

# 修 士 論 文

## Does Social Capital Help Improve the Irrigation Service Fee Payment?

A case study of an irrigation association in the Philippines

社会関係資本と水利費支払いの関係性

ーフィリピンの水利組合の事例にー

東京大学 新領域創成科学研究科

国際協力学専攻

学籍番号 47-086790

氏名 田中 映江

Akie Tanaka

本論文は，修士（国際協力学）取得要件の一部として、2012 年 1 月 19 日に提出され、  
同年 1 月 30 日・31 日の最終試験に合格したものであることを、証明する。

2012 年 1 月 31 日

東京大学大学院 新領域創成科学研究科

環境学研究系 国際協力学専攻

主査\_\_\_\_\_

## **Abstract**

The purpose of this research is to analyze the relationship between the irrigation service fee (ISF) payment rate and social capital by examining the key factors of social capital that disincentivize ISF payments by farmers in an IA in the Philippines. This thesis utilizes theories of social capital and collective action for its analysis. This thesis finds that land tenure is the key factor that makes it difficult to raise the ISF payment rates.

It is difficult to govern irrigation systems because of their characteristics as a common pool resource. A common pool resource can be exhausted by excessive use of the resource and the inability to exclude people who do not bear the costs of usage. Irrigation is available for use by any farmer as long as it reaches their rice paddies, regardless of whether or not the farmers bear the costs of maintaining the irrigation system. Preventing the free riding of irrigation systems in order to facilitate the sustainable management of resources is a critical issue. Solving this problem requires understanding the mechanisms of a non-payment system.

In the 1970's and 80's, the government of the Philippines was keen on constructing irrigation systems. Due to the top-down construction of irrigation systems by the National Irrigation Administration (NIA), farmers do not really have an incentive to operate and maintain irrigation systems that support effective sustainable irrigation management. The NIA encouraged farmers to organize irrigation associations (IAs) in an attempt to give more incentives to farmers operating and maintaining irrigation systems. Then, the NIA also aims to turn over some rights of ownership and management of national irrigation systems to IAs. However, the process of turnover has been slow and many IAs have been too fragile to properly maintain irrigations systems. The ISF is the main financial source to organize an IA. The low ISF payment rate causes the fragility in IAs. Therefore, this thesis tries to examine how farmers can be motivated to pay the ISF by examining the factors that disincentivize farmers' ISF payments.

This research uses theories of social capital and collective action for analysis. Social capital is the concept that utilizes human relationships and societal ties among people as a type of capital that can be invested in order to bring benefits to individuals or to a whole society. Theories of social capital can serve to explain the success of irrigation management. One prominent study verifies the role of an irrigation organizer as the catalyst to facilitate farmers in creating collective actions for sustainable irrigation management (Uphoff and Wijayaratna, 2000). This thesis adopts the concept of three types of social capital suggested by Woolcock (2001): bonding, bridging and linking.

Also, theories of collective action explain the mechanisms that create incentives for farmers to join in collective action. Generally, they explain that farmers' motivations to join in collective actions are based on farmers' perceptions of rules and institutions which prevent free-riding. Theories of collective action are relevant to social capital in that social capital can facilitate the creation of rules and institutions. Therefore, this thesis tries to approach the issue of whether strong

social capital can help achieve collective action among farmers ( a higher ISF payment) in an IA to create sustainable irrigation management.

The theoretical hypothesis for this research is composed of two assumptions and three hypothetical relationships. The first assumption is that the sustainable operation and maintenance of irrigation requires collective action including the farmers' ISF payment. The other assumption is that institutional arrangements and infrastructure are interlinked, but this thesis does not discuss the technical aspects of irrigation. The three hypothetical relationships are: 1) the farmers' motivation for the ISF payment has relationships with the institutional arrangements that prepare a system to allocate water fairly among the farmers, 2) the institutional arrangements can be promoted by strong social capital, and 3) there is a relationship between social capital and incentives for ISF payment.

This thesis attests several working hypotheses led by the theoretical hypothesis which analyzes the key selected factors of social capital that affect the ISF payment in BRISIA. They are: 1) IAs with strong social capital have high ISF payment rates, 2) An IA which has stronger social capital creates a more functional IA., 3) IAs with a water rotation system have better ISF payment rates, 4) IAs with strong perceptions of corruption in the Philippine government (low linking) have low ISF payment rates, 5) The relationship between an IA and Barangay (the smallest political division in the Philippines) affects the ISF payment rate, 6) IAs with stronger Bayanihan (the traditional cooperative behavior of communities in the Philippines) have a higher rate of ISF payment, 7) What are the factors of social capital that affect the ISF payment.

This thesis uses the Balanac River Irrigation System Association (BRISIA) as a case study. Though it is one of the best organized irrigation systems in the Philippines, this system encounters a low collection rate of irrigation service fee (ISF) payments. The author conducted interviews with the farmers of BRISIA and distributed and collected questionnaires.

The main findings of this thesis are: 1) The IA that lacks bonding social capital seems to have a low ISF payment rate, 2) The downstream users with weak social capital creates a high functioning organization that coordinates fair water distribution, 3) The downstream IAs that experience scarce water supply and low ISF payment rates have a water rotation system, 4) The relationship between the negative perception of the government and ISF payments is not clarified to be strong, 5) There are no relationships between barangay functions and the ISF payment, 6) There are no relationships between bayanihan practice and the ISF payment, and 7) There is a strong relationship between the land tenure of farmers and ISF payment rates. The major contribution of this thesis is that it finds that land tenure determines the human relationships that compose social capital. Therefore, this thesis sheds a new light on the causal relationship between social capital and the ISF payment.

## Acknowledgements

I would like to thank to Professor Eiji Yamaji and Professor emeritus Tsuneaki Yoshida at the University of Tokyo for supporting me in my research. Professor Yamaji accepted me to be my supervisor while I was in the United States and gave me precious advice over the long distance. Professor emeritus Yoshida visited me in Metro Manila while I was in field work and my research was saved by his academic and financial help.

There are many more professors who kindly helped me in my research. First of all, I would like to thank to Professor Lutgarda Tolentino and Professor Victor Ella at the University of the Philippines Los Banos. Professor Tolentino educated me in rural sociology of the Philippines. Professor Ella always welcomed me and taught me technical aspects of the irrigation in the Philippines.

I also appreciate the great help of Professor Kazuyuki Inubushi at Chiba University, who visited me in the Philippines and introduced me to wonderful people who helped me accomplish the field survey; Mr. Yasukazu Hosen, Ms. Nobuko Katagiri and Ms. Emma D. Quicho at International Rice Research Institute, where I was based during my field survey in Laguna. Also, Professor Masao Kikuchi at Chiba University, Professor Ieko Kakuta at Asia University, Dr. Masako Fujiie and her husband Mr. Hitoshi Fujiie helped me by answering my questions for this research. In addition, Dr. Renato G. Reys at Central Luzon State University also extended his help while I was in the Philippines.

I would like to thank to resource people for my research. Mr. Bayani P. Ofrecio and Mr. Renato S, Gamboa at National Irrigation Administration of the Philippines helped me by answering lots of questions about irrigation management in the Philippines. Also, I would like to thank to Ms. Mayeth and the engineer at NIA PILA office. Ms. Mayeth educated me in all about Irrigation Management Transfer and Balanac River Irrigation System and gave me all data she had and prepared me to initiate the field study. The help of Ms. Mayeth was enormous. Ms. Norma Lagmay, Provincial Agriculturist of Ilocos Norte welcomes me with lots of hospitality and kindly taught me about “*zanjera*” in Ilocos Norte.

I would like to appreciate all Balanac River Irrigation System’s Board of Directors, barangay captains and midstream farmers for their patience and kindness to answer my interviews and questionnaires. My interviews went over hours and my questionnaires were very long, so contribution of each farmer is unforgettable. Also, Mr. Jimmy, ISF collector and the tricycle driver gave me rides to everywhere around Balanac River Irrigation System during my data collection. In addition, I would thank all farmers who accepted my interviews for a pre-test in Naga.

I would like to thank to all of the people who provided me with precious information about irrigation projects implemented at their agencies to support my research; Mr. Takamitsu Matsuo, Mr. Hiromasa Suzuki and Mr. Teruhisa Tajiri at Japan International Cooperation agency, Ms. Evangeline B. Sibayan at Phil Rice, and Mr. Takafumi Kadono at Asian Development Bank.

I also appreciate my translators; Marie, EJ and Mena. Especially, Marie and I achieved hours of interviews with several farmers by visiting them house to house in a day every day. Additionally, I want to extend my appreciation to a librarian of the University of the Philippines Los Banos, Ms. Elsa D. Escalante who was willing to photocopy and prepare documents from the library for me who was always in rush.

My wonderful Filipino friends helped my life in the Philippine emotionally, offered me great help by introducing me to resource people, helped collecting questionnaires, translated Tagalog, and invited me to conduct a pre-study over the new year holiday in Naga. They are Jaja Gaid, Ann Hazel P Javier, Derlie Mateo-Babiano, Michelle Buen Tumilba and her parents, Richard Frank Diaz, Raelleen Diaz, Groria and Jinky and their very kind family, Malou Sandoval, and Lea Rebueno.

Last but never least, I am very deeply appreciating Rumiko Sasaki, Yu Maemura, Sarah Batto, and Samuel Murray. They always showed their kindness to me in difficult time and I kept counting on them for years and turned to them when I got stuck. Rumiko organized the bibliography and did all the cumbersome work to submit this thesis on time while I was in America, and Yu, Sarah, and Sam supported me by offering their time to edit this thesis. Ryo Takahashi created the beautiful maps.  
--THANK YOU VERY MUCH.

It took three years for me to complete this thesis because of my study abroad at Indiana University. I send my deep apology with this thesis to Ms. Mayeth to whom I promised to send two years ago.

Thank you very much.  
Maraming maraming salamat po.

Akie Tanaka  
2012.1.19

## Table of Contents

Abstract.....	2
Acknowledgements.....	4
List of Tables .....	9
List of Figures .....	10
List of Abbreviations .....	11
1-1 Background.....	13
1-2 Purpose .....	15
1-3 Methods .....	15
2-1 Irrigation in the Philippines .....	19
2-2 Irrigation Management Transfer.....	23
2-3 The Participatory Approach in the Philippines.....	28
3-1 Collective Action.....	30
3-1-1 Issues of Collective Action.....	30
3-1-2 Solutions for Collective Action.....	32
3-1-3 Governance of irrigation .....	36
3-2 Social Capital.....	37
3-2-1 Definition .....	37
3-2-2 Functions .....	39
3-3 Social Capital in the Philippines.....	40
3-3-1 Filipino Traits.....	40
3-3-2 Filipino Society .....	42

3-4 Agrarian Reform in the Philippines .....	44
3-5 Social Capital and Irrigation in the Philippines .....	46
3-6 Motivation for the Irrigation Service Fee Payment .....	48
4-1 The Theoretical Hypothesis .....	56
4-2 The Working Hypotheses .....	58
5-1 Field Study.....	61
5-2 The Profile of Studied BRISIA.....	66
5-3 The Questionnaires .....	66
5-3-1 Structures of Questionnaires .....	67
5-3-2 Data Collection and Methods for Analysis .....	68
5-3-2 the Interviews .....	72
6-1 Institutional Arrangements of BRISIA .....	74
6-2 Relationship between ISF payment and Social Capital (midstream).....	82
6-3 The Relationship between the Functions of TSAs and Social Capital .....	86
6-4 Relationships Between ISF Payments and Corruption .....	94
6-5 Reasons for ISF Non-Payment .....	96
6-6 The Relationship between ISF Payments and the Barangay .....	100
6-7 The Relationship between the Bayanihan System and ISF Payments .....	101
6-8 Land Ownership and Agricultural Work Agreements in Laguna.....	102
6-8-1 Farming Operations and Land Work Agreements.....	107
6-8-2 Land Tenure and ISFs .....	107



6-9 Ways to Earn Capital .....	107
7-1 Attesting Hypotheses .....	110
7-2 The issues remained unsolved .....	113
7-3 Suggestions for Improvement of BRISIA .....	114
7-4 Implication for International Cooperation .....	115
References.....	117
Appendix.....	128

## List of Tables

Table 1 - Field Survey Schedule .....	15
Table 2- Philippines Irrigated Areas in 2008 .....	20
Table 3- Functioning level of Irrigation Associations of the Philippines in 2001 .....	26
Table4- Progress of Irrigation Management Transfer in the Philippines .....	26
Table 5- Irrigation service Fee Collectibles and Collections in 2002 .....	50
Table 6- Profile of BRISIA-- .....	65
Table 7- Contents of the questionnaire to the TSA leaders .....	69
Table 8- Contents of the questionnaires to the midstream farmers .....	70
Table 9- Contents of the questionnaires to barangay captains .....	71
Table 10- Contents of the interviews with TSA leaders .....	72
Table 11- the Share of the ISF payment (the unit is peso)-- .....	77
Table 12- the costs and benefits from faming in 2007 in BRISIA.....	78
Table 13- Water Distribution Calendar of BRISIA (Dry 2007)—.....	81
Table 14- Key Questions about the ISF Payment (midstream)-- .....	83
Table 15- Questions and Answers about TSA Leaders’ Social Capital Linking .....	93
Table 16- Questions and Answers about Linking (midstream farmers)--.....	95
Table 17- Reasons Why Farmers Do Not Pay the ISF.....	96
Table 18- Harvest Report and Irrigated/ Benefited Area .....	98
Table 19- Types of Bayanihan for Agriculture .....	102
Table 20- Type of Bayanihan in Farmers’ Daily Lives .....	102

## List of Figures

Figure 1- Maps of the Philippines.....	17
Figure 2- Map of Laguna .....	17
Figure 3- Philippines GDP (USD\$)--.....	19
Figure 4- Theoretical Hypothesis.....	56
Figure 5- Working Hypotheses .....	59
Figure 6- - Map of BRISIA.....	63
Figure 7- Model of Canals .....	64
Figure 8- Structure of BRISIA.....	76
Figure 9- Averaged Irrigation Service Fee Payment Rate (Wet08, Wet07, and Dry07) .....	79
Figure 10- The Collection Efficiency of Balanac River Irrigation System.....	79
Figure 11- Irrigation Service Fee Payment .....	82
Figure 12- The Mechanisms of Non-ISF Payments.....	97
Figure 13- Total Yield (Wet 07)--.....	99
Figure 14- Irrigated Area (Wet 2007)-- .....	99
Figure 15- ISF Rates per Lateral Canal (Wet 2007)--.....	100
Figure 16- Findings of the research .....	113

## List of Abbreviations

Abbreviation	Meaning
AFMA	Agriculture and Fisheries Modernization Act
ASEAN	Association of Southeast Asian Nations
BOD/BOT	Board of directors, trustees
BRISIA	Balanac river irrigation system
CARP	Comprehensive Agrarian Reform Programme
CARP	Congress of People's Agrarian Reform
CIS	Community irrigation system
CO	Community organizers
FSDC	Farm Systems Development Corporations
FIO	Farmer's irrigators organizers
IA	Irrigation association
IDD	Institutional Development Department
IDO	institutional development organizer)
IMT	Irrigation management transfer
IRRI	International Rice Research Institute
ISF	Irrigation service fee
JICA	Japan International Cooperation Agency
JSM	Joint system management
NFA	National Food Authority
NIA	National Irrigation Administration
NIS	National irrigation system
NGO	Non governmental organizations
PAP	Participatory Approach Program
PIM	Participatory irrigation management
PIS	Private irrigation system
SEC	Security and Exchange Commission
TSA(G)	Turn out service association (group)

# Chapter 1

## Introduction

---



The Head Gate to the Balanac River Irrigation System  
(Photo taken Feb 25, 2009 by the author)

## 1-1 Background

How to govern natural resources is a critical issue in the world. Especially, the central issue is how to allocate natural resources among stakeholders. Water is a scarce resource, and the world faces a significant challenge in how to allocate water fairly to satisfy increasing needs among stakeholders (UN-Water 2011). Water for irrigating farm land is in the same situation, and irrigation water has to be allocated sufficiently in order to adjust to increasing variations in crop rotations and water usage. Vermillion et al. (2005) argue that increasing the efficiency of water use for agriculture is the key issue. They also state that institutions for irrigation management, such as irrigation associations (IAs), should be capable of governing whole irrigation systems without government intervention. Thus, transformations in governance over irrigation systems have accelerated across the world.

Though irrigation management has been used as an avenue for the governments to concentrate their power, the expanding costs for governments to operate and maintain irrigation systems cannot be sustained by these governments. Also, it has gradually been discovered that self-governance of irrigation management by farmers is cost-effective and an ideal way to realize effective and efficient water distribution among farmers. Thus, privatization of irrigation systems is often promoted and implemented throughout the world. This movement of privatization is called “irrigation management transfer (IMT),” and irrigation associations that are composed of farmers have been gaining ownership and management of irrigation canals, as a response to the excessive state of intervention in irrigation management during the 1970’s and 1980’s (Shivakoti et al. 2005).

However, the process toward an IMT does not happen smoothly in many developing countries. Many irrigation associations have been facing difficulties with self-sustaining irrigation systems in many Asian countries (Shivakoti et al. 2005). Though the Philippines is the first country to implement IMT, and regardless of its long history of turning over of irrigation systems to farmers, the Philippines encounters malfunctions in irrigation management by irrigation associations. In order to foster the IMT process, foreign donors and the National Irrigation Administration implemented projects to rehabilitate existing canals and to strengthen irrigation associations.

Healthy financial management is crucial for sustainable irrigation management. The irrigation service fee (ISF) payment received from those benefitting from the irrigation system is the major source of funding for irrigation associations. Yet, the farmers in the Philippines are not motivated to pay the ISF, and improving the ISF payment rate (the percentage rate of irrigation association members who pay the ISF) is the key issue to improving the IMT process. Irrigation associations experience financial vulnerability when taking over responsibility of the operation and maintenance (O&M) of irrigation systems turned over under the IMT. That is why there are an increasing number of studies to find the factors that encourage or discourage farmers’ incentives to pay the ISF.

It used to be believed that irrigation issues could be solved by technical improvements, but an increasing number of studies have found that institutional improvements in the governance of irrigation management play an important role. Then, the characteristics of irrigation as a common pool resource received attention from theorists who research the institutional arrangements that encourage collective action. These theorists have studied the solutions to overcome common pool resource problems. In one of the most prominent studies on common pool resource management, Ostrom (1990) suggests successful design principles for common pool resource management through the study of long-lasting common pool resource institutions. She looked at several cases of sustainable irrigation management, and found several similarities. One of these similarities is that the rules for irrigation had been devised and modified over time according to a set of collective-choice and constitutional rules.

Theorists are also paying more attention to the social infrastructure that facilitates collective action. In this way, theories about social capital have also become popular and are being applied to programs to find the successful method of governance for natural resources, including irrigation management. Social capital is the concept that focuses on interpersonal ties which bring about collective action or benefits to individuals. Social capital can be defined as the human network which will facilitate collective action amongst the members. For example, Uphoff and Wijayarathna (2000) find successful examples of social capital in irrigation management. Increasing attention is being paid to institutional and social aspects that facilitate collective action.

Therefore, this thesis will apply theories of collective action and social capital to examine the factors that affect ISF payments. Then, this thesis will try to find any relationships between social capital and ISF payments by studying an irrigation association in the Philippines. The selected irrigation association, the Balanac River Irrigation System Irrigation Association (BRISIA) is one of the most outstanding irrigation associations in the Philippines, but they experience a low ISF payment rate.

The structure of this thesis is as follows. Chapter 1 is an introduction, which clarifies the main issues of the thesis, the background, the purpose of the thesis, and the methods used for this research. Chapter 2 is an extended background, which will explore deeper into the issues of irrigation management in the Philippines. Chapter 3 discusses theories of collective action and social capital. Chapter 4 describes the theoretical and working hypotheses of this research. Chapter 5 introduces the methods of this research. The research methods used in this study are basically based on a field study conducted in 2009. Chapter 6 analyzes data obtained through interviews and questionnaires, then discusses the findings of this research. Chapter 7 concludes with a discussion of the outcomes of this research.

## 1-2 Purpose

The purpose of this research is to analyze the relationship between the ISF payment rate and social capital by examining the key factors of social capital that disincentivize ISF payments by farmers in an irrigation association in the Philippines. This study examines three major hypothetical relationships: 1) the farmers' motivations to pay the ISF is related to institutional arrangements that allocate water fairly among the farmers, 2) the aforementioned institutional arrangements can be promoted by strong social capital, and 3) there is a relationship between social capital and incentives for ISF payments. In order to explore these relationships, this research specifies several factors that create social capital which can affect ISF payments. Through this research, this study will analyze the relationships of these social capital factors with ISF payments based on literature reviews about relevant theories, irrigation management issues in the Philippines, and Filipino culture. Then, the research will attempt to attest to the relationships between the possible factors and the ISF payments by using the data collected in the field survey of BRISIA.

## 1-3 Methods

For this study, the author conducted an intensive field survey in the Philippines over a period of forty days, at the Balanac River Irrigation System Irrigation Association (BRISIA) in Laguna on Luzon Island. The author hired local assistants whose mother tongue is Tagalog and who can speak fluent English; one person was a member of IRRI (International Rice Research Institute) and two of them were students at the College of Agriculture in the University of the Philippines. Table 1 below exhibits a detailed schedule of my field survey.

**Table1- Field Survey Schedule**

<b>Term</b>	<b>Contents of the Survey</b>
26/Dec/2008	Focus discussion with BOT members of BIA
23-24/Feb/2009	Interviews with the NIA provincial office
25/Feb/2009	Site visit to the B. irrigation system
26/Feb/2009-22/Mar/2009	1) Interviews with TSA leaders, 2) Distribution and collection of questionnaires to TSA leaders and barangay captains
23-31/Mar/2009	Distribution and collection of questionnaires to farmers of lateral canal A



The first week, the author conducted interviews with the National Irrigation Administration Provincial Office (NIA PILA) which is in charge of the Balanac irrigation system. The author conducted interviews mainly with the Institutional Development Organizer (IDO) and the engineer at the NIA PILA office, in order to grasp the management situation at the BRISIA. The author also conducted a site visit of the whole Balanac river irrigation system during this week.

The second and third weeks were spent conducting semi-structured one-on-one interviews with the leaders of the Turnout Service Groups (TSAGs), the smallest groups which are composed on average of 30-50 members of farmers who share the same canal turn-outs along each lateral canal. They are grouped based on geographical proximity. Also the TSAG leaders answered the questionnaires about their personal social capital. In addition, during this week, the author attended a monthly BRISIA Board or Trustees (BOT) meeting.

The fourth week was spent distributing and collecting questionnaires to farmers in the lateral canals A1 to A4 located in the midstream section of the BRISIA. These midstream groups were selected for this study, because the motivation or incentives of the farmers to pay the ISF are not known. Upstream farmers are typically thought to be motivated to pay the ISF because they have a relatively better water supply than the midstream farmers, which brings income to pay the ISF, and downstream farmers' harvests can be easily influenced by floods or a lack of water supply, which should discourage paying the ISF. The water level of Laguna Bay is said to grow higher each year because of the accumulation of garbage. This garbage accumulation affects the downstream areas to have floods. However, midstream farmers should have a steady water supply and it is not obvious what motivates the farmers to pay or not to pay the ISF. For this reason, the midstream groups are best for the research on incentives for paying the ISF.

Additionally, the interviews at the NIA headquarters in Metro Manila were conducted on December 14, 2009 and on March 26, 2009 in order to collect data about the Balanac irrigation system and its general transition of "Irrigation Management Transfer" (turnover) in the Philippines. In order to measure social capital, several interviews were conducted and questionnaires were distributed to midstream farmers, TSA leaders and barangay leaders.



Figure1- Maps of the Philippines



Figure2- Map of Laguna

## Chapter 2

### Background

---



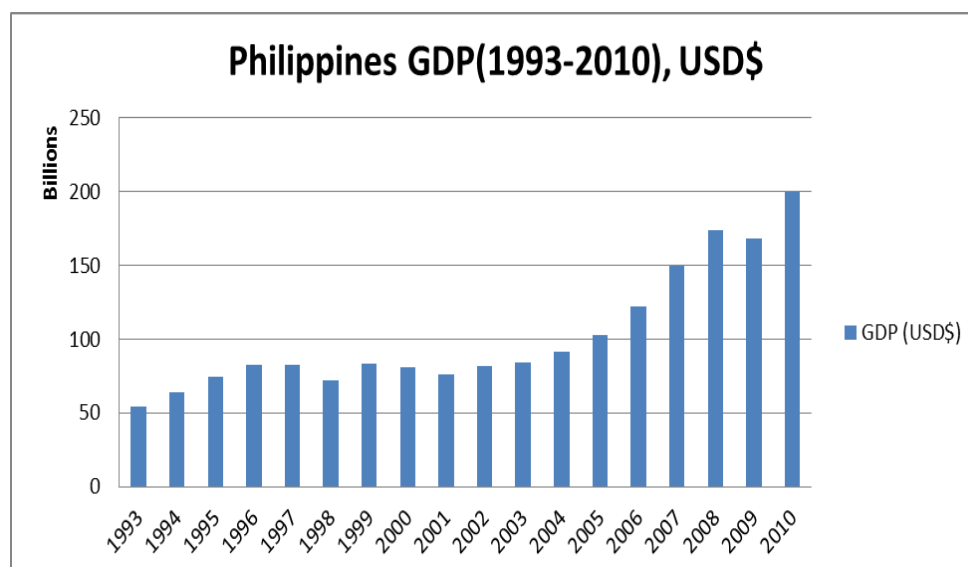
(Midstream of Balanac River Irrigation System)

(Photo taken Feb 25, 2009 by the author)

## 2-1 Irrigation in the Philippines

The Philippines was the first among South Asian countries to implement the Irrigation Management Transfer (IMT). Though the country has a long history of turning over irrigation systems to farmers, the irrigation associations are not organized well enough to operate and maintain their irrigation systems in a sustainable way. This section examines the issues of irrigation in the Philippines closely.

Irrigation is community based infrastructure in the Philippines, and the lifeline of rice farming in the dry season. During transplanting, when seedlings are germinating at their fields and panicles and grains are developing, they continuously need water (Genilno 2005). 30%-50% of water use is for standing water to prevent weeding growth (Greenlands 1997). Farmers want to maintain an adequate amount of water in their paddies which they have learned from their long experience farmers.



