analysis, I examine the treatment effects of the CCG for households who were newly added in the coverage by the expansion strategy. Even the number of eligible households increased drastically, the actual recipients of the CCG have not increased, and I find no significant effects on the outcomes related to dietary consumption for this subpopulation. Discussion with these results leads to emphasize the importance of underlying determinants like community-level food securities and shed light on the insufficient governmental efforts in terms of capacity of local administrative office, dispatch of information, and intervention to the market development.

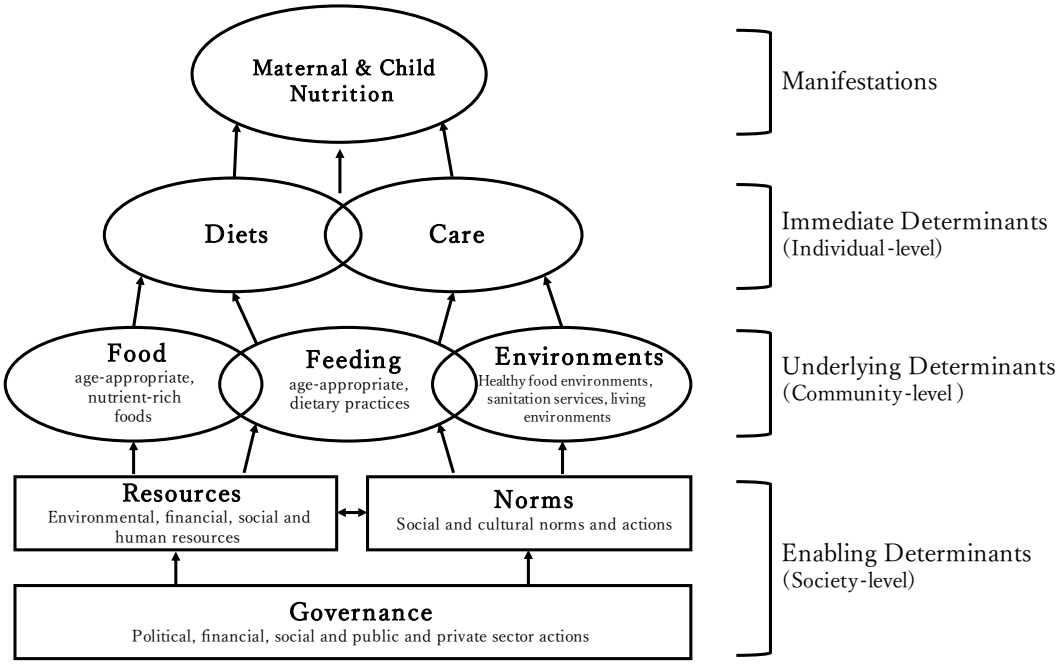
The remainder of this thesis is as follows. Chapter 2 presents the overview of the previous literatures related to the cash transfers and rural infrastructure as a source of the heterogeneous impacts of the policy and summarize into the research objective of this thesis in Chapter 3. Chapter 4 provides the detailed information about the CCG. I will provide the description of data and variables in Chapter 5, and estimation strategy in Chapter 6. Chapter 7 presents the empirical results followed by the discussions and conclusions in Chapter 8, 9.

2. Previous literatures and Background of Study

2.1 Literatures on the concept of malnutrition

First of all, this thesis builds on the conceptual framework that The United Nations Children's Fund (UNICEF) outlined on the determinants of maternal and child nutrition and refined recently (UNICEF 2020; UNICEF 1990). It decomposes determinants of nutritional outcomes into three different phases as enabling, underlying, and immediate determinants. Each phase consists of multiple factors and interacts with each other sequentially. Immediate determinants indicate the individual-level conditions for better health and consist of diets and care factors. Inadequate dietary intake and diseases provoked through inappropriate care practices could directly cause malnutrition. Underlying determinants lie under these immediate causes and denote the community-level situations, which are composed of three elements; food security, feeding and hygiene practices, and basic environments, which are available for each household. Environments includes sanitation and health services, and some living situations that allow better dietary choice and physical activity. Underlying causes are also affected by society-level enabling determinants, that comprise governance, resources, and norms. These financial, political, or cultural factors could restrict alternatives on available foods and services, though individual households have no choice but for accepting that societal conditionality. This framework does not let us describe the complete situation nor predict the potential outcomes but helps us organize the nutritious problems that appears through the complicated and multisectoral levels.

Figure 1. Conceptional framework of malnutrition



Source: UNICEF(2020) and UNICEF(1990)

2.2 Literatures on cash transfer policy and its heterogeneous impact

Cash transfer policies have been implemented for poverty reduction and also for improvement of child health and nutrition in many developing countries. In the framework mentioned above, cash transfers approach the resource aspect of the enabling determinants and ameliorate higher phased elements such as feeding practices and household food securities.

There is tremendous number of literatures that confirm the effectiveness of the cash transfers on various aspects of poverty, with different program designs all around the world. In the 1990s, the Conditional Cash Transfers (CCT) have been implemented in some Latin American countries and gathered attention as an innovative instrument for seeking poverty reduction and social protection. Beneficiary mothers could receive money as long as they satisfied the conditions related to child education and healthcare practices. These CCTs were proved to have improved household consumption, the score of human capitals, and closed the poverty gaps (Fiszbein et al. 2009). For example, the Familias en Acción (FeA), the CCT program conducted in Columbia, have found to promote beneficiaries to spend more on foods, especially highly nutritious foods that improve the composition of consumption (Attanasio et al. 2009). These favorable experiences brought additional expectations of cash transfers and found that the Unconditional Cash Transfers (UCT), which impose no requirement for recipients, also

contributed to the poverty alleviation (Baird et al. 2013). Some UCT trials emphasized its fungibility and selectable usage and shed light on its impact on not only economic but also psychological outcomes (Haushofer and Shapiro 2016). These continuous efforts already entered the stage of reviewing and arranging their features and consequences, such as the synthetic review by Bastagli et al. (2016) that gathered the evidence from 31 CCTs and 10 UCTs all around the world.

As for child healthcare in Nepal, the cash transfer program combined with information sessions that was financed by the international donors, was found to have positive effects on increasing knowledge and behavioral change about child nutrition even in a short term of treatment (Levere et al. 2016). Renzaho and his co-authors examined the effectiveness of the government-sponsored Child Cash Grant (CCG), an unconditional cash transfer policy targeted households with young children (Renzaho et al. 2019). They confirmed that the policy raised child nutritional status of the beneficiaries through the improvement of food availability and behavioral practices of healthcare. Their study was unique in that they also found the impacts of cash for the water, sanitation, and hygiene (WASH) outcomes, which compose underlying determinants of the UNICEF conceptional framework mentioned above.

Recently, moreover, many discuss further potential of cash transfers and its expansion into more inclusive policy, gives more attention to the notion, design, evidence, and quandaries of the Universal Basic Income (UBI) (Gentilini et al. 2020; Banerjee et al. 2019). It seems to achieve the goal of development economics to raise income of poor people with decreasing the implement costs for targeting the appropriate recipients, and it is expected to spread its impacts on other aspects of poverty like human capital accumulation or activities in labor markets. There exist controversial opinions, because it could enhance the laziness and dependency of beneficiaries, or it could demand more budget than underdeveloped countries could afford. Many experimental pilots have been intensifying the debate, however, some evidence in the past few decades encourage us to introduce them. For example, Haarmann and his co-authors evaluated the influence of the Basic Income Grant (BIG) pilot project held in the Otjivero-Omitara area of Namibia, which was one of the cutting-edge pilots of UBI and provide money unconditionally to every person under the age of sixty with resident registration. They verified the gained food security, economic activities (such as increased entrepreneurship, creation of new local markets), and child nutritious scores (Haarmann et al. 2009).

While many existing studies found the effectiveness of cash transfer programs, what I find lacking is the focus on examining the heterogeneity of program impacts, particularly based on the availability of infrastructure. Most studies on various cash transfer policies basically examine the average impacts for beneficiaries, using suitable statistical methods to estimate and provide some policy implications. The number of such research would grow continuously

because of the explosive increase of the randomized control trial (RCT) that helps us create valid control groups and facilitates grasping the mean effects. However, it should be further important to see the heterogeneous treatment effects of cash assistance policy depending on the surrounding environments like infrastructural assets, especially if we consider whether to implement the cash transfers with universal design that partly ignore these differential impacts. Dammert (2009) focused on the heterogeneity of the conditional cash transfer in Nicaragua and measured the effects at the subgroup level using covariates that included characteristics of the head of household and locality. He also captured the poverty level as a source of heterogeneity and focused on the quantile treatment effect. Although some literature paid attention to the heterogeneous treatment impacts of cash transfers, they mainly dealt with the individual characteristics, and no former study has focused on the regional heterogeneity and identified its detailed elements that distort the treatment effects. Renzaho et al. (2019) also stressed that they found the differential impacts of the UCT in Nepal among districts for the outcomes including the prevalence of child underweight and stunting, medical care practices, WASH outcomes, and food security. They concluded that the CCG policy had brought about the upward trend of child nutritious status on average across all selected districts, while they realized amount of certain regional heterogeneous effects of the program and have not specified the actual source of these structural differences.

2.3 Literatures on rural infrastructure

One possible source of the regional heterogeneity could be the biased distribution of rural infrastructure represented by the low level (unpaved etc.) and the scarce of the road construction. That poor road situation causes most problems of remoteness, such as limited access to specific facilities, and the deterioration in each function and services of local markets. The importance of market access needs to be stressed in term of the dietary situation (Hirvonen and Hoddinott, 2017). Suppose the augmented provision and the enhancement of road facilities around local markets, for instance. Farmers are able to save transportation costs and time, and this directly contributes to increasing profits and allows them to bring a greater number of crops to the market. Earning higher profits enables them to invest in seeds, fertilizer, and labour for an abundant future harvest. They could allocate the saved time to other economic activities like initiating small businesses. As consumers, they could obtain more variety of foods and daily items that were brought from distant production areas through strengthened land routes. Moreover, markets sometimes function as informal ways to share the information and norm related to their livelihood and easier access to the local market promotes the community-building which leads to realize the social inclusion (Mair et al. (2012); Hagen-Zanker et al. (2015)).

We can see some empirical reports that verified how the roads contribute to the economic development and poverty reduction. Fan and Chan-Kang (2008) estimated the impact of road investment on the rapid economic growth in China in 1980s-1990s and found that rural roads had great benefit/cost ratios for national and agricultural GDP, which was four times larger for rural low-grade roads than high-grade in urban. Dillon and his colleague tried to grasp the influence of public investments in rural Nepal and found the macro trend that the investments in road facilities improves households' welfare measured by farm-lands values (Dillon et al. 2011). As micro-level surveys, on the other hand, Charlery et al. (2016) conducted panel data analysis and clarified how incomes of neighborhood residents and their inequality would be changed due to the new road construction. They confirmed that the road constructed newly in Lete (the specific name of one administrative unit) in Nepal contributed to 28 percent increase of income on average and showed its breakdown of major income sources.

For the relationship of road infrastructure and nutritional status, while not empirical, Grocke and McKay (2018) provided a well-described case study based on the ethnographic fieldwork in mountainous Humla District, Nepal. They depicted how the arrival of roads affected dietary security and nutrition in terms of availability, access, utilization, and stability. It helped villagers get another source of food, which resulted in the gained quantity and the elimination of food-related anxieties. They also indicated the possible disadvantage of the road enhancement, that could lead residents to consume more amounts of nutrient-poor foods and cause overweight and obesity, an emerging aspect of recent malnutrition.

For the other indicators to present the geographical characteristics that could bring about the unobserved heterogeneity of the cash transfer impacts, some papers use remoteness or urbanization of the living municipality alternatively. Headey et al. (2018) provided an extensive and systematic report that explores how child-nutrition scores are associated with the level of urbanization and travel time to large cities, using data from 23 sub-Saharan African countries. They found a nonlinear relationship between nutritional outcomes (height of children and dietary diversity) and travel time, with the largest reduction in a bit far area and a moderate downward trend as travel times increase. Interestingly, these negative effects fade off when they put controls for socioeconomic status and access to social and infrastructural services in the least square method, and only small coefficients remain in the classification of the urbanization. Adopting their suggestion, this thesis also uses the variable that indicate the rurality of living towns/cities (will be mentioned again in the Chapter 6).

Considering with the UNICEF conceptional framework of malnutrition, road infrastructure and the related public investments could be positioned in the resource factor of enabling determinants, that decide what food the household could obtain and what dietary practices they could implement. They could be partly seen as the reflection of the governance

factor because governments are mandated to provide public services, which indirectly affect the health services and healthy environments of communities, which can affect the healthcare practices each individual could take. These environmental resources interact with the financial resources stimulated by the cash transfer policies and influence the underlying household/community-level determinants. We need to pay more attention to these synergetic effects of enabling determinants. They might give us a hint to boost the program impacts, or they might cancel out the mutual effectiveness, that impose us another challenge in addressing the comprehensive implementation.

Besides, how have researchers ever dealt with these geographical characteristics which provoke the heterogeneity in the general evaluation schemes? In fact, there is limited literature that investigated the effects of these geographical characteristics in evaluating social assistance programs, such as cash transfers. The geographical situations including the rural infrastructure rarely improve in the short-time period that the regular cash assistance continues. Hence, it tends to gather less interests by researchers who aim to examine the effect of specific policy for specific population at specific time period. Main challenge for evaluators has been how to address the counterfactual situations, that "program participants cannot be simultaneously observed in the alternative state of no participation" (Rawlings and Rubio 2005), in order to describe the genuine impacts of the programs.

As mentioned before, the emerging number of RCTs have been conducted as the most powerful weapons to tackle this problem. This method allows us to create comparable treatment groups and control groups and eliminate selection bias. These two groups by random assignment differ only in their treatment status and any consequences that follow from it (Angrist and Pischke 2015), which secures the average balance of all covariates including other unobserved features and the geographical characteristics as long as the size of chosen groups were large enough. In a random setting, we should not always have to add any controls other than the treatment status. Because it could just improve the precision of estimates, many previous literatures controlled region-specific difference in the form of fixed effects or lagged variables (e.g., Haushfer and Shapiro 2016; Lim et al. 2010), while these groups could already be regarded as comparable. These region-specific fixed effects often have hindered us to capture the sole and synergetic impacts of the rural infrastructure in the evaluation framework.

Even if the RCT is unfeasible, we could create the comparable control groups to estimate the causal effects with observed data, using various quasi-experimental methodologies. One typical approach in the cash transfer evaluation utilizes the panel data that contain before and after the implementation and adopt the estimation strategy such as a difference-in-difference (DID) approach to delete the unobserved difference on the time-invariant factors. However, we assume the situation of rural infrastructure is given and does not change in survey

period. This could explain why no research has ever seriously faced how infrastructure differentiate the treatment impacts of the policy.

2.4 Brief summary and research motivation

Thus far, this thesis adduced the nutritional situation of children in Nepal and the possibility of cash transfer programs as tools to approach enabling determinants under child malnutrition. Subsequently, I pointed out the geographical heterogeneous impacts of the policies that could be attributed to differing level of rural infrastructure in the developing countries. Lastly, we showed how former researchers treated or took account of the potential existence of such geographical differences and found less trials have been made to appreciate the effect of the rural infrastructure in the impact evaluation of cash transfer policy.

This research gap motivates the author to stress the importance to see the effects of infrastructure like roads simultaneously in measuring the effect of cash transfers held in the infrastructurally poor areas. There are two main paths that rural road infrastructure influences the effectiveness of the cash-giving policy. First it affects the choice of whether to actually receive the assistance or not when the access to information is limited or transportation costs to visit offices to register and receive the assistance are high. This may provide the meaningful difference between the intention and the actual impact of treatment. Secondly, it restricts the change in the beneficiaries' behaviors that policy makers expect to improve and leads to a limited or even a negative consequence. Despite these two aspects, the cash transfer policy has been recognized as a powerful instrument to ease the poverty and tended to expand into the universal design, with less consideration on the region-specific heterogeneity. This thesis is going to put the synergy of cash transfers and other public works in the spotlight and create a stir in the excessive trust and expectation on these policies including basic incomes.

As a cash transfer project that aims to improve the child nutrition, this paper focus on the national Child Cash Grant (CCG) program in Nepal that unconditionally distribute money to every eligible household. This policy started to extend its coverage recently according to the national expansion strategy, which are explained in detail later, and provide us additional insight on the universal design of cash transfers. As already pointed out in reviewing previous literatures, Nepal is one of the least developed countries with challenging terrains that could interfere with economic activities of people. Its harsh rocky mountainous characteristic has caused and intensified the natural disasters, bringing about additional damages for economy. The large-scale deadly earthquake in 2015 led more scholars to focus on the scarce and its influence of rural socioeconomical situation, but still little literature holds in project evaluation.

3. Research Objectives

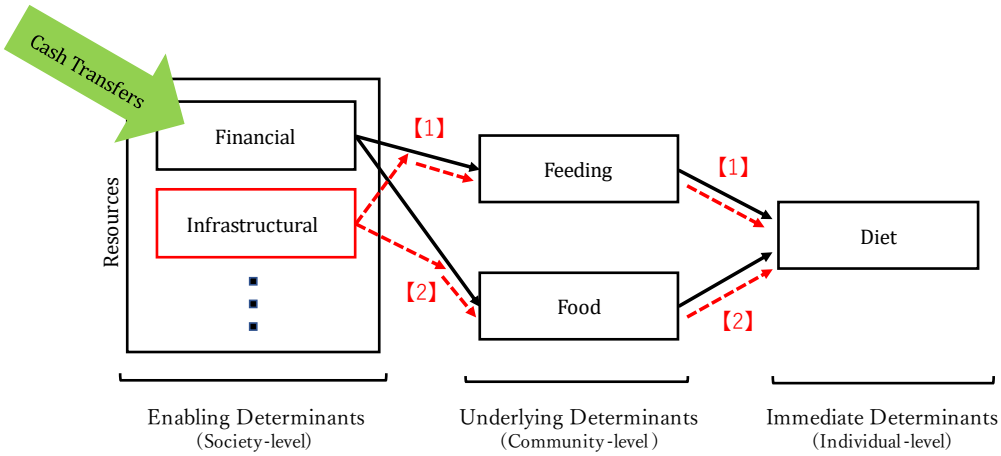
This thesis consists of two main objectives. Firstly, author aims to clarify the relationship between the cash transfer policy named Child Cash Grant (CCG) in Nepal and rural infrastructure around the beneficiaries. They could affect the beneficiaries' behaviors both before and after the receipt, which would restrict the impact of the program. These fixed factors are rarely appreciated in estimating the average unbiased effects in most previous literatures. An elucidation of this association would contribute to shedding light on the refinement of cash transfer programs or designing another public policy related to infrastructure development. To achieve this objective, I formulate the following two different hypotheses,

Hypothesis 1: Poor rural infrastructure (represented by the scarce of road facilities) has prevented the eligible households of the CCG from receiving the program benefits.

Hypothesis 2: Even after they received the CCG, the amount of rural road infrastructure has affected the magnitude of program's impacts on the dietary choices and child nutritional outcomes of beneficiaries.

In reference to the Hypothesis 2, Figure 2 briefly illustrates the channels that infrastructure could affect the expected impacts of the CCG, partially extracted from the UNICEF framework I already mentioned. There supposed to be two routes of infrastructural influences; the direct effects of physical distance (【1】) and the indirect effects of remote markets (【2】). When a beneficiary tries to utilize the money, the difficulty or inconvenience of accessing to market imposes extra costs to travel, which decreases his/her affordability and limits the available feeding practice (【1】). This physical barrier could also be the psychological burden for him/her and further inactivates such an ideal behavior. Moreover, rural infrastructure affects the community-level food factor combined with financial elements through influencing the market and logistical activities, that could indirectly change the immediate outcomes (【2】). A recipient of the cash transfer is not able to unleash its potential for nutritional problems when local markets play insufficient role for trading and have small amount and alternatives of food items in their circulation. In fact, this thesis could not strictly divide these direct and indirect impacts because it is hard with my dataset to measure and control the capacities of rural markets properly. However, it would be reasonable to some extent to regard the observed impacts as relating to the direct scenario, considering the short duration of the policy for some population.

Figure 2. Direct and Indirect impacts of infrastructure along with the cash transfers



Secondly, this thesis aims to evaluate the effectiveness of the recently expanded portion of the Child Cash Grant (CCG) policy in Nepal. While the extension strategy is in progress, to my best knowledge, no attempts have been made to evaluate the shot-run impacts of program or examine the validity of enlarging its coverage. Using the data after the expansion enable us to evaluate if the policy works for the newly targeted beneficiaries and provide expected impacts to address child nutrition. There is little statement on the how the expansion has been actually proceeded, however, policy makers seemed not to recognize the serious trouble and continued its implementation at least until 2019 (Sjöblom 2020). To achieve this objective, I set the following simple hypothesis.

Hypothesis 3: The CCG have contributed to the improvement of the child nutritional status positively for beneficiaries newly targeted through expansion strategy.

4. Child Cash Grant in Nepal

This chapter presents the overview of the Child Cash Grant (CCG) policy launched by the government of Nepal in 2009 and indicates three remarkable facts on this program especially in terms of the association with the rural infrastructure, that underlies three hypotheses proposed in the earlier chapter.

Nepal locates in the foothills of the Himalaya Mountains and its territory consists of three distinct ecological regions; Mountains, Hills, and Terai (lowlands). The Mountain area has limited transportation and communication facilities that hampers smooth economic activities. Many poorest districts are included, therefore pilot projects tend to target the households in this region. Hills also range in high altitude from about 610 to 4,800 meters above sea level, but it contains the most populous and fertile metropolitan areas such as Kathmandu and Pokhara that owns much developed infrastructure. Terai region locates in the southern part of the nation and includes the most abundant lands. Around 23% of the Nepal terrains are categorized as Terai, however, about half of the population resides here and the most developed rural infrastructure are found in this region.

Besides, in terms of the governmental administration, Nepal consists of 7 provinces that include total 77 districts. These districts are further segmentized into the smaller unit of administration, named Village Development Committee (VDC), which is established to enhance the coalition of local community and the government and strengthen the service delivery. The CCG policy also have been provided through the VDC administrative units, while they have dissolved and formalized into other units named Gaunpalika in 2017.

4.1 Basic information of the CCG

Since the close of civil conflicts and the conclusion in Comprehensive Peace Agreement between the Government of Nepal and the Communist Party of Nepal (Maoist) in 2006 and the establishment of the republic in 2007, Nepal started to make forward to inclusive society with much social protection programs. The CCG is the key policy in the context of these expansive set of social protections, which has begun in 2009 with the governmental source and obtained supports from UNICEF, the Asian Development Bank and the Japan Fund for Poverty Reduction.

The government of Nepal holds up its objective as bringing about improvement in the condition of child-care in poor and highly backward families (Ministry of Finance 2009) and defined the target of the CCG program as households who belong to poor Dalit and all families in Karnali Zone (five districts in the mid-western Mountain regions) with child under the age of five. Dalit is the lowest caste/ethnic group and also called “untouchable” in Nepal and have

suffered from the enduring discrimination and been stuck in the disadvantaged status economically. To identify the "poor" households, moreover, they added a wealth criterion: eligible households were landless or having less than a certain area of plots. In practice, however, this wealth criterion has found not to be applied evenly and consistently. Government officials have faced difficulty of certifying the possession of lands at local level and determined eligibility without it, that has resulted in some targeting errors (Hagen-Zanker et al. 2015). In addition, households who satisfy these criteria needs to register before receiving the grant. The registration demands the birth certificate of their child, therefore holding it could be seen as an additional conditionality of the CCG. The actual distribution processing rate would be referred in detail in the following section.

The amount of transfer was set to NPR 200 per child per month, for up to 2 children in each household, and basically distributed at four-month intervals. Because of the weak administrative capacity of local governments, however, the amount of transfer found to be varied across the beneficiaries, in reality (Okubo 2014).

To enhance its effectiveness, the CCG is complemented with some training programs on Infant and Young Child Feeding (IYCF) and parenting behaviors by both governmental and non-governmental actors. For example, Save the Children have supplemented the CCG with the parenting package targeting parents and caregivers in the policy, named International Child Development Programme (ICDP) that aims to provide not only nutrition but also physical, cognitive, social, and emotional development of child through better skills of parents and "good interaction" with children (Sjöblom 2020). Though the CCG expects and induces the beneficiaries to address the child malnutritional problems, there is no requirement on their behaviors and the usage of additional incomes. In this mean, the CCG could be classified into the UCT.

A remarkable fact on the CCG is that its coverage has expanded gradually since 2016, in the hope of the national coverage within ten years (Mathers 2016a). As mentioned, the CCG had provided to households in the specific region or belonged to specific caste groups in the rest of the country. The Budget Speech of Fiscal Year 2016-2017 declared to target the disadvantaged families of all regions in the future and make the CCG universal. The targeted areas were planned to expand according to the Human Poverty Index (HPI) of each district not depending on ethnicity or caste and would reach to all around the nation by 2025. Additionally, the amount of transfer got doubled from NPR 200 to NPR 400. This extension would have sharply reflected the large number of excluded poor children who cause social tension and the confirmed fact that the government could afford with carefully considered scenario, though it could be still controversial in terms of efficiency and cost-effectiveness.

After the expansion strategy has implemented, the requirement of receiving the CCG contains only three elements: having at least one child under five, owning no or less land than

defined standard, owning a birth certificate of a child. Because the coverage was to spread geographically based on districts, the ethnicity and caste status no longer relates to the eligibility of the household. Even the non-Dalit household outside the Karnali zone could receive the transfer if only district where they locate has included in the coverage.

Figure 3. Basic information of the CCG before and after the expansion

Period	2009~	2016~
Target	Karnali zone Dalit household outside Karnali	All households (expanding coverage gradually by districts)
Benefits (per month)	NPR200	NPR400
Requirements	Wealth criterion (Land) Birth certificate child under 5	Wealth criterion (Land) Birth certificate child under 5
Condition (usage)	None	None

4.2 Discussion points

On this fundamental information about the CCG, I would focus on the three notable points to support the research objectives. First, while there are some literatures that examine the impact of the CCG empirically, no report focuses on the beneficiaries newly added in target after the expansion has occurred. Renzaho et al. (2019) found the improving trends in child nutritional status using data before 2016 and only in Karnali zone. In addition, Hagen-Zanker et al. (2015) reported great change in eating patterns of children (e.g., parents could let them take more their desirable food) and significant increase in dietary diversity index in the comparison with non-recipient households using PSM estimation, while they also focused before the expansion. While the strategy aimed to cover the whole country in 10 years, they should check the validity and impacts of the mid-times, that would enable to change and modify the policy design before wasting many costs.

Second, although the number of the eligible households increased substantially, the actual number of households who received the transfer remains in low standard. In our dataset, explained in detail later, we have 555 households who were assigned eligibility in 2018 but only 115 households have received the transfers and 95 out of 264 among the target group in 2017 and 60 out of 74 in 2016 group received. This stagnating trend in the actual rate of beneficiaries should be solved to realize continuing the significant extension of the CCG.

To address this issue, let us quickly sort the actual procedure to receive the money

for each eligible household, based on the qualitative part in Hagen-Zanker et al. (2015). Households need to obtain information on whether they are eligible for the grant at first. Many of them tended to hear of the CCG from VDC or municipality officials, on the other hand, casual conversations with neighbors and the local market as a place for such informal interactions played an important role to disseminate the program. Hagen-Zanker et al. (2015) reported that this word-of-mouth pathway contributed to achieve high awareness of the policy (98% in their sample), while such informal communication also had risks to convey the incomplete or rather falsified information of the program along the way to filter down. After the households recognize their eligibility, they have to go to the VDC office for registration. It could take a long time and costs more especially for people in remote areas. In Bajura district, for example, a certain number of households forced to spend more than half a day due to the geographical difficulties. Moreover, the window for registration would open only in the specific period of year which could lead to the crowd and compel some households to cover additional costs. Even after registered, they must go to the VDC office again to collect the cash grant. However, due to the poor administrative capacity of the local government, they are sometimes forced to visit several times. Because there is no option to receive in the form of mobile money, they need to receive in hands.

Considering these procedures, the recipients are repeatedly demanded to take over these transportation costs, that is deeply dependent on the quality and quantity of rural infrastructure around them. As discussed in the former chapter, rural infrastructure like roads decide the difficulty of accessing to the facilities including local markets and VDC offices, and the level of difficulty distributed widely and heterogeneously especially because of the distinct geographical features in Nepal.

Additionally, these processes show that the choice on whether to receive the grant deeply depends on the individual judgement, that provokes the problem of “self-selection” and makes it harder for us to measure the actual treatment effects. Because this CCG programs has not assigned its beneficiaries at random, I applied the quasi-experimental method to eliminate the bias, which will be mentioned again in the later part.

Despite the obvious of high transportation cost due to the insufficient road infrastructure, policy makers make beneficiaries bear these extraordinary costs and give no additional support. In the case of the maternity incentive scheme in the same country, on the other hand, the government gives extra cash incentives according to the geographical regions, in order to compensate different transportation fees to visit health facilities (Khanal 2019). Such subsidies have not been discussed in the official document in terms of the CCG at this moment.