**Figure3 Philippines GDP (USD\$)**

(Source: The World Bank: <http://data.worldbank.org/>)

The Philippines is an ASEAN member and its GDP has generally increased since 2001 to 2011 though high inflation slowed GDP growth in 2008 (Figure3). 14.8% of GDP is composed of agriculture in 2009 (The World Bank 2011). The Philippines imports rice though it is under the strict control; The Philippines government controls the price of palay (Filipino term for un-husked rice) to maintain its high price (Cabling and Dace 2006). The Philippines is in the monsoon area, and its dry season is from May to November and its wet season is from December to April.

The Philippines has a total area of about 300,000 sq km. About 298,170 sq km of the total area is land area, and the remaining 1,830sq km is water. There is an estimated potential irrigable area of 31,263.40 sq km as of 2008, which is double the total irrigated area. There is 1,606,398 ha of area that can be potentially developed (Table2).

**Table2-Philippines Irrigated Areas in 2008**

<b>Area</b>	<b>Area(Ha)</b>
<b><i>Agricultural Land</i></b>	9,161,000
<i>arable land</i>	4,936,000
<i>permanent cropland</i>	4,225,000
<b><i>Estimated Potential Irrigable Area</i></b>	3,126,340
<b><i>Irrigated Area</i></b>	
National Irrigation System	748,593
Communal Irrigation System	554,020
Private Irrigation System	217,329
<b><i>in total</i></b>	1,519,942
<b><i>Remaining Area to be developed</i></b>	1,606,398

(Source: NIA: <http://www.nia.gov.ph/>, accessed May 2009)

The Philippines experienced 7.1% growth of GDP in 2010. 5.4% of GDP depended on agriculture in 2010 (EoP 2011). 30.5% of labor in the Philippines engaged in agriculture in 2009 (GP 2009). Filipino rice farmers' average annual income is 19,843 pesos (about \$1 a day). On the other hand, the non-farming urban population earns 49,698 peso per person in a year, and the non-farming rural population earns 24,821 pesos per person annually (Casiwan et al. 2006). Thus, Filipino rice farmers are in poverty, and the irrigation that they rely on to grow rice can play a key role in solving poverty in the Philippines.

The late 1960's was the beginning of the green revolution in the Philippines. In 1964, the National Irrigation Administration (NIA) was established. In the 1970's, the NIA became largely financially autonomous from the government, which promoted the transfer of irrigation management to the farmers. In 1973, the Masagana 99 Rice Program was implemented which expanded rice production by providing capital to farmers and modernizing their agricultural technologies by promoting fertilizers and highly productive seedlings. In the 1980's, irrigation in the Philippines was in a so-called "golden age," because President Marcos (1966-86) made big investments in irrigation projects. Also, during his presidency the Agrarian Reform began which distributed land from landowners to tenants or lease holders.

During this time, the modernization of rice farming caused farmers to depend on unofficial money lenders, who were charging farmers with no collateral high interest, and it was convenient for the majority of the farmers (Umehara 1998). These farmers needed instant cash to catch up with rice-farming modernization. In addition, the new seedlings were easily affected by physical factors such as weather, so the harvested yield of those farmers was unstable. Mascarinas (1991) made a survey at 15 barangays (the smallest political administrative unit in the Philippines) in the Philippines and found that informal credit was the prevailing credit system in the rain-fed areas. In this way, the farmers in the Philippines became subordinated to the individual private money lenders.

In the 1970's, the NIA led the irrigation development (JIID 1995). Wittfogel (1956) argues the construction and ownership of irrigation systems were based on national strategies to centralize and accumulate the government's political power. However, in the Philippines in the 1980's, due to the NIA's scarce financial status, the NIA could not self-manage huge national irrigation systems, and they began to turn over their irrigation systems to irrigation associations (JIID 1995). The Presidential Decree No.552 in 1974 provided a legal basis for the co-existence of IAs and NIA for irrigation development in the Philippines (Elesar et al., 2005). This process of turning over irrigation systems is known as the irrigation management transfer (IMT). Therefore, the IMT is a process in which functions of irrigation management are transferred from the government to private sectors, associations, NGOs, local governments, or the associations which are composed of farmers.

The government of the Philippines also required the NIA to be an independent sector and to self-finance mainly by collecting irrigation service fees (ISF). The NIA then became encouraged to collect the ISF from farmers by turning over their systems to irrigation associations. On the other hand, farmers were not motivated to turn over the management of the irrigation systems or not encouraged to pay the ISF. One reason is that farmers recognized the irrigation systems constructed by the government as public goods (Lauraya and Sala 1994). Since the farmers did not take responsibility for the operation and maintenance of the irrigation systems that were turned over, the overall distribution of irrigation water was inefficient.

Mizutani (2002) explains that the IMT applied a participatory approach (PA) called participatory irrigation management (PIM). PIM was a common strategy used widely in Monsoon Asia (Mase 2002). PIM is the transformation of the models or the degree of farmers' participation so as to expand the responsibility and the authority of the farmers in irrigation management (Fujita 2002).

PIM aims to develop and strengthen the functions of irrigation associations (IAs). The NIA set up an Institutional Development Department (IDD) in its office, and the IDD hired new institutional development officers (IDOs) (and community organizers (COs)) to work closely with farmers to strengthen the abilities of irrigation associations. PIM gave farmers opportunities to

receive training from the COs. Through the PIM's training the farmers in IAs developed organizational skills and coordination skills (Bagadion and Korten 1991).

Irrigation systems in the Philippines are grouped into three types: 1) national irrigation systems (NIS), 2) communal irrigation systems (CIS), and 3) private irrigation systems (PIS). The NIA owns both NISs and CISs. Though the NIA maintains its ownership of the NIS, part of the NIS management was transferred to irrigation associations under the IMT. In general, a NIS covers more than 1000ha of service area. With respect to the CIS, the NIA turned over both the ownership and management to irrigation associations. The beneficiaries of the CISs have to recover the costs of construction of the CISs, though the users of the NISs do not need to contribute to the capital costs of the NISs' construction. A CIS covers usually less than 1,000ha of service area. A PIS is a private irrigation system and is not the target of the IMT. There are no size limits for PISs.

In 1975, the CISs were turned over to IAs for the first time according to the Memorandum Circular 1975 (Raby 1997). The IMT of the NISs began in the 1980's in the Philippines. The first pilot project to turnover NISs was implemented in 1981. In 1981, the PA was implemented in the operation of NISs; farmers were involved in the rehabilitation processes of the NISs, and they were grouped into irrigation associations to operate and maintain their turned over irrigation systems. Around 1983, NIA extended the PA operations to include nationwide CISs.

The NIA aims to alleviate difficulties in operating and maintaining NISs by using the PIM, and the NIA also aims to develop the capacity of IAs to carry out the operation, maintenance (O&M), and collection of the ISF. The regional offices of the NIA that govern the NISs are responsible for constructing and maintaining the NISs. The NIA collects the ISF from the beneficiaries of irrigation to cover its operation costs of the NIA. However, since the NIA is responsible for the main system of operation and maintenance of NISs, the PIMs take on a role of only information sharing or consultation. They have little influence over planning, designing or constructing the NISs (Elesar et al. 2005).

It is also important to modernize the Philippines' irrigation systems as well as to work on turnover. Maruyama et al. (2001) examines that by the 1990's the Philippines was at a phase in which rehabilitation and maintenance of irrigation systems were under-invested, though they were thought to bring in high rates of return. In 1997, the Philippines stipulated the Agriculture and Fisheries Modernization Act (AFMA), which envisioned a modern, dynamic, small holder-based, private sector-led, and market driven agricultural and fishery's sector to ,. The AFMA upholds five purposes; (1) to accelerate the development of irrigation, (2) to improve the performance of existing irrigation systems, (3) to prevent the further destruction of watersheds and aquifers, (4) to rehabilitate existing irrigation systems, and (5) to promote the development of effective, affordable, and efficient irrigation systems (Wilfredo 2005). Also, the AFMA promotes further turnover of the NISs and build-operate-transfers of the NISs (RoP 2009). However, Wilfredo (2008) concludes that

compliance with the AFMA had a minimal effect, that the AFMA brought very little impact on irrigation development, and that the NISs and CISs' performances have not changed significantly after the implementation of the AFMA.

Kikuchi et al. (2003) found that in the 2000's the Philippines was at a stage of "increasing efficiency of the existing irrigated land base, heightening demand for rehabilitation, and the improvement and better maintenance of water" (Kikuchi et al. 2003). This means that the country needs to improve the quality of O&M in the existing irrigation systems. Kikuchi (2005) argues that the Philippines needs to diversify its agriculture and to expand the size of commercialized and efficient agricultural management. Wilfredo (2003) expects the cost-effective and self-sufficient small scale irrigation such as shallow tube wells, low-lift pumps, small inundation schemes, farm reservoirs, and small diversion dams as engines of growth of the Philippines' agriculture. These efforts are useful to help the Philippines agriculture become competitive in the international market. At the same time, Filipino farmers are motivated to maintain rice self-sufficiency at any cost because it is risky to rely on the international market (Castilio 2006). In 2009, the *Manila Bulletin* reported that the government planned to liberalize rice trading in the ASEAN countries (IRRI, 2009). Therefore, both in order to achieve self-sufficiency of rice in the Philippines and protect domestic markets, and to liberalize the rice market and open it to the international market, it is necessary to increase the efficiency of rice production in the Philippines.

In sum, the irrigation systems in the Philippines are under the IMT and in the process of being turned over to the IAs. However, the process of IMT is not easy, and IAs need to be strengthened to operate and maintain the irrigation systems effectively. At the same time, irrigation in the Philippines is in urgent need to be maintained more efficiently and to become more private driven and small scale.

## **2-2 Irrigation Management Transfer**

This section focuses more closely on the issues of irrigation management transfer (IMT) in the Philippines. As mentioned in the previous section, IMT experiences difficulties due to the lack of capacity of irrigation associations (IAs) and the farmers' motivation to operate and maintain the irrigation systems that were previously managed by the government. This section reveals the status of IAs in the Philippines and the problems they encounter.

Irrigation Management Transfer (IMT) has been implemented in many developing countries. It uses the participatory approach, and the management under IMT is called participatory irrigation management (PIM). Ofrecio (2005) claimed that IMT in the Philippines has four purposes: 1) to reduce the O&M costs of the government, 2) to empower users and increase satisfaction through



beneficiaries' participation, 3) to increase water efficiency by improving local governance, and 4) to increase productivity.

The World Bank advocated the PIM, and it is concerned with poverty mainly caused by small-scale farmers in developing countries. The central issue of the PIM is concerned with how to distribute water fairly among farmers, how to encourage farmers to pay the ISF, and the sustainability of the conditions of the irrigation systems. The PIM has not been successful in many countries. Ishi and Sato (2003) analyze three reasons of the PIM's failure. One of the reasons is that IAs are not mature enough to operate and maintain irrigation systems that were turned over. Secondly, the top-down style of irrigation management and the government's arrogant attitudes towards farmers inhibit farmers' ownership. Thirdly, the IAs have neither the technical or financial capacity to handle the irrigation systems.

The Philippines is the first country in Asia that implemented the PIM in irrigation management under the processes of the IMT. In 1963, the NIA was established as the state-owned irrigation administration that had ownership and responsibility of operation and maintenance (O&M) of all irrigation systems in the country. The NIA was created under the Republic Act no. 3601, and it was categorized as a government owned and controlled corporation. It did not receive government subsidies for its operation and maintenance of the irrigation systems. In 1974, its responsibility was expanded to delegate the management of the NIA to duly organized farmers organizations, and the NIA started to charge the ISF from beneficiaries (Meja 2002). In those days, the NIA specialized in technical aspects of irrigation management and did not have proficient management skills.

In the early 1970's, the NIA confronted the problem. Farmers refused to pay the ISF because they lacked incentives to be responsible for the irrigation facilities constructed by the NIA, and the farmers' opinions were not incorporated in the construction. In 1974, the Presidential Decree No. 552 was issued to collect the ISF to cover all costs of O&M of the irrigation systems and to recover the costs of construction of the CISs. In 1976, the Ford Foundation financed the CIS projects to implement the first participatory approach (PA). Eventually the approach was implemented in all of the CISs in the country. In 1981, the PA was also implemented for NISs. In 1991, due to the implementation of the Local Governmental Code, the development and management of CISs were transferred to the local governments. Then, the local governments took charge of the CISs O&M, which were eventually transferred to IAs. NISs were also turned over to IAs, though the NISs' turnover is limited to the turnover of irrigation facilities excluding the turnover of head gates and dams.

In the Philippines, the PIM was translated into the participatory approach program (PAP). The PAP started to make type contracts with IAs and to involve farmers into the management of irrigation systems. Later the NIA implemented the IMT, under which the NIA initiated the joint system management (JSM) signed between the NIA and IAs. Under the PAP, once farmers are

formed into IAs and IAs are registered to the Securities and Exchange Commission, each IA can choose what type of contract they wish to make.

Under the IMT there are three steps in the process of the NISs' turn over. The type of contract IAs agree on depends on the level of maturity of the IAs. Type 1 is a maintenance contract, in which IAs are in charge of maintenance work along a certain length of a canal system. Type 2 is an irrigation service fee (ISF) collection contract, in which IAs are in charge of operation of systems and the collection of the ISF from members. IAs can save some portion of the amount collected, if it exceeds a certain amount. Type 3 is a full turn over contract. Under the type 3 contract, IAs are in charge of O&M of a whole irrigation system and they are required to amortize a certain amount of construction or rehabilitation costs within 50 years to the NIA. Under the Type 3 contract, the NIA maintains the head gates and the dams of National Irrigation Systems (NISs). An IA can make an agreement either under the Type 1 or Type 2 contracts, or a combination of the two.

Another type of contract in the NISs' turn over process is the JSM contract signed between the NIA and an IA, or within an IA federation, in compliance with its mandate under the Agriculture and Fisheries Modernization Act (AFMA). Under the JSM, the NIA is in charge of O&M of the main facilities, while the IAs take care of the secondary and terminal facilities. The NIA and an IA share the ISF collection. Under the JSM, the share of the collected ISF can be negotiated between the NIA and IAs. Usually the NIA and an IA divide the share into half. Ideally, the IAs can increase their portion of the ISF collection depending upon how much it costs to break even, or the direct operation and maintenance costs of the NIA (Bagadion 2002).

Aiding donors such as the World Bank, Asian Development Bank, and Japan International Cooperation Agency (JICA) have invested in irrigation construction and rehabilitation, as well as irrigation association strengthening projects. There are several Irrigation Association Strengthening Projects conducted by JICA. Some of these projects involve the physical rehabilitation of canals. A study suggests that the rehabilitation of canals motivated farmers to strengthen the function of IAs (Samad and Vermillion 1999). For example, as one of their NIS turn over programs, JICA implemented an irrigation association strengthening project from 2007 until recently. The components of this project are: 1) reorganizing and forming IAs, 2) training for efficient O&M, water distribution, and crop rotation calendars, and 3) necessary rehabilitation (JICA 2011).

JICA (2001) reports that 38% of the IAs malfunctioned in 2000 (Table3)<sup>1</sup>. Also, 3 years of JICA reports clarify the progress of the IMT (Table 4). The report issued in July 2003 presents that 14% of the IAs malfunctioned, 13% of the IAs were in a Type 1 contract, 10% of the IAs were in a

---

<sup>1</sup> One number on the table3 is inconsistent with a number on Table4 in that in 1999 on the table37% of IAs did not functioned, but on the table4 38% of IAs did not function. The numbers are based on the JICA reports, and there is the inconsistency among them.

Type 2 contract, and more than 50% of the IAs are using a combination contract of Type 1 and Type 2. The report issued in September 2003 presents that 38% of the IAs were reported to malfunction in 1999, 20% of the IAs were in a Type 1 contract, 13% of the IAs were in a Type 2 contract, and 1% of the IAs were in a Type 3 contract. Comparing this report with the report issued in July 2007, the progress of the IMT is clear; more IAs shifted to make a higher level of contract, and Type 3 rose to 21% of all contracts. However, this result does not differentiate NISs from CISs, so it is not clear what percentage of IAs of NIS are represented in the table below.

**Table3- Functioning level of Irrigation Associations of the Philippines in 2001**  
**NIA-IDD Functional Trend Report (source: JICA 2001)**

Status of IAs		1996	1997	1998	1999	2000
Number of IAs		821	1,316	1,513	1,679	1,693
Well-functioning		10%	12%	12%	35%	16%
Partly-functioning		50%	54%	57%	28%	46%
Not-functioning		40%	34%	31%	37%	38%

**Table4- Progress of Irrigation Management Transfer in the Philippines**

(Note: The data on JICA 2003.9 indicates the data of 1999 only for the number of IAs that did not function, and the data is inconsistent with the data on Table3. There are no notes about it on the JICA reports.)

IA's Contract Type Status Reported			
Reported on	Nihoh Koei et al. (JICA)	JICA	JICA
Report year	2003.7	2003.9	2007.7
No function	14%	38% (1999)	
Type1	13%	20%	8%
Type2	10%	13%	53%
Type1+2	50%<		
Type3		1%	21%
Total	86%<	34%	82%
*The author constructed this table based on the JICA reports			

The process of turnover should be slow, because it takes significant time to train and organize farmers and IAs. However, once that effort has been made, and IAs under IMT start to function well, irrigation allocation should become more efficient and rice farming should become

more cost effective. As we have seen above, while the Philippines have progresses in IMT, the transfer process has been slow. It seems that many systems are still under the management of the government and many IAs have experienced difficulties in self-financing the O&M.

Several studies examine the reasons for IAs' malfunctioning. JICA (2003a) analyzes the causes of malfunctions of the IAs and finds that the IAs lack human resources, and that NIA's IDOs quit their jobs frequently because their salaries were not paid. Also, both the NIA and IAs lack the financial resources to rehabilitate their facilities, and because of that farmers lack incentives to maintain irrigation systems, which cause the low rate of ISF payments (JICA 2003a).

Gronfeldt (1997) finds that the "lack of sense of ownership" is the main cause of slow NIS turnover, because the NIA retains ownership of NISs and transfers only the "management burden" to farmers. He argues that property rights of the irrigation systems as a whole should be transferred to IAs in the process of privatization (Gonfeldt 1997). Easter (2000) finds that with respect to most of the large government financed irrigation projects, the turnover process is slow and that many farmers feel that the IAs are not very responsive to the needs of irrigation users. Easter analyzes that the impediment of the transfer is the transaction costs associated with reforming systems and organizations. The transaction costs result from the large numbers of parties involved, the diversity among them,, costs associated with search and information gathering, bargaining and decisions costs, and monitoring and enforcements costs etc. He concludes that there are five ways to minimize the transaction costs; a) private corporation management, b) a water charge system that fairly determines the amount of water farmers receive, c) improve drainage and watersheds, d) use environmental impact assessments to make the water flow more efficient and sustainably, and e) institutional arrangements integrated in the NIA's construction design (Easter 2000).

The new guidelines of the IMT issued in 2008 states that farmers who compose irrigation associations have to be involved and participate in the process of planning, design, and construction of the canal facilities and that this participation process should enhance the farmers' sense of ownership in their irrigation facilities. The real ownership of head-gates and dams are still left in the NIA in the new guidelines. The main point of the new guidelines is the integration of several types and stages of contracts between IAs and the NIA. Foreign donors introduced concepts of the modified contract.

Therefore, the Philippines implanted the IMT program though since the 1980's its process has been impeded. The Philippines' IAs experience difficulties under autonomy in self-sustaining their O&M of the irrigation systems. It is important to strengthen the functions of IAs and to motivate farmers to actively participate in the O&M of irrigation systems. The next section discusses participation under the IMT process in the Philippines and assesses how the IAs have been formed and activated in the process of the IMT.

## **2-3 The Participatory Approach in the Philippines**

In the Philippines, the participatory approach program (PAP) was introduced in the 1970's. The NIA was responsible only for technical aspects of irrigation and not for institutional aspects of irrigation. In those days, the Farm Systems Development Corporation (FSDC) was in charge of institutional concerns. However, this division of labor led to unsatisfactory performance in the irrigation systems.

The PAP's central focus was on grouping the IAs as legal bodies. Thus, the provincial offices of the NIA hired Institutional Development Officers (IDOs) to help implement this goal. In 1991, the PAP concept was introduced to the NIS management. At the time, farmers were involved in the rehabilitation process of NIS, and IAs became the body in charge of major parts of irrigation management. By the year 1983, the PAP concept was introduced in all small-sized irrigation projects. In 1986, institutional groups working for the institutional development program were organized into the Institutional Development Department (IDD) at the head-quarters of the NIA. The IDD is in charge of the institutional development of IAs in order to manage irrigation systems more effectively.

IDOs help IAs form as well as organize. IAs needed training from the IDOs about basic leadership, as well as for institutional and financial management. Also, the trained farmers passed down the information to fellow farmers and played the role of FIOs (Farmer's Irrigators Organizers). FIOs no longer exist. Currently, IDOs help form and organize IAs. After the formation of IAs, the IDOs' role shift to that of trainers or evaluators of IA functionality (Gamboa 2009).

Water in the Philippines belongs to the State (Raby 1997), and an irrigation association needs to be a corporate autonomous body that registers with the Security and Exchange Commission (SEC). Only then can they receive authority to operate and maintain the facilities, distribute water, collect fees, impose sanctions, and to get water right permits (Korten and Siy, Jr. 1989). Gronfeldt (1997) examines that the transfer of ownership of the irrigation systems is not just the transfer of responsibilities involving irrigation facilities, but also plays a key role to raise "the sense of ownership" in the transfer of irrigation systems from the state to farmers. The NIA's participatory approach defines that the ideal irrigation association has strong leadership, a water sharing system, social justice, and democracy (Kakuta 2001). However, it has been difficult to raise an irrigation association equipped with all of these skills, while keeping it an autonomous body that can effectively operate and maintain the irrigation systems of the Philippines.

## Chapter3

# Literature Review

---



Ladies washing clothes at upstream  
(Photo taken Feb 25, 2009 by the author)

### **3-1 Collective Action**

Irrigation is a common pool resource. McKean (2000) defines common-pool resources as goods that can be kept from potential users only at great costs or with difficulties, and as goods which are subtractable in consumption and that can disappear. In other words, rule complying members cannot easily exclude water users who do not follow the rules to use water (non-excludability), but when those people use the resource the amount of others decreases (subtractability). Thus, irrigation as a common pool resource is characterized by 1) difficulties of exclusion and 2) subtractability. 1) The difficulties of exclusion refers to the fact that those who do not pay irrigation service fees can still receive water, and it is difficult to exclude them because the water reaches their paddies due to certain geographical advantages. 2) Subtractability refers to the situation in which once the irrigation water reaches some paddies, the amount of water for other farmers' will decrease. Due to these characteristics, irrigation is trapped in a problem disabling fair water sharing.

The management of irrigation systems in many of the South Asian countries is nested in a vicious circle caused by centralized hierarchical irrigation construction, low physical performance, unarranged water delivery, low Irrigation Service Fee Payments, and little motivation to engage in operation and maintenance (The World Bank 1998). This vicious circle happens due to the characteristics of common pool resources. Each stakeholder tries to maximize their own benefits, and they end up in a non-cooperative game and end up with a sub-optimal solution.

This is why collective action is necessary among stakeholders in the governance of a common pool resource. Collective action to manage irrigation systems in a sustainable way is the main goal of institutional arrangements of irrigation associations. The government implements policies that strengthen irrigation associations through providing farmers with techniques and knowledge. By complying with those policies, farmers organize irrigation associations that can settle disputes between the upstream and downstream farmers over water distribution issues. In this way, good institutional arrangements function to solve issues involving irrigation management. Therefore, this section explores the theories of collective action. In particular, this section covers the theories of how the common pool resource problem occurs and how (and by whom) the problem can be solved.

#### **3-1-1 Issues of Collective Action**

Firstly, this section examines how a common pool resource problem occurs. When water is abundant because of adequate rainfall to satisfy the needs for water for all farmers, there would be no problems related to water distribution. However, if there are no rules of rotation and punishment

for violation when water is scarce, the head-end (up-stream) users could receive as much water as they want with their geographical advantage. This causes dissatisfaction for the tail-end users with water delivery. The farmers who are located close to the canals or gates would be little concerned about canal cleaning. On the other hand, farmers far away from the canals and gates would be relatively more motivated to clean canals and to maintain the facilities in good condition, since the water distribution to tail-end users greatly depends on the canals' conditions. Thus, if there are no rules, farmers close to the canals can get water without cleaning canals or paying the water user fee, because it is difficult to cut-off water that reaches them.

Ostrom and Gardner (1993) explain that the cause of irrigation issues is the inherent asymmetry of head-tail irrigators along irrigation systems in conjunction with the attributes of a common-pool resource. They also articulate that due to the characteristics of common pool resources, under "the state of nature" the geographical asymmetry which exists between upstream and downstream farmers causes conflicts over water distribution. In this way, the downstream farmers lack water if the upstream farmers exploit water as much as they want. Therefore, they argue that bargaining among the farmers plays an important role to solve the asymmetry situation. For example, the farmers may agree to introduce a water rotation calendar that can bring irrigation water downstream first before the upstream farmers start to use water.

Lam (1998) studies irrigation management in Nepal and argues that the irrigation systems received more attention on physical attributes than on social attributes. He focuses on the various variables related to irrigation management. He argues that both physical and social attributes significantly affect the outcomes of the collective efforts, and he categorizes the attributes into several categories. Since this thesis only focuses on the social aspects of irrigation management, it assumes that the physical aspects are given, only social attributes are discussed.

The social attributes Lam claims are: 1) the size of irrigation systems, 2) existence of alternative water sources, 3) farmers' income sources, and 4) the variety of composition of irrigators. The design of the rules which bind individual farmers' action affects the size of the groups. Even in large groups there are many cases where the groups function well for all the stakeholders, depending on the rules institutionalized in the groups. Whether alternative sources of water exist or not affects the degree of dependence of farmers on irrigation systems. For example, the farmers located downstream who experience water inadequacy may not want to commit to the ISF payment because they use pumps. Also, the farmers whose income does not depend on agriculture may not want to commit the collective action such as the ISF payment. A group composed of the farmers from a variety of social and economic backgrounds may face difficulties in interaction to agree on the sets of rules for long term irrigation management.

Tang (1992) argues that there are two attributes in irrigation systems that affect collective action and outcomes of an irrigation system: physical and community attributes. Physical attributes



are the size of the irrigation system, the pattern of water supply, and the availability of alternative water source. Community attributes include irrigators' sources of income and social, economic, cultural, and locational differences among irrigators. He states that the degree of how much the farmers are dependent on farming income and irrigation water affects the incentives of farmers to commit collective action. Also, he concludes that whether or not farmers in the irrigation systems are successful in governing and maintaining their systems depends on the balance between the benefits and costs they face. He also mentions that federalized arrangements or multilevel arrangements can reduce transaction costs and facilitate coordination and problem solving in large irrigation systems. Lastly, he also claims that in order to ensure mutually productive relationships among farmers it is important to have institutional arrangements that ensure fair sharing of costs and benefits among participants (Tang 1992). In this way, Tang's study focuses on the attributes of irrigation and finds the causes of problems in governing irrigation systems.