A final discussion point appears after they gain the transfer. Even if more eligible households could actually receive the money, the impacts of the CCG policy could be limited by the poor rural infrastructure, and that could bring about the unobserved heterogeneity for each

beneficiary. Reminding the goal of the CCG to address the chronic malnutrition of children, one ideal usage of transferred cash is for diverse dietary, that is classified as an immediate determinant in the UNICEF conceptual framework. To realize that usage, they need to go to local market regularly whose accessibility is decided with the surrounding transport infrastructure. Some parents could give up using money in suitable purpose considering the high transportation costs they have to pay additionally in Nepal. As we stated in the description of the distribution process, the amount of payments is nominally identical regardless of how much cost they should cover for daily use of money, that could impose tough conditions on them and lead to heterogeneous impact of the cash grant.

5. Data and Variables

5.1 Data to use

This thesis mainly utilizes the household-level data collected in the Household Risk and Vulnerability Survey (HRVS) conducted between 2016 and 2018 by the research group of the World Bank. Walker et al. (2019) conducted this panel survey to examine the vulnerabilities of households to major natural and socioeconomic shocks, their coping strategies, and the actual impacts on their welfare. However, this survey is also suitable for my thesis since it contains sufficient information on the household characteristics including the treatment status of the CCG, some nutrition-related outcomes like food expenses and anthropometrics, and the geographical features like access to facilities. The last survey was fielded in June to August 2018, that enables us to observe the situation after the expansion strategy has implemented. I extracted the data in 2018 and utilize for my estimations as a cross-sectional dataset.

The whole range of sampling included all households in the non-metropolitan 75 districts in Nepal (out of total 77districts). The research team narrowed down this sampling into 50 districts with probability proportional to size, then this 50 was classified into 11 strata. Subsequently, they selected 400 sampling units with probability proportional to stratum's share and randomly picked up 15 households out of each sampling unit, that resulted in about 6,000 households. Since this thesis has interest on the cash transfer policy that targets specific households, I apply the eligibility of the CCG on this population and find 555 households who have at least one child aged under 59 months and resides in the districts where expansion has reached in 2018. Figure 3 describes this sampling procedures, and Figure 4 shows the list of districts that were included in the coverage of the policy in each year, depending on the expansion strategy explained in Mathers (2016a). They planned a district-wise expansion

according to the Human Poverty Index (HPI) that compose of the three elements of human development; life expectancy, literacy rate, and access to safe water for children, which was calculated with the data of the Nepal Living Standards Survey (NLSS) and Population Census of 2010-2011. They would introduce additional districts with lower HPI scores in each year till achieving the national coverage.

Figure 4. Targeted districts of each year

2016	Karnali zone(Dolpa/Mugu/Humla/Jumla/Kalikot), Rautahat, Achham
2017	+Bajhang, Mahottari, Jajarkot, Kailali
2018	+Sarlahi, Doti, Bajura, Siraha, Rasuwa, Dhanusha, Dailekh, Salyan, Bara,Rukum, Rolpa

Moreover, I supplement this dataset with the VDC level indicators collected by the International Centre for Integrated Mountain Development (ICIMOD). ICIMOD collected the geographical indices of every VDC through the webGIS and Spatial Data Infrastructure (SDI) system, such as road density. Even after VDC has dissolved in Nepal, the HRVS data continues to identify the administrative units as VDC, that allows us to match these VDC-level measures. Geographical information in the HRVS is a little subjective because it depends on the household questionnaire, therefore I added some objective measures. However, we need to be conscious of the fact that ICIMOD data reflects the situation in 2015 and there is a certain time gap between these two sets.

5.2 Variables

5.2.1 independent variables

This thesis uses three kinds of variable groups as independent variables: household characteristics, assets, and geographical indicators. Here I would provide explanation of selected variables I convert into the form that could be included in the estimation.

Household characteristics

As for the educational variable, I create new index that indicate the magnitude of actual educational achievement ranged 0-8, according to International Standard Classification of Education (UNESCO Institute for Statistics) (2011). The correspondence table is shown in Table A1.

One of the most unmissable features of households in Nepal should be their ethnicity and caste status. There are more than 100 small different ethnicities/castes and more than 100

different languages, and more than 10 different religions (Central Bureau of Statistics (CBS) 2011). Dalit groups have been suffered from the exploitation, violence, and social exclusion historically, and that is the reason why emerging policies including the CCG put them on high priorities. However, another ethnic group Madheshi, who live around the borders with India and account for 35-50% of the national population, have also been of poor standing. Moreover, no political and economic rights had been recognized for them before the Citizenship Law in 2006. Considering these, I make two dummy indicators that become one if the household belongs to Dalit or Madheshi. My dataset contains 81 ethnicity/caste groups, and the classification of these status are conducted referring to the Population Monograph of Nepal by CBS of Nepal (CBS (2014)).

Household assets

For control variables of the assets the eligible household owns, I create the dummy for the piped water supply, a flush, a mobile phone, email and internet, and a cable TV.

Geographical characteristics

In order to grasp the effects of geographical features and rural infrastructure, I prepare four different variables that control the confounding from various aspects. One important index is the road density that represents the quantity of road infrastructure surrounding the eligible households. The second is the indicator for rural municipality. Heady et al. (2018) suggest the possibility that the classification of a cluster whether urban or rural matters more than a distance to large urban center. They also conclude the effects would be minimized if controlling for household wealth and education and access to social and infrastructural services, while the thresholds of the classification depended on the country-specific definition. Local governmental operation act 2017 declared that municipalities in Nepal would be divided into a metropolis, sub-metropolis, municipality or other rural municipality based on the standard related to its population and facilities, and I make the indicator of rural municipality. The third index is the distance to the local markets. Practical consumption of the beneficiaries would be made through the local markets. If they have to pay too much transportation costs for traveling there, they would refrain from activating their consuming activities, that reduces the effectiveness and impacts of the CCG. Furthermore, we should focus on not only travel distance but also travel modes, that decides the easiness and comfortability. With the increasing availability of motorcycles or tempos, it is possible to see a drop on travel time even if there is no change in actual distance to the facilities (Dillon et al. 2011). HRVS data collected the means which beneficiaries normally use when they travel to the closest daily market. I create the dummy which equals to one when they are forced to ride cars or buses,

which are the most onerous form of transportation for them.

5.2.2 dependent variables

This thesis uses the household dietary diversity (HDD) score and the food expenditures as two main outcome variables. HDD reflects the economic activities of each household to access a variety of foods. HRVS's questionnaire included the detailed items they consumed in the seven days before the interview. I group around 40 types of consumed foods and convert into the discrete scores ranging 0-12, referring to the guideline by Food and Agriculture Organization (FAO) (FAO 2010). Food expenditures also shows the amount they spent at the market in the seven days before the interview. FAO (2010) recommended a reference period of the previous 24 hours because it is less subject to recall error, however, one-week recall period could provide an indication of a household's habitual diet. Such behavioral practices are classified in the diet element of immediate determinants of UNICEF conceptional framework, which directly affect child's nutritional status. These two scores show the habitual activities of households; therefore, the beneficiaries of the cash transfer are expected to improve them immediately after they receive money. Levere et al. (2016) observed that their pilot experiment of cash transfer plus information training program brought about the improvement in outcomes of knowledge and behavior even in the short-term of survey, while they could not find the significant impacts in child growth outcomes.

Additionally, expenditures on the other kinds of goods are prepared as explained variables. In a popular lore, an unconditional cash grant like CCG seems to have potential disadvantages from a policy perspective. Beneficiaries might spend additional money on temptation goods or durable assets that they could not afford with usual incomes (Haushofer and Shapiro 2016), and that swerve off the objective of the CCG. I prepared the amount of non-food expenditures including spendings on durables and luxury items. The classification of these items is shown in Table A2.

As anthropometric outcomes of children, I use Weight-for-age Z-scores (WAZ), Height-for-age Z-scores (HAZ), and Weight-for-height Z-scores (WHZ). These scores utilized to capture each scourge of malnutrition; underweight, stunting, and wasting. This thesis generates the indices using the 2006 World Health Organization (WHO) report.

6. Estimation Methodology

In order to examine the first hypothesis, this thesis employs the simple logistic regression model on the likelihood of attendance of the CCG treatment. In addition to the geographical indices which is in focus of this part, indicators of household characteristics

including the requirements for receiving the CCG and indicators for assets are added. The problem of multicollinearity would be verified with the variance inflation factors (VIF).

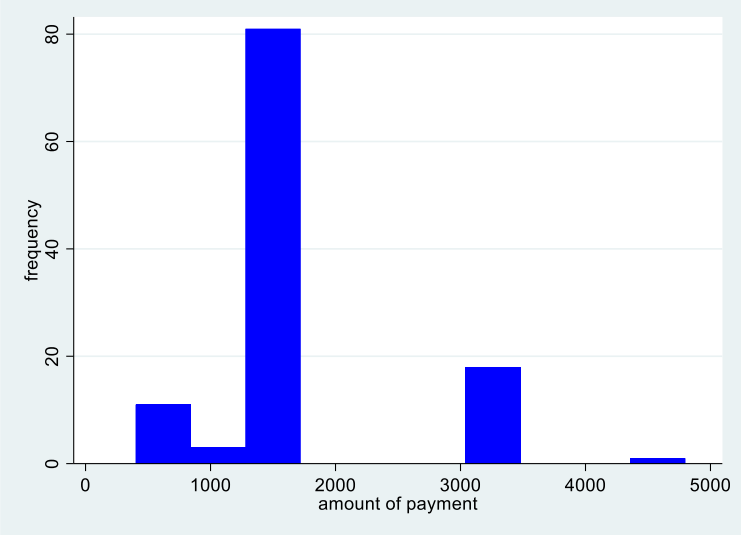
For the second hypothesis, I use the inverse probability weighting regression adjustment (IPWRA) approach, that use the inverse of the propensity scores as weights for the regression model. This method consists of two phases; estimating the probability of treatment using logistic model for the first step, which is similar to the model I already introduced, then using regression adjustment for outcome variables in the second stage with weights made by the inverse of propensity score. This estimate allows us to control for selection bias due to observable differences and is called "doubly robust" because it provides a consistent estimator if at least one of these two models (treatment and outcome) is correctly specified (Wooldridge 2007). While matching method with propensity score allows us to identify only the treatment effect, the IPWRA gives us a chance to insert the covariates for confounding effects and interaction terms to see the synergetic effect of the treatment and other variables. That interaction term is what I focus on for the Hypothesis 2. I adopted $w_i = T_i + (1 - T_i)\frac{\widehat{e_i}}{1-\widehat{e_i}}$ as weights to estimate the average treatment effect on the treated (ATT), where T_i is the treatment indicator and $\widehat{e_i}$ is the estimated propensity score (Hirano et al. 2003). The IPWRA demands two assumptions; one is unconfoundedness or the conditional independence assumption (CIA) which means that the treatment status is assigned randomly if we impose conditions on the set of covariates we use to calculate propensity scores. This is a strong assumption because the unobserved elements might be influential on treatment, and we need to be careful in interpreting the estimates. Another assumption is known as the "overlap", which means that each subject has a positive possibility of assigning in treatment if we condition on the selected covariates. We could check this assumption with the standardized difference of each covariate. Small value of these differences indicates that treatment and control groups are well balanced if we weight with the prepared propensity scores and that the regression adjustment would be trustworthy (Imbens and Wooldridge 2009; Stuart 2010).

I also adopted the IPWRA method for examining the third hypothesis, with the subgroup of the whole households which were targeted after the expansion of the CCG policy. In addition, I use the propensity score matching (PSM) method for a robustness check. PSM is one of the methods commonly used for measuring the impacts with the cross-sectional data, and similar assumptions as IPWRA are needed to conduct it. I exploit the same propensity scores for PSM as IPWRA.

As a point to notice, these methods with propensity scores focus on evaluating the impacts of the treatment status but not the impacts of the amount of transfer, that could vary among the beneficiaries because of weak capacity of the local governments for implementation

of the policy. Okubo (2014) pointed out higher amount of the CCG is associated with the improvement in the scores of underweight and wasting, using the amount as an independent variable in his regression model. However, the estimation strategy of this thesis could just evaluate the impacts of treatment and ignore difference in the impacts of the amount of payment. The actual amount of payment is show in the Figure 5. Over the 70% of the recipient gains NPR1600 and 15% gains NPR3200 in the past four months, which are the same as defined amount for one and two transfers. Therefore, I regard these differences as negligibly small and use only the dummy variable that becomes 1 if the household receive the grant in the survey year.

Figure 5. Frequency of the amount of payment in the past 4 month



7. Results

Table 1-3 show the descriptive statistics of groups who received the CCG in the past one year and who did not before weighting. I can observe no significant difference between two groups in basic household characteristics but for ethnicity/caste status. 41.7% of received households belong to Dalit whereas only 10.5% among non-recipients. Some indicators for job types also differs while the magnitude of difference is not large. Over 90% of households have jobs related to the agricultural sector for both groups. Another surprising difference is found in the possibility of possessing a birth certificate, although it is placed as a condition to gain the transfer. In terms of household assets, we observe that all indicators we use show significant difference. However, the directions of values were varied across the assets, and I cannot conclude that household with poor assets tends to receive the aid, which is desirable as a social inclusion policy. Two groups also have different features also in geographical indicators. Households in received group tend to live in rural municipalities, which is consistent with the expansion strategy that prioritize these regions as first targets. I find that all the objective measures obtained from ICIMOD dataset show the significant difference. Families who received the CCG tend to live in the region with more roads, rivers and forest, and I check its causal effect with the first hypothesis.

Table 2 shows the summary table for expenditures or usage of money, and I find some indicators that are unsimilar between treatment and comparison groups. Here I should emphasize the large and significant difference in financial assets and the amount of savings. Households in control group have twice as much amount of financial assets and savings as received households have, indicating the tendency that the program could cover relatively oppressed population on average. Interestingly or even ironically, moreover, I see no difference in the expenditures on luxury goods between two groups.

Table 3 shows the case of the child anthropometric outcomes, and I could find sufficient difference for the z-score of underweight and stunting. The CCG seems to be provided to depressed people who hunger the assistance most, also in this point of view.

7.1 Hypothesis 1 – Impacts on the attendance of the CCG

Table 4 shows the results of logistic estimation on the possibility to attend the CCG program. I assessed the goodness-of-fit and multicollinearity in our regression model with the Hosmer-Lemeshow test and the variance inflation factors (VIF), confirming the fitness and the precision of the estimated coefficient (Table 5, Table 6).