In addition, the differences of conditions (heterogeneities) among irrigators can hinder them from engaging in collective action. First of all, Bardhan and Dayton-Johnson (2002) argue that various heterogeneities such as economic heterogeneities, social heterogeneities, and cultural heterogeneities negatively affect the incentives for irrigators to participate in collective action. They also argue that heterogeneity weakens the effects of social norms and sanctions to enforce cooperative behaviors and collective agreements. Based on the case study conducted in the Philippines, Fujiie et al. (2005) finds six factors that hamper collective action. They are; 1) water supply which is uniformly abundant, 2) asymmetry between head-tail irrigators in water supply, 3) large numbers of members in association, 4) low population density, 5) high share of nonfarm households, and 6) short history of association. This study also looks at the heterogeneities among farmers from a different perspective from Bardhan and Dayton-Johnson's perspective. These studies show the heterogeneity is one of the reasons why farmers do not cooperate.

To sum up, there are several factors in irrigation that cause difficulties in governance. They are mainly 1) characteristics of the common pool resources, 2) an asymmetry between head-end users and tail-end users, 3) physical attributes, 4) social or community attributes, and the 4) various heterogeneities of irrigators. These factors affect the reasons why farmers might not commit to collective action.

### **3-1-2 Solutions for Collective Action**

This section explores the solutions for common pool resource problems. The author categorizes theories related to the solution of common pool resource problems into three approaches: 1) institutional approaches, 2) approach from the size of irrigation associations, and 3) approaches from the farmers' incentive mechanisms. The institutional approach focuses on the conditions of

institutions that enable to govern irrigation in a sustainable way. The approach from the size of irrigation association is concerned with the size of the institutions governing irrigation systems. The approach from the farmer's incentive mechanism discloses how the farmers are motivated to commit collective action to govern irrigation systems.

#### **a) Institutional Approach**

Tang (2002) argues that institutional arrangements can mitigate the perverse effects of situations created by the physical and community attributes of irrigation systems. Institutional arrangements require two factors: operational rules and collective-choice arrangements. Operational rules define who can participate in which situations. The collective-choice arrangements are the arrangements or conditions which facilitate the functions of operational rules. Operational rules are 1) to identify boundaries of the number of members (numbers, tenure, share of duties as members etc.), 2) to prescribe the water allocation rules (fixed percentage, fixed time slot, and fixed order), 3) to prescribe the types and amounts of resources required of each cultivator, and 4) to punish rule-invaders to keep rules in order.

The collective-choice arrangements are the arrangements or conditions which facilitate the functions of operational rules. Collective choice arrangements have multiple levels of collective-choice entities and collective-choice rules. Tang explains that different sets of collective action rules and different communities of participants may be involved in collective-choice situations. Also, depending on their attributes, different collective-choice entities may be constituted to exercise collective-choice prerogatives on behalf of the users and other concerned parties. Collective-choice rules are used to monitor the people's action from the perspective of whether they follow operational rules. These rules and sets of conditions determine the incentives of farmers to commit collective action to mitigate the negative effects of irrigation systems (Tang 1992).

There is research which focuses on the conditions of the establishment of institutions which determine the quality of irrigation governance. Ostrom (1990) finds similarities among enduring, self-governing common pool resource institutions, and organizes the principles that characterize all of the robust common pool resource institutions. She gives eight design principles of long-enduring common pool resources institutions: 1) Individuals (or households) who have rights must be clearly defined, 2) appropriation rules are related to local conditions, 3) most individuals affected by the operational rules can participate in modifying the operational rules, 4) monitors are accountable to the appropriators, 5) appropriators who violate operational rules are likely to be assessed with graduated sanctions by other appropriators, by officials, or by both, 6) appropriators and their officials have rapid access to low-cost local arenas to solve conflicts, 7) the rights of appropriators to devise their own institutions are not challenged by external governmental authorities, and 8) for common pool

resources in a larger system, appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises.

Ruttan (2008) conducts a quantitative analysis to assess the conditions where economic asymmetry brings negative effects on collective action over management of the commons. His conclusion suggests two conditions: 1) economically advantaged individual(s) gain from providing the collective good, and are thus willing to pay a greater share of the costs, and 2) the actions of one or a few individuals provide sufficient positive externalities to provide good for all. In an irrigation association it could be the leader who can satisfy the second condition, and also who are financially better off and more dependent on the irrigation systems than the other members. This could suggest that the quality of leadership is a key factor of a successful irrigation association. Fujiie (2003) also finds that the excellence of leadership in an irrigation association as a dependent variable to explain a functional irrigation association. These two theories focus on qualities of leaders to govern irrigation systems to solve the irrigation management problems.

#### **b) Approach from the size of irrigation associations**

In addition, there are studies which argue that the size of the irrigation systems affect the quality of the governance of the irrigation systems. First of all, Vincent (1990) claims that small scale irrigation systems are governed more effectively and more sustainably than larger irrigation systems. He argues that this is because a participatory approach can fully match the abilities of the farmers' management of small irrigation systems.

Ostrom (1990) especially exemplifies the Philippines which is famous for its small scale and traditional style of irrigation associations which are successfully managed, called "*zanjera*". Nozawa (2002, 2009) also describes *zanjera*. A *zanjera* is a traditional small scale irrigation association, which was established to construct and maintain dams and canals by themselves. The dams are made from local materials such as bamboo and wood, and they have been usable since the Spanish occupation era. A *zanjera* is an irrigation association which was established by farmers, so their irrigation techniques are based on social capital that has originally existed in those communities. Additionally, a *zanjera* is maintained in a way conflicts among the members can be avoided. For example, the land was converted and each farmer received almost the same size of land. Depending on the size of land allocated, called "atar", the share of water rights (the amount of water they can receive) is calculated. The farmers in a *zanjera* have to provide labor and engage in collective action needs. Also, they have methods of enforcing and monitoring the systems of collective action (Nozawa 2002, 2009). Nozawa (2003, 2006) also finds that some *zanjeras* were integrated into the national irrigation systems (NISs) constructed by the NIA. In addition, she finds that the NISs that made use of the functions of traditional *zanjeras* function better than the NISs that do not have *zanjera* functions.

### **c) Approach from the farmers' incentive mechanisms**

As a third approach, there is some research which focuses on the farmers' incentives to govern the irrigation systems that determine the quality of irrigation systems. Lam (1998) studies irrigation management in Nepal and finds that the incentives for farmers to contribute to operation and maintenance (O&M) are as follows: 1) when farmers perceive that they are able to reap the long-term benefits of engaging in collective action they contribute to collective actions, 2) when farmers are aware of their interdependence and also viability of working with one another for mutual benefits, they contribute to collective actions, 3) when a set of rules is in place that counteracts perverse incentives and provides positive incentive for cooperative activities, they contribute to collective actions, 4) when the set of rules is credible, commonly understood, well-enforced and agreed upon, they contribute to collective actions, and 5) when the set of rules is on the basis of mutual trust of members, they contribute to collective actions.

Also, Freeman (1992) argues that a significant factor of "fare water share" to overcome the head-tail problem is that water volumes irrigators receive are proportional to the share of the water fee, and to their influence at general meetings of irrigation associations. It is also important that irrigators can measure the amount of water they received at their paddies. The costs farmers bear must be proportional to the water volume they receive. This is the critical point of the effective water user's association. However, this policy is difficult to implement if the ISF is determined by the government as in the Philippines. Also, many of the south-east Asian farmers irrigate paddy to paddy, so their water share can neither be measured exactly nor proportional to the water volume they receive.

In addition, Inspired by Freeman's idea, Kakuta (2008) points out that irrigation associations in the Philippines do not have systems to realize fare water share. She thus argues that it is necessary to have volume meters at the gates, and that checking the water amount they receive needs to be strictly enforced, to which the rate of the ISF is subject. Also, Freeman comments that it is advisable to have check gates and weirs to ensure each paddy stops paddy-to-paddy farming.

Dozina, Kikuchi and Hayami (1978) claim that farmers are not motivated to participate in irrigation projects because they expect high rates of return which contribute to the whole community. However, they argue that individuals participate in irrigation projects only when each farmer expects that a project will generate substantial benefits for him/herself. The distribution of the benefits among the members within a group is an important factor that determines whether a farmer joins a project. These theories show that knowing how much water each farmer receives becomes an incentive for the farmer to participate in collective action.

The World Bank (1998) reports that the factors to improve irrigation management in India are: 1) institutional reforms to give further incentives for irrigators to maintain their systems, 2) no

dependency on the national irrigation administration, but inducing private sector and community driven irrigation maintenance, 3) raising the rate of the ISF to cover full costs needed for O&M, and 4) funding maintenance by rehabilitating systems among the others. These factors also give incentive to the farmers to govern irrigation systems better.

This section has explored three approaches to solving the problems of common pool resources: 1) the institutional approach, 2) an approach from the size of irrigation associations, and 3) an approach from the farmers' incentive mechanisms. These approaches explain the theories to solve the common pool resource problems. The next section focuses on the relationship between farmers and the government in sustainable irrigation management.

### **3-1-3 Governance of irrigation**

The previous section explored the issues and solutions of common-pool resource problems in irrigation management. This section discusses how the actors can approach the issues with a focus on the relationship between irrigators and the government. The participatory approach is a method to facilitate irrigation management (Satoh et al. 2007). This section also discusses methods the government should use to encourage farmers' participation for sustainable irrigation management.

Based on a study in the Philippines and Sri Lanka, Groenfeldt (1988) argues that the joint management of irrigation sources involves both the government and farmers in a common task. He argues that potential benefits to the government include lower costs and greater productivity, and that potential benefits to farmers include more profitable and secure agriculture, as well as stronger and more effective community organizations. Thus, according to his theory, both parties have gains, and the farmers' participation is a solution that costs least to achieve high agricultural productivity.

Tang (1992) suggests that the self-governance of irrigation systems by irrigators has several advantages, but he notes that farmers usually do not organize irrigation associations automatically. He argues that whether farmers develop abilities for self-governing is often affected by design and policies. How the government deals with the irrigation governance affects irrigators' incentives to participate in the governance. A good incentive structure within the government agencies leads to the farmers' participation to improve the overall performance of an irrigation system. However, the bureaucracy hinders cooperation among farmers, and ineffectiveness in collective-choice action prevails in many bureaucratic government agencies of developing countries. Thus, he concludes that it is important to 1) to restructure the government agencies, 2) to develop financial mechanisms that link the financial rewards of agencies in O&M, 3) to attract engineers to deal with farmers' issues, and 4) to develop a mutual relationship between the government and self-governing organizations (Tang, 1992)

Lam (1998) argues that the ideal governance system for successful irrigation management is farmers-led governance. He argues that the governance structures of the farmers' governing irrigation system tend to emphasize problems, and that such a governance structure does not enable farmers to allow social capital to evolve or to accumulate. Also, he argues that the government system to govern irrigation systems should be decentralized. Additionally, since he claims that individuals can be opportunistic and short-sighted within a particular vision, external assistance plays an important role.

To sum up the theories discussed in this section, the government is still an inducer, a facilitator in finance, or an information think-tank, and irrigators should shoulder the costs of O&M. The government officials should mobilize more local resources, especially the knowledge of irrigators. The next section examines the issue of irrigation service fee payments in the Philippines, which is one of the crucial collective action issues.

## **3-2 Social Capital**

### **3-2-1 Definition**

Social capital is defined in various ways without reaching any agreements (Grootaert and Basterlaer 2002). Social capital is the concept that focuses on human relationships and societal ties among people as capital people can invest in to receive benefits for individuals or the whole society and works as an informal safety net. Coleman (1988) states that social capital exists in the structures of relationships between actors. He finds the forms of social capital in 1) obligations, expectation, and trustworthiness of structures, 2) information channels, and 3) norms and effective sanctions. Narayan (1999) argues that social capital is relational, and he defines social capital as 'the norms and social relations embedded in the social structures of society that enable people to co-ordinate action and to achieve desired goals.' Lin (2001) argues that "social capital consists of resources embedded in social relations and social structure, which can be mobilized when an actor wishes to increase the likelihood of success in a purposive action." These definitions focus on the relational aspects of social capital.

Another definition focuses on the forms of social capital. Putnam (1995) defines social capital as features of social life, networks, norms, and trust, which enable participants to act together more effectively to pursue shared objectives. Uphoff (1999) gives categorization in the form of social capital. He defines social capital as "an accumulation of various types of social, psychological, cultural, cognitive, institutional, and related asset that increase the amount (or probability) of mutually beneficial cooperative behavior." He categorizes social capital into two types: 1) structural social capital, and 2) cognitive social capital. The structural social capital includes "roles, rules, precedents

and procedures as well as a wide variety of network that contribute to cooperation, and specifically to mutually beneficially collective action” (Uphoff 1999). He continues to argue that cognitive social capital includes “norms, values, attitudes, and beliefs that derive from mental processes and that contribute cooperative behavior and mutually beneficial collective action.” It seems that social capital becomes the basis of realizing collective action.

There is another categorization of social capital. Woolcock (2001) suggests three types of social capital: bonding, bridging, and linking. Bonding refers to relationships between families, close friends, and neighbors. Bonding social capital is stronger than bridging social capital in essence. Bridging social capital refers to the relationships between distant friends, associates, and colleagues. Bridging social capital refers to connections between people who share broadly similar demographic characteristics. Linking refers to the relationship between people who have power to gain knowledge, information, and resources (Woolcock 2001).

For example, Woolcock’s definition is used in the report of The National Economic and Social Forum (2003). This report defines bonding as relationships between people like you for getting by in life, and bridging as the relationships between people not like you forgetting on in life, and linking as the relationships between people at a different step in the social ladder for obtaining access to resources and knowledge. Also, it says that “a mix of bonding, bridging and linking social capital is desirable because too much of one without the others can distort the benefit of social connections.” In this way, Woolcock’s definition is applicable to the policies.

Ostrom (2000) argues that social capital takes any forms, but there are similarities in the forms. She argues that individuals who devote time to constructing patterns of relationships among humans are building assets whether consciously or unconsciously. Also, she states that social capital is formed over time and is embedded in common understanding, which is hard to articulate in languages, and which is eroded if large numbers of people are concerned or if a large proportion of participants change rapidly under some condition. In addition, she finds the characteristics of social capital as follows: 1) social capital does not wear out with use but rather with disuse, 2) it is not easy to see and measure, 3) it is hard to construct through external interventions, and 4) national and regional government institutions strongly affect the level and type of social capital available to individuals to pursue long-term development efforts (Ostrom 2000).

Also, there is a critique about social capital. Harriss (2002) argues that the World Bank attempts to politicize “depolicizing” development issues or poverty issues by using and mystifying the concept of social capital. He argues that regarding human relations as “capital” is a discourse of neo-liberalism only to reduce costs of the government with exaggerating the role of civil society or citizens, members or beneficiaries rather than the government (Harriss 2002).

However, social capital is basically based on the interpersonal relationships and that brings about the outcomes of collective action or investment in human capital. For this research, the

definition of Woolcock (2001) was especially selected though all of the definitions overlap somehow each other. This is because the definition of Woolcock is easier to apply when measuring social capital when compared with the other definitions.

### **3-2-2 Functions**

Social capital has several functions that help improve individuals and societies. For example, in Ireland, it is reported that weak social capital leads to less profits, poverty, crime, and low performance of pupils at schools and communities (The National Economic and Social Forum 2003). Coleman (1988) argues that social capital is especially important because it creates human capital in future generations. Based on a study conducted in a rural area of Tanzania, Narayan and Pritchett (1999) find that social capital and households' income levels are positively correlated. Putnam (2001) states that the critical factor is social capital that makes the difference in the development of political systems in northern and in southern Italy. He also states that in modern America, social capital is declining and it impairs the qualities of civic engagement.

However, social capital does not always function well for individuals and societies. Ostrom (2000) argues that all forms of social capital can produce harm. Mafias or gangs are the examples. Also, Knack and Keefer (1997) deny the correlation between associational ties and economic performance. Social capital can work negatively if individuals are bound by norms or social structure to restrict and control mutual benefits among the actors (Gargiulo and Benassi 2000) (Portes 1998). Thus, in theory, social capital works both positively and negatively.

The theories of social capital are applied to development projects and the policies that aim to strengthen organizational capacity (JICA 2002) (MAFF 2007). Uphoff and Wijayaratna (2000) verify the role of an irrigation organizer as the catalyst who facilitates farmers to engage in collective action for sustainable irrigation management. The organizer makes both formal and informal agreements that enable efficient water allocation, and they regard the collective action that is mutually beneficial for irrigators as social capital. Ostrom (2000) stresses the importance of strengthening social capital by maximizing its positive effects on physical and human capital, and that social capital affects physical and human capital that affects productivity and growth. When Lam (1998) argues about the roles of physical and social attributes of irrigation systems, he also considers the organizational structure that is based on human relationships. Physical, human and social capital has to be coordinated to increase productivity.

Woolcock (1998) explains two dimensions of social capital have implications for development policies: 1) bottom-up approach, and 2) top-down approach. The bottom-up approach facilitates integration of intra-community ties (bonding) and linkage of extra-community networks. The top-down approach promotes the synergy of state-society relations and the integrity of cohesive



corporate ties created by autonomy. Autonomy refers to whether community members have access to non-community members both at the micro level and at the macro level, and whether politicians have professional ethos and commitment to pursue collective goals. His approach focuses on structural relationships among stakeholders. Lin (2001) explains social capital in the context of human networks, and she also finds structural relationships among people.

Theorists use different methods to assess functions of social capital. Ostrom (2000) uses game theory to assess the incentive mechanisms of farmers who bargain over their net-benefits. Woolcock and Narayan (2000) discuss four perspectives to analyze social capital: 1) communitarian approach, 2) network approach, 3) institutional approach, and 4) synergy approach. The communitarian approach focuses on the number and density of organizations. As a group has more density, the stronger social capital becomes. As homogenous entities bring about more benefits, the stronger social capital becomes. The network approach focuses on the significance the vertical and horizontal relationships in social, economic, ethnic, and gender differences. This approach is useful for analyzing intra-community relationships (bonding) and inter-community relationship (bridging) in organizations, communities, and societies. It is also useful to analyze the relationships between societies and governments. The institutional approach applies the idea that the vitality of a community results from the political, legal and institutional environment. The Synergy approach gains lots of empirical support, and stresses the synergy effect on governments and citizens.

There are several approaches to examine social capital. Put all together, this thesis defines social capital as human networks and ties that bring about collective action. Social capital is the basis that prepares institutions that enable sustainable irrigation management. In order to analyze the relationships among people, this thesis adopts the concept of three types of social capital suggested by Woolcock (2001): bonding, bridging and linking.

### **3-3 Social Capital in the Philippines**

This thesis chooses to study the case of the Philippines. It is plausible to suspect that the factors that inhibit IAs in the Philippines from operating and maintaining the irrigation systems effectively may have something to do with what Filipinos are and how they interact each other, which become the components of social capital. Thus, the following sections employ the concept of social capital and examine the people and society of the Philippines.

#### **3-3-1 Filipino Traits**

Any nationality possesses various unique traits, but it is difficult to discuss the general traits of one nationality because the discussion can be biased and general traits do not describe each person with unique characteristics. Filipinos also have various traits which are difficult to categorize.

However, languages characterize the people who use them. This section introduces four Filipino terms in the context of irrigation management; “Pakikisama”, “Hiya”, “Kanya-Kanya”, and “Utang-na-loob.”

“Pakikisama” is the term meaning getting along well with others (UCFFCP 2011). “Pakikisama” is the Filipino word meaning faithful camaraderie (Zulueta and Nebres 2008). “Pakikisama” means good public relationships or avoidance of open disagreements or conflicts with others (Panopio and Raymundo 2004). Filipinos also value social justice to share good fortune to the unfortunate people (Agapay 2008). As is described in the word “Pakikisama” Filipino farmers may get along with other farmers by complying sets of rules of irrigation associations.

“Hiya” is translated into the “feeling of embarrassment one gets when he perceives himself as socially acceptable for whatever reason” (Andres 1994). Filipinos are shame-oriented and care deeply for social approval (Panpoio and Raymundo 2004). Timbreza (2003) argues that Filipinos are diplomatic in that they avoid conflicts and violence because they respect others and value peace. Filipinos are conciliatory and accommodating and value tolerance and perseverance, but these values can work in negative ways when exploited by authorities. This is known as “hiya” (Timbreza, 2008). Filipinos care a lot about shame and fame for their personal dignity, and they obey authorities. The value of “hiya” impinges on the wrong-behaviors in relationships of reciprocity (Hollnsteiner 1963). Filipinos fear or shame their authorities and they have a “don’t be caught” attitude, which is equal to “Palusot,” “oagkukunwari,” or “kaplastican” in Filipino words. These words mean that as long as the wrong behaviors are not known by the authorities, people do not care about committing to wrong-doings (Agapay 2008). This “hiya” trait could lead Filipino farmers to pay the ISF because they want to get social approval, but at the same time this trait could discourage Filipino farmers to pay the ISF as long as they are not caught by BRISIA or the NIA.

The farmers interviewed in 2009 for this research often used the term “kanya-kanya” and said that some farmers are “kanya-kanya,” meaning that they do not follow the rules of their communities. “Kanya-kanya” is a term meaning “individualistic” or “selfish” if it is negative, and it also means “voluntary” or “self-serving” if it is positive. In both ways, the feeling of “kanya-kanya” generates envious feeling about others, and Filipinos also tend to be jealous if others have honor or prestige as the results of their hard work. In this way, “kanya-kanya” syndrome leads to non-cooperation among members of the society (Zulueta and Nebres 2008). The interviews the author conducted in 2009 reveal that the farmers have become more “kanya-kanya” than before and no longer work together for farming as they did before.

A Filipino term “Utang-na-loob” means “debts of gratitude” or “debts of the inside.” Andres (1994) states that “this is the principle of reciprocity incurred when an individual helps another,” and that “(t)he person helped then feels an obligation to repay the debt in the future when the helper himself is in need of aid, or he may repay his debt by sending gifts.” This value prevails

in any transactions including employment at public offices. This also works when people take advantage of others and in times of corruption and graft (Jacano 1999). “Utan-na-loob” also works to prevent tenants from becoming leasers, especially when landlords are families or friends (Hayami and Kikuchi 2000).

These Filipino terms explain some Filipino attributes and thought processes though they may not be unique only to Filipinos. This section introduced the concepts that can describe some Filipino traits which becomes the basis of social capital in the Philippines. The next section will closely study the Philippines society.

### **3-3-2 Filipino Society**

This section examines the characteristics of the Filipino society. About 35% of total population of the Philippines engages in agriculture in 2011 (The World Bank 2012), and farmers in the Philippines are in poverty. That is why it is important to separate the rural society from the general society in this discussion.

#### **a) Nationwide**

Abad (2005) argues that social capital in the Philippines has three main traits. Firstly, they have extremely strong bonding among families and close friends. He also finds that the networks of families and friends may be the only way to find caregivers, secure funds, seek consolation, get a job and even perhaps to gain a promotion. This mechanism makes it difficult to build ties outside of the circles and to have an active public life. In the Philippines, the networks of families and close friends usually offer social and economic security for individuals, and ritual kinship also plays an important role to enhance both family networks and non-family networks.

Secondly, Philippines society has a paucity of associational ties (bridging social capital) and asymmetry of social capital in that people’s trust is likely to come from the ranks of privileges of a person (Abad 2005). Abad (2005) also illuminates that weak bridging social capital in the Philippines; the weakness in bridging social capital minimizes participation to various organizations (except for the religious or sports groups) even though the public and private agencies have made various efforts to get people involved into more activities. The trait may lead to mistrust of strangers in the Philippines.

Thirdly, Abad (2005) articulates that the national survey reports that the society of the Philippines is in asymmetry of social capital in that the society has disparities in gender, socio economic status, residence, and age or marital status. Males, urban residents, those better-educated, and people who have higher family income or possess better stocks of social capital can be privileged in Philippines society.

### **a) Rural society**

In 2000, the rural population in the Philippines was 52.4% of the total population (Raymundo 2004). In 2009, the rural population in the Philippines was 34.3% of the total population (IFAD 2009b). The International Fund for Agriculture Development (IFAD 2009a) reports that 80% of Filipinos in poverty live in rural areas. They are dependent upon subsistence farming.

The Philippines has a “barangay” unit, which is the smallest political unit that has the right to levy taxes and the legislative and police power (Busto 2008). A barangay refers to communities consisting of 1,000 inhabitants residing within a city or municipality and is administered by a group of elective officials (Guillermo 2010). Raymundo (2004) states that a barangay is based on the mentality called “*Gemainschaft*,” which includes close kinship and hostility towards their neighbors. The family is central to a Filipino's identity, and many “*sitios*”, which are territorial enclaves that form a part of barangays in rural areas<sup>2</sup> and are composed mainly of family relationships (Dolan 1991).

The rural Philippines has a “*bayanihan*” system. Guillermo (2010) defines a *bayanihan* as a group spirit or teamwork and it denotes an atmosphere of unselfish cooperation in a community activity such as the sharing of labor for the common good. In Laguna, the practice of *bayanihan* was called “*Tornohan*”, meaning cyclical reciprocal labor arrangements for plowing and harvesting. It obliges participants to reciprocate favors through offering equivalent labor to support each other (Tolentino 2009). In this system the members of an irrigation association are expected to help plowing and harvesting at each member's plot until all plowing and harvesting work is completed at all members' plots. Suppose there are 10 farmers for land preparation; it takes 10 days in total for 10 farmers to prepare land for all farmers in rotation. Based on this definition the practices of “*bayanihan*” which means people cooperate without payment such as for cleaning canals or dikes, are not traditional styles because there are no rotations of labor (Tolentino 2009).

Hollnsteiner (1963) finds that before the 1960's rural societies already had options to practice in *bayanihan* or to have contractual relationships for large scale tasks except for in the remote areas of the Philippines that had not been dominated by the cash economy yet. Tolentino (2009) states that by the 1970's, the green revolution began, and the labor market developed at that time, when people preferred waged employment to *bayanihan*. Agricultural technologies the green revolution brought were labor-intensive. That is why labor in a community was replaced by waged labor. Banking developed for waged people, so the labor market became agriculture dominant (Ballescas 1995).

---

<sup>2</sup> The definition of “*Sitio*” is from Wikipedia, accessed August 12, 2011.