As I expected in my hypothesis, the variables on the geographical characteristics

have significantly affected the choice of the eligible households to receive the grant. The odds rates of receiving increases if the eligible household resides in a region with more road facilities and those positive effects are significant in 1% level, while the effect size would not be as large as it looks because of the small width of actual change of density. I see the significantly negative coefficients for the distance to market for each household. The more distance they need to travel to the local market, the less they tend to attend the program. Controlling the access to market with means of transportation, I can also confirm that the inconvenience of accessing to market keeps eligible families away from the receipt. If the household is forced to use a car or a bus to travel to a market, the odds ratio for probability to receive the CCG decreases significantly. Additionally, the indicator of rural municipality provides the positive effects though the significance levels are relatively low. I will mention more on this result in the following chapter.

Besides, I find some other variables that have eye-catching effects about the choice on whether to attend the program. I recognize positive effects with high educational attainments. As for the conditions of receiving the CCG, I see no significant effects with the amount of plot that beneficiaries hold. These results are consistent with the previous research that found that condition of the landholdings did not work in practice. Similarly, I identify no significant difference between people who own their child's birth certificate and who do not. That could be the sign that even the basic rule of holding birth certificate have not been followed by the residents and governmental officers. This result is not consistent with the evidence by Hagen-Zanker et al. (2015) that reported 93% of their interviewee had brought the birth certificates properly for registration.

Furthermore, the odds ratios strongly react on the variables of ethnicity status. Dalit households have strong tendencies to attend this cash transfer program, while Madheshi households, who also position as a poor ethnic group, have extremely low possibility to receive the CCG. Before the expansion of the policy, the eligible households were limited to the those who lived in the Karnali zone, or those who belongs to Dalit ethnic groups. Such former recognition of people on the policy seems to be unchanged even after the promulgation, that could attribute to the scarce of efforts by governmental offices to share the sufficient information around enlargement of the coverage.

7.2 Hypothesis 2 – Poor rural infrastructure limits the impacts of the CCG

In order to analyze the impacts of the CCG whose receipt status includes self-selection bias, I use the propensity scores for weighting adjustment method, named inverse probability weighting regression adjustment (IPWRA). The variables I use for calculating propensity scores are showed in Table 7 and selected variables are basically the same as I used

for Hypothesis 1. Rubin (2001) argued that the reliable regression adjustment should keep its absolute standardized differences of means less than 0.25 and the standardized differences of variables I put in the model seems to satisfy that criterion (Table 8). I conduct the IPWRA estimation with several different sets of variables to clarify the effects of each interaction term of the indicator for the CCG and variables around rural infrastructure and add OLS results just for comparison. I also checked the joint significance of the interaction terms and the treatment status.

Household Dietary Diversity and Expenditures on Food

Firstly, I focus on the main outcomes of my thesis: household dietary diversity (HDD) and food expenditures, which are classified in the immediate determinants of "diet" in the UNICEF conceptual framework. Before examining the Hypothesis 2, we can see no significant impacts of the treatment status on HDD, which suggests the CCG does not contribute effectively to achieve more nutritional dietary (IPWRA estimators in Column (1) ~ Column (7), and OLS estimators just for comparison in Column (8) and Column (9) of Table 9). Four interaction terms of the receipt status and infrastructural measures indicate the synergetic impacts or suppressing impacts of rural infrastructure in the CCG scheme. I find no significant effects of those with road density, distance to market, and the indicator for rural municipality (Column (4), (5), (6)), while I can verify some negative impacts at 5% significance in the cross term with the dummy variable that becomes one if they need to ride a car or bus just for accessing to local market, while I could not confirm the strong joint significance for these terms (Column (7)). I could also confirm the importance of the educational attainments of household head because the coefficients appeared in all significant and positive values.

In Table 10, I analyze the effects on the food expenditure of each household. As with the HDD, I find little evidence that the CCG boosted the investment in food items by beneficiaries. In addition, I find the significant and negative effects again with the interaction term with the indicator of riding a car/bus to the market (Column (7)). The beneficiaries of the CCG tend to spend 39% less for their meals if they cannot travel to the market with easy means of transportation like by walking or by a tempo. Besides, I find interesting evidence that the food expenditures are less for households in a defined rural area, while the impacts of this cash transfer get larger for such people (Column (5)). This result partly contradicts the argument by Headey et al. (2018) that associated the rurality with the poor nutritional status. I could not identify any synergy of the CCG with road density and distance to market (Column (4) and (6)).

Other Expenditures

I could not find the evidence that beneficiaries spend more money to improve the qualities of their diets, then for what purpose they use that additional income? To answer this appearing question, this thesis tries similar analyses with other outcome variables on expenditures. As for the total amount of non-food expenditures, I find no significant effects of the CCG receipt and the coefficients distributed around, or even less than zero (Table 11). What deserves more than a passing notice is that I could find a large negative impact of the cross term with the indicator of limited means of transportation to market at 1% significance level, while confirming no definite effect on each indicator solely (Column (7) in Table 11). To investigate this point more, I divide non-food expenditures into detailed usage and focus on the spendings on durable assets and luxury goods (Table 12, 13). The treatment households of the cash transfer policy are found to increase their purchase amount of durables, particularly a fixed assets like a metal roof (Haushofer and Shapiro 2016). However, the CCG still provides no significant impacts on these consumptions and most coefficients of cross terms with geographical features appeared insignificant.

Furthermore, I also set agricultural inputs as a dependent variable. In the regression model to estimate the CCG's impacts on food expenditures (Table 10), I can also see that households with agricultural jobs tend to spend about 40% less on food items at markets. This difference could be attributed to the fact that they could substitute the food purchases with their own crops. This mechanism further leads one possible explanation that the beneficiaries put their extra money for their agricultural products, that could enrich their food consumption and bring about more incomes. Nevertheless, the impacts of the CCG on the agricultural inputs shows even negative values significantly (Table 14). This result means that eligible households pay out 86.3% less costs for their agriculture. It is possible for them to use these extra incomes for investments in their other self-employment activities (Haushofer and Shapiro 2016), while I do not identify their amounts in this thesis. However, that kind of usage loses sight of the essential goals of this specific policy that launched to address the child malnutrition problem.

In addition, saving is another possible usage of the grant, but I cannot find any significant effect of the CCG on the amount of saving. I also try the case of total financial assets and found some negative tendency for recipients, while these results might not be robust this time because I do not use baseline wealth criteria but for a land ownership in calculating propensity scores.

Child Anthropometric Outcomes

Table 18, 19, 20 showed the anthropometric outcomes for children in eligible

households who are aged under 59 months old at time of survey. All scores are standardized with the sample medians and standard deviations of whole population of the survey that represents the non-metropolitan areas in Nepal (see Figure 2 again). These outcomes represent the manifestation part of the UNICEF conceptional framework. As for the hypothesis 2, I find the negative coefficient of the interaction term of the receipt status and indicator for inconvenient means of transportation, on the WAZ scores at 10% significance level. This result is consistent with the hypothesis, while there is the opposite significant effect for HAZ, the score of stunting and no significant effects for WHZ, the score to measure wasting. The similar inconsistent trends are observed in the cross terms of road density.

However, there are still no significant improvements in their three anthropometric outcomes for beneficiaries of the CCG. These results are, in fact, consistent with the evidence in the previous literature and the similar explanation could be applied (Levere et al. 2016). One possible reason is that the survey has conducted shortly after the beginning of the program for some recipients. Data which I use had collected in June-August in 2018. Therefore, only a half year had passed after some of beneficiaries got the eligibility, that may be not enough to for any behavioral change to affect the actual child outcomes.

7.3 Hypothesis 3 – The CCG have contributed for new beneficiaries after expansion

In order to examine the third hypothesis, this thesis extracts 438 households out of whole eligible households who do not satisfy the former conditionalities to receive the CCG: belonging to Dalit or living in Karnali zones and estimates the treatment effects on dietary-related outcomes. The IPWRA method is adopted to measure the ATT and the PSM method for robustness check. This time it is not necessary to consider the confounding covariates and the interaction terms of treatment status, therefore I could refer to PSM results. The results of logistic regression to create propensity score is showed in Table 21 and the standardized differences in Table 22. I use a similar set of variables I adopted in former section but altered agricultural job status into non-agricultural job status to keep the balance of groups. The standardized values of weighted variables in treatment and control groups proved to be balanced so that I could estimate the impacts.

Prior to estimation of the effects of the CCG, I find the unique impacts on the possibility to receive the grant for these group. The amount of land the household owns provide the significantly positive effects on the probability of attendance, even though the result is insignificant for the case with whole samples. The wealth criterion of landholdings slightly works for the households who were targeted after the expansion.

Table 23 shows the effects of the CCG on the HDD for newly targeted beneficiaries. I

cannot find any significant results regarding the treatment in all estimation. As for the food expenditures, I find that spendings are significantly lower for people who receive the CCG by around 15% (column (1) in Table 24), while I cannot identify its robustness in the estimation with PSM (column (3)). I find no evidence for additional population that confirm that the cash transfer programs that aimed to address their child nutritional problems really contribute to the improvement of the beneficiaries' behaviors related to spends on food. These behaviors and decisions around food consumption are found to be improve in the previous literature that also examined the effects of the cash transfer policy (Levere et al. 2016). I will discuss the difference of our results and former experiments in the following chapter.

8. Discussion and policy implication

First, I could find that rural infrastructure represented by road facilities certainly affects the possibility to receive the CCG, confirming that the hypothesis 1 holds. People who live in the regions with poor roads or live far away from local markets have low attendance rates. Rural road infrastructure decides the capacity of transportation of households who reside around them and the access to markets partly indicates the access to information considering their informal function to disseminate political information. Generalizing the discussion, this shows that social inclusion policies like cash transfers could not even reach to the targeted population and cause the difference between the intentional and actual participation unless policy makers complement the transfers simultaneously with other policies related to the rural transportation.

In addition, I used two types of variables that specify the access to local markets, with distances from their residence and means of access which indicate the convenience of traveling. Concretely I used a dummy that identifies the households who need to ride a car or a bus for daily travels to markets in the later case. Both indicators support the hypothesis 1 that convenient access secures the high attendance of the CCG, but I can find larger influence with the second variable. This could suggest the necessity for researchers to grasp the situation more practically from the perspective of beneficiaries' daily lives, even though the recent technological innovation around the geographical information allows us to control these factors more objectively and even without fieldwork.

Besides, the positive coefficient of rural municipality indicates the possibility that more people in the rural municipality reach to receive the grant than those in more urbanized areas. This seems a bit unique because geographical and social/infrastructural elements are also

controlled in the regression model, therefore other aspect of this definitional difference would matter. One possible explanation is that the governmental capacity to manage the policy would not meet the demands especially in the metropolitan areas. In the qualitative survey of Hagen-Zanker et al. (2015), they found the windows of the administrative office got crowded with people who wanted to register for the CCG. Due to this situation, some people could not complete the registration on one day and forced to revisit the office, that imposed additional transportation fees and time on these eligible households. Because the classification of the municipality basically depends on the population in the region, people in urban would have been suffering from these wasting costs regardless of actual difference in quantity of infrastructure.

In accord with these verifications, policy makers should compensate the costs at least in the registration process caused by the poor rural infrastructure and physical remoteness. Differentiated amount of payment depending on the infrastructural situations is one possible countermeasure, which is also adopted for the national maternal incentive grant in Nepal. High holding rate of mobile phones could give them a clue (98% in comparison group and 84% in treatment group, see Table 1) because they are able to save cumbersome transportation costs if they substitute the remote application for registration.

As related to the defined conditionalities of the CCG, I confirm that the conditions on both landholdings and birth certificates do not work adequately in practice. The case study by Hagen-Zanker et al. (2015) already pointed out that wealth criterion of plot areas was not applied in the registering process, while 93% of their respondents owned birth certificates, that contradicts my results completely. This poor performance could attribute to the weak capacity of local governmental office and the lack of transparency in actual registering process. However, these conditions could admit of doubt in the first place, because it must be tough for administrative units to manage this information of the potentially eligible households. For example, households must go to the VDC office at least twice before completing registration, once for birth certificate and second for the CCG registration, while the eligibility is assigned simultaneously. It could impose additional and unnecessary costs for both implementers and beneficiaries. There are rooms for refinement of policy designs considering the actual applications of its conditionalities.

Digressing from the hypothesis, furthermore, one of the largest differences in the possibility to receive the CCG is observed in the ethnicity groups the households belong to. Before the expansion strategy has implemented, the Dalit households were only in the coverage of the policy outside Karnali zones. This typical recognition could remain even after this criterion has excluded, seeing my results that indicates the strong tendency that Dalit households come forward to receive the grant. Madheshi households, who have also been suffering from lower social positions, have significantly lower possibility of receiving while they should be in the

coverage of the policy. They might not even notice that they are targeted. These consequences would represent the lack of efforts by the government to spread the information about the CCG policy and its expansion, and the overdependence on informal dissemination, like interactions in neighborhood and local markets.

For examining the second hypothesis, I adopted the IPWRA estimation and focused on the interaction terms of the treatment status and the variables that explain the geographical or infrastructural characteristics. As I expected, I find the evidence that poor rural infrastructure decreases the impacts of the CCG treatment on the dietary outcomes, when I control the inconvenience of transportation means they must take. This result depicts how the cash treatment and rural infrastructure, which are both categorized as enabling determinants, interact and affect the community-level underling determinants, that further bring about the specific results as immediate individual-level outcomes. Policy makers need to consider these synergetic influences and reflect in the policy design or complemental policies. As with the registration process, differentiating the amount of payment would be a possible solution that facilitate them to cover different transportation costs and promote the effective usages. What I need to mention is, however, that the robustness has not been checked because no other cross terms reflect the influence that limit the impacts on the dietary outcomes similarly.

Additionally, what I must mention about this estimation is that I cannot identify any treatment effects of the CCG on the dietary outcomes before focusing on the synergetic influence. I used household dietary diversity (HDD) and food expenditures as main outcomes to see, and these behavioral practices are something that beneficiaries could improve easily, considering the amount they receive. Levere et al. (2016) confirmed the cash transfer program with information sessions related to child-nutrition had provided the improvement in the behavioral practices of mothers even in the short-term of the survey. The estimates of my thesis, however, does not follow their results.

In terms of the third hypothesis, I also find that the CCG have not contributed for beneficiaries who were added to the coverage after the policy had expanded. There are no significant effects on the HDD, and even significantly negative effects on the food expenditures for the households who received money. This result contradicts my hypothesis 3. As mentioned, we have no paper that evaluates the treatment effects of the CCG after the expansion strategy has promulgated, so this evidence might have provided valuable feedback and contributed to draw up a guideline for continuing expansion. As of the survey moment, this thesis should conclude that the expanded CCG have not functioned to improve dietary outcomes, which are essential for addressing child malnutrition.