Also, Castillo (2006) argues that farmers feel spending time for income producing activities is more worthwhile than committing to bayanihan. Leasing machines and hiring labor are less expensive than affording foods for people for appreciation as bayanihan. He admits that wages have been escalating. Ballescas (1995) finds that the implementation of irrigation schedules and the introduction of new agricultural technologies made farmers' activities fixed and stable, which reduced interaction and communication among farmers. He also finds that collective action among farmers was rarely seen, which increased conflicts because farmers aim to gain more than the others. Probably that is why the bayanihan in irrigation construction Solis (1991) reported became a news article. In this case, irrigators collected 5P (about 10 yen) donations per day from 70 farmers in the community in order to construct a main canal.

Nowadays bayanihan for young generations refers to any cooperative work without payment and cooperative work for the communities. The meanings of bayanihan today are: 1) reduced expenses for food, drinks, and festivities, 2) exchange requirements that are less tied on a one-to-one basis to specific tasks, 3) some attempts to accommodate the landless groups in exchange, 4) hiring someone to replace ones' labor contribution in exchange, 5) appearance of "paid exchange labor" via reciprocal hiring of each other (Castillo 2006).

These are some main characteristics of Filipino society. Though bonding social capital seems to be strong at any time, the bridging social capital seems to be weakened over time in farming lives as well as in the daily lives of Filipinos. The next section will focus particularly on the influence of agrarian reform on the society of the Philippines.

### **3-4 Agrarian Reform in the Philippines**

In context of social capital capital in farming communities, land tenure matters because the tenure forms relationships among farmers. The agrarian reforms in the Philippines frame the tenure of farmers. Therefore, this section will explore the issues in historical relationships between land and farmers in the Philippines.

The Spanish regime (1565-1898) created share tenants who paid the fixed rate of the share of their harvest to landowners. "Hacienda," a huge plantation based on political power that resulted in landlordism for commercial crops was cultivated by both share tenants and daily paid labor. Under the American regime (1898-1946), land monopoly rapidly expanded to provide Americans with the right to obtain farm land and it helped them run large farm operations. Since the Spanish occupation brought about "hacienda," the Philippines experienced poverty that was partly caused by land monopoly. This inequality in land distribution in the Philippines caused unrest and anti-government political communist parties such as the New People's Army organized by tenants in Central Luzon who wanted land to own and till (Aralar 2007).

The Marcos Regime (1972-1986) was notorious as a dictatorship which implemented martial law to bestow absolute power to the president (Zaide and Zaide 2004). However, President Marcos implemented several historical policies that gave priorities over rice farmers such as land reform in 1972. In this reform, the government purchased holdings bigger than 7ha and parceled out the land to rice farming or corn crop rotation tenants. Hayami and Kikuchi (2000) present that there are two steps in Marcos's Martial Law proclaimed in 1972: operational leasehold, and operation land transfer. Operation leasehold converted share tenants that paid their share of the crops, into leasehold tenants who paid rent. Operation land transfer transferred land ownership to the tenants. In this operation, the government expropriated land in excess of the landlords' retention limit. The land taken away by the government was resold to tenants (Hayami and Kikuchi 2003). President Marcos's land reform targeted only farm lands for rice and maize, and beneficiaries were limited to tenants. Seasonal labor was excluded. The majority of farmers (almost half in rural areas) were landless agricultural labor, who could not receive any benefits from the land reform. Also, the annual rate to amortize land costs was a large burden for farmers, so they were not fascinated by the program; the land reform targeted larger sized farmers, and small-sized farmers who could not amortize were degraded to tenants. Also, the landowners oppressed this program to suspend it (Balisacan and Nozawa 1994). The cultivated land by tenants increased from 1971 to 1980, though this program excluded the landless labor that composed of 66% of rural labor at large-sized farming in 1979 (Ballescas 1995).

Filipinos strongly wanted to the end this dictatorship, and the movements resulted in a revolution that brought President Aquino into power (1986-1992). In 1988, President Aquino enacted the Comprehensive Agrarian Reform Programme (CARP). Aralar (2007) defines CARP as an integrated plan to raise agricultural productivity and improve poverty and to transfer land ownership from the landlords to the tillers. Farmers appreciated CARP because it targets all cultivating land and all types of agricultural labor, and people praised President Aquino because he brought democracy back to the Philippines. CARP was complex and consumed a significant amount of effort to interpret legally. Kasuya (1995) evaluates CARP as a failure because the redistribution of land was not effective due to democratic procedures; the Aquino government prioritized establishing a democratic institution, so the implementation of CARP was under an oppressive power. The main change CARP stipulated was that limits of ownership for land increased dramatically (Umehara 1998). CARP defines qualified beneficiaries as all people who engage in farming, and a qualified beneficiary was allowed to own three hectares of agricultural land (Aralar 2007). Borras (2001) evaluates CARP as a significant success that achieved land redistribution. He finds that 60% of targeted land was distributed by 1999, which seems to be inflated. In 2008, 80% of land redistribution was accomplished, and 1,057,217 ha of land still needed to be redistributed (DAR 2008). The areas that will be distributed are private land contentious for redistribution. However, President

Gloria (2001-2010) counted on landlords, so the process of CARP was slow. Borras (2001) criticizes that the implementation process of CARP was state-centered, and that it had to be more interactive with society.

Aralar (2007) finds that there are two types of agricultural tenancy relations existing in the Philippines today: 1) share tenancy and 2) leasehold tenancy. Share tenancy was abolished by the law of agrarian reform, and leasehold tenancy became legal after the agrarian reform. There are three differences between the two relationships. First of all, share-hold tenants can choose to shoulder any one or more of the items used for production, but in leaseholds tenancy, tenants or lessees always shoulder all items of production except for land. Secondly, in share tenancy, tenants and landholders are co-managers, while in leasehold tenancy, a tenant is the sole manager. Thirdly, in share-hold tenancy a tenant and a landowner divide the harvest in proportion to their contributions, whereas in leasehold tenancy the tenants or lessees get the whole harvest as long as they pay the rent, which cannot be equivalent to more than 25% of the average normal harvest (Aralar 2007).

Labor can be classified into two types: casual labor or permanent labor. Farming labor retains some power to make decisions about which labor to choose. Both types of labor get paid in-kind (palay) by the farmers who own the land. However, the labor is carefully employed by land owners permanently or casually to avoid accusations in the landlord-tenant relations (Castillo 2006). Usually farming households prefer to use family labor, but if needed they hire labor; they do not exchange labor as bayanihan. Also, they prefer to have contractual labor rather than casual labor, since farmers regard contractual labor as more professional (Genilo 2005).

### **3-5 Social Capital and Irrigation in the Philippines**

The characteristics of communities influence irrigation management, because it is concerned with both technical and human issues. Especially, Asian models of irrigation related activities are embedded in social institutions based upon daily life. The models represent social capital as members and knowledge about decision-making, monitoring, and sanctioning (Denizen-Dick 1997). The way irrigation involves human and society helps create institutional arrangements to share water fairly among the members of irrigation associations. If farmers are not satisfied with the water allocation, they would first need to agree upon what institutions, systems, and rules they need to realize this fact. The satisfaction with water allocation is correlated with the amount they can harvest; if farmers receive a good harvest, they are satisfied with the water allocation unless there are other factors coming into play such as rat infection. The satisfaction with water allocation is the decisive factor for irrigators (Duncan 1978), (Facon 2000). In order to improve the satisfaction of water allocation, it is necessary for farmers to participate in the decision making processes of the irrigation associations.

The motivation to participate in the decision making processes comes from the problems that they want to improve such as water distribution. In order to solve farmer's problems, the functions of the irrigation association have to be effective.

Farmers' participation accompanies costs. Farmers calculate whether the benefit of participation is larger than the costs they have to incur. Meinzen-Dick (1997) articulates that the best test of the outcomes of farmers' participation is to see whether farmers continue to participate based on their expected costs and benefits which are determined by the chances of voicing concerns about water allocation. Whether the irrigation association can be effective enough to consider the interests of all irrigators would depend on the strength of social capital of the association. This social factor plays an important role to make irrigation associations effective and make irrigation management sustainable.

Kakuta (2001) describes that one of the social factors unique to the Philippines is the "patron-client relationship" in irrigation management. She finds that the "patron-client relationship" prevails in any social relations in the Philippines. For example, it exists in relationships between barangay captains and villagers, land-owners and tenants, and employers and employees. They are tied with the 'debts of gratitude'; those who have more social-political or economic power gain social recognition and prestige from people, and they are expected to officially or personally help the citizens who chose them to be in the positions. This relationship also works to help solve financial or family issues (Kakuta 2001). Kakuta (1994) finds that the ties based on the "debts of gratitude" actually helps solve the issues involving water disputes between upstream and downstream irrigators. This is one way social factors contribute to achieve fair water share.

However, indigenous culture does not always help achieve the fair share of water, but can also impede fair water distribution or irrigation management projects. Thus identifying indigenous culture and taking it into consideration is necessary to assess how solutions will work. Kakuta (2007c) argues that irrigation projects should identify indigenous cultures such as the patron-and client relationship and should change the local cultures, which is one factor that will help make projects successful and the impacts of the projects sustainable.

Kakuta (2007a) articulates that the NIA implemented a participatory approach that is based on a modernized law-based organizational approach, but she finds that in recent years the NIA shifted focus on local human networks and ties. She appreciates this change as a contributor to successful irrigation operation and maintenance. Also, she argues that identifying the best leader who can use the "patron and client relationship" to realize democracy and justice is the key to implement fair water distribution policies (Kakuta 1998). However, she notes that excessive dependency on leadership causes other problems for sustainability (Kakuta 2000).

There are other studies on using social capital in natural resource management in the Philippines. Dahal and Adhikari (2008) conducts a survey on forest management in the Philippines.



They find that the success factors of community action are cohesion and traditional norms among indigenous people, which shows strong bonding social capital. Quinones Jr, and Seibel (2000) conducted a survey on microfinance and social capital formation in the Philippines. They found that deregulation of finance to encourage microfinance led to social capital cohesion and to alleviate poverty. Cramb (2005) surveys that a land-care program in the Philippines created bridging social capital, and horizontal and vertical extra-community ties, and that it promoted the quality of services and land care initiatives. Matous (2007) finds that higher social capital leads to an advantage to access water better in a slum of the Philippines. Thus, all of these studies find that enhancing social capital is a key factor to improve community lives in the Philippines.

The other studies analyze factors to make irrigation management sustainable. Fujita et al. (2005) conduct a cross section analysis of the national irrigation system in the Philippines where collective action is rarely seen. They find that those places are where 1) the water is scarce, 2) water supply is in asymmetry, 3) the size of the association is large, 4) the population density is low, 5) the ratio of non-farm households is high, and 6) the history of irrigated farming is short. Kolavalli and Brewer (1999) argue that the performance of irrigation associations is most correlated with leadership, secondly correlated with expected benefits, and least correlated with support from external agents. They also find that the motivation to join collective action comes from benefits of participation after the transfer of some set of water rights to irrigation associations to secure their power. As it becomes clear in this section, there are very few studies on irrigation management from the perspective of social structures that can compose social capital in the Philippines. Thus, this thesis contributes to reveal some relationships between social capital and irrigation management, and to find factors that affect the low ISF payment in the Philippines.

### **3-6 Motivation for the Irrigation Service Fee Payment**

The Irrigation Service Fee (ISF) is collected from irrigators for irrigation use. In the Philippines, the fee collection performance of the system is measured by dividing irrigation fees which are actually collected by irrigation fees that are due (Bos and Murray-Rust, 1994) (Bos 1997). In the Philippines water cannot be appropriated without a water right acquired through a water permit, and the water permit of NIS belongs to the NIA (Raby, 1997). Water users have to pay the ISF to the NIA, which is calculated based on the size of the irrigated landholding and the type of irrigation system in either the wet or dry season.

The ISF collected covers the construction or rehabilitation of canals and the operation and maintenance (O&M) of irrigation facilities. The NIA sets the rate of the ISF based on the selling price of the *palay* (the Filipino term for un-husked rice). Though the NIA previously owned and managed irrigation systems in the Philippines, the irrigation systems have gradually been transferred

to farmers under the irrigation management transfe (IMT). The ISF is used to cover the costs of construction by the NIA and to cover the costs of the O&M of irrigation facilities (Raby 1997).

Malabed (1990) reports that the NIA did not receive any subsidies from the government, and that though the government upheld CARP (Congress of People's Agrarian Reform), which includes agendas such as subsidizing farmers' cooperatives or constructing irrigation facilities, the government could not achieve the targets because they lack financial means. The IBON Facts and Figures (2002) reports that the government provided the NIA with enough budget only for the construction of irrigation projects and not for O&M. Thus, the NIA relies on ISF payments for its O&M.

Since 2009's dry season, the rate of the ISF rose from 11 peso/kg of palay to 15 peso/kg of palay. The rate changed based on the selling price of palay set by the National Food Authority (NFA). At the time, the NFA raised the price of palay after the rice crisis of the previous year. However, the payment rate of the ISF did not increase. The payment rate remained around 40-50% across the country (Gamboa 2009). When farmers do not pay the ISF on time, the amount of the ISF accumulates on their back accounts. Late payments are subject to getting an extra charge of 1 percent/month. On the other hand, on time payments are subject to receiving a 10% discount (Mayeth 2009). In this way, the NIA tries to motivate farmers to pay the ISF on time. However, the ISF payment rate remained half of the amount that should have been collected.

The back account refers to the account of non-payments of the ISF. If farmers could not pay the ISF for a crop rotation season, the amount of ISF for a season goes to the back account. If the current account is smaller than the back account, their land can be taken away, though the deprivation has never happened in reality. The amount of late payment is counted by using the current price of palay, so if the value of palay increases the amount they have to pay increases. This mechanism makes it difficult for farmers who did not pay on time to pay back the amount accumulated on the back account (Gamboa 2009). Table 5 shows that the back account was expanding by 2001.

**Table5- Irrigation service Fee Collectibles and Collections in 2002**

(million pesos)				
Year	Current Account		Back Account	
	collectible	collection	collectible	collection
1993	609	271	2,665	60
1994	651	284	3,219	67
1995	605	266	3,254	82
1996	720	324	3,563	113
1997	813	385	4,095	125
1998	677	244	4,426	88
1999	697	252	4,681	78
2000	729	332	5,319	96
2001	749	391	5,815	97

Source: NIA (IBON Facts and Figures 2002)

The critical issue here is why farmers do not pay the ISF. The previous studies find several factors involving non-payment of the ISF. Applying the theories of collective action and social capital, the author categorized them as follows; 1) institutional arrangements that enable farmers to motivate farmers to pay the ISF, 2) infrastructure that enables the efficient distribution of water, 3) social capital, and 4) the amount of capital available for farmers.

**a) Institutional Arrangements and the Water Sharing System**

This factor involves the functionality of the irrigation associations (IAs) and whether they achieve fair water distribution within the IAs. As discussed in the previous sections, collective action to solve a common pool resource is related to the functions of the institutions, the size of organizations, and incentive mechanisms. Specifically, a water sharing system was discussed as the main solution of the head-tail problems in irrigation management. The following arguments find factors of the ISF payment in institutional arrangements of the IAs, and whether the IAs have mechanisms to fairly distribute water to the irrigators.

Yoshinaga (2009) studies the Balanac River Irrigation System to analyze incentives and penalty mechanisms to realize optimal water distribution. One of his

findings of the factor of non-payments of the ISF is that the Balanac River Irrigation System did not have any integrated rules and penalties about non payments, which caused problems including low collection rates. Also, Lauraya and Sala (1995) argue that the application of various degrees of pressures such as the use of judicial authorities in the collection process resolves ISF payment problems.

Macalalad (2005) also examines the penalty system of the Balanac River Irrigation System. ISF payments made after the due date are subject to a penalty which is calculated at one percent simple interest for every one month delay. She also claims several factors influence the ISF payment: 1) household expenditures, 2) administrative factors, and 3) granting discounts for the prompt payment and the imposition of penalties on delinquents. Household expenditures, especially emergency expenditures pressure the liability of the ISF payment. This point about the availability of capital for farmers be discussed later the section. She outlines administrative challenges as 1) the timing of the ISF collection, 2) non-satisfaction with the water delivery, and 3) farmer's hope for exemption.

By studying the irrigation systems in Ghana, Sato and Satoh (2006) find that in order to raise the ISF collection rate, it is important to raise awareness of the need for ISF payment by improving information transparency in associations' activities and fee collection, as well as by using some fee spending for their agricultural activities. JBIC (1996) claims that the ISF payment rate rose as the costs of participation increased, and that irrigation associations in a JSM contract (which incur more costs of participation), marked the better payment of ISF than those not in the contract. This survey concludes that it is significant that participatory approaches such as the JSM contract give incentives for farmers to pay the ISF. These above are the main arguments about the institutional mechanisms that incentivize farmers to pay the ISF.

By studying community irrigation systems (CISs) in the Philippines, Ota (2007) argues that there are several factors correlated with the ISF payment or free-riding. His study finds that water volume and the number of members affect sustainability and the occurrence of free riders. Free riders take advantage of public goods without incurring the costs of the goods. His study finds that: a) in small sized IAs with adequate water supply free riders appear at the time of dues collection, and the free riders increased over a few years until the collection ended, b) in middle sized IAs with insufficient water, free riding was well controlled, and c) in large sized IAs with insufficient water, many members were free riders, and payment was enhanced by improving water distribution. This argument is related to the size of the IAs and the water availability in the IAs.

Also, with respect to the relationships with water availability and the ISF payment, Kikuchi, Fujita, Marciano and Hayami (1998) find that there is a case where the water

master of an irrigation system distributes more water to the area which had the higher ISF payment rate. This behavior resulted in the resentment of the farmers from the area which had lower ISF payment rates. Eventually these farmers stopped payment because they introduced pumps. They also argue that it is natural that farmers along the NISs are not willing to pay the ISF because irrigation systems were constructed by the NIA without farmers' participation. While they practice rain-fed rice production they did not have to make any payment until the the NIA built the irrigation systems.

Reys (1978) discusses the relationships between the perception of the water available for farmers and the ISF payment. He argues that as long as farmers appreciate the available water from irrigation the important issue is whether they get the water for nothing or for "paying" for labor contribution or some other form of appreciation. Farmers do not always show their appreciation for water in the form of money payments. However, when the ties among farmers are formed, appreciation is shown through favors in-kind or in other ways.

#### **b) Infrastructure and Efficiency of Water Distribution**

This factor involves the technical aspects of irrigation management: whether the infrastructure enables the efficient distribution of water. This issue is also related with the equipment installed in canals or gates to measure water volumes. The following arguments focus on this issue.

Kikuchi, Fujita, Marciano and Hayami (1996) analyze why the Sta. Cruz irrigation system in Laguna deteriorated rapidly in a short period after its construction, and they find several factors to describe the deterioration. They find that the willingness to pay ISF depends heavily on the quality of water supply, and that the system was in a vicious downward spiraling cycle; the low quality of operation and maintenance caused low system performance, which caused low fee payments and resulted in low quality O&M.

Kakuta (2010) (2009) (2011) argues that the fare share system, for which the volume of irrigation water has to be measured at the gate of the plots, allows farmers to know how much water they use. This system convinces farmers to pay the ISF unlike the current system bills the ISF depending on the size of the plots.

In addition, Moya (1979) discusses that some of the farmers' negative behavior related to irrigation, such as checking, breaking embankments, and the closing and opening of turnout gates on purpose are in part associated with the physical factors of water distribution. She contends that the distance from the source of water is the most important physical parameter related to almost all farmers' behavior. The long distance from the water source, which should lower the amount the farmers receive, could be one of the

reasons why the farmers do not want to pay the ISF. The distance from the water source matters, probably because the infrastructure is not good enough to distribute water efficiently, or because the IAs fail to distribute water fairly within the IAs.

**c) Social Capital**

There are some studies which find the relationship between social capital and ISF payments. Calimlim and Orden (2004) find a significant relationship between ISF payment and age, educational attainment, tenure status, source of capital, price of palay, timeliness of water release, farmers' values and perceptions. Age, educational attainment, tenure status, and farmers' value and perceptions are components of social capital. The factors of source of capital and price of palay will be discussed later in this section. Timeliness of water release is related with the institutional arrangements that enable fair water sharing.

The following arguments find an effect of linking social capital to ISF payment. Kakuta (2007b) finds that the rate of ISF payment has difficulties in being increased even by external powers, and that often corruption prevails in irrigation associations in the Philippines. She argues that morale improvement is necessary to improve the rate of ISF payment. Moral improvement can occur by implementing new institutional arrangements or by identifying key factors in a local traditional system.

Nozawa (2001) argues that one factor of the non-payment issue is the fact that President Estrada (1998-2001) exempted all ISF payments in 1998. In order to compensate for income loss caused by the Elnino phenomena and the currency crisis that affected Filipino farmers, President Estrada reset the ISF rate to benefit small sized farmers (Nozawa 2001). Therefore, the trust in IAs and the government seemed to raise the rate of ISF payment.

**d) The size of farmers' capital**

The other arguments find the amount of capital available for farmers as the main factor affecting ISF payment. The farmers' income mainly depends on the size of the land they cultivate, price of palay, and the accessibility to capital. Also, the income size of the farmers is also very relevant to water availability, which was discussed in earlier in this section.

Cusi's (2004) analysis shows that the low collection efficiency of the ISF attributes to the inability of the average farmer to shoulder the burden of the ISF because of a lack of capital/ In addition, and local currency and inflation lead to low collection efficiency. Also, IBON (2002) argues that the payment rate is low if most of the farmers are marginal rice farmers who own only a hector per person. Due to their small income from rice farming,

those farmers can only afford their life expenses, and they do not have any money left for the ISF. It also reports that farmers who do not pay the ISF would not feel many benefits from irrigation for their small paddies.

As discussed above, Calimlim and Orden (2004) find a significant relationship between ISF payment and age, educational attainment, tenure status, source of capital, price of palay, timeliness of water release, farmers' values and perceptions. However, they claim that the price of palay is the most significant factor. In addition, Magallanes (1992) finds that the four factors are correlated; 1) the rate change of ISF collection, 2) sufficiency of annual income, 3) the index of control by farmers' groups, and 4) the incidence of borrowing from informal sectors.

These are the findings of the existing studies about the reasons and factors of farmers' non-payment of the ISF. There are relatively many findings about the relationship between institutional arrangements and the payment of the ISF, and the relationship between infrastructure that enable the efficient distribution of water and ISF payments. However, though social capital was discussed as the basis for institutions that encourage collective action in the earlier section, the relationship between ISF payments and social capital has not been the focus of many studies. Therefore, this thesis contributes to find and analyze the relationships between them.

# Chaper4

## Hypothesis

---



The gate to midstream  
(Photo taken Feb 25, 2009 by the author)



## 4-1 The Theoretical Hypothesis

Based on the literature review, this research leads to a theoretical hypothesis that has five components, two assumptions, and three hypothetical relationships (Figure 4). The five components are: 1) sustainable irrigation operation and maintenance, 2) the incentive for collective action, 3) social capital, 4) the institutional arrangement that enables the distribution of water in a fair way, and 5) the infrastructure that enables efficient distribution of water. The first assumption is that sustainable operation and maintenance of irrigation requires collective action including the farmers' ISF payment. The other assumption is that institutional arrangements and infrastructure are interlinked, but this thesis does not discuss the technical aspects of irrigation. The three relationships are: 1) the farmers' motivation for the ISF payment has relationships with the institutional arrangements that prepare a water sharing system and the infrastructure of irrigation enables the efficient distribution of water, 2) the two factors can be promoted by strong social capital, and 3) there is a relationship between social capital and incentives for collective action.



**Figure4: Theoretical Hypothesis**

With respect to the second factor, incentives for collective action, it should be noted that when farmers decide to participate in collective action, they have incentive for that action. The

incentive may be based on a self-calculation of costs and benefits to engage in collective action. The costs and benefits may be affected by social capital, the institutional arrangements, or the infrastructure of irrigation.

Fairness and efficiency used above should be defined. Bos and Murray-Rust et al. (1994) define that equality assumes the fairness of water distribution, and fairness requires irrigators to follow the water plans to make the water delivery equitable. Efficiency requires the water loss of conveyance to be minimal, which occurs due to seepage and evaporation. Bos and Murray-Rust et al. (1994) define efficiency as a measure of hydraulic conditions in a spatial context over a specific time and period, using some criteria such as overall project efficiency, conveyance efficiency, distribution efficiency, and field application efficiency<sup>3</sup>.

With respect to the first assumption about collective action to achieve sustainable irrigation management, collective action for sustainable irrigation management includes: 1) ISF payment, 2) preparing water rotation calendar, 3) holding and attending the meetings of the IAs, and 4) cleaning canals. This research regards the ISF payment as the most critical for sustainable irrigation management. The revenues from the ISF in the Philippines sustain the management of both the NIA and the IA under the transfer program. Both for the NIA and the IAs, their financial viability is critical to maintain successful irrigation management.

With respect to the second assumption, there are two explanations in the inter-linkage between institutional arrangements and infrastructure: 1) the institutional arrangements for fair water sharing can be achieved when the canals are suitable for efficient water distribution, or 2) the institutional arrangements such as preparing the water distribution calendar for fair water sharing can be achieved when the water is scarce and when the canals are not suitable for efficient water distribution. If farmers are satisfied with the volume of water available for them, they do not need a water rotation system or institutional arrangements that enable fair water distribution. For example, if an IA is located upstream of irrigation, the IA may not have any rules or meetings, because all farmers in the group may have sufficient water without any coordination among the farmers.

The first theoretical relationship between the ISF payments and the institutional arrangements and infrastructure was discussed in the previous section. With respect to the second relationship, where social capital is strong, there are better conditions in either or both institutional and engineering factors. First of all, if social capital is strong, farmers can cooperate to organize institutional

---

<sup>3</sup> Overall Project Efficiency = Crop Irrigation Water Requirement / Total Inflow into Canal System  
Conveyance Efficiency = Total Water Supplied by the Conveyance System /

Total inflow into the Conveyance System

Distribution Efficiency = Total Water Delivery to Fields / Total inflow into the Delivery System

Field Application Efficiency = Crop Irrigation Water Requirement / Water Delivery to Field

arrangements that achieve a fair water sharing system (water rotation system). Also, when farmers have strong relationships within an IA (if they have strong social capital), they can make use of their local knowledge, labor, or financial sources to organize the functionality of the IA that can bring about fair water distribution. In addition, strong social capital may induce the compliance of rules of an IA by the farmers. These consequences of the use of social capital would eventually strengthen social capital. Secondly, if social capital is strong, the relationships of farmers with other stakeholders such as designers or constructors of irrigation systems and among farmers would be strong, and that would help construct or rehabilitate the irrigation facilities that can distribute water efficiently. However, in this research it is assumed that technical aspects of the irrigation systems are given; this thesis does not examine the relationship between irrigation infrastructure and social capital.