One possible explanation for this is that the training sessions which is accompanied with the CCG would not provide enough information about practices the beneficiaries could do

with the additional incomes. There are both governmental and non-governmental actors who provide the sessions related to the CCG, but we can find no standard contents they should provide, and little reports were published about these programs. It must be an urgent task to establish a such clear set of standards of contents for the training sessions in the rural village that can follow the expansion strategy.

Another possible explanation is that beneficiaries could not realize the ideal practices because of the limited capacity of the rural markets, which stocks small amount and few kinds of food items, even if they are willing to behave as the CCG aimed at. Not just for the dietary outcomes, I also find no significant increases in savings and other expenditures including durables, luxury goods, and agricultural input. This could mean that the CCG cash transfer have not stimulate any types of consumption activities and this could also attribute to the quality of the local markets. The market capacity is classified into the underlying, community-level determinants and also related to the infrastructure that supports the product distributions, while these community-level aspects lie beyond I could see with my dataset. Though the ultimate goal of cash transfers like the CCG is to realize the well-nourished status for children, we need to be conscious of the route and signposts through which the financial assistance provides influence step wisely. In any case, the CCG policy should be complemented with the additional public undertakings related to the market capacity in order to realize its original objective.

9. Conclusion

In this thesis, I analyzed the synergetic impacts of the CCG policy in Nepal with rural infrastructure and physical distances that decide the transportation costs from which program beneficiaries have suffered. Utilizing household-level dataset, which was collected for another purpose, this thesis showed that status of infrastructure can doubly harm the target population of cash transfer program, first by restricting the receipt of the cash transfer and second by restricting the impacts of the cash transfer. I find high rates of participating the policy for eligible households who reside near the sufficient road facilities and have good access to local markets in terms of physical distance and convenience in means of transportation. Further, I find that ATT of the policy on the dietary outcomes shrinks if the household live in the area with inconvenient access to local market. Supplementarily, I tried to measure the effects of this CCG program for the beneficiaries who were currently targeted by the expansion strategy, which were not examined in the previous studies. Though the coverage has expanded steadily, newly targeted households are found to experience no significant improvement in the behavioral

outcomes which are expected to change even in a short-term. I find more significant results when controlling the geographical and infrastructural features not with the objective measures like distances but with the indicator like means of transportation that reflects the actual viewpoint of beneficiary.

These estimation results stress the importance of the infrastructural factors in the impact evaluation schemes, while they have been considered less serious and sometimes deleted in the estimation strategy to gain unbiased estimators. There are many literatures that light on the program designs themselves like conditionalities, amount of payment and spans of distribution (e.g., Haushofer and Shapiro 2016). However, this thesis suggested the potential limiting influence of outer factors surrounding the cash transfer policies. Policy makers need to complement and reinforce the programs, and in term of the CCG case, the enhancement of rural infrastructure to realize costless and convenient transportation could be a trigger for an effective implementation.

While this thesis provides the unique evidence on the relationship between the cash transfer policy and rural infrastructure around the beneficiaries, there are considerable limitations and fields for further studies. First, I adopted IPWRA estimators to partially control the selection bias, which demands the strong assumption of unconfoundedness. The treatment status supposed to be decided depending only on the selected pre-treatment variables. Nevertheless, I could not control any wealth-related factors but for the lands they own, like incomes due to the lack of data. Considering the fact that most households are engaged in agriculture, the difference might not a big deal, but I should have focus on that element in order to grasp the treatment effects on the consumption, which indicates the flow of money.

Second, while I mainly put focus on the behavioral indices related to the dietary practices, I could not identify any improvement in the anthropometric outcomes. Levere et al. (2016) reached the similar results with their pilot experiment of conditional cash transfer. Here we need to clarify the mechanism that proper dietary practices really contribute to the child growth outcomes. Even after improved their diets, mothers or household heads needs to sustain them and keep household food security and realize other care practices like playing, exercises and sleeping. Policy makers should also be conscious of such aspects and supplement the CCG with the educational sessions.

Finally, while this thesis tried to grasp the impacts of the CCG for added beneficiaries in the expansion strategy, I used data which were collected shortly after the actual receipts for some households. Some households answered the questionnaire only two months after they received the grants. This could result in the no notable difference in anthropometric scores. The CCG policy is actually a long-term assistance because the households could continue to receive the money until their child becomes age of five, therefore, it is also necessary for researchers to

observe the situation in the long run, with periodic feedbacks like I tried to show in this thesis. The government of Nepal has been conducting the national population census after ten years of absence, in November 2021[1]. This could enable us to conduct further analyses for evaluating the expansion strategy itself with the sufficient length of time to realize its impacts.

[1] 「CBS National Census 2021」(https://censusnepal.cbs.gov.np/Home/Index/EN) (accessed Jan. 16, 2022)

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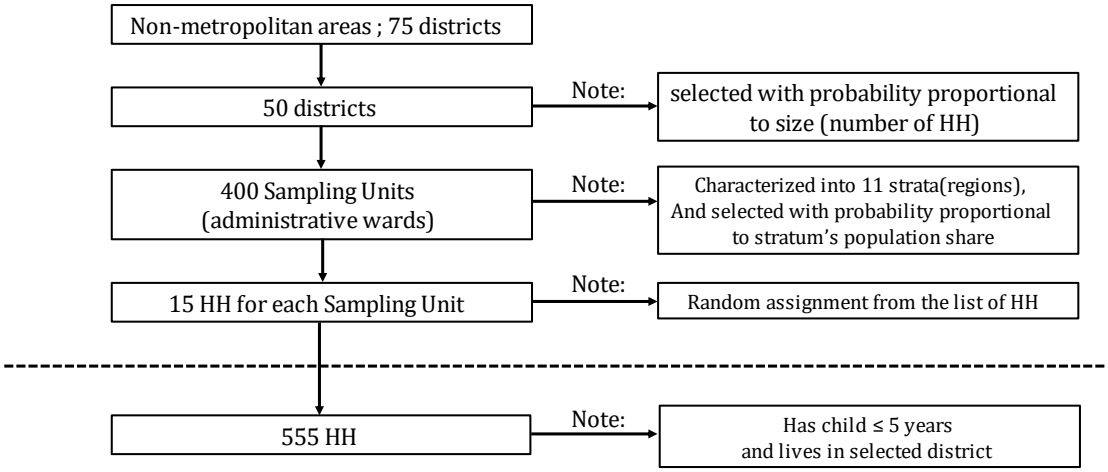
Figure A1. Sample selection protocol



Source: Made by the author based on the data collected by Walker et al. (2019)

Table 1. Descriptive statistics before weighting (independent variables)

	Control (440)		Received (115)		Difference (t-value)
	Mean	SD	Mean	SD	
Household Characteristics					
Household Size	6.364	2.157	6.374	2.045	-0.010(-0.047)
No. of Children	1.232	0.464	1.278	0.469	-0.046(-0.947)
Household Head's Educational Status	1.266	1.645	1.643	1.907	-0.378(-1.943)
Femele Household Head	0.245	0.431	0.209	0.408	0.037(0.850)
Dalit	0.105	0.306	0.417	0.495	-0.313***(-6.459)
Madheshi	0.302	0.460	0.009	0.093	0.294***(12.450)
Job Type: Agricultural	0.916	0.278	0.991	0.093	-0.075***(-4.758)
Job Type: Non-Agricultural	0.602	0.490	0.539	0.501	0.063(1.210)
Job Type: Self Agricultural	0.891	0.312	0.991	0.093	-0.100***(-5.825)
Job Type: Wage Agricultural	0.093	0.291	0.043	0.205	0.050*(2.105)
Job Type: Self Non-Agricultural	0.170	0.376	0.122	0.328	0.049(1.372)
Job Type: Wage Non-Agricultural	0.484	0.500	0.461	0.501	0.023(0.443)
Other Public Assitance	4489.545	9739.038	6313.043	9945.011	-1823.498(-1.758)
Birth Certificate	0.343	0.475	0.513	0.502	-0.170**(-3.266)
Landholdings	4448.558	5139.606	4116.816	5502.244	331.742(0.583)
Household Assets					
Piped Watersupply	0.473	0.500	0.870	0.338	-0.397***(-10.039)
Flush	0.357	0.480	0.235	0.426	0.122**(2.664)
Mobile Phone	0.980	0.142	0.843	0.365	0.136***(3.922)
Email/Internet	0.141	0.348	0.078	0.270	0.063*(2.078)
Cable TV	0.282	0.450	0.061	0.240	0.221***(7.122)
Geographical Characteristics					
Rural Municipality	0.427	0.495	0.626	0.486	-0.199***(-3.891)
Distance: Market	7.620	12.667	5.983	5.972	1.637*(1.993)
Market by Car/Bus	0.095	0.294	0.052	0.223	0.043(1.724)
Road density	0.017	0.018	0.027	0.017	-0.011***(-6.154)
River density	1.077	1.109	1.638	1.533	-0.561***(-3.680)
Forest density	0.355	0.481	0.552	0.621	-0.197**(-3.158)

*** p<0.01, ** p<0.05, * p<0.1

Table 2. Descriptive statistics before weighting (Expenditures)

	Control (440)		Received (115)		Difference (t-value)
	Mean	SD	Mean	SD	
Outcome Variables					
Household Dietary Diversity (HDD)	7.982	1.380	7.696	1.409	0.286(1.947)
Expenditure: Food	1420.618	706.013	1294.441	644.825	126.177(1.831)
Expenditure: Non-Food (total)	70998.850	236066.368	46518.574	35860.318	24480.276*(2.085)
Expenditure: Daily Necessities	17004.234	10149.186	15394.652	6794.881	1609.582*(2.019)
Expenditure: Energy	5275.370	3906.015	5646.261	3103.892	-370.890(-1.078)
Expenditure: Transportation	5875.920	6886.238	3453.391	2859.075	2422.529***(5.728)
Expenditure: Luxury Goods	1415.802	9157.495	1474.391	8612.249	-58.589(-0.064)
Expenditure: Durables	17720.209	179946.326	5521.348	17288.848	12198.861(1.398)
Expenditire: Money Due	23707.314	62615.095	15028.530	24363.719	8678.783*(2.314)
Financial Asset	40571.634	141974.715	17618.330	31044.491	22953.304**(3.118)
Saving	24329.602	70857.904	9129.565	23540.958	15200.037***(3.773)
Agricultural Inputs	11216.352	20649.964	1825.696	2490.230	9390.657***(9.284)

*** p<0.01, ** p<0.05, * p<0.1

Table 3. Descriptive statistics before weighting (Child anthropometric scores)

	Control (487)		Received (132)		Difference (t-value)
	Mean	SD	Mean	SD	
WAZ	0.238	0.979	-0.031	1.037	0.269**(2.671)
HAZ	0.120	1.095	-0.087	0.890	0.207*(2.250)
WHZ	0.199	0.953	0.080	1.022	0.119(1.203)

*** p<0.01, ** p<0.05, * p<0.1

Table 4. Logistic regression for the possibility to receive the CCG (odds rate)

	= 1 if received CCG	
Household Size	-0.0491	-0.0797
	(0.0742)	(0.0732)
No. of Children	0.395	0.39
	(0.295)	(0.299)
Household Head's Educational Status	0.182**	0.173**
	(0.0797)	(0.0761)
Female Household Head	-0.37	-0.438
	(0.377)	(0.366)
Dalit	2.119***	2.068***
	(0.404)	(0.382)
Madheshi	-2.101*	-2.116*
	(1.11)	(1.169)
Job Type: Agricultural	1.909	1.869
	(1.385)	(1.482)
Job Type: Non-Agricultural	0.146	0.11
	(0.293)	(0.289)
(Log)Other Public Assitance	0.038	0.0473*
	(0.0289)	(0.0281)
Birth Certificate	0.193	0.258
	(0.282)	(0.277)
(Log)Landholdings	0.0845	0.0696
	(0.083)	(0.0756)
Rural Municipality	0.461	0.15
	(0.299)	(0.29)
Road density	38.51***	44.56***
	(7.807)	(7.933)
Distance: Market	-0.0451***	
	(0.0141)	
Market by Car/Bus		-1.140*
		(0.589)
Controls for Households' Asset	Yes	Yes
Constant	-4.553***	-4.483***
	(1.64)	(1.7)
Waid chi^2	120.99	111.7
Pseudo R^2	0.3813	0.3728
Observations	555	555

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 5. Hosmer-Lemeshow test to assess goodness-of-fit

	chi2	df	Prob>chi2
(1)	5.51	8	0.7016
(2)	11.17	8	0.1920

Table 6. the variance inflation factors (VIF) of independent variables in logistic regression

Variable	VIF	
	(1)	(2)
Household Size	1.46	1.46
No. of Children	1.19	1.19
Household Head's Educational Status	1.20	1.20
Female Household Head	1.21	1.21
Dalit	1.23	1.24
Madheshi	1.79	1.77
Job Type: Agricultural	1.31	1.33
Job Type: Non-Agricultural	1.27	1.27
(Log)Other Public Assitance	1.07	1.07
Birth Certificate	1.10	1.10
(Log)Landholdings	1.35	1.35
Piped Watersupply	1.87	1.87
Flush	1.20	1.22
Mobile Phone	1.08	1.08
Email/Internet	1.17	1.17
Cable TV	1.31	1.30
Rural Municipality	1.28	1.18
Road density	1.17	1.17
Distance: Market	1.17	
Market by Car/Bus		1.08
Mean VIF	1.29	1.27

Table 7. Logistic Estimation for calculating PS (Odds ratios)

	=1 if received CCG
Household Size	-0.102(0.0723)
No. of Children	0.387(0.290)
Household Head's Educational Status	0.160**(0.0780)
Female Household Head	-0.429(0.353)
Dalit	1.912***(0.335)
Madheshi	-3.438***(1.055)
Job Type: Agricultural	2.664(1.627)
(log) Other Public Assistance	0.0304(0.0275)
Birth Certificate	0.321(0.257)
(log) Landholdings	0.144**(0.0680)
Rural Manicipality	0.834***(0.269)
Distance: Market	-0.0410***(0.0118)
Road density	36.14***(7.347)
Constant	-6.315***(1.849)
Observations	555

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<

Table 8. Standardized differences for household data

	Standardized differences	
	Raw	Weighted
Household Size	0.0048896	-0.0599977
No. of Children	0.0995758	0.0955267
Household Head's Educational Status	0.2120501	-0.0726437
Female Household Head	-0.0875933	-0.0169082
Dalit	0.7597265	-0.090657
Madheshi	-0.8850073	0.0017993
Job Type: Agricultural	0.3638194	0.0405576
(log) Other Public Assistance	0.305118	0.0263071
Birth Certificate	0.347474	0.1409145
(log) Landholdings	0.2803149	-0.0351583
Rural Manicipality	0.4052273	0.0984382
Distance: Market	-0.1653136	0.0216801
Road density	0.6264273	-0.0905883

Table 9. Effects of the CCG on the Household Dietary Diversity (IPWRA)

	HDD								
	IPWRA						OLS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CCG	-0.120	-0.0725	-0.0859	0.0320	-0.262	-0.290	-0.00918	-0.286*	0.0881
	(0.236)	(0.199)	(0.203)	(0.315)	(0.346)	(0.282)	(0.217)	(0.147)	(0.166)
Household Size		0.0802	0.0800	0.0776	0.0861	0.0799	0.0760		0.0889***
		(0.0535)	(0.0530)	(0.0558)	(0.0524)	(0.0521)	(0.0536)		(0.0289)
No. of Children		-0.381*	-0.388*	-0.381*	-0.389*	-0.384*	-0.390**		-0.335**
		(0.200)	(0.201)	(0.200)	(0.203)	(0.201)	(0.198)		(0.130)
Household Head's Educational Status		0.184***	0.186***	0.184***	0.187***	0.184***	0.187***		0.124***
		(0.0661)	(0.0671)	(0.0657)	(0.0667)	(0.0645)	(0.0674)		(0.0378)
Female Household Head		-0.187	-0.201	-0.186	-0.168	-0.188	-0.192		0.00203
		(0.283)	(0.286)	(0.282)	(0.286)	(0.284)	(0.286)		(0.144)
Dalit		-0.356	-0.374	-0.365	-0.360	-0.350	-0.390		-0.719***
		(0.249)	(0.238)	(0.240)	(0.245)	(0.245)	(0.242)		(0.163)
Madheshi		-0.522	-0.433	-0.499	-0.465	-0.564	-0.0672		-0.124
		(0.343)	(0.289)	(0.334)	(0.325)	(0.346)	(0.268)		(0.142)
Job Type: Agricultural		-0.567	-0.566	-0.518	-0.645	-0.592	-0.527		-0.401*
		(0.907)	(0.912)	(0.945)	(0.878)	(0.932)	(0.893)		(0.226)
Rural municipality		-0.315	-0.328	-0.299	-0.465	-0.351*	-0.332		-0.211*
		(0.207)	(0.208)	(0.208)	(0.314)	(0.211)	(0.209)		(0.124)
Distance: Market		0.00152		0.00131	0.000464	-0.0114			-0.00971**
		(0.0102)		(0.0102)	(0.0101)	(0.0108)			(0.00472)
Road density		-3.990	-3.381	-2.562	-5.169	-4.218	-3.355		-14.75***
		(6.202)	(6.603)	(7.984)	(5.848)	(6.008)	(6.699)		(3.202)
Market by Car/Bus			-0.252				0.0835		
			(0.348)				(0.388)		
CCG*Road density				-3.772					
				(11.38)					
CCG*Rural municipality					0.314				
					(0.428)				
CCG*Distance: Market						0.0369			
						(0.0241)			
CCG*Market by Car/Bus							-1.102**		
							(0.533)		
Constant	7.816***	8.495***	8.537***	8.417***	8.660***	8.624***	8.490***	7.982***	8.559***
	(0.197)	(0.952)	(0.957)	(0.997)	(0.932)	(0.970)	(0.936)	(0.0658)	(0.282)
F-stat (p-value) for CCG+X+CCG*X				0.30(0.8221)	0.86(0.4631)	0.84(0.4714)	2.04(0.1078)		
Observations	555	555	555	555	555	555	555	555	555
R-squared	0.002	0.125	0.127	0.125	0.127	0.132	0.136	0.007	0.129

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 10. Effects of the CCG on the food expenditures (IPWRA)

	(log) Food Expenditure								
	IPWRA						OLS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CCG	-0.0431	-0.0275	-0.0318	-0.0744	-0.174*	-0.00836	-0.00468	-0.0917*	-0.0689
	(0.0628)	(0.0589)	(0.0596)	(0.106)	(0.0980)	(0.0819)	(0.0633)	(0.0526)	(0.0524)
Household Size		0.0948***	0.0953***	0.0960***	0.0994***	0.0949***	0.0939***		0.108***
		(0.0180)	(0.0184)	(0.0178)	(0.0167)	(0.0179)	(0.0180)		(0.0108)
No, of Children		0.0371	0.0379	0.0371	0.0310	0.0373	0.0374		-0.0204
		(0.0840)	(0.0849)	(0.0839)	(0.0850)	(0.0837)	(0.0829)		(0.0467)
Household Head's Educational Status		0.00485	0.00616	0.00485	0.00762	0.00486	0.00654		0.0110
		(0.0144)	(0.0144)	(0.0145)	(0.0141)	(0.0145)	(0.0145)		(0.0127)
Female Household Head		-0.0350	-0.0457	-0.0356	-0.0199	-0.0350	-0.0426		0.0152
		(0.0745)	(0.0747)	(0.0743)	(0.0741)	(0.0745)	(0.0750)		(0.0461)
Dalit		0.0108	-0.00110	0.0149	0.00780	0.0102	-0.00659		0.0197
		(0.0647)	(0.0648)	(0.0642)	(0.0626)	(0.0651)	(0.0651)		(0.0536)
Madheshi		0.221*	0.245*	0.211*	0.265*	0.225*	0.375*		-0.0380
		(0.122)	(0.143)	(0.120)	(0.142)	(0.122)	(0.195)		(0.0542)
Job Type: Agricultural		-0.402***	-0.399***	-0.424***	-0.462***	-0.400***	-0.385***		-0.408***
		(0.102)	(0.106)	(0.105)	(0.0915)	(0.100)	(0.0984)		(0.0664)
Rural municipality		-0.116*	-0.105*	-0.124*	-0.233***	-0.113*	-0.106*		-0.0531
		(0.0646)	(0.0632)	(0.0684)	(0.0847)	(0.0651)	(0.0630)		(0.0449)
Distance: Market		0.00463		0.00472	0.00381	0.00577			0.00163
		(0.00329)		(0.00328)	(0.00318)	(0.00361)			(0.00122)
Road density		-1.883	-1.893	-2.523	-2.798**	-1.863	-1.883		0.00751
		(1.399)	(1.519)	(1.533)	(1.413)	(1.405)	(1.511)		(1.084)
Market by Car/Bus			-0.0658				0.0527		
			(0.0964)				(0.0984)		
CCG*Road density				1.691					
				(3.586)					
CCG*Rural municipality					0.244*				
					(0.127)				
CCG*Distance: Market						-0.00326			
						(0.00739)			
CCG*Market by Car/Bus							-0.390**		
							(0.187)		
Constant	7.090***	6.910***	6.937***	6.946***	7.039***	6.899***	6.920***	7.138***	6.854***
	(0.0420)	(0.165)	(0.170)	(0.178)	(0.157)	(0.161)	(0.162)	(0.0243)	(0.0931)
F-stat (p-value) for CCG+X+CCG*X				1.22(0.3001)	2.60(0.0517)	1.12(0.3407)	1.86(0.1348)		
Observations	555	555	555	555	555	555	555	555	555
R-squared	0.002	0.224	0.221	0.225	0.238	0.225	0.231	0.005	0.215

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 11. Effects of the CCG on the non-food expenditures (IPWRA)

	(log) Non-Food Expenditure								
	IPWRA						OLS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CCG	-0.129	-0.118	-0.130*	0.0128	-0.162	-0.120	-0.0877	-0.204***	-0.0897
	(0.0883)	(0.0741)	(0.0749)	(0.130)	(0.1000)	(0.0946)	(0.0782)	(0.0689)	(0.0673)
Household Size		0.148***	0.148***	0.145***	0.149***	0.148***	0.146***		0.150***
		(0.0187)	(0.0193)	(0.0187)	(0.0189)	(0.0188)	(0.0187)		(0.0138)
No, of Children		0.0306	0.0250	0.0305	0.0287	0.0305	0.0243		-0.00918
		(0.0895)	(0.0896)	(0.0898)	(0.0898)	(0.0896)	(0.0875)		(0.0828)
Household Head's Educational Status		0.0317*	0.0342**	0.0317*	0.0325**	0.0317*	0.0348**		0.0334**
		(0.0164)	(0.0162)	(0.0163)	(0.0165)	(0.0164)	(0.0165)		(0.0150)
Female Household Head		0.00751	-0.00588	0.00909	0.0121	0.00751	-0.00114		0.0324
		(0.0939)	(0.0939)	(0.0938)	(0.0975)	(0.0939)	(0.0944)		(0.0606)
Dalit		-0.318***	-0.335***	-0.329***	-0.319***	-0.318***	-0.344***		-0.229***
		(0.0747)	(0.0750)	(0.0778)	(0.0748)	(0.0745)	(0.0736)		(0.0706)
Madheshi		-0.100	-0.0225	-0.0717	-0.0869	-0.101	0.177		0.00603
		(0.0886)	(0.0918)	(0.0824)	(0.0894)	(0.0902)	(0.137)		(0.0663)
Job Type: Agricultural		-0.267***	-0.265***	-0.205*	-0.285**	-0.267***	-0.244**		-0.0756
		(0.0993)	(0.0906)	(0.105)	(0.113)	(0.0999)	(0.102)		(0.0799)
Rural municipality		-0.153**	-0.160**	-0.132	-0.188*	-0.153**	-0.163**		-0.146***
		(0.0767)	(0.0706)	(0.0806)	(0.110)	(0.0777)	(0.0702)		(0.0543)
Distance: Market		0.00240		0.00215	0.00216	0.00228			-0.00336
		(0.00504)		(0.00511)	(0.00501)	(0.00586)			(0.00252)
Road density		-3.298*	-2.807	-1.514	-3.575*	-3.300*	-2.793		-2.185
		(1.805)	(1.864)	(2.432)	(1.947)	(1.802)	(1.860)		(1.338)
Market by Car/Bus			-0.221				-0.0372		
			(0.134)				(0.150)		
CCG*Road density				-4.710					
				(4.083)					
CCG*Rural municipality					0.0737				
					(0.158)				
CCG*Distance: Market						0.000342			
						(0.00937)			
CCG*Market by Car/Bus							-0.602***		
							(0.218)		
Constant	10.66***	10.18***	10.22***	10.09***	10.22***	10.19***	10.20***	10.73***	9.957***
	(0.0642)	(0.161)	(0.159)	(0.171)	(0.168)	(0.165)	(0.164)	(0.0327)	(0.116)
Observations	555	555	555	555	555	555	555	555	555
R-squared	0.009	0.293	0.300	0.297	0.294	0.293	0.312	0.015	0.244

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 12. Effects of the CCG on expenditures for durables (IPWRA)

	(log) Expenditure on Durables								
	IPWRA						OLS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CCG	-0.596	-0.544	-0.726	1.045	-0.390	-0.830	-0.603	0.299	-0.111
	(0.580)	(0.568)	(0.542)	(1.065)	(0.945)	(0.743)	(0.574)	(0.469)	(0.538)
Household Size		0.340***	0.330***	0.300**	0.335***	0.339***	0.324**		0.454***
		(0.126)	(0.125)	(0.126)	(0.129)	(0.126)	(0.126)		(0.102)
No, of Children		0.332	0.201	0.331	0.338	0.329	0.198		0.0190
		(0.750)	(0.759)	(0.744)	(0.744)	(0.753)	(0.755)		(0.452)
Household Head's Educational Status		0.387**	0.418***	0.387**	0.384**	0.387**	0.420***		0.354***
		(0.152)	(0.132)	(0.151)	(0.154)	(0.152)	(0.134)		(0.112)
Female Household Head		0.576	0.473	0.595	0.560	0.576	0.487		0.967**
		(0.724)	(0.712)	(0.725)	(0.736)	(0.722)	(0.715)		(0.474)
Dalit		0.0958	-0.0717	-0.0424	0.0990	0.104	-0.0967		-0.534
		(0.597)	(0.553)	(0.602)	(0.595)	(0.597)	(0.561)		(0.547)
Madheshi		0.978	2.223	1.325	0.931	0.922	2.812		-1.588***
		(1.724)	(2.454)	(1.955)	(1.708)	(1.728)	(2.540)		(0.498)
Job Type: Agricultural		1.160	1.144	1.913	1.223	1.128	1.207		0.102
		(2.487)	(2.356)	(2.368)	(2.472)	(2.443)	(2.397)		(0.784)
Rural municipality		0.925	0.563	1.176**	1.047	0.878	0.557		0.236
		(0.614)	(0.562)	(0.595)	(0.826)	(0.620)	(0.563)		(0.415)
Distance: Market		-0.0280		-0.0311	-0.0272	-0.0451			0.00397
		(0.0338)		(0.0337)	(0.0337)	(0.0341)			(0.0168)
Road density		0.708	11.34	22.44	1.668	0.408	11.38		-3.800
		(15.30)	(15.14)	(19.67)	(15.26)	(15.25)	(15.14)		(10.53)
Market by Car/Bus			-3.575***				-3.035**		
			(0.955)				(1.323)		
CCG*Road density				-57.38*					
				(32.05)					
CCG*Rural municipality					-0.256				
					(1.207)				
CCG*Distance: Market						0.0487			
						(0.0724)			
CCG*Market by Car/Bus							-1.774		
							(1.571)		
Constant	5.285***	0.259	0.665	-0.935	0.124	0.429	0.591	4.390***	1.165
	(0.407)	(2.738)	(2.636)	(2.642)	(2.686)	(2.708)	(2.673)	(0.222)	(0.990)
Observations	555	555	555	555	555	555	555	555	555
R-squared	0.005	0.053	0.097	0.067	0.054	0.055	0.099	0.001	0.075

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 13. Effects of the CCG on expenditures for luxury goods (IPWRA)