With respect to the third relationship, if social capital is strong the farmers should be motivated to participate in collective action. Strength of social capital may have a direct relationship with the ISF payment. As discussed in the previous chapter, bonding, bridging, or linking may affect the motivation of the ISF payment.

## **4-2 The Working Hypotheses**

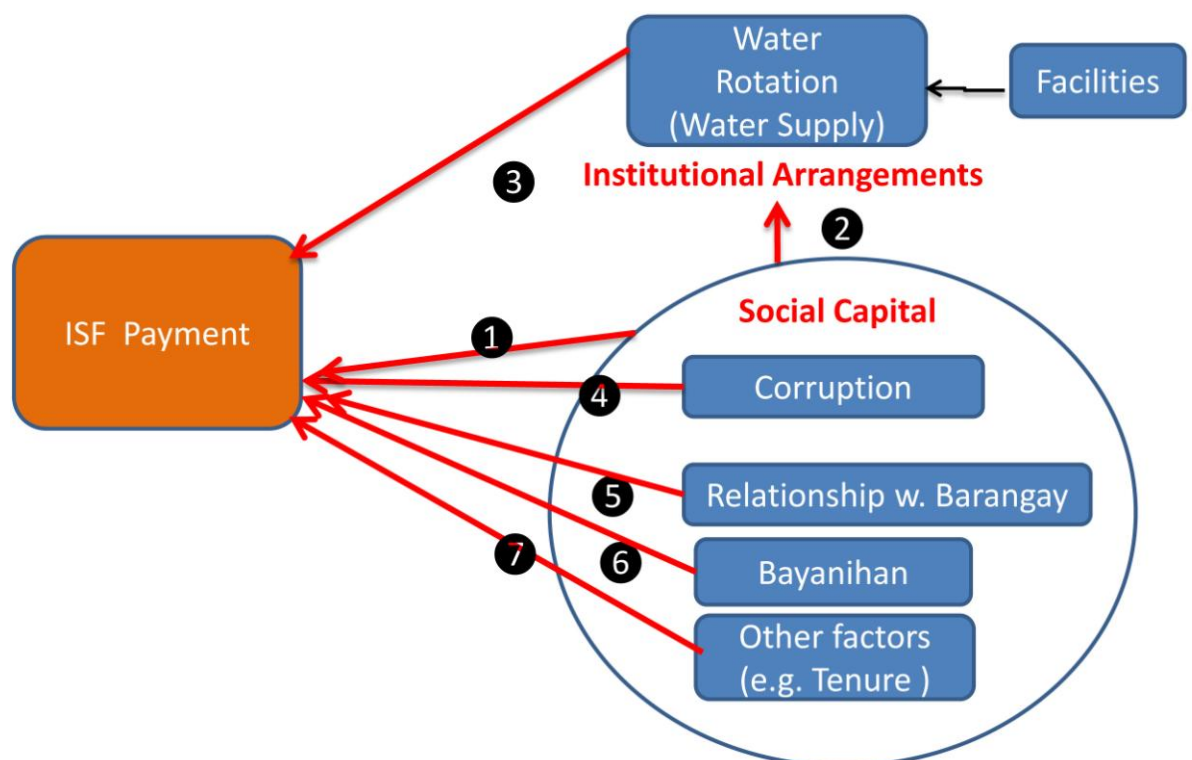
The theoretical hypothesis leads to several working hypotheses. Again, hypothetical relationships that compose the theoretical hypothesis and that have not been made clear are: 1) the farmers' motivation for the ISF payment has relationships with the institutional arrangements that prepare a water sharing system and the infrastructure of irrigation enables the efficient distribution of water, 2) the institutional arrangement and infrastructure are interlinked, 3) the two factors can be promoted by strong social capital, and 4) there is a relationship between social capital and incentives for collective action.

The first theoretical relationship can be attested by the working hypothesis: whether a water sharing system (water rotation system), which is a critical institutional arrangements, has any relationships with the ISF payment. The second theoretical relationship can be attested by the working hypothesis: strong social capital leads to functional institutions that can create a fair water sharing system. The third theoretical relationship can be attested by several working hypotheses depending on what components of social capital will be focused on. Based on the literature review, this research identifies the possible key components of social capital: bonding (especially focusing on bayanihan), bridging (especially focusing on the relationship with barangay captains), and linking (especially focusing on farmers' perception about corruption). Bonding, bridging, and linking can be measured by various components (such as the geographical variation, economic variation, and the

social status variation among farmers), so the focused components of each type of social capital should be hypothesized separately.

Therefore, the working hypotheses are as follow (Figure 5):

- 1) The irrigation association which has strong social capital has the high ISF payment rate.
- 2) An irrigation association which has stronger social capital creates a more functional irrigation association.
- 3) The irrigation association which has a water rotation system has a better ISF payment rate.
- 4) The irrigation association which has strong perceptions of corruption in the Philippines government (low linking) has low ISF payment rates.
- 5) The relationship between an irrigation association and Barangay affects the ISF payment rate.
- 6) Irrigation associations with stronger Bayanihan have a higher rate of ISF payment.
- 7) Whether there are any other possible factors of social capital that affect the ISF payment.



**Figure5- Working Hypotheses**

# Chaper5

## Methods

---



A deteriorated canal at midstream of Balanac River Irrigation System  
(Photo taken Feb 25, 2009 by the author)

## 5-1 Field Study

For this study, the author conducted an intensive field survey in the Philippines over 40 days at the Balanac River Irrigation System Association (BRISIA) in Laguna of Luzon Island. The author hired local assistants whose mother tongue is Tagalog and can speak fluent English; one person was related to the IRRI (International Rice Research Institute) and the other two were students at the University of the Philippines College of Agriculture.

BRISIA is the national irrigation system established in 1966. The Balanac River Irrigation System originally had an intake dam, but was rehabilitated into the run off of the river (ogee type). This system is composed of the main canal, 4 tributary laterals, and 2 creeks (Figure 6 and 7). The Main Canal 1 to 5 and Buboy Extension 1 to 5 are upstream. The Main Canal 6 and 7, and A1 to 4 are midstream. Main Canals 11 to 13, Lateral A11, A12, A1A1 to A1A3, and Binan creek and Salasad Creak are downstream (Table 6 and Figure 6). It has a length of 28.296 km in total. It runs through 17 barangays administered under 4 municipalities. It has 32 TSA groups and 983 registered members (Table 6). A TSA group stands for a turn-out service group that is a group of farmers who share the same turn out of the Balanac River Irrigation System.

The Balanac River Irrigation System covers over 17 barangays<sup>4</sup>. A barangay is the basic political unit which services as the primary planning and implementing unit of governmental policies, plans, programs, projects and activities of communities (AVB printing press, 2007). A barangay wields both police power and the power of taxation. The leader of a barangay is called a barangay captain, and they must be elected. The 4 municipalities in the area of BRISIA are; Sta. Cruz, Magdalena, Pagsanjan, and Lumban. A province is a political and corporate unit of government composed of municipalities and component cities. BRISIA is in Laguna province, which is 30 km south of Metro Manila.

The Balanac River Irrigation System is designed to cover 1,200 ha of service area<sup>5</sup> and 1,056 ha of firm-up service area<sup>6</sup>. In average, this system serves an irrigated area<sup>7</sup> of 719.03 ha in

---

<sup>4</sup> The number of the barangays is according to one of the ISF collectors of BRISIA.

<sup>5</sup> Service area is the area provided by water from irrigation facilities. This area has to be reported upon the completion of construction of this system (Gamboa 2009).

<sup>6</sup> Firm-up service area is the area that can be served by the water available. This area is counted by subjective observation. Firm-up service area excludes the area that is not used for agriculture after the completion of the construction of this system (Gamboa 2009).

<sup>7</sup> Irrigated area is reported area every season where crops are planted and which receives irrigation water (Gamboa 2009).

the wet season and 903.47 ha in the dry season. The difference occurs because of the water inundation from the lake (Laguna Bay) to paddies, which decreases the irrigated area. In Laguna, dry season starts in November and wet season starts in May.

BRISA was awarded as one of the outstanding IAs in 2004 by NIA head-quarters. Also, BRISIA achieved a 70% ISF collection rate in the dry seasons of 1998 and 2008. Thus, this IA is one of the well-functioning IAs in the Philippines. Thus, this research chooses this IA for a case.

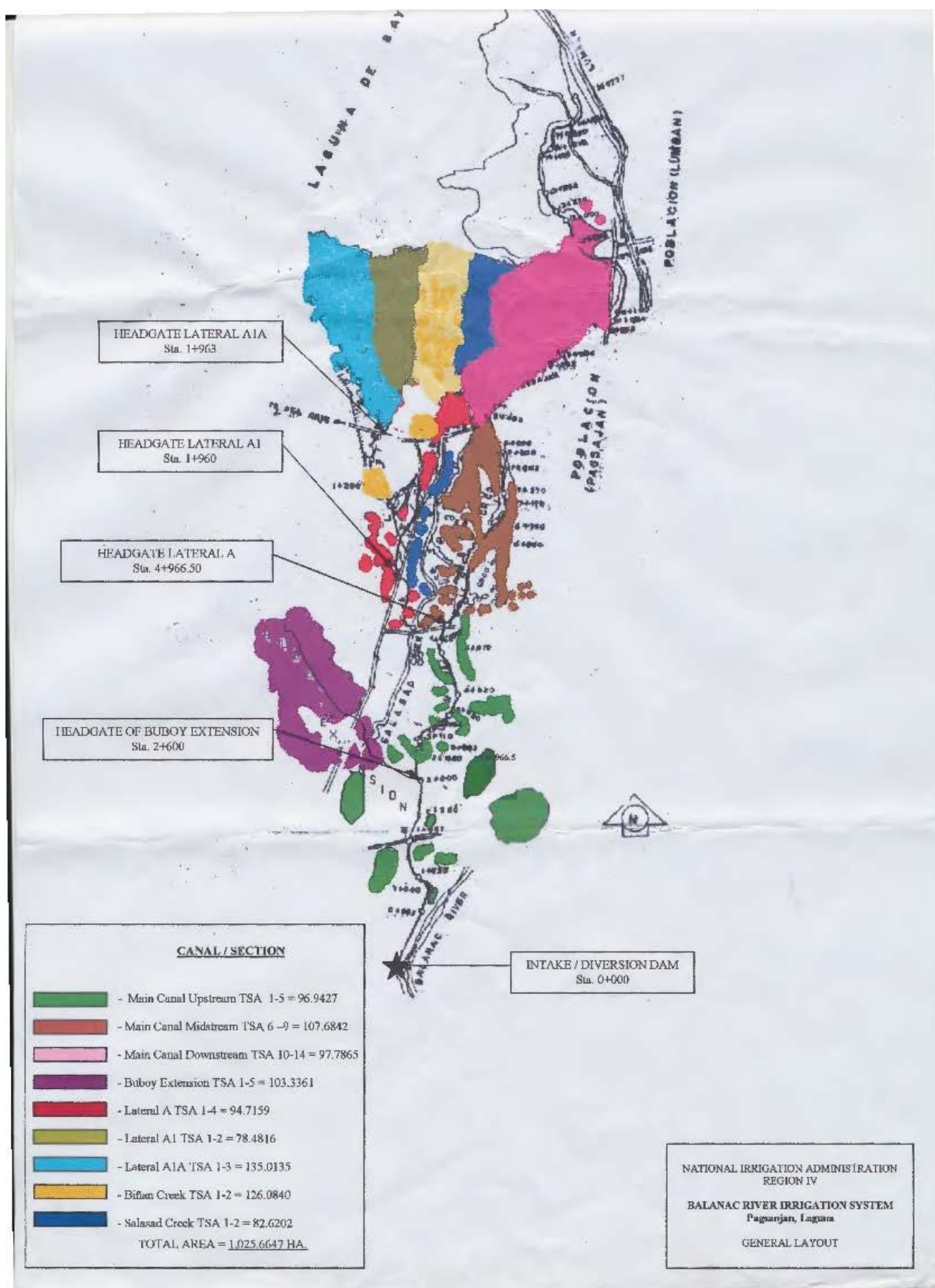
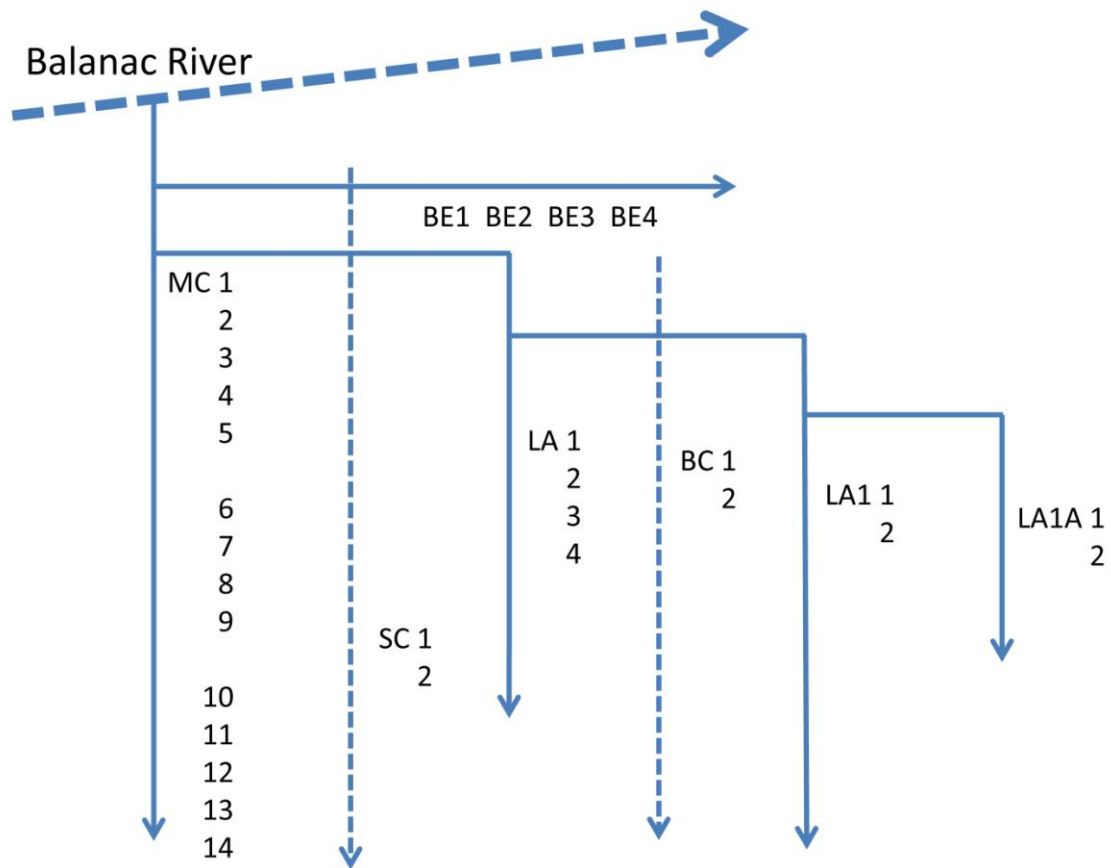


Figure6 Map of BRISIA





**Figure 7 Model of Canals**

**Table6 Profile of BRISIA**

<b>BALANAC RIS PROFILE PER SECTOR</b>						
SECTOR	CANAL	TSA	BRGY.	Municipality	Area (Has.)	No. of Farmers
UPSTREAM	MC	1	Bucal, Cigaras, Ilog	Magdalena	25.4998	20
		2	Sabang, Cigaras	Magdalena	18.6643	24
		3	Cigaras	Magdalena	19.3126	20
			Layugan	Pagsanjan		
		4	Layugan, Dinggin	Pagsanjan	22.8260	19
	BE	5	Layugan, Dinggin	Pagsanjan	13.9905	27
				<b>Sub-total</b>	<b>100.2932</b>	<b>110</b>
		1	Cigaras	Magdalena	17.8435	31
		2	Cigaras	Magdalena	13.3339	21
			Buboy	Pagsanjan		
		3	Buboy	Pagsanjan	11.2794	18
		4	Buboy, Cabanbanan	Pagsanjan	14.6309	22
		5	Buboy, Cabanbanan	Pagsanjan	36.2275	38
				<b>Sub-total</b>	<b>93.3152</b>	<b>130</b>
				<b>Total- Upstream</b>	<b>193.6084</b>	<b>240</b>
MIDSTREAM	MC	6	Layugan, Cabanbanan	Pagsanjan	14.8092	24
		7	Dinggin, Calachuchi	Pagsanjan	38.5295	38
		8	Calachuchi	Pagsanjan	28.5701	34
		9	Sampaloc	Pagsanjan	26.1925	26
				<b>Sub-total</b>	<b>108.1013</b>	<b>122</b>
	Lat. A	1	Cabanbanan	Pagsanjan	11.2205	26
		2	Cabanbanan	Pagsanjan	14.3909	22
		3	Sabang, Biñan	Pagsanjan	14.2225	21
				<b>Sub-total</b>	<b>39.8339</b>	<b>69</b>
	Lat. A1	1	Sabang	Pagsanjan	5.3206	10
	Salasad C.	1	Sabang	Pagsanjan	27.4426	21
				<b>Total- Midstream</b>	<b>180.6984</b>	<b>222</b>
DOWNSTREAM	MC	10	Sampaloc	Pagsanjan	28.7983	31
		11	Poblacion I	Pagsanjan	67.9078	54
		12	San Isidro	Pagsanjan	29.8956	28
		13	San Isidro	Pagsanjan	43.0295	52
			Maytalang I	Lumban		
		14	Maytalang I	Lumban	20.7716	17
				<b>Sub-total</b>	<b>190.4028</b>	<b>182</b>
	Lat. A	4	Biñan	Pagsanjan	44.8833	41
			Maytalang II	Lumban		
	Lat. A1	2	Maytalang II	Lumban	74.2137	60
	Lat. A1A	1	Pagsawitan	Sta. Cruz	40.4532	38
		2	San Pablo Sur	Sta. Cruz	39.2336	34
		3	San Pablo Norte	Sta. Cruz	49.9570	27
	Biñan C.	1	Biñan	Pagsanjan	11.1101	50
		2	Maytalang I & II	Lumban	121.4114	40
	Salasad C.	2	Maytalang I	Lumban		
			Maytalang II	Lumban	53.6660	49
				<b>Total - Downstream</b>	<b>625.3311</b>	<b>521</b>
				<b>TOTAL - Balanac RIS</b>	<b>999.6379</b>	<b>983</b>

## **5-2 The Profile of Studied BRISIA**

The Balanac River Irrigation System Irrigation Association (BRISIA) was organized in 1980 and registered in 1990 at the Securities and Exchange Commission. In 1989, BRISA was revitalized by the Famers Irrigators Organizers who organized the Turn-out Service Area Group (TSAG). In 1991, BRISIA entered into type 1 and 2 contracts at the same time. An interview with the BRISIA president revealed that this IA was mature enough to involve farmers in operation and maintenance, and that the process to make contracts went smoothly. In 2002, BRISIA entered into the type 3 contract to turnover the whole system excluding the dam and head-gate to BRISIA. BRISIA increased their savings, and since 2009 have received 50% of the revenues from ISF payments. The rest of the revenues go to the NIA.

The Balanac River Irrigation System started operations in 1966 by using funds from the Asian Development Bank. Since then this system was rehabilitated several times with the support of foreign donors. The Balanac dam is located in the barangay of Bucal, Magdalena. Laguna Bay is the drainage area. The main canal is 13 km long with four lateral and sub-laterals that are 28 km long in total. In 1995, the Irrigation Operation Support Project (IOSP2) commenced. In 1997, the World Bank rehabilitated the system as a WRDP (Water resource Development Project). Also, in 2007 and 2008, this system received rehabilitation projects. Due to these projects, the Balanac River Irrigation System is relatively well rehabilitated.

BRISIA performs a variety of functions including operation and maintenance, cleaning canals, water distribution, billing and collection of the ISF, conflict resolution, and planning crop rotation and water distribution schedules. BRISIA does not have any functions as a farmers' bank nor a business entity that can sell their members' crop rotation, though they aim to have them in the future.

## **5-3 The Questionnaires**

The midstream farmers (Laterals A1, A2, A3, and A4) were the target of this study, and a student assistant (translator) distributed questionnaires to each farmer's home with the help of one of the ISF collectors of BRISIA. Friends of the author collected the questionnaires. All farmers of the targeted four TSAGs were supposed to receive a questionnaire, but due to time constraints this did not happen. Also, another critical reason why questionnaires could not be distributed to each farmer was that the ISF collector did not know where all the targeted farmers resided, and the other two ISF collectors were not available during this period. In addition, many farmers who received the questionnaire refused to answer it.

Upon the collection of the questionnaires the collectors asked for reasons of refusal to the farmers. Several reasons for refusal were revealed. First of all, some said that the owners of the

land they till were abroad, and they were afraid of upsetting the landowners with their answers. Similarly, some daily waged labor (care-takers) on the land said they did not have the right to answer the questionnaires. Secondly, some of the land owners were deceased though their names were listed as registered members. Thirdly, some of the lands were mortgaged, and farmers whose names were listed as members did not actually have land, so they refused to answer the questionnaires. Fourthly, some farmers were inactive TSA members and they did not pay the ISF, and they refused to answer the questionnaires. Also, some TSA leaders that received our questionnaires to help distribute them, refused to pass the questionnaires on to some farmers, because they were located far from the leaders, and they neither attended the TSA meetings nor pay the ISF. Fifthly, some farmers did not want to be disturbed by questionnaires. Lastly, some farmers refused for no specified reasons. The second and third reasons were the most popular (11 out of 29) reasons.

Six different types of data were collected for this study: 1) the data on BRISIA profiles and its functions based on the interviews with the Institutional Development Officer of BRISIA and the gate keeper of BRISIA, 2) the data of ISF payment rates for the last three crop rotation seasons based on the records at the BRISIA office, 3) the data on the function of each TSA based on the interviews with each TSA leader of BRISIA, 4) the data of social capital in each TSA based on the questionnaires distributed to TSA leaders of BRISIA, 5) the data of social capital of each barangay based on the questionnaires distributed to each barangay leader in the area of BRISIA, and 6) the data of social capital among the midstream farmers based on the questionnaires distributed to the midstream farmers (Lateral A1-A4).

### **5-3-1 Structures of Questionnaires**

The questionnaires were distributed to each TSA leader, each midstream farmer (LA1-LA4), and each barangay captain. A few TSA leaders and barangay captains were neither at their houses nor their offices, and questionnaires were not distributed to them. All questionnaires measure the strength of each type of social capital. In order to capture social capital in general among stakeholders, the questionnaires include some questions about economic variation, geographical variation, and jobs. The questionnaires adopt some questions used as the sample questions offered by the World Bank (2004). Social capital is measured by three components: bonding, bridging, and linking. Bonding is basically family and friendship ties. Bridging is basically interaction with other groups beside agricultural organizations. Linking is the trust over social strata, in other words, trust on different levels of government administrations. All questionnaires contain questions on the basic profile of the people who receive them, and on each type of social capital.

The Questionnaires to the TSA leaders are about the basic profile of economic situations of the TSA groups, and the geographical variation among the residential places of the farmers, as well as how concentrated they are (Table 7). The economic profile is measured by their income levels and yield. The social status is measured by their non-farming occupations and their education attainment. The geographical variation is measured by the locations of rice paddies and members' residential locations. The strength of ties is measured by the degree of trust, the patron-client relations, and the satisfaction levels with the group, the leader, and BRISIA.

The questionnaires to the mid-stream farmers focus particularly on the reasons for committing to the collective action of BRISIA (Table8). It also contains a question on the satisfaction with water distribution. The questionnaires to the midstream farmers include questions about their relationships with the other stakeholders. For example, the questionnaires ask from whom the farmers get advice on various occasions.

The questionnaires to the barangay captains include questions about basic information on the captain, the barangay, and about the barangay's relationships with irrigation and social capital (Table 9). However, during the field study the author found that barangays do not play an important role in the context of the BRISIA's irrigation management. Thus, only a part of the data from the questionnaires to the barangay captain is used for the analysis.

### **5-3-2 Data Collection and Methods for Analysis**

The questionnaires to the midstream farmers (A1-A4) were answered by 49 farmers and collected by 56 farmers out of 131 members in total. The questionnaires to the barangay captains were answered by 14 leaders and collected by 17 captains out of 18 captains in total. The questionnaires to the TSA leaders were answered by 27 leaders and collected by 29 leaders out of 32 in total. The questionnaires distributed had several flaws in the way the questions were structured, thus answers of some of the questions were not reliable. For this analysis, the author selected several key questions that have usable answers. It was difficult to find clear relationships between ISF payments and social capital, which was probably because the indicators (questions) used to measure the types of social capital were not appropriate, and because the sample size (the number of the questionnaires answered) was too small. Thus, the analysis mainly compared simple sums and averages of answered numbers for each question, and tries to find plausible relationships.

**Table 7 Contents of the questionnaire to the TSA leaders**

Questions to TSA leaders			
Profile	Q1-3	Residence ( place & year)	Where do you reside? How long have you resided? Where are your paddies?
	Q4,5, Q8-11	Economic situations yeild, annual income, payment to landowners)	How much of yields? More yields than the other farmers? Your annual household income? Better off than the other farmers? How many cavans of palay do you pay? How long have you tilled yout paddies?
	Q6-7	Occupations	Do you have an govermental position? Occupations beside farming?
Bonding (within BRISIA BOT)	Q12	family tie	Any family in BRISIA or NIA Pila?
	Q13-15	satisfaction on BRISIA	Is BRISIA functioning well? Can BRISIA help solve your TSA problems? Do other BOD members listen to you?
	Q16-17	friendship tie	How many BOD members are your friends to talk personal probelems? Do you talk your personal problems to BRISIA president?
Bonding (wihin TSA)	Q18	tenure	Are there any farmers who are neither tenants or landlords?
	Q19-22	geographic variance	How many farmers of your TSA members are from the your brgy? How manyt farmers in your TSA reside which municipalities? Changes in the numbers of farmers and land lots? How many members in you TSA are in one family?
	Q23	participation to collective action	How often have you cleaned the Main Canal?
	Q24	friendship tie	To how many friends in your TSA you talk about personal problems?
	Q25	family tie	How many members in your TSA are families?
	Q26	self satisfaction	Do you feel honored to be the TSA leader?
Bridging	Q27-29	important groups in their lives	List your most important groups? How many farmers of your TSA belongs the groups you listed? How often do you meet the groups you listed?
	Q30-34	the way to sell the palay	How do you sell harvested palay to the market? How much is the price of palay at the market? Do you buy inputs from the individual money lenders? Are the individual money lender your friends?
	Q35-36	1) family tie 2) friendship tie	Do you have any non-faming family members in your neighborhoods? Do you have non-farming close friends in your neighborhoods?
Strengths of Ties	Q37-41	to whom they get advice&money	Who you get agrocultural advice from? Who do you count in your emergency situation? Who do you count in your harvesting crisis? Is your barangay captain effective? Have you received any foods or gifts from your barangay captain?
	Q42	Who to trust	What kind of people do you trust beyong families and relatives?
Linking	Q43-65	Trust on NIA, Municipality, Province, District and Government	Do you have anyone you get help from at the govermental body? What kind of position is the person in? Is she/he your family or close friend? How much do you trust the govermental body?