	(log) Expenditure on Luxury Goods								
	IPWRA						OLS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CCG	0.109	0.0748	0.0488	0.00340	-0.513	0.131	0.130	-0.825***	-0.185
	(0.347)	(0.336)	(0.332)	(0.639)	(0.545)	(0.423)	(0.350)	(0.318)	(0.344)
Household Size		0.0800	0.0789	0.0817	0.0984	0.0801	0.0747		0.135*
		(0.0790)	(0.0799)	(0.0756)	(0.0800)	(0.0789)	(0.0792)		(0.0757)
No, of Children		0.229	0.211	0.229	0.205	0.229	0.210		0.0794
		(0.485)	(0.478)	(0.485)	(0.474)	(0.486)	(0.481)		(0.324)
Household Head's Educational Status		-0.113	-0.108	-0.113	-0.102	-0.113	-0.107		0.0208
		(0.0746)	(0.0762)	(0.0747)	(0.0766)	(0.0746)	(0.0757)		(0.0769)
Female Household Head		-0.460	-0.477	-0.461	-0.399	-0.460	-0.468		0.293
		(0.353)	(0.343)	(0.354)	(0.354)	(0.354)	(0.343)		(0.346)
Dalit		-0.480	-0.506	-0.473	-0.492	-0.481	-0.522		-0.787**
		(0.330)	(0.332)	(0.334)	(0.327)	(0.331)	(0.335)		(0.319)
Madheshi		-0.0754	0.100	-0.0910	0.102	-0.0644	0.488		0.398
		(0.506)	(0.537)	(0.512)	(0.483)	(0.508)	(0.333)		(0.403)
Job Type: Agricultural		0.399	0.398	0.365	0.158	0.405	0.439		-0.322
		(0.311)	(0.315)	(0.439)	(0.376)	(0.316)	(0.332)		(0.591)
Rural municipality		-0.333	-0.379	-0.345	-0.799*	-0.324	-0.383		-0.512
		(0.396)	(0.350)	(0.370)	(0.414)	(0.407)	(0.350)		(0.312)
Distance: Market		-0.00239		-0.00225	-0.00567	0.000977			-0.0243***
		(0.0206)		(0.0202)	(0.0210)	(0.0180)			(0.00873)
Road density		-4.738	-3.305	-5.714	-8.401	-4.679	-3.278		-17.62**
		(11.14)	(10.63)	(14.43)	(11.15)	(11.20)	(10.50)		(7.852)
Market by Car/Bus			-0.503				-0.147		
			(0.572)				(0.816)		
CCG*Road density				2.577					
				(21.76)					
CCG*Rural municipality					0.975				
					(0.691)				
CCG*Distance: Market						-0.00962			
						(0.0422)			
CCG*Market by Car/Bus							-1.168		
							(0.972)		
Constant	0.294	-0.0335	0.0293	0.0201	0.480	-0.0672	-0.0200	1.228***	1.122
	(0.216)	(0.735)	(0.739)	(0.808)	(0.749)	(0.754)	(0.745)	(0.166)	(0.744)
Observations	555	555	555	555	555	555	555	555	555
R-squared	0.000	0.031	0.034	0.032	0.038	0.032	0.036	0.010	0.051

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 14. Effects of the CCG on agricultural inputs (IPWRA)

	(log) Agricultural Input								
	IPWRA						OLS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CCG	-0.863**	-0.854**	-0.811**	-1.024	-0.847	-1.141**	-0.698*	-0.0412	-0.165
	(0.363)	(0.344)	(0.347)	(0.649)	(0.619)	(0.451)	(0.372)	(0.326)	(0.349)
Household Size		-0.0145	-0.0116	-0.0102	-0.0147	-0.0148	-0.0176		0.0999
		(0.0770)	(0.0769)	(0.0771)	(0.0801)	(0.0775)	(0.0777)		(0.0734)
No, of Children		-0.223	-0.188	-0.223	-0.222	-0.226	-0.191		-0.0621
		(0.454)	(0.455)	(0.454)	(0.446)	(0.452)	(0.460)		(0.351)
Household Head's Educational Status		0.0508	0.0442	0.0508	0.0507	0.0507	0.0458		0.214***
		(0.0803)	(0.0783)	(0.0801)	(0.0800)	(0.0805)	(0.0782)		(0.0762)
Female Household Head		-0.0141	0.00124	-0.0162	-0.0148	-0.0142	0.0141		-0.152
		(0.517)	(0.519)	(0.517)	(0.535)	(0.524)	(0.517)		(0.377)
Dalit		-0.782**	-0.752**	-0.768**	-0.782**	-0.774**	-0.775**		-0.974**
		(0.378)	(0.372)	(0.379)	(0.375)	(0.383)	(0.371)		(0.439)
Madheshi		0.190	-0.103	0.153	0.188	0.134	0.440		0.674
		(0.544)	(0.602)	(0.559)	(0.546)	(0.555)	(0.598)		(0.416)
Job Type: Agricultural		7.550***	7.557***	7.469***	7.553***	7.518***	7.615***		7.570***
		(0.643)	(0.632)	(0.663)	(0.637)	(0.677)	(0.619)		(0.329)
Rural municipality		-0.467	-0.363	-0.494	-0.462	-0.514	-0.369		-0.525*
		(0.374)	(0.380)	(0.386)	(0.561)	(0.386)	(0.380)		(0.316)
Distance: Market		0.0118		0.0122	0.0119	-0.00530			-0.0448***
		(0.0200)		(0.0203)	(0.0204)	(0.0266)			(0.0167)
Road density		22.95***	20.22**	20.61**	22.99***	22.64***	20.26**		0.210
		(7.633)	(7.973)	(9.115)	(7.605)	(7.750)	(8.024)		(8.536)
Market by Car/Bus			0.846*				1.344**		
			(0.464)				(0.540)		
CCG*Road density				6.158					
				(16.46)					
CCG*Rural municipality					-0.0112				
					(0.780)				
CCG*Distance: Market						0.0489			
						(0.0389)			
CCG*Market by Car/Bus							-1.636**		
							(0.721)		
Constant	7.063***	-0.219	-0.296	-0.0909	-0.225	-0.0482	-0.365	6.241***	-1.025*
	(0.260)	(0.974)	(0.973)	(1.046)	(0.871)	(0.978)	(0.966)	(0.205)	(0.600)
Observations	555	555	555	555	555	555	555	555	555
R-squared	0.021	0.142	0.147	0.143	0.142	0.145	0.152	0.000	0.265

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 15. Effects of the CCG on amount of savings (IPWRA)

	(log) Savings								
	IPWRA						OLS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CCG	-1.123	-0.976	-1.009	-0.521	-0.147	0.0760	-0.897	-0.253	-0.0714
	(0.701)	(0.617)	(0.633)	(1.000)	(0.928)	(0.826)	(0.659)	(0.505)	(0.558)
Household Size		0.214	0.201	0.203	0.188	0.216	0.195		0.359***
		(0.152)	(0.157)	(0.150)	(0.149)	(0.154)	(0.159)		(0.118)
No, of Children		-0.432	-0.520	-0.432	-0.398	-0.421	-0.522		-0.508
		(0.731)	(0.748)	(0.732)	(0.711)	(0.725)	(0.744)		(0.488)
Household Head's Educational Status		0.650***	0.646***	0.650***	0.635***	0.651***	0.648***		0.564***
		(0.193)	(0.193)	(0.194)	(0.195)	(0.194)	(0.193)		(0.126)
Female Household Head		-0.0788	0.0403	-0.0733	-0.164	-0.0787	0.0530		0.911*
		(0.972)	(0.973)	(0.979)	(0.970)	(0.960)	(0.972)		(0.534)
Dalit		0.414	0.516	0.374	0.431	0.384	0.494		-0.515
		(0.699)	(0.690)	(0.690)	(0.707)	(0.707)	(0.697)		(0.587)
Madheshi		1.081	1.383	1.181	0.831	1.285	1.917		-0.123
		(1.212)	(1.268)	(1.271)	(1.159)	(1.218)	(1.770)		(0.553)
Job Type: Agricultural		1.970	1.914	2.186	2.309	2.088	1.970		0.794
		(1.875)	(1.869)	(1.997)	(1.997)	(1.744)	(1.840)		(0.859)
Rural municipality		-0.333	-0.729	-0.261	0.324	-0.161	-0.734		-0.186
		(0.686)	(0.645)	(0.712)	(0.982)	(0.688)	(0.648)		(0.449)
Distance: Market		-0.0925**		-0.0934**	-0.0879**	-0.0298			-0.0483***
		(0.0371)		(0.0372)	(0.0366)	(0.0419)			(0.0185)
Road density		-20.49	-14.34	-14.26	-15.32	-19.39	-14.30		-29.07**
		(16.72)	(17.23)	(22.40)	(17.57)	(17.03)	(17.26)		(11.33)
Market by Car/Bus			-0.925				-0.435		
			(1.130)				(1.162)		
CCG*Road density				-16.46					
				(34.27)					
CCG*Rural municipality					-1.376				
					(1.302)				
CCG*Distance: Market						-0.179**			
						(0.0801)			
CCG*Market by Car/Bus							-1.609		
							(2.752)		
Constant	6.228***	3.406	3.201	3.064	2.682	2.781	3.133	5.358***	3.052***
	(0.544)	(2.383)	(2.384)	(2.606)	(2.549)	(2.234)	(2.353)	(0.245)	(1.132)
Observations	555	555	555	555	555	555	555	555	555
R-squared	0.014	0.108	0.095	0.109	0.113	0.124	0.097	0.000	0.063

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 16. Effects of the CCG on financial assets (IPWRA)

	(log) Financial Assets								
	IPWRA						OLS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CCG	-0.963**	-0.893**	-0.993**	0.251	-1.034	-0.498	-0.731*	-0.747**	-0.357
	(0.419)	(0.406)	(0.404)	(0.721)	(0.660)	(0.511)	(0.394)	(0.364)	(0.389)
Household Size		0.186	0.177	0.158	0.190	0.186	0.163		0.275***
		(0.114)	(0.110)	(0.114)	(0.119)	(0.114)	(0.111)		(0.0714)
No, of Children		-0.296	-0.390	-0.296	-0.302	-0.291	-0.395		-0.392
		(0.476)	(0.480)	(0.475)	(0.480)	(0.471)	(0.467)		(0.301)
Household Head's Educational Status		0.205**	0.219**	0.205**	0.208**	0.205**	0.222**		0.108
		(0.100)	(0.0975)	(0.0972)	(0.102)	(0.103)	(0.0987)		(0.0749)
Female Household Head		-0.279	-0.288	-0.265	-0.265	-0.279	-0.258		-0.0279
		(0.480)	(0.483)	(0.469)	(0.483)	(0.482)	(0.490)		(0.327)
Dalit		-0.113	-0.159	-0.212	-0.116	-0.124	-0.212		-0.500
		(0.437)	(0.404)	(0.432)	(0.435)	(0.440)	(0.401)		(0.393)
Madheshi		0.684	1.392*	0.935*	0.727	0.761*	2.644*		0.696**
		(0.431)	(0.752)	(0.566)	(0.501)	(0.444)	(1.517)		(0.280)
Job Type: Agricultural		-0.579	-0.606	-0.0361	-0.636	-0.534	-0.473		0.522
		(0.638)	(0.583)	(0.666)	(0.706)	(0.641)	(0.598)		(0.639)
Rural municipality		-0.177	-0.488	0.00378	-0.288	-0.112	-0.501		-0.261
		(0.403)	(0.380)	(0.418)	(0.455)	(0.412)	(0.383)		(0.285)
Distance: Market		-0.0453		-0.0476	-0.0461	-0.0218			-0.00348
		(0.0300)		(0.0299)	(0.0304)	(0.0305)			(0.0129)
Road density		-5.402	1.869	10.25	-6.278	-4.988	1.958		-4.422
		(10.50)	(10.11)	(11.13)	(11.14)	(10.55)	(10.08)		(5.859)
Market by Car/Bus			-2.053**				-0.905		
			(0.988)				(0.831)		
CCG*Road density				-41.32*					
				(24.36)					
CCG*Rural municipality					0.233				
					(0.903)				
CCG*Distance: Market						-0.0671			
						(0.0701)			
CCG*Market by Car/Bus							-3.771		
							(2.374)		
Constant	8.768***	8.759***	8.886***	7.899***	8.881***	8.524***	8.727***	8.552***	6.731***
	(0.251)	(0.906)	(0.879)	(0.980)	(0.926)	(0.929)	(0.887)	(0.143)	(0.791)
Observations	555	555	555	555	555	555	555	555	555
R-squared	0.022	0.059	0.077	0.071	0.059	0.063	0.098	0.009	0.060

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 17. Standardized differences for child anthropometric data

	Standardized differences	
	Raw	Weighted
Household Size	-0.1268412	0.0074322
No. of Children	0.0848289	0.0914576
Household Head's Educational Status	0.1920947	-0.0983042
Female Household Head	0.0033364	-0.0003386
Dalit	0.8197812	-0.1273737
Madheshi	-0.9401	0.0028223
Job Type: Agricultural	0.3399597	0.0410148
(log) Other Public Assistance	0.3823764	0.0336381
Birth Certificate	0.3464998	0.1675674
(log) Landholdings	0.2722374	-0.0492103
Rural Manicipality	0.3620276	0.16708
Distance: Market	-0.1872458	0.0142366
Road density	0.5818549	-0.0598238

Table 18. Effects of the CCG on WAZ

	WAZ								
	IPWRA						OLS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CCG	-0.118	-0.114	-0.132	-0.0387	-0.112	-0.191	-0.108	-0.269***	-0.0570
	(0.146)	(0.123)	(0.122)	(0.217)	(0.218)	(0.169)	(0.131)	(0.100)	(0.114)
Household Size		-0.0350	-0.0306	-0.0362	-0.0350	-0.0349	-0.0325		0.00989
		(0.0390)	(0.0376)	(0.0390)	(0.0394)	(0.0388)	(0.0376)		(0.0228)
No, of Children		-0.00116	-0.0216	-0.00219	-0.00106	-0.00142	-0.0197		-0.0442
		(0.114)	(0.115)	(0.115)	(0.115)	(0.114)	(0.115)		(0.0751)
Household Head's Educational Status		0.0508	0.0563	0.0512	0.0508	0.0510	0.0565		-0.00145
		(0.0400)	(0.0390)	(0.0401)	(0.0403)	(0.0398)	(0.0392)		(0.0243)
Female Household Head		-0.354**	-0.375**	-0.352**	-0.355**	-0.355**	-0.374**		-0.142
		(0.170)	(0.171)	(0.169)	(0.170)	(0.170)	(0.171)		(0.101)
Dalit		-0.269*	-0.307**	-0.275*	-0.269*	-0.265*	-0.313**		-0.361***
		(0.145)	(0.137)	(0.142)	(0.142)	(0.145)	(0.139)		(0.119)
Madheshi		-0.253	-0.119	-0.237	-0.253	-0.265	-0.00604		0.224**
		(0.233)	(0.145)	(0.227)	(0.240)	(0.234)	(0.133)		(0.0978)
Job Type: Agricultural		-1.552**	-1.564**	-1.514**	-1.551**	-1.563**	-1.549**		-0.225
		(0.743)	(0.725)	(0.744)	(0.740)	(0.731)	(0.737)		(0.145)
Rural municipality		-0.0458	-0.0370	-0.0322	-0.0439	-0.0566	-0.0430		-0.135
		(0.127)	(0.127)	(0.134)	(0.175)	(0.129)	(0.127)		(0.0841)
Distance: Market		0.00804		0.00787	0.00805	0.00357			0.00760**
		(0.00617)		(0.00626)	(0.00621)	(0.00644)			(0.00322)
Road density		0.984	1.164	2.027	1.002	0.848	1.172		3.804
		(3.718)	(3.598)	(4.402)	(3.851)	(3.625)	(3.624)		(2.384)
Market by Car/Bus			-0.359***				-0.245		
			(0.135)				(0.159)		
CCG*Road density				-2.723					
				(7.409)					
CCG*Rural municipality					-0.00379				
					(0.274)				
CCG*Distance: Market						0.0133			
						(0.0150)			
CCG*Market by Car/Bus							-0.354*		
							(0.209)		
Constant	0.0868	1.916**	2.016***	1.853**	1.914**	1.961**	2.004***	0.238***	0.372*
	(0.115)	(0.779)	(0.762)	(0.786)	(0.778)	(0.767)	(0.773)	(0.0444)	(0.199)
Observations	619	619	619	619	619	619	619	619	619
R-squared	0.004	0.111	0.117	0.112	0.111	0.113	0.119	0.012	0.061

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 19. Effects of the CCG on HAZ

	HAZ								
	IPWRA						OLS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CCG	-0.0379	-0.0337	-0.0405	-0.391	0.167	0.0778	-0.0741	-0.207**	-0.0563
	(0.139)	(0.126)	(0.126)	(0.239)	(0.218)	(0.162)	(0.134)	(0.0918)	(0.104)
Household Size		-0.0395	-0.0378	-0.0335	-0.0447	-0.0395	-0.0353		-0.0167
		(0.0281)	(0.0276)	(0.0278)	(0.0303)	(0.0283)	(0.0275)		(0.0206)
No, of Children		-0.0450	-0.0527	-0.0401	-0.0364	-0.0446	-0.0553		-0.0262
		(0.120)	(0.119)	(0.120)	(0.121)	(0.121)	(0.118)		(0.0812)
Household Head's Educational Status		0.0231	0.0252	0.0210	0.0211	0.0228	0.0250		-0.0120
		(0.0264)	(0.0265)	(0.0269)	(0.0262)	(0.0264)	(0.0261)		(0.0262)
Female Household Head		-0.240	-0.248	-0.253	-0.253	-0.240	-0.249		-0.201*
		(0.218)	(0.221)	(0.219)	(0.220)	(0.216)	(0.221)		(0.113)
Dalit		-0.0377	-0.0520	-0.00932	-0.0205	-0.0429	-0.0427		-0.0164
		(0.140)	(0.135)	(0.142)	(0.138)	(0.139)	(0.136)		(0.115)
Madheshi		0.792***	0.842***	0.717***	0.726***	0.809***	0.686***		0.344***
		(0.263)	(0.300)	(0.220)	(0.232)	(0.266)	(0.234)		(0.110)
Job Type: Agricultural		-1.066*	-1.071*	-1.248*	-0.964	-1.050*	-1.091*		-0.348*
		(0.614)	(0.612)	(0.654)	(0.587)	(0.631)	(0.601)		(0.185)
Rural municipality		0.0355	0.0391	-0.0292	0.209	0.0511	0.0474		-0.183**
		(0.118)	(0.125)	(0.123)	(0.200)	(0.122)	(0.125)		(0.0867)
Distance: Market		0.00310		0.00390	0.00392	0.00953			0.00477
		(0.00732)		(0.00718)	(0.00736)	(0.00927)			(0.00371)
Road density		-1.499	-1.435	-6.455	0.124	-1.302	-1.446		2.856
		(3.351)	(3.272)	(4.675)	(3.472)	(3.349)	(3.223)		(2.291)
Market by Car/Bus			-0.134				-0.290		
			(0.163)				(0.220)		
CCG*Road density				12.95*					
				(6.731)					
CCG*Rural municipality					-0.348				
					(0.282)				
CCG*Distance: Market						-0.0191			
						(0.0177)			
CCG*Market by Car/Bus							0.486*		
							(0.279)		
Constant	-0.0491	1.350**	1.388**	1.651**	1.125*	1.285*	1.404**	0.120**	0.533**
	(0.116)	(0.674)	(0.674)	(0.726)	(0.646)	(0.684)	(0.665)	(0.0496)	(0.237)
Observations	619	619	619	619	619	619	619	619	619
R-squared	0.000	0.051	0.052	0.064	0.058	0.055	0.056	0.006	0.048

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 20. Effects of the CCG on WHZ

	WHZ								
	IPWRA						OLS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CCG	-0.208	-0.166	-0.185	0.347	-0.442	-0.388*	-0.154	-0.119	-0.0227
	(0.191)	(0.158)	(0.157)	(0.239)	(0.291)	(0.223)	(0.169)	(0.0987)	(0.116)
Household Size		-0.00442	-0.000358	-0.0130	0.00278	-0.00424	-0.00269		0.0398
		(0.0522)	(0.0504)	(0.0516)	(0.0511)	(0.0519)	(0.0502)		(0.0255)
No, of Children		0.0246	0.00366	0.0175	0.0129	0.0239	0.00607		-0.0468
		(0.133)	(0.135)	(0.133)	(0.131)	(0.134)	(0.135)		(0.0832)
Household Head's Educational Status		0.0825	0.0881	0.0856	0.0853	0.0830	0.0882		0.0294
		(0.0584)	(0.0579)	(0.0563)	(0.0575)	(0.0576)	(0.0580)		(0.0281)
Female Household Head		-0.100	-0.120	-0.0825	-0.0831	-0.101	-0.119		0.115
		(0.235)	(0.237)	(0.235)	(0.236)	(0.232)	(0.237)		(0.102)
Dalit		0.00918	-0.0273	-0.0316	-0.0145	0.0195	-0.0358		-0.226*
		(0.190)	(0.180)	(0.177)	(0.178)	(0.185)	(0.182)		(0.124)
Madheshi		-0.542*	-0.403**	-0.436*	-0.453*	-0.577**	-0.261		-0.0196
		(0.292)	(0.202)	(0.232)	(0.253)	(0.293)	(0.212)		(0.101)
Job Type: Agricultural		-0.740	-0.754	-0.480	-0.880	-0.772	-0.735		-0.0600
		(0.710)	(0.694)	(0.675)	(0.734)	(0.674)	(0.705)		(0.154)
Rural municipality		-0.269*	-0.266	-0.176	-0.507**	-0.300*	-0.274*		-0.111
		(0.152)	(0.163)	(0.151)	(0.250)	(0.154)	(0.162)		(0.0849)
Distance: Market		0.00677		0.00562	0.00564	-0.00604			0.00779***
		(0.00730)		(0.00719)	(0.00710)	(0.00922)			(0.00278)
Road density		1.275	1.514	8.383	-0.952	0.883	1.524		1.419
		(4.874)	(4.811)	(5.883)	(4.437)	(4.646)	(4.843)		(2.441)
Market by Car/Bus			-0.375*				-0.231		
			(0.211)				(0.238)		
CCG*Road density				-18.56**					
				(7.940)					
CCG*Rural municipality					0.478				
					(0.324)				
CCG*Distance: Market						0.0381**			
						(0.0181)			
CCG*Market by Car/Bus							-0.446		
							(0.335)		
Constant	0.288*	0.952	1.050	0.521	1.260	1.081	1.035	0.199***	-0.0171
	(0.169)	(0.764)	(0.748)	(0.756)	(0.783)	(0.726)	(0.760)	(0.0432)	(0.216)
Observations	619	619	619	619	619	619	619	619	619
R-squared	0.010	0.066	0.073	0.088	0.077	0.080	0.075	0.003	0.030

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 21. Logistic Estimation for calculating PS in Newly targeted (Odds ratios)

	=1 if received CCG
Household Size	-0.175*(0.0960)
No. of Children	0.214(0.399)
Household Head's Educational Status	0.190**(0.0964)
Female Household Head	-0.337(0.434)
Madheshi	-3.174***(1.067)
Job Type: Non-Agricultural	-0.243(0.337)
(log) Other Public Assistance	0.0577(0.0365)
Birth Certificate	-0.318(0.349)
(log) Landholdings	0.350**(0.144)
Rural Manicipality	1.121***(0.371)
Distance: Market	-0.0308**(0.0129)
Road density	45.39***(8.414)
Psedo R-squared	0.2761
Wald chi-squared	58.90
Constant	-5.133***(1.254)
Observations	438

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 22. Standardized differences for household data for Newly targeted

	Standardized differences	
	Raw	Weighted
Household Size	-0.0687322	-0.0794429
No. of Children	-0.0085611	-0.0546435
Household Head's Educational Status	-0.1027557	0.0242181
Female Household Head	0.3622389	0.0130004
Madheshi	-0.9393659	-0.0010855
Job Type: Non-Agricultural	-0.219532	-0.0553441
(log) Other Public Assistance	0.3219756	0.0264953
Birth Certificate	0.4994077	0.0504045
(log) Landholdings	-0.0535039	0.0357138
Rural Manicipality	0.4238207	0.131492
Distance: Market	0.0007783	-0.0575905
Road density	0.8943784	-0.1066054

Table 23. Effects of the CCG on the HDD for new beneficiaries

	HDD				
	IPWRA		PSM	OLS	
	(1)	(2)	(3)	(4)	(5)
CCG	-0.0156	0.0741	-0.1786	-0.102	0.0799
	(0.241)	(0.218)	(0.2559)	(0.202)	(0.216)
Household Size		0.223***			0.114***
		(0.0518)			(0.0305)
No, of Children		-0.0770			-0.295**
		(0.219)			(0.145)
Household Head's Educational Status		0.0739			0.123***
		(0.0609)			(0.0397)
Female Household Head		-0.376			0.00121
		(0.271)			(0.157)
Madheshi		-0.0667			-0.163
		(0.226)			(0.145)
Job Type: Agricultural		-1.094**			-0.294
		(0.541)			(0.228)
Rural municipality		0.0638			-0.112
		(0.239)			(0.138)
Distance: Market		-0.000463			-0.0108**
		(0.0111)			(0.00513)
Road density		-16.21***			-16.27***
		(4.519)			(3.474)
Constant	7.997***	8.128***		8.084***	8.288***
	(0.148)	(0.693)		(0.0688)	(0.286)
Observations	438	438	438	438	438
R-squared	0.000	0.159		0.001	0.101

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 24. Effects of the CCG on the Food expenditures for new beneficiaries

	(log) Food Expenditure				
	IPWRA		PSM	OLS	
	(1)	(2)	(3)	(4)	(5)
CCG	-0.148*	-0.0703	-0.1298	-0.188***	-0.144**
	(0.0829)	(0.0657)	(0.0917)	(0.0707)	(0.0660)
Household Size		0.128***			0.109***
		(0.0184)			(0.0121)
No, of Children		0.0562			-0.0183
		(0.0680)			(0.0515)
Household Head's Educational Status		-0.0182			0.00297
		(0.0176)			(0.0151)
Female Household Head		-0.0763			0.0222
		(0.0768)			(0.0529)
Madheshi		0.417***			-0.0346
		(0.160)			(0.0553)
Job Type: Agricultural		-0.665***			-0.407***
		(0.0910)			(0.0752)
Rural municipality		0.0286			-0.0321
		(0.0721)			(0.0514)
Distance: Market		0.00737**			0.00221
		(0.00334)			(0.00141)
Road density		-3.188**			0.0369
		(1.375)			(1.185)
Constant	7.094***	6.891***		7.134***	6.839***
	(0.0508)	(0.155)		(0.0264)	(0.103)
Observations	438	438	438	438	438
R-squared	0.022	0.391		0.015	0.227

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A1. The corresponding table of educational indicator

in dataset	ISCED(2011)	index
pre-school	Less than Primary	0
class 1	Primary Education	1
class 2		
class 3		
class 4		
class 5		
class 6	Lower Secondary Education	2
class 7		
class 8		
class 9	Higher Secondary Education	3
class 10		
SLC (School Leaving Certificate)	Post Secondary non-Tertiary Education	4
Intermediate +2	Short-cycle tertiary Education	5
Bachelors	Bachelor's or equivalent level	6
Master or Higher	Master or equivalent level	7
Professional Degree	Doctor or equivalent level	8
Literate (level less)	Less than Primary	0
No Education	Less than Primary	

Table A2. Classification of non-food expenditures

durable assets	Repair and maintenance of the house
	Repair and servicing of household effects
	Home improvements and additions
	Crockery, cutlery and kitchen utensils (household use)
	Kitchen appliances (refrigerator, cooking range, blenders,etc.)
	Pillows, mattresses, blankets, etc
	Furniture and fixtures
	Electric fans
	Heaters (electric, gas, kerosene)
	Sewing machine
	Iron (electric or other
	Television/VCR
	Washing machine
	Cassette recorder or player, radio, etc
	Camera, camcorder, etc
	Bicycle
	Motorcycle
	Motor car or other such vehicle
	Other durable goods (bullock/he buffalo carts, etc.)
	Pressure lamps/petromax
	Telephone Set, Curdless, Mobile
	Computer / Printer
luxury	Entertainment (cinema, CD/cassette rentals, etc.)
	Newspapers, books, stationery supplies(except educational expenses)
	Pocket money to children
	Wages paid to watchman, servant, gardener, driver, etc
	Excursion, holiday, (including travel and lodging)
	Toys, sports goods
	Jewelry, watches
	Other frequent expenses not mentioned
energy	Wood (bundle wood, logwood, sawdust)
	Kerosene oil
	Coal, charcoal
	Cylinder gas (LPG)
	Matches, candles, lighters., lanterns, etc
	Light bulbs, shades, batteries, etc
daily necessities	Ready-made clothing and apparel
	Shoes, slippers, sandals, etc.
	Personal care items like shampoo, cosmetics, soap
	Dry cleaning and washing expenses
	Personal services (haircuts, shaving, shoeshine)
	Household cleaning articles (soap, bleach, washing powder)
transportation	Public transportation (buses, taxis, rickshaws, train tickets
	Petrol, diesel, motor oil (for personal vehicle only)
money due	Legal expenses and insurance (life, car, etc
	Income taxes, land taxes, housing and property taxes
	Repair and other expenses for personal vehicle (registration, fines)
	Postal expenses, telegrams, fax, telephone
	Marriages, births, and other ceremonies
	Funeral and death related expenses
	Expenditure on religious ceremonies