**Table 8 Contents of the questionnaires to the midstream farmers**

Questionnaires to midstream farmers			
Profile	Q1, 3, 4,	tenure	Are you land owners, Caretakers or tenants? Do you till land? Do you have to pay the ISF?
	Q2	Occupation	What are your occupations beside farming?
	Q5-9	Residence	Where do you reside? (Barangay, Municipality) How long have you resided there? Where are your rice paddies? How long have you had the paddies? How much do you have to pay to the land owners?
	Q10-11	Benefits to be the TSA members	How long have you been a TSA member? What non-financial benefits do you receive by being a TSA member?
	Q12-14	Economic situations	How much yields did you harvest in the last 3 cropping seasons? How much do you earn annually? Has being a TSA member affected your income?
Bonding	Q15-30	among BRISIA, TSA and Barangay	Do you have any family or friends among BRISIA, NIA, or barangay? Are you satisfied with the function of BRISIA? Do you feel that BRISIA contributed to your life? Do you think that your TSA function effectively? Do you find your TSA leader is trustworthy? Can you talk your personal problems to the TSA leader? How many family members are in your TSA? To how many TSA members you can talk about your personal problems? Have you received any favor from Barangay cap. or TSA leader? From whom do you get agricultural advice? Who do you count on in your financial emergency? Who do you count on in your harvest crisis? Do you think that Barangay cap. listen to you? Who else do you trust beside family and relatives?
Collective Action	Q31-38	TSA membership	Have you signed on a document to be a TSA member? (not) Why? Are you an active TSA member? Are you satisfied with water supply? Do the canals in your TSA need rehabilitation? Do you attend TSA meetings? How often? Why? Has your TSA leaders invited to TSA meetings?
	Q39-42	Cleaning canals	Do you clean Lateral A before a cropping season? (not) Why? Do you clean sub lateral before a cropping season? (not) Why? Do you clean farm ditches before a cropping seasons? (not) Why? Has your TSA leader invited to canals cleaning?
	Q43-46	ISF payment	Did you pay the ISF the last 3 cropping seasons? (not) Why? Do you think that 15peso/kg is manageable rate of the ISF? Has your TSA leader convinced you to pay the ISF? Do you know the cropping calendar provided by BRISA?
	Q47	Cropping Calendar	How do you know the time to start your cropping?
	Q48	Illegal action	Have you dumping garbage in the canals?
Bridging	Q49-50	Important groups	What are the important groups in your life? How much was the rate of palay last three cropping seasons?
	Q51-52	the way to sell palays	How do your members sell their palay to the market? How many non-family TSA members do you trust?
Linking	Q53-64	Trust on NIA, Municipality, Province, District Government	Do you have anyone you get help from at the governmental body? What kind of position is the person in? Is she/he your family or close friend? How much do you trust the governmental body?

**Table 9 Contents of the questionnaires to barangay captains**

<b>Questionnaires to Barangay Leaders</b>			
Profile	Q1,2,4	1) Year of leadership, 2) occupation, 3) education	Since when you have been the Barangay captain? What occupations do you have beside the Barangay captain? Which grade of education have you finished?
	Q3	frequency to come to his office	How often do you come to the Barangay office?
	Q5,6	year of residency in this barangay	How long have you resided in this barangay? Since when do you own the residential land?
	Q7	important groups	What groups do you belong?
	Q8	if they serve meals or money to voters	Did you serve meals or money to voters or their kids during the election campaign?
Barangay Profile	Q9	issues	What are the critical issues of this barangay?
	Q10-12	1) population, 2) numbers of households and families	What is the population of this barangay? How many households does this barangay have?
	Q13-15	1) years of residency, 2) immigration and migration, working abroad	How many years people in this barangay reside there? How much percentage of population migrated or immigrated? How much percentage of population work abroad?
	Q16-19	economic variance	How much percentage of population are farmers? What is the average income in this barangay? What is the average income if farmers in this barangay?
	Q20	percentage for budget of public service	How much percentage of the barangay budget are used for public goods?
Bonding	Q21-24	Barangay activities	What kinds of activities do you organize for the people of this barangay? How often the activities are organized? What kind of occasions people in the barangay come to talk to you the office beside A2? The reasons why people in the barangay talk to you? How often have people come to talk to you per month/year?
	Q25-29	if they give money or jobs to residents	Have you helped people by giving money? How often have you given the money? Have you helped people by introducing jobs. How often have you done that?
	Q30-33	Bayanihan	How often have you joined the parties of non your family? Do you observe bayanihan in your barangay? What kind of bayanihan does your TSA has? The strength of bayanihan compared with other barangay? Since when the bayanihan has been like that?
Bridging	Q34-36	Activities & interaction w. neighbor Barangay	How often people in this barangay generally go out weekly? What kind of groups do majority of residents belong? How often do you attend the regular meeting with other captains?
	Q35-39	Family & friendship ties	Do you have close friends or family among other captains? Do you have friends or family among other captains in neighbor municipalities? How many of them are close friends?
Irrigation and People	Q40-43	agricultural problem solving ability	How often people talk to you about irrigation? What kind of problems those people talk to you? To whom do you get advice to solve the problems? Did you see any changes or solutions after talking to them? Do you have friends to whom you can talk about your personal problems in BRISIA or NIA?
	Q44-45	Illegal action	Have you informed non-farmers that garbage dumping is not permitted? How did you do?
Linking	Q46-68	Trust on NIA, Municipality, Province, District and Government	Do you have anyone you get help from at the governmental body? What kind of position is the person in? Is she/he your family or close friend? How much do you trust the governmental body?



### 5-3-2 the Interviews

This field survey included interviews with each TSA leader. The interviews include questions about the profile and function of the TSA. The interview was semi-structured and not all farmers answered all questions on Table 10. The interviews went in detail to cover all questions about TSA function. Therefore, the data sets are not complete and include several missing values. The analysis conducted in the next section is based on data sets which have relatively complete values, and it does not discuss all results of each question, but limits the discussion to the factors which seem important to the analysis.

**Table 10 Contents of the interviews with TSA leaders**

<b>Category</b>	<b>The Contents of the Interview with TSA leaders</b>
<b>Profile</b>	Location of TSA, No. of members, Tenure ( himself and members), No. of years of leadership, Location of paddies,Size of paddies, Occupation beside farming
<b>Function</b> (Reliance on the leader)	Attendance to BOT meeting, Satisfaction to be the leader, Frequency of getting consultation from farmers, The entity to which the leader raise issue, Whethere the members talk to the leader about personal problems
<b>Function</b> (TSA meetings)	Elections or Appointing, Functions of officers, Budget, Souces of budget ( payment rate), TSA meetings ( frequency, attendance, enforcement), Avenues of information dissemination
<b>Water Flow</b>	Satisfaction of water supply, Pump-users, Water Rotation System, Cropping Calender, Enforcement ( garbage dumping, Water Steal)
<b>Cleaning of Canals</b>	Cleaning of Main Canal, Lateral, Sub-lateral, Attendance, Frequency, Bayanihan type of Cleaning
<b>ISF Payment</b>	ISF payment rate ( perception), Reasons of non-payment, The ways to motivate farmers to pay, Satisfaction of ISF rate
<b>Bayanihan</b>	Bayanihan except for cleaning of canals, Neighborhood Bayanihan ( wedding, funerals etc), Strength of Bayanighan, Change is Bayanihan
<b>Facilities</b>	Satisfaction of Canal Facilities, History of rehabilitation projects, Members' involvement to the projects

# Chapter 6

## Results

---



Carabao (Buffalo)

(Photo taken Feb 25, 2009 by the author)

This chapter reveals the findings of the interviews and the questionnaires conducted for this thesis. It first clarifies the institutional arrangements of BRISIA, which are based on the interviews with Myeth (an Institutional Development Officer of NIA for BRISIA in 2009) and further information the author received from Myeth, and interviews with BRISIA officers in March 2009. Secondly, this chapter discusses the findings about each working hypothesis through analysis of the questionnaires. In this section, midstream refers only to the canals classified as Laterals A 1, A2, A3 and A4.

## **6-1 Institutional Arrangements of BRISIA**

### **a) Organizational structure**

BRISIA takes care of O&M for all of the canals though O&M for the dam is maintained by the NIA. BRISIA, this IA has the BOD (the board of directors). The organizational structure of BRISIA is visualized on Figure 8. The BOD is composed of the 32 TSA leaders. Based on the nomination or voting in BRISIA every 2<sup>nd</sup> year, the president, the vice presidents (junior and senior), the secretary, the treasury, the auditor and the PROs (information dissemination officers) have to be elected. Accepting to be the members of the BOD is voluntary, and the members are not paid. The BOT has the monthly meeting, and the honorarium is paid to the participants in the monthly BOD's meetings<sup>8</sup>.

Ideally, there would be an annual general assembly where all farmers are invited, but BRISIA had not held any general assembly since its establishment as of 2009. As an embryo meeting of the general assembly, BRISIA has the cluster assemblies for the upstream farmers, for the midstream farmers, and for the downstream farmers. However, despite the IDO and BRISIA's efforts, few people attend the cluster meetings.

Also, BRISIA has several committees. The finance committee has three ISF collectors and a billing clerk. The collectors go to rice fields and house to house to collect ISF<sup>9</sup>, and the billing clerk collects the ISF from the farmers who visit the BRISIA office to make payment. Two ditch tenders are in charge of cleaning of either the whole Main Canal or the four main laterals. They are supposed to walk every day along the canals and collect garbage accumulated near the canal gates<sup>10</sup>.

---

<sup>8</sup> The meetings of the BOT are held every second Thursday of the month. The members of the BOT also get some monetary promos as the Christmas gifts.

<sup>9</sup> The ISF bills should be distributed 10 days before harvesting.

<sup>10</sup> However, lots of garbage was stuck at the gates when the author observed the canals.

They are all employed and these BRISIA employees have to be the relatives of the farmers of BRISIA.

The NIA PILA, which is in charge of the NISs in Laguna employ a gate keeper, who is responsible for opening the head gate at the Banalac dam. The water master also coordinates the water distribution by checking gauges in canals. The NIA PILA also hires the IDO (Institutional Development Officer), whose mission is to strengthen abilities of the IA. The water master and the IDO work closely with BRISIA on the daily basis.

Since the implementation of the new guidelines the title names of the positions have changed. “Water resource technician” is the ex-gate keeper, “water resource facilities operator” is the ex-water master, and “water resource facilities tender” is the ex-ditch tender. The BOD became the BOT (board of trustees) after the implementation of the guidelines.

#### **b) Membership**

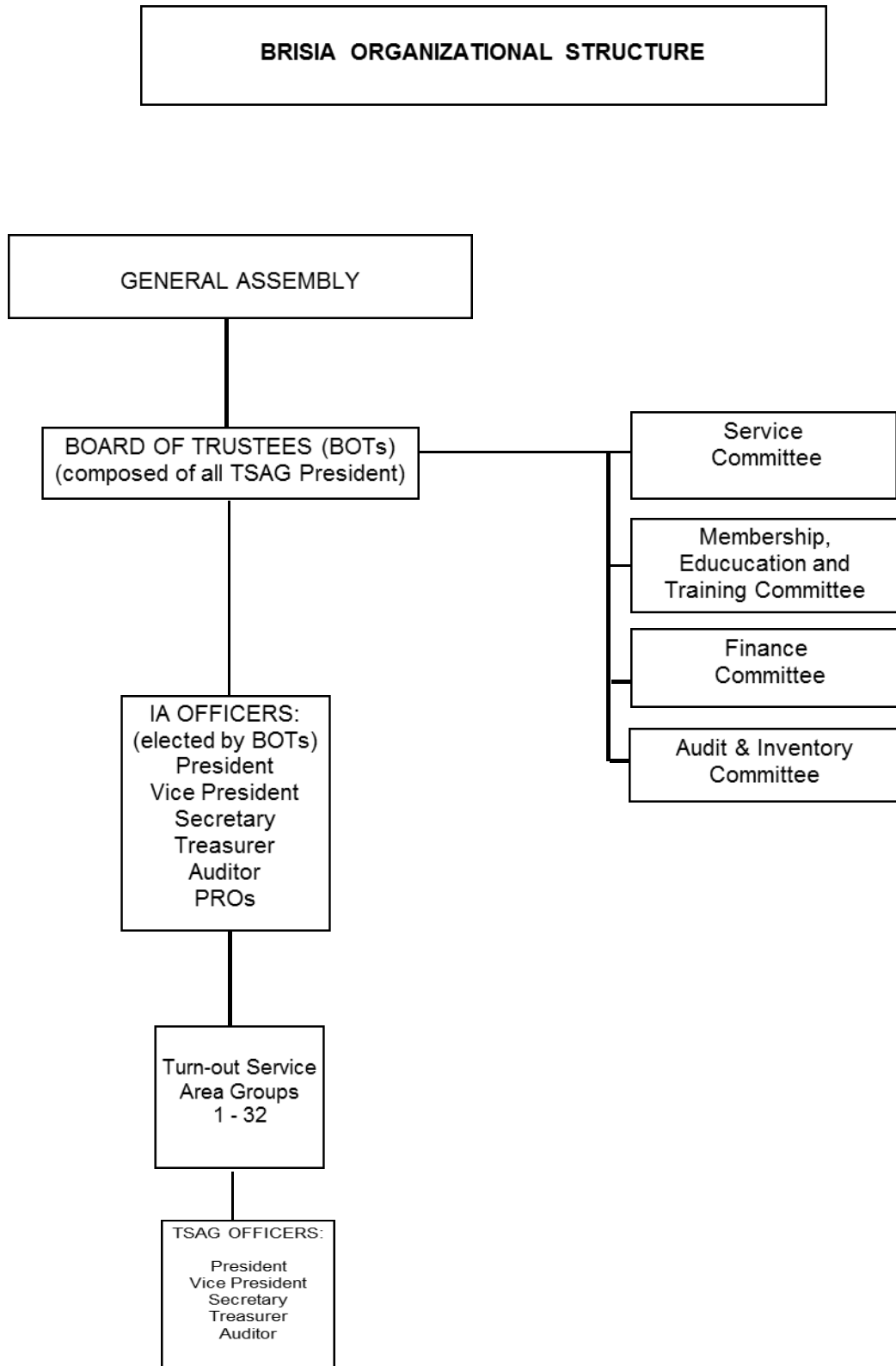
There are 983 farmers registered under BRISIA. Though the NIA prepared the official signature form for membership of BRISIA, many farmers are reluctant to sign on the official documents. It is estimated that there are approximately 100 individuals who have the right to become members but have not yet signed on to the NIA’s document. However, it does not matter if the farmers are officially registered members or as long as they receive water from the irrigation under BRISIA. That is why the NIA argues that all farming individuals regardless registered or not, benefit from the irrigation systems have to be obliged to pay the ISF. The farmers who are not officially BRISIA members cannot receive priorities when the registered farmers can receive subsidies from the Department of Agriculture or the Department of Agrarian Reform among other governmental agencies.

#### **c) BOT Meeting**

The BOT members are required to attend the monthly meetings, where the Water Master and IDO from NIA join. Main topics discussed in the meetings were as follows; 1) water distribution and downstream farmers’ non-satisfaction with water supply, 2) garbage dumped in the canals, 3) the non-payment of the ISF, 4) the dilapidated canals that should be rehabilitated because of siltation, 5) the loss of next rice-farming generations, and 6) quarrying<sup>11</sup>. A participant can receive 100 pesos.

---

<sup>11</sup> It was happening about 100km away from the dam. A construction firm gets stones from the river side and causing the change of water flow. Quarrying is permitted to some depth, but usually due to the absence of the police power on BRISIA, quarrying goes over the limits and risks the water flow.



**Figure8 Structure of BRISIA**

#### d) Financial Management

There are four main revenue sources for BRISIA: 1) the ISF, 2) the revenue generated by contracting for repair of canals, 3) the membership fee paid by each farmer, and 4) donation from the outside. The share of ISF between BRISIA and NIA was 50:50 as of 2009 (Table 11).

**Table 11 the Share of the ISF payment (the unit is peso)**

FOR BRISIA						
Cropping Season	Program Area (has.)	Estimated Collectible (P)	Target Collection (P)	TYPE OF SHARING		
				NIA - BRISIA	NIA	BRISIA
D R Y		(multiplied at P10.00)	(assumed 80%)			
	950	1,425,000.00	1,140,000.00	50 - 50	570,000.00	570,000.00
W E T		(multiplied at P9.00)	(assumed at 70%)			
	850	765,000.00	535,500.00	50 - 50	267,750.00	267,750.00
TOTAL	1,800	2,190,000	1,675,500	50 - 50	837,750	837,750

#### e)The ISF Payment

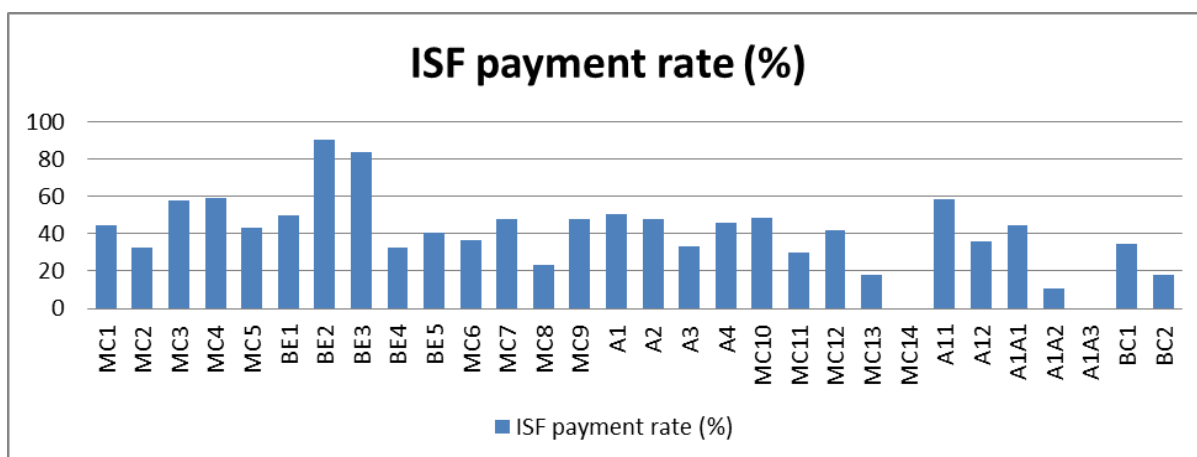
The farmers who cultivate land by using water from the Balanace River Irrigation System have to pay the ISF. BRISIA requires either landowners or tenants to pay the ISF. Calculation of the ISF is based on the area of land cultivated every crop rotation season. 150kg times ha (land cultivated) times 15peso/kg makes the ISF for a dry season. 100kg times ha (land cultivated) times 11peso makes the ISF for a wet season in 2008. Since the dry season of 2009 the ISF for a wet season was raised to 15peso/kg, which the NIA decided as a nationwide policy. Table 12 presents that the ISF accounts for about 6% of total costs of production in a season, so the burden of a farmer for the ISF seems to be small compared with the other costs.

**Table12 the costs and benefits from faming in 2007 in BRISIA****(The unit is peso)**

<b>BALANAC RIVER IRRIGATION SYSTEM</b>	
<b>COST OF PRODUCTION / HECTARE</b>	
<b>WET - 2007</b>	
<b>PROGRAMS</b>	<b>COST</b>
<b>A. LABOR</b>	
1. Plowing ( Using rotoator x 2)	3,600.00
2. Harrowing and leveling (handtractor)	2,800.00
3. Animal (1 day)	400.00
4. Clearing and preparation of dikes	800.00
5. Labor before transplanting	400.00
6. Transplanting	1,865.00
7. Fertilization	600.00
8. Spraying	600.00
9. Weeding	2,000.00
10. Harvesting	2,500.00
<b>11.ISF</b>	1,000.00
<b>SUB-TOTAL</b>	<b>16,565.00</b>
<b>B. INPUTS</b>	
1. Seeds	1,000.00
2. Fertilizer	4,480.00
3. Insecticides	950.00
4. Herbisides	870.00
5. Molluscides	970.00
<b>SUB-TOTAL</b>	<b>8,270.00</b>
<b>GRAND-TOTAL</b>	<b>24,835.00</b>
<b>PRODUCTION:</b>	
15 cavans paid landowner (buwisan)	
20 cavans for personal consumption	
55 cavans x 50kgs x 9.50/kl	26,125.00
Less expenses	24,835.00
<b>NET INCOME</b>	<b>1,290.000</b>

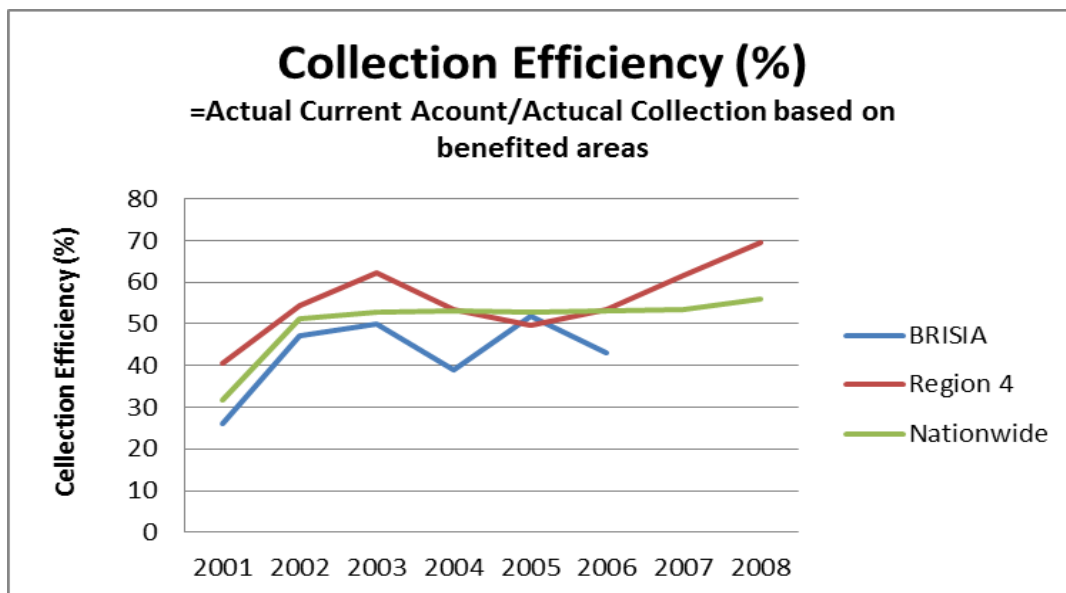
b)

There is an incentive mechanism for farmers to make the ISF payment on time; the payment on time is subject to a 10% discount, and the late payment is subject to a penalty, that acumulates on the back account of landowners. The landowners are incentivized to encourage their tenants to pay the ISF on time. The former water master of BRISIA was the awarded for his outstanding accomplishment to raise the ISF collection rate. According to him, he raised the rate of the ISF collection by asking the landowners to let their tenants to pay the ISF, and he billed the ISF to each farmer.



**Figure9 Averaged Irrigation Service Fee Payment Rate (Wet08, Wet07, and Dry07)**

Figure 9 was constructed based on the ISF collection data for the three sequential crop rotation seasons recorded at BRISIA office. For the computation, the full ISF payment was counted, and the partial payment is excluded. Also, for the computation, an exempted payment was not excluded from the denominator because neither BRISIA nor NIA PILA office did not keep all records of the exempted payment. The data for Main Calan 8 was missing except for the data for Wet08. The rate is calculated based on the number of plots which were billed; if one farmer owns some plots each plot is counted as one. This figure shows that the ISF payment is higher in a dry season than in a wet season, and that the averaged collection rate for each crop rotation season is 39%, 41.5%, and 61.6% for wet '08, wet '07 and dry '07 respectively.



**Figure10 The Collection Efficiency of Balanac River Irrigation System**



Figure 10 was constructed based on the data provided by the NIA in 2009. The data for BRISIA after 2006 was not available. This table indicates that the collection efficiency of Balanac River Irrigation System is lower than the regional average and the national average. The interviews with the TSA leaders clarify the relatively higher dissatisfaction of water supply downstream; 50% of the downstream TSA leaders answered that their TSA members are not satisfied with the water supply, though all of the TSA leaders of the midstream and downstream farmers think that their fellow TSA farmers are satisfied with the water supply in general.

**g) Cleaning Canals**

The rich tenders are supposed to clean the main canals and laterals. Though ideally the farmers of BRISIA should help ditch tenders, mainly the BRISIA BOTs help them. Each farmer cleans his or her own tertiary canals. No money involves in cleaning the canals.

**h) Water Distribution and Crop rotation Calendar**

The water master checks the water availability downstream and adjusts the amount of water flow. Water distribution is scheduled by BRISIA each crop rotation season. A water distribution calendar also works as a crop rotation calendar. No punishment mechanisms are involved even though non-followers of this calendar would be found. In general, downstream farmers do not (cannot) follow the schedule, because water usually reaches later than the scheduled dates. According to the water distribution calendar system for dry 2007 (Table 13), upstream farmers can start cropping first, and downstream farmers follow, which is the same for any other years.

**Table 13 Water Distribution Calendar of BRISIA (Dry 2007)**

<b>DRY SEASON 2007</b>					
<b>BALANAC RIS FARMING ACTIVITY SCHEDULE</b>					
<b>Initial Water Delivery Starts October 23, 2006</b>					
Week No.	Date	Canal Section	Barangay	Municipality	Area (ha.)
1	Oct. 23 - Oct. 29	Main Canal	Sabang, Bucal	Magdalena	20
		Main Canal	Cigaras	Magdalena	30
		Buboy Ext.	Buboy	Pagsanjan	25
			Sub-total		<b>75</b>
2	Oct. 30 - Nov. 5	Main Canal	Cigaras	Magdalena	50
		Main Canal	Layugan	Pagsanjan	50
		Buboy Ext.	Buboy	Pagsanjan	30
			Sub-total		<b>130</b>
3	Nov. 6 - 12	Main Canal	Dingin	Pagsanjan	30
		Main Canal	Layugan	Pagsanjan	30
		Buboy Ext.	Buboy	Pagsanjan	30
		Lateral A	Cabanbanan	Pagsanjan	20
			Sub-total		<b>110</b>
4	Nov. 13 - 19	Main Canal	Sampaloc	Pagsanjan	30
		Main Canal	San Isidro	Pagsanjan	30
		Buboy Ext.	Buboy	Pagsanjan	20
		Lateral A	Sabang	Pagsanjan	40
			Sub-total		<b>120</b>
5	Nov. 20 - 26	Main Canal	Sampaloc	Pagsanjan	30
		Main Canal	San Isidro	Pagsanjan	30
		Lateral A	Maytalang I	Lumban	20
		Lateral A1	Pagsawitan	Sta. Cruz	45
			Sub-total		<b>125</b>
6	Nov. 27 - Dec. 3	Lateral A1	Pagsawitan	Sta. Cruz	45
		Salasad	Sampaloc	Pagsanjan	45
		Biñan Creek	Biñan	Pagsanjan	40
			Sub-total		<b>130</b>
7	Dec. 4 - 10	Lat. A1	Pagsawitan	Sta. Cruz	30
		Lat. A1A	Pagsawitan	Sta. Cruz	30
		Salasad	Maytalang I	Lumban	30
		Biñan Creek	Biñan	Pagsanjan	30
			Sub-total		<b>120</b>
8	Dec. 11 - 17	Lat. A1	Maytalang II	Lumban	20
		Lat. A1A	San Pablo Sur	Sta. Cruz	20
		Salasad Check	Maytalang II	Lumban	25
		Biñan Creek	Biñan	Pagsanjan	15
			Sub-total		<b>80</b>
9	Dec. 18 - 24	Lat. A1	Maytalang II	Lumban	10
		Lat. A1A	San Pablo Sur	Sta. Cruz	5
		Biñan Creek	Maytalang II	Lumban	35
			Sub-total		<b>50</b>
10	Dec. 25 - 31	Lat. A1A	San Pablo Sur	Sta. Cruz	15
		Biñan Creek	Maytalang II	Lumban	15
			Sub-total		<b>30</b>
			Total Program Area		<b>970</b>

## 6-2 Relationship between ISF payment and Social Capital (midstream)

### a) The ISF Payment

The average rate of the ISF payment of the three crop rotation seasons for the four midstream TSAs (Lateral A1-A4) was 44.42%. Figure 11 indicates that upstream farmers pay better than the down stream farmers, and that the rates of the ISF payment are higher in dry season. It would be plausible that these results show a relationship between the ISF payment and the water availability; in dry seasons farmers rely only on the irrigation, but in wet seasons the rain and the floodings of the Laguna Bay would cause too much water to affect negatively for rice farming.

The findings of the results for the key questions 43, 46, and 47 about the ISF payment of the midstream (Table 14) is that the midstream farmers' motivation comes from their feelings of the responsibility about making payment for the use of water and the fear of increasing the back account. 65% of the farmers who answered the questions paid in the wet season of 2007, 71% of the farmers who answered questions paid in the dry season of 2008, and 61% of the farmers paid in the wet season of 2008. There was only one person who said that he did not pay in the wet season of 2007 and the dry season of 2008. There were two people who said that they did not pay the ISF in the dry season of 2008. These results show that mostly the farmers who pay the ISF on time answered this questionnaire. The questionnaire reveals that the reasons why two farmers did not pay are because they did not get adequate water and because he had emergency expenses and did not have capital enough to pay. Therefore, the farmers' satisfaction with water distribution and their capital available affect the ISF payment.

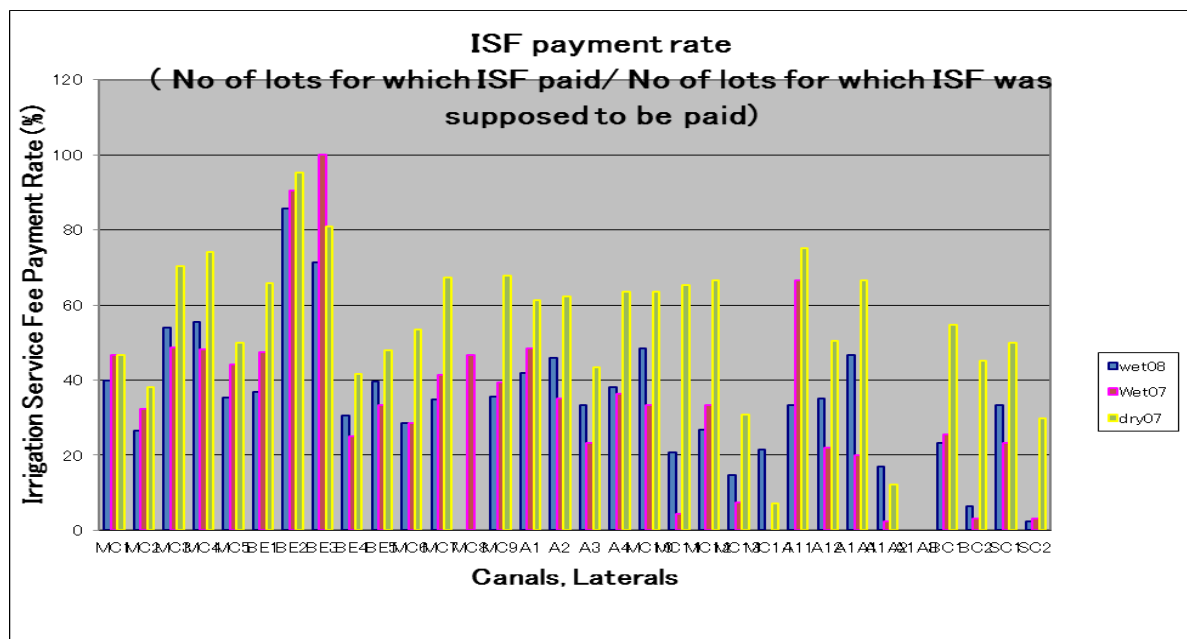


Figure11- Irrigation Service Fee Payment

**Table14 Key Questions about the ISF Payment (midstream)**

	Key questions about the ISF payment (Midstream farmers)
Q43	Did you pay the ISF for the last 3 cropping seasons?
Q46	Do you know about the cropping calendar provided by BRISIA?
Q47	How do you know it is about time to start your cropping?

Also, the result of the question 46 shows that 57% of the farmers who answered the questionnaires knew about the crop rotation calendar (water distribution calendar) provided by BRISIA. Question 47 shows that 29% of the farmers who answered this questionnaire knew the timing to start crop rotation when water came, 29% of the farmers knew from the crop rotation calendar provided by BRISIA, and 16% of the farmers knew it from the knowledge about the previous year's crop rotation cycle. The rest have other ways for them to know the timing. Some knew the crop rotation timing by the alerts from their TSA leaders and their neighbors. Only 3 people answered that they started the crop rotation when inputs and capital became available. These results show that about 30% farmers follow the crop rotation calendar and the rest of the farmers do not care it. This may be related with the reasons why the downstream farmers would receive inadequate water, and their payment of the ISF is lower than the upstream. It is not clear that the crop rotation calendar (water distribution calendar) provided by BRISA is effectively functioning to distribute water fairly to all areas; if it is effective when all farmers follow the calendar the water should be fairly allocated.

With respect to water supply, 80% of farmers who answered questions are satisfied with the water supply. This fact would explain the relationship between the high ISF payment and high satisfaction with the water supply of the farmers who answered questionnaires. When they are asked whether they clean canals, 63% of farmers clean Lateral A, because they think that cleaning canals results in better water supply. It seems that the farmers make efforts to have better access to water.

#### **b) Social Capital of Midstream**

##### Bonding

With respect to the strength of bonding social capital, there are several findings. First of all, this questionnaire assesses geographical closeness among the farmers. 91% of the farmers reside in Pagsanjan and the distribution of the barangays where the farmers reside is concentrated on barangay Cabanbanan which has 44% of the farmers in the study reside. The average year they reside in the place is 48 years, which is mostly equal to the average age of the farmers. These results show that the midstream farmers should have a strong relationship as neighbors because most of them reside close each other since their birth.

Secondly, this questionnaire assesses bonding relationship among the members of the TSA, BRISIA and Barangay. 22% of the farmers have family members or friends among BRISIA personnel, NIA Pila personnel, or barangay officials. On the other hand 67% did not. The rest of 10% of farmers did not answer this question. 75% to 80% of farmers are satisfied with the functions of BRISIA and the TSAs. 53% of the farmers find that the TSA leader was trustworthy or helpful. 35% of the TSA leaders are counted on when farmers have personal problems. 12% of the TSA presidents are the farmers' family members. No farmers received any foods, gifts, money, or jobs by the current barangay captains or the TSA leaders. 7 people answered that they got gifts. These results show that the family kinships or friendships do not play an important role to achieve the high satisfaction with the TSA functions.

#### Strength of ties

With respect to the strength of the ties between the stakeholders and the midstream farmers, there are also several findings. The person the midstream farmers count on first for receiving agriculture help are the TSA leader for 25% of them, other BRISIA members for 16% of them, the BRISIA president or municipal agriculturist for the 9% of the farmers, and TSA members for 31% of them. The person beyond their families the farmers count on if farmers need a small amount of money enough to pay for one-week household is mostly an individual lender for 31% of them. If the farmers suddenly faced harvest failure 24% of farmers would count on the individual moneylenders to get help, and they would not count on the barangay officials or BRISIA members etc. Thus, barangay officials, the BRISIA members, and TSA members do not play key roles in farmers' personal emergency. 53% of the farmers are satisfied with the functions of the barangay leaders, but 47% do not. When the farmers are asked who the farmers trust beside their family members or relatives, 53% only trust family members and relatives. 22% of them answered that they trust friends. 10% of them trust moneylenders and 6% of them trust neighbors. All of these results show that the bonding social capital among the midstream farmers does not exceed the agricultural boundaries; farmers use the agricultural networks only for an agricultural purpose. These results show that the BRISIA, the TSAs, and the barangays are not reliable when farmers are faced with an emergency.

#### Bridging

When it comes to bridging, many of the answers of the questionnaire were not useful for analysis, but it could assess the important groups or association in the farmers' lives. The farmers find the most importance in agricultural groups rather than association of other jobs beside farming, or religious groups. However, the numbers to each answer is very few, and the diversified options

respondents chose reads that the farmers have wide networks but that the reliance level on one non-farming association does not seem to be strong.

### Linking

With respect to linking, 59% of the farmers trust the PILA NIA office, 61% of them trust the municipal office, 53% of them trust the provincial office, 49% of them trust congressman, and 47% of them trust the government. This result presents that people have worse perceptions towards the higher administrative bodies.

Since the ISF payment rate is higher upstream, it is plausible that there are some changes of social capital depending on the TSA. However, comparing the strength of social capital among the TSA groups, the clear differences were not found. Thus, this study does not conclude about how social capital is related to the ISF payment at the TSA level. What this section discloses are: 1) the midstream farmers live each other as neighbors, 2) they are highly satisfied with the TSA functions, 3) TSA members, BRISIA nor barangays do not play a role as financial help for emergency, 4) they have wide networks with people both in agricultural lives and non-agricultural lives, and 5) generally about half of the farmers trust in governmental agencies and have weaker trust in the higher governmental decision making bodies.

### **c) Causal Relationship**

It is plausible to argue some casual relationships between the ISF payment and social capital of midstream. The findings involving the relationships are; 1) most of the midstream farmers who answered are satisfied with the water supply and they do not comply with the crop rotation calendar but they receive water up to their satisfaction levels, 2) the interviews revealed that only LA1 (the most upstream) had a water sharing system, but LA2-4 did not have any water rotation systems, 3) the average ISF payment rate of these four areas is 44% (the rate of the ISF for the other midstream area is also 44%, while the ISF rate of the upstream TSAs marked 53%), and 4) the satisfaction with the TSA functions does not seem to have any relationships with family ties.

20% of the farmers who answered questionnaires report that they are not satisfied with the water supply even though the farmers who answered seems to be mostly the payers of the ISFs for the three crop rotation seasons, and most of the farmers do not follow the crop rotation calendar. This inadequate (non-satisfaction with) water distribution could have something to do with weak social capital. The farmers are mostly neighbors who reside there since their birth, which means that their agricultural lives and non-farming lives should be overlapping. (The relationship between agricultural lives and non-farming (barangay) lives of midstream will be discussed in the later section, too.) However, the neighbors who include the colleagues in farming life (including the TSA members, BRISIA, nor a barangay captain) are found not reliable to count on for their

emergency. These could indicate the weak bonding among the farmers. Therefore, the low degree of bonding social capital may have something to do with the farmers' uncooperative behavior which ignores the crop rotation calendar or which does not introduce a fair water sharing system in the lower stream TSAs and do not satisfy the needs for water of all farmers. Considering the fact that farmers who answered the questionnaires are mostly satisfied with the water supply and paid the ISFs on time though the level of measured social capital does not indicate much strength and the average ISF payments is low around 44%, the social capital of the whole midstream farmers would be even lower, or social capital may not have anything to do with the ISF payment.

Therefore, the first working hypothesis: the irrigation association which has high ISF payment rate has strong social capital could gain some plausible support from this research that would imply low social capital behind the low ISF payment rate, but the findings of this research is too limited and modestly concludes that the relationship between social capital and the ISF payments was not explained well in this research.

### **6-3 The Relationship between the Functions of TSAs and Social Capital**

#### **a) The function of the TSA**

The interviews explain the functions of TSAs. Firstly, the TSA leaders are mostly land owners; 78% of the TSA leaders are land owners, and the rest of the leaders are caretakers and mortgagees. The average attendance rate to monthly BOT meeting was 10 times per year in 2008. 74 % of the leaders answered that the members seek advice from the BRISIA president, but 48% of them answered that they do not talk to the president about their personal problems. The relationship between TSA leaders and members seems to be limited to agricultural issues. Their relationship does not seem to have any relation to the reliance level (frequency of consultations they receive about agriculture or personal issues), the satisfaction of the TSA leaders with being a leader and their tenure, location or size of their paddies, the number of years serving as a leader, their occupation besides farming, or the location of their streams.

With respect to the TSA meetings, 74% of the leaders answered that they hold TSA meetings. The fact that meetings are held does not seem to have any relationship with the location of their streams or the functions of the TSA officers. For example, 80% of the downstream TSAs, 71% of the midstream TSAs, and 80% of the upstream TSAs hold TSA meetings. 70% of the leaders said that they have functioning officers in their TSA groups. There are more functioning officers downstream than upstream. Functioning officers serve in 70% of the downstream TSAs, 50% of the upstream TSAs, and 42% of the midstream TSAs. 48% of all the leaders said that they hold elections to select a leader, though the frequency of the election depends on the TSA. 40% of the

upstream TSAs, 57% of the midstream TSAs, and 40% of the downstream TSAs have elections to select their presidents.

The only three TSAs which have financial resources contributed by members are all located downstream. These member contributions to the organization appear to show the downstream members' strong commitment to the organization. The attendance rate seems to be higher at downstream TSA meetings. The rates of the attendance at TSA meetings are 31% for the upstream TSAs, 21% for the midstream TSAs, and 38% at the downstream TSAs. The downstream TSA demonstrates the highest rate of TSA meeting attendance. The downstream members' contributions to the organization show the members' strong commitment to the organization. There are no enforcement mechanisms to punish water stealing or garbage dumping at any TSAs, though there is one TSA which charges a fine to members who break the TSA rules. Also, 40% of the upstream TSAs, 33% of the midstream TSAs, and 10% of the downstream TSAs disseminate information from house to house rather than at the fields. The low amount of information distributed from house to house in downstream TSAs is most likely because of the geographical distance; downstream TSAs cover more municipalities than upstream TSAs. These results indicate that downstream BRISIA TSAs function relatively well.

Despite the positive results regarding the functioning of downstream TSAs, satisfaction levels over water supplied through the TSA is lower in the downstream TSAs. 90% of the upstream TSAs leaders report members are satisfied with the water supply, but one TSA in the lower section of the upstream area is not satisfied. 57% of the midstream TSAs leaders think that the members are satisfied with the water supply. In comparison, 40% of the downstream TSA leaders think that the members are satisfied with the water supply. Four downstream TSA leaders answered that their members use pumps, and the rest of the TSA leaders answered that their members do not use pumps. These results suggest that water is scarce downstream and consequently, the downstream TSA members' satisfaction level with the water supply is low. This result can explain why more downstream TSAs have a water rotation plan to help distribute scarce water resources fairly among the members. 20% of the upstream TSA leaders explained that they have a rotation plan; one leader said that they allocate water upstream in the AM and downstream in the PM within their TSA. 29% of the midstream TSAs have a rotation plan; one of the midstream TSAs adopts the aforementioned AM-PM plan and the other TSAs adopt a rotation plan that distributes water for three days to the upstream TSAs and distributes water on the other three days to the downstream TSA. 60% of the downstream TSAs have a rotation plan; most of them adopt the aforementioned 3-3day distribution plan, and one of them distributes water for four days to the upstream and distributes during the other four days to the downstream. It is clear that the TSAs that have less water, have adopted a water rotation plan.



With respect to whether the farmers follow a crop rotation calendar (which also follows the water distribution calendar) provided by the BRISIA, the interviews revealed that the upstream farmers follow a crop rotation calendar, but the downstream farmers do not follow one. All upstream TSA leaders answered that all or almost all farmers follow a crop rotation calendar. 70% of the TSA leaders answered that farmers follow a crop rotation calendar. 80% of the downstream TSAs answered that all or many members follow a crop rotation calendar. It seems that the downstream farmers use the water as it reaches downstream and share the water through a rotation plan. On the other hand, upstream farmers start getting their water as planned according to the crop rotation calendar. This crop rotation pattern (water distribution pattern) does not consider head-tail irrigation problems, which disincentivize downstream farmers from paying the ISF, as Ostrom and Gardner (1993) argue according to the discussion in Section 3-1-1. This could be one of the factors for choosing the rate of ISF payments in the BRISIA; the downstream TSAs have the lower rate, though a higher percentage of upstream farmers pay the ISF than downstream farmers. This would show that the crop rotation calendar provided by BRISIA does not achieve the fair distribution of water among all TSA leaders, but it appears to benefit the upstream farmers while the downstream farmers suffer with more scarce water. None of the TSA leaders answered that they think they can punish the farmers who do not follow the crop rotation calendar.

Later sections of this chapter analyze the ISF payment in detail. Farmers' satisfaction with the ISF rate is lower at downstream TSAs than upstream TSAs. Most of the upstream leaders think that the members are satisfied with the rate of the ISF, but three out of ten downstream leaders think that the members are not satisfied with the rate. The dissatisfaction rate is not high, but downstream farmers seem to have more difficulty with paying the ISF than upstream farmers.

With respect to cleaning canals, the interviews revealed that the main canal is cleaned by the BOD members with the help of the TSA members and the ditch tenders. Depending on the group, the leaders answered that some members or none of their TSA groups help with the canal cleaning. It seems that more members from upstream and downstream TSAs help with clearing the main canal, but the downstream data has many missing values and is not suitable to compare with different stream groups. The leaders said that the sub-lateral canals must be cleaned by the BRISIA ditch tenders. The canals that the ditch tenders cleaned are those closest to the ditch tenders' rice paddies. There is no mechanism for the TSAs to punish people who do not join in cleaning the main or sub-lateral canals. The tertiary lateral canals are cleaned by individual farmers. Thus, it appears that the TSA does not function well in distributing duties for cleaning canals.

With respect to the results from the questions about canal facilities and rehabilitation projects, the author asked these questions with the expectation that more repaired canals or more participation in the rehabilitation projects would motivate farmers to pay the ISF. Most of the TSA leaders answered that they had received or conducted some kind of rehabilitation project, such as cementing,

re-plopping, or conducting minor repairs. Among all the projects discussed by the TSA leaders in the questionnaire, five projects in the upstream and midstream TSAs got TSA members involved in the physical labor or in payment for part of the costs of the projects. The TSA leaders in five repair projects answered that they did not see any change in members' attitudes towards paying the ISF whether the members were involved in the project or not. However, three TSA leaders in the downstream TSAs answered that they observed a change in attitude toward the ISF payments after members got involved as labor or in financing the projects. Therefore, the findings suggest that participation in repair projects creates a positive attitude toward ISF payment to some extent. However, the sample size used in this research is too small to provide predictable evidence about the effects of irrigation project participation on ISF payments.

This section finds that the crop rotation calendar provided by BRISIA does not seem to help distribute water fairly among the different streams. The satisfaction with the water supply is low amongst downstream farmers. Most of the downstream TSAs are not satisfied with the water supply and several TSAs were using water pumps. Having a water rotation system is more popular among the downstream TSAs, rather than the upstream and the midstream TSAs. The interviews also reveal that nine out of sixteen upstream and midstream TSA leaders think that most or all members follow the crop rotation calendar provided by BRISIA, but only one downstream TSA leader thinks that farmers use the crop rotation calendar while the rest of the TSAs leaders think that none or only some farmers use the crop rotation calendar. The questionnaire reveals that 67% of the farmers are satisfied with the canal system, but 26% of the farmers are not (while the rest of the farmers did not answer). These results show that the canal facilities are maintained in a satisfactory manner, but the crop rotation calendar provided by the BRISIA may not be helping to achieve fair water sharing amongst all TSA groups. The crop rotation calendar does not appear to be effective because even though most of the upstream farmers follow the crop rotation calendar, water distributed to the downstream TSAs seems to be scarce and requires the implementation of a water sharing plan within each downstream TSA.

#### **b) Social Capital at the TSA Level**

The questionnaires reveal that there are several characteristics of social capital within the TSAs. First of all, from the questions about the resident's profile, it was found that 70% of the TSA leaders live in Pagsanjan, and the same percentage of rice paddies are also in Pagsanjan. The average number of years of residence of the TSA leaders at their rice paddies is 49 years, so generally the TSA leaders have lived in the same place since birth. The average year of cultivation of the rice paddies is 30 years, so generally they start farming when they become an adult.

55% of the TSA leaders think that they earn more yields than other farmers. The data to examine the annual revenue of the TSA leaders was not usable for the analysis. Besides rice farming,

59% of the TSA leaders engage in other farming, and 26% of the farmers engage in non-farming businesses. There are no special characteristics found in the non-farming occupations of the TSA leaders according to their stream location. 63% of the TSA leaders do not think they are better off than the other farmers. Most of the TSA leaders are the landowners, so they should be better off than the famers in general. (The data to measure the annual income of the farmers had flaws).

According to the interviews, 15 answers out of 27 were valid about the perception of the TSA leaders concerning the farmers' land ownership. The results are all based only on the valid answers. Four out of four upstream TSA leaders answered that the TSA members are mostly land owners. Three out of five TSA leaders said that the members mostly rent their farmland. The downstream farmers are mostly either tenants or landowners, but four out of six downstream TSA leaders mentioned "caretakers" in their groups. It seems that downstream TSAs have more "caretakers" than the upstream TSAs.

### Bonding

With respect to the bonding level within the BRISIA BOT, the results show that the BOT members' families include the most of BRISIA personnel or NIA PILA officers. Almost all BRISIA personnel or NIA PILA officers are somehow connected as family relatives of the TSA leaders. 50% of the upstream TSA leaders, 43% of the midstream TSA leaders, and 40% of the downstream TSA leaders have familial kinship with the BRISIA BOT. Thus, the downstream TSA leaders have less family ties with the BRISIA personnel or the NIA PILA officers

The questionnaire asks the number of TSA members residing in each barangay (Pagsanjan, Lumban, Magdalena, and Sta Cruz). This information reveals that most of the upstream (MC1-5) TSA members reside in Magdalena and less in Pagsanjan. The midstream (MC6-8) TSA members live in Pagsanjan while most of the downstream (MC11-14) TSA farmers are from Lumban. Upstream (BE1-BE5) farmers generally are from Pagsanjan and most of the midstream farmers (A1-4) live in Pagsanjan. Most of the downstream farmers (A1-2, A1A1-3, BC1-3) reside in Sta. Cruz. There is not enough data to assess the distribution or variation of the farmers across streams. These facts show that most of the farmers in each TSA live generally in a barangay, though there is variation in the distribution of residential boundaries.

86% (excluding people who did not respond) of the TSA leaders think that the BRISIA functions as well as can be expected, and each stream region has one TSA leader who does not think BRISIA functions well. 89% of leaders think that the BRISIA can bring solutions to their TSA problems. 89% of the leaders think that the other BOT members are willing to listen to their opinions. Thus, it seems that the TSA leaders' satisfaction with the BRISIA's functions is generally high across all TSAs.

When it comes to the strength of ties among the BRISIA BODs (composed of the all TSA leaders), TSA leaders are friends with on average ten other BRISIA BOD members. 15 people, six people and seven people are the average number of upstream, midstream, and downstream TSA leaders' friendships with BRISIA BODs. When asked whether you can talk to the BRISIA president about their personal problems, 77% of TSA leaders said yes. There is no pattern in this answer depending on different locations. These results show that there is strong social capital bonding among the TSA BOD members. Also, the BRISIA president has gained strong trust with the TSA leaders.

When it comes to the bonding level within a TSA, not many answers were valid. The questionnaire reveals that 75%, 70%, and 90% of upstream, midstream and downstream TSA leaders respectively answered that the TSA includes farmers who are neither landowners nor tenants. This tells that downstream TSA groups work on land to which they are neither landowners nor tenants. This variation in land ownership seems to be a key factor that affects the relationships among the farmers. The NIA only recognizes either landowners or tenants, so if there is a prevailing land work contract which is not recognized by the NIA, this can complicate the ISF collection. The land contracts existing in the BRISIA areas will be discussed in the later section of the chapter. The author finds that this land ownership situation is the crucial factor for ISF collection and this affects the rate of ISF payment.

Each TSA leader was asked how many member farmers of the same TSA are friends with whom they can talk about personal problems. Their answers show that the average number of friends is nine people (28%), fourteen people (51%), four people (1%), and seven people (18%) who are the close friends of upstream, midstream and downstream TSA leaders. When the TSA leaders were asked the number of family members among member farmers of the TSA, the average number was two people (6%). Two people (7%), two people (6%), and three people (8%) out of the TSA members are family members of the upstream, midstream and downstream TSA leaders. 93% of TSA leaders feel honored to be in their position. The finding is that family kinship among TSA members is highest among the upstream farmers and weakest among the midstream farmers.

Nine people (28%); eight people (29%), eleven people (35%), and eight people (22%) out of the upstream, midstream and downstream farmers respectively live in the same barangay where the TSA leaders reside. This result shows that the most of the TSA members in every TSA do not reside in the same barangay where their TSA leaders reside. The midstream TSA leaders reside with the most TSA members out of all the stream areas. Also, this result suggests that the residential location of the downstream farmers has the most geographical variation.

The findings about social bonding are; 1) downstream TSA leaders have less family connections with the BRISIA or the NIA, 2) generally farmers reside close to each other but downstream farmers seems to have more variation in the residential locations of farmers, 3) it seems

that the TSA leaders 'have a high satisfaction with the BRISIA's functioning, 4) the downstream TSA groups have mostly other land work agreements other than as landowners or tenants, 5) there is strong social capital bonding among the TSA BOD members, 6) the BRISIA president has gained the trust of the TSA leaders, and 7) family kinship among TSA members is most concentrated among the upstream farmers and least concentrated among the midstream farmers. These results show that downstream farmers have more geographical variation (the spread of farmers' residences over the barangays seems to be wider) and socially (the downstream farmers have more variety in the farmers 'land ownership and work agreements).

### Bridging

59% of TSA leaders answered that the TSA groups are important in their lives. 33% of the leaders answered that the BRISIA is one of the most important groups in their lives. 30% of the leaders answered that a religious group is one of the most important groups in their lives. 59% of the leaders answered that job groups are the one of the most important groups in their lives. 44%, 47%, and 44% of the TSA groups are non-agricultural out of all the groups in the upstream, midstream and downstream TSAs. This result shows that the TSA groups means a lot to the lives of the TSA leaders. At the same time, the non-agricultural groups are as important as the TSA groups to the TSA leaders. 92% of the leaders have family members who are not members of the TSAs in their neighborhoods. 96% have close friends who are not members of the TSAs in their neighborhoods. This questionnaire provides little information about bridging social capital.

### Strength of Ties

The questionnaire also tries to assess the strength of social ties between TSA members. Twelve TSA leaders count on the BRISIA president to get agricultural advice, ten leaders count on the municipal agriculturist, and a few count on the TSA members or the other BRISIA BOTs. If they suddenly were to have a bad harvest, the majority of the TSA leaders (10) would count on the BRISIA president to help with agricultural emergencies, and the rest would count on the other TSA members, the municipal agriculturist, the BRISA BOT members, and the barangay captains. The BRISIA president seems to be the most trusted member to have the ability to help with the agricultural emergency situations. If the TSA members wished to borrow enough money to support a household for one week, the majority of the leaders would count on the individual money lenders (10) or the palay buyer (9). This means that the BRISIA leader is not expected to have the ability to financially help the TSA members in emergency situations. If the TSA leaders suddenly faced a failure with their harvest, most (10) of them would rely on the BRISIA president and some would rely on the TSA members to help them out. Thus, the BRISIA president is trusted to have the ability to help them cope with a harvest emergency. The barangay captain does not seem to have an important

role with the TSA leaders, because the questionnaires revealed that the TSA leaders did not experience much personal influence nor received many favors from their barangay captains. 69% of farmers only trust their families and relatives; neither neighbors nor the money lenders are found to be trustworthy. The main finding in this section is that the BRISIA president's function is that s/he is trusted by the TSA leaders as a resource for their agricultural lives.

### Linking

The questions and answers regarding linking are in Table 14 below. These results show that most of the TSA leaders have families or friends in higher level administration, though most of the leaders do not have close relationships with the senators or cabinet. For the analysis, "strong" is rated as 3, "middle" is rated as 2 and "weak" is rated as 1. The strength of trust with TSA leaders and offices is shown to be the same among PILA NIA office, the municipal office, and the provincial office. The strength of trust towards the NIA office and the government are slightly lower, and the highest strength of trust level within all offices is only rated as in the middle (see Table 14).

**Table 15 Questions and Answers about TSA Leaders' Social Capital Linking (Unit; %)**

	TSA leaders' Linking Social Capital	YES	NO	Family	Friend	Strong	Middle	Weak
Q43	Do you have any one in PILA NIA to ask helps when you need?	65	33					
Q45	Is he/she your families or close friends?			1	0			
Q46	How much do you trust the PILA NIA office?					8	15	1
Q47	Do you have any people in municipal office to ask helps when you need?	96	4					
Q49	Is he/she your families or close friends?			81	19			
Q50	How much do you trust municipal office?					8	15	1
Q51	Do you have any people in provincial office to ask helps when you need?	72	28					
Q53	Is he/she your families or close friends?			32	68			
Q54	How much do you trust the provincial office?					8	15	1
Q55	Do you have any congressmen in district offices to ask help when you need?	81	19					
Q56	Is he/she your families or close friends?			96	4			
Q57	How much do you trust the district office?					9	14	1
Q58	Do you have any people in NIA ( the central office) to ask help when you need?	58	42					
Q60	Is he/she your families or close friends?			96	4			
Q61	How much do you trust the NIA office?					9	15	1
Q62	Do you have any senators/cabinet to ask help when you need?	7	93					
Q64	Is he/she your families or close friends?			16	84			
Q65	How much do you trust the office?					3	14	5

### **c) The Relationship Between Social Capital and the Functionality of the TSAs**

The results of the questionnaire show several relationships between water rotations and ISF payments as well as between social capital and the functionality of the TSAs. The functionality of the downstream TSAs is better than the upstream TSAs, because 80% of downstream TSAs have TSA

meetings, 70% of the downstream TSAs have a set of functioning officers, and 60% of the downstream TSAs have a water rotation plan. Conversely, dissatisfaction with the water supply is strong among the downstream TSAs (60%). Downstream TSAs are seemingly better organized because their water supply is low; so the downstream farmers have to cooperate in order to coordinate the water distribution.

This finding reveals that the water rotation system (also called the fair-share water system) is mostly implemented in the downstream TSAs, which also have the lowest ISF payment rates. This suggests that the relationship between the water rotation system and the ISF payments is counterintuitive. The amount of the ISF payment is high in downstream TSAs, not because the fair-share system is implemented, but because the water supply is scarce. Consequently, the ISF payment rate is low, and a fair-share water system must be implemented to make up for the low payment rate. Therefore, the 3<sup>rd</sup> hypothesis that the irrigation association which has a water rotation system has the higher ISF payment is refuted.

It would be difficult to conclude that there is a relationship between social capital and functionality of the TSA. However, the downstream data shows that some relationship exists between social capital and the functionality of the TSA. The results also reveal that the downstream TSAs 1) are functioning at a relatively high level, 2) have more variation between location of the farmers' residences, 3) have land work agreements that are not recognized by the NIA, and 4) maintain less family ties with the BRISA or the NIA than other TSAs. It appears that downstream TSAs have weak social capital, because they have more variation in the elements that make up social capital. However, the downstream TSAs have a water rotation plan to share water amongst the downstream TSA farmers, and their social capital that appears weaker than other TSAs, also requires more cooperation. Thus, the results suggest a counterintuitive relationship between social capital and the functionality of the TSAs due to a greater need for cooperation and higher functionality amongst TSAs that appear to have lower social capital.

Another key finding is that many downstream farmers serve as caretakers. Considering that the downstream TSAs pay the lowest ISF payment, this finding suggests that land ownership issues play an important role in raising the ISF payment amount. This issue will be discussed later in Section 6-6. The third key finding is that the crop rotation calendar provided by the BRISIA seems to not help the fair-share water system because the downstream TSAs are exclusively in need of water rotation plans. This suggests that a big IA, like BRISIA, does not achieve a fair water usage rotation among the TSAs.

## **6-4 Relationships Between ISF Payments and Corruption**

This study tests the relationship between ISF payments and the perception of corruption by the midstream TSAs by assessing the relationship between trust levels amongst TSA leaders and the midstream farmers regarding the governmental administration and the ISF payment rates.

This study quantifies the TSA leaders' levels of trust in the government by giving points of 1-3 based on the results of Table 14. This point system labels the TSA leaders' level of trust in the government on a scale of 1-3 as weak, medium and strong. The results from summing and averaging all the numbers according to the administrative levels reveal that the trust level in the NIA PILA office is 2.29, in the municipal office is 2.29, in the provincial office is 2.29, in the district office is 2.33, in the NIA office is 2.32, and in the senators and cabinet are 1.90. These results show that the national government seems to be least trusted. However, the difference between the numbers does not have much variation (between 1.9 and 2.33), though these results reveal a relatively high level of distrust toward the government. The trust levels of the upstream TSA leaders, the midstream TSA leaders, and the downstream TSA leaders are similar, so the perception towards governmental bodies does not vary depending on the locations of the streams. Also, looking closely at the level of trust per stream following the data about the linking of TSAs, it is still difficult to articulate a positive or negative relationship between corruption and ISF payments.

With respect to the midstream farmers' perception of corruption, Table 15 shows that the trust levels toward all governmental agencies is high, although the majority of the farmers do not feel they have anyone they can ask for help in these agencies. The previous section, Section 6-2, found that those who answered the questionnaires also generally pay their ISFs on time. Thus, it would be plausible to argue that there is a negative relationship between the farmers' perceptions on corruption and the ISF payment rate. In other words, there seems to be a positive relationship between a high trust in the government and ISF payment rates according to the data collected from midstream farmers.

**Table 16 Questions and Answers about linking (midstream farmers)**

	Questions and No. of Answers about Linking (midstream farmers)	Yes	No
Q53	Do you know anyone in PILA from whom you can get help?	9	29
Q54	Do you trust the PILA NIA office?	29	3
Q55	Do you know anyone in municipalities from whom you can get help?	14	21
Q56	Do you trust the municipal office?	30	5
Q57	Do you know anyone in the provincial office from whom you can get help?	12	22
Q58	Do you trust the provincial office?	26	5
Q59	Do you know anyone in the district office from whom you can get help?	7	26
Q60	Do you trust the Congressman?	24	7
Q61	Do you know anyone in the government from whom you can get help/	6	26
Q62	Do you know the government offices?	23	11
Q63	Do you know anyone in the cabinet/ senators from whom you can get help?	3	33
Q64	Do you trust the cabinet/senators?	22	10



With respect to the TSA leaders' perception of corruption, by giving points 1-3 according to the results of Table 14 to the level of trust from weak, middle and strong, this study could quantify the levels of the trust to the governments. When summing the all numbers depending on the administrative levels of the TSA leaders, the trust level in the NIA Pila office is 2.29, the trust level in the municipal office is 2.29, in the provincial office is 2.29, in the district office is 2.33, the NIA office is 2.32, and in the senators and cabinet are 1.90. These results show that the government seems to be least trusted. However, the difference between the numbers does not have much variation (between 1.9 and 2.33), though these results clarify the relatively high level of distrust to the government. The trust levels of the upstream TSA leaders, the midstream TSA leaders, and the downstream TSA leaders are similar, so the perception towards governmental bodies does not vary depending on the locations of the streams. Also, looking at closely the level of trust on each level by different stream TSA leaders based on the data about linking of TSAs, it is still difficult to articulate a positive or negative relationship between corruption and the ISF payment.

Though the data from the midstream farmers suggest that there is a positive relationship between the TSA farmers' trust level in governmental agencies and ISF payments, the data obtained from the TSA leaders does not clarify this relationship. Therefore, these findings serve to question the hypothesis that the perception of corruption has a negative relationship with ISF payments. It is necessary to have more studies about this relationship by collecting and comparing the data from different streams and IAs.

## 6-5 Reasons for ISF Non-Payment

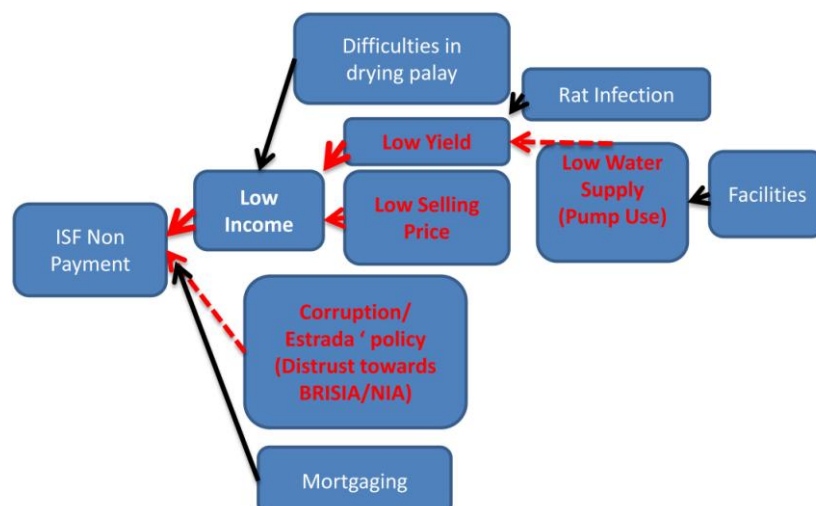
The author interviewed the TSA leaders about the reasons why the farmers do not want to pay the ISF. The answers are listed below in Table 16.

**Table 17 Reasons Why Farmers Do Not Pay the ISF**

	Reasons for "why farmers do not pay ISF"	No. farmers
1)	Low yield	7
2)	Corruption+Estrada's ISF discount policy ( distrust to the government/NIA/BRISIA) Not enough services provided by NIA/BRISIA	5
3)	Low selling price	4
3)	Low water supply+pump-using	4
5)	Rat infection	2
6)	Difficulty in drying palay in wet season	2
7)	Not good facilities provided	1
8)	Lack of capital	1
9)	Mortgaging	1

Seven out of the twenty-seven TSA leaders interviewed, reported that low harvest yields is the main factor inhibiting farmers from paying the ISF. Another five TSA leaders do not pay the ISF because they distrust either the government, the NIA, or the BRISIA because of their perception of corruption. These farmers feel that they have not received services worth the ISF payment. Four TSA leaders find that the low market price of palay affects farmers' income as rice-farmers. The palay price is not enough to allow giving money for the ISFs. Another four TSA leaders think there are two reasons that farmers would not pay the ISF. The first reason is that their water supply is not enough for them to have enough yield of palay to allow them to afford paying the ISF. The second reason is that the farmers also have to use pumps, so they feel that they do not receive enough benefit from irrigation worth paying the ISF. There are several other minor reasons. Rat infection causes low yields which constrains farmers' budgets for ISF payments. Another farmer had a difficult time drying palay during the wet season. This prevented him from selling as much palay, which affects his income for paying ISF payments. Another TSA leader thinks that the TSA farmers are not satisfied with the canals and the services they receive from the facilities. Another TSA leader thinks that farmers generally do not have enough capital to pay the ISF. The other TSA leader is concerned with the farmers' payments due for his land mortgage, which limits the farmers' ability to pay the ISF.

Table 16 shows that the author found there are a number of relationships that affect ISF non-payments according to the data from interviews. These mechanisms that prevent ISF payments are depicted in Figure 12 below. The red line in Figure 12 indicates the top three factors that create ISF non-payments. The reason for ISF non-payment as low income is considered as essentially the same as a lack of capital. Although these reasons were not a majority opinion, these factors are related with low yield and low selling price, so, in combination, these reasons are shown in red as well.



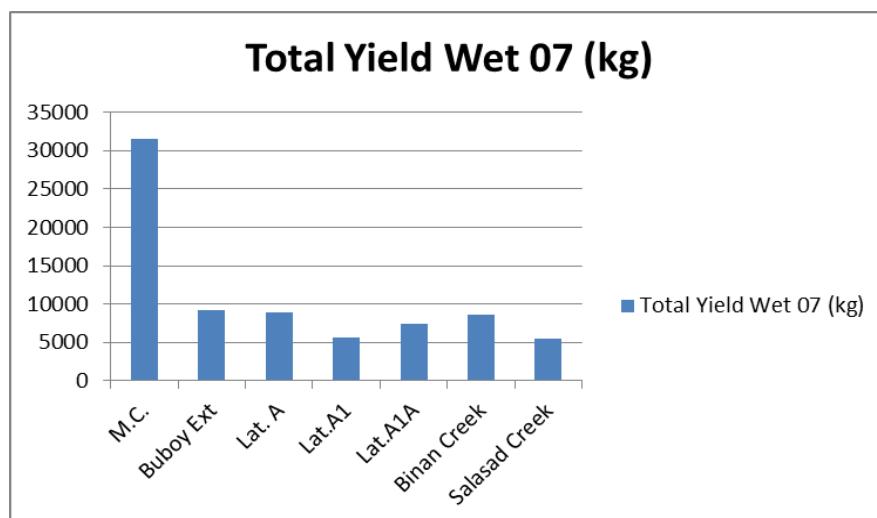
**Figure 12 The Mechanisms of Non-ISF Payments**

It is also important to note that the interviews with the TSA leaders revealed some reasons why farmers pay the ISF. One of the TSA leaders answered that the reason why farmers pay the ISF is that they are afraid of being sued by the NIA due to non-payment. Another leader answered that farmers feel reluctant to ask neighbors to share more water for their paddies, if they are not paying the ISF. These answers show that the sanctions work to motivate some farmers to pay as discussed in the institutional approach of theories of collective action in Section 3-1-2, and reflect the feelings of reciprocity expressed in the Tagalog saying, “Utang-na-loob,” as discussed in Section 3-4-1.

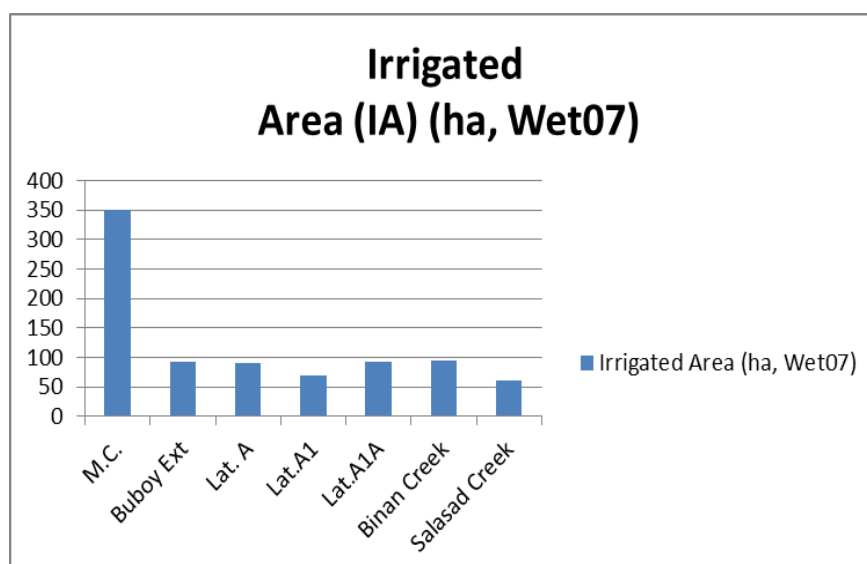
This survey clarifies that most of the TSA leaders view the primary reason why farmers do not pay the ISF is because of low harvest yields. It is not clear from the data collected if the main cause of the low yield is examined from the data collected. The relationship between the ISF payment rate and harvest yields can be examined by the data on Table 17, Figure 13, and Figure 15. Comparing the data in Figure 13 and Figure 15, it seems that there is no relationship between the ISF payment rate and the harvest yield from the wet season of 2007. Comparing the patterns of the irrigated area in the dry season 2007 with the ISF payment rate of the dry season 2007, the patterns also look different (Figure 14 and 15). These data do not reveal any relationship between the ISF payment rate and total harvest yields or irrigated areas.

**Table 18 Harvest Report and Irrigated/ Benefited Area**  
(Units: Area-ha, Yield-kg)

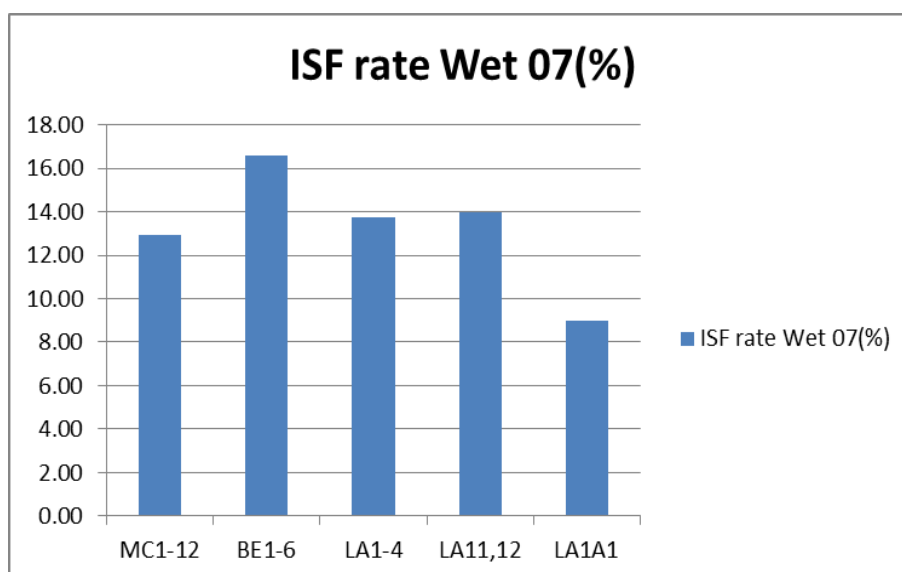
	Wet 2007					
	Harvest Report & Irrigated /Benefited Area					
	Irrigated Area (IA)	Benefited Area (BA)	(IA/BA)/ IA*100	Area Planted	Total Yield	Average Yield
M.C.	350.50	341.51	2.56	350.00	31545.00	90.00
Buboy Ext	92.52	92.52	0.00	92.52	9252.70	100.00
Lat. A	89.40	89.40	0.00	89.40	8940.00	100.00
Lat.A1	69.50	37.16	46.53	69.50	5560.00	80.00
Lat.A1A	92.58	85.30	7.86	92.58	7406.34	80.00
Binan Creek	95.30	88.13	7.52	95.30	8557.00	90.00
Salasad Creek	60.20	60.20	0.00	60.20	5418.00	90.00
Sub-total	850.00	794.22	6.56	849.50	76679.04	



**Figure13. Total Yield (Wet 07)**



**Figure14. Irrigated Area (Wet 2007)**



**Figure 15 ISF Rates per Lateral Canal (Wet 2007)**  
(Used the same data sources as used for Figures 9 and 11.)

## 6-6 The Relationship between ISF Payments and the Barangay

Many of the questions posed to the barangay captains focus on the strength of the social capital of a barangay. These questions seemed to be irrelevant when Section 6-3 finds that the barangay life is not very related to agricultural life. Also, the results of Section 6-3 show that the barangay captains do not play an important role in the lives of the TSA leaders. Therefore, this thesis concludes that there are no direct relationships between the ISF payment and the barangay life. Therefore, this section does not go in detail regarding the data results about social capital of the barangay.

This section briefly explains how agricultural life and private life overlaps in the midstream TSA area where Lateral A intersects the midstream area, as found in Section 6-2. The previous section, Section 6-3, reveals that Pagsanjan is the area where most farmers in the midstream TSA reside. Thus, this section compares the data concerning the midstream area of Pagsanjan with all data collected in order to reveal how agricultural life and private life overlaps in the midstream TSA area.

First of all, 42% of the barangay leaders are rice-farmers, and the rest of the leaders are not engaged in any farming that uses irrigation. 71% of the barangay captains from Pagsanjan are farmers. The average percentage of farmers in all barangays is 40%, but the average percentage of midstream farmers in the barangays of Pagsanjan is 52%. The average percentage of rice-farmers in all the barangays is 37%, but the average percentage of rice-farmers in the barangays of Pagsanjan is 51%. These results show that agricultural life and the private life is more connected in the midstream TSA area because the Pagsanjan region has larger farming and rice-farming population.

Barangay captains articulated that the people of the barangay come to talk to the barangay captains mainly about family problems or complaints about their neighborhoods. The average time the barangay residents spend asking their captains for help is 23 times per year, but the amount of time the residents from the midstream area spend is 12 times per year. Also, the average strength of the bayanihan in the midstream area is 2, and the average strength of the bayanihan in whole area is 2.5. Thus, midstream area selected for this study seems to have less interaction or cooperation amongst residents than the others. Therefore, the midstream areas in the Pagsanjan region selected for this study have more overlap between their private life and agricultural life. In addition, there is lower cooperation among residents in the midstream TSA areas of the Pagsanjan region than all the other areas on average.

## **6-7 The Relationship between the Bayanihan System and ISF Payments**

The interviews with the TSA leaders include the questions about the bayanihan system. Except for the Lateral canal A2, which has a bayanihan system for cleaning canals, the rest of the TSAs do not have bayanihan systems for cleaning canals. However, each TSA has some kind of bayanihan related to agriculture, such as cleaning the main canal, minor repairs of canals, etc. (see Table18). 50% of the upstream TSAs, 29% of the midstream TSAs, and 60% of the downstream TSAs have some kind of bayanihan system related to agriculture. This result is related to the findings of the previous section, Section 6-3, which reveals that downstream TSAs are more cooperative than other TSAs since they have a water rotation system and more bayanihan practices in place. Also, as Section 6-2 reveals, midstream farmers seem to be less cooperative than farmers in other TSAs. Therefore, there seems to be a relationship between the strength of social capital in TSAs and the existence of agricultural bayanihan systems.

All leaders think the strength of the bayanihan system has not changed over the past 10 years, and all the TSA groups have the same kind of “neighborhood bayanihan”. “Neighborhood bayanihan” require cooperation in order to prepare funerals, weddings, feasts, etc. (see Table19). Almost all TSAs have some kind of “neighborhood bayanihan” practice. Thus, bayanihan practices in general do not seem to affect the rate of the ISF payments.

**Table 19 Types of Bayanihan for Agriculture**

Bayanihan for agriculture	
Type	No of answers
Canal cleaning of MC	14
Minor repair of canals	6
Land preparation	1
Planting	1
Canal rehabilitation	2
Disilting	2
Cutting grasses	2
Mice to Spray out	1
Carabao sharing	1
Installation of cemented pipes	1
Rat elimination	1

**Table 20 Type of Bayanihan in Farmers' Daily Lives**

Bayanihan for daily life	
Type	No of answers
Special Occasions ( wedding, funeral, Fiesta, Inauguration)	18
Construction of houses/Buiding Tents and nip-a-hat	5
Projects	1
Moving	1
Bringing sick people to hospitals	1
Cleaning of neighborhood/Cutting grasses	4
Nothing	3

## **6-8 Land Ownership and Agricultural Work Agreements in Laguna**

On the membership lists possessed by the BRISIA, the NIA and the BRISIA recognize only either land owner or tenants. The BRISIA ISF collectors use this list to collect ISFs. However, as was discussed in Section 6-3, the questionnaires to the TSA leaders revealed that there are many “caretakers” of farming land downstream where the rate of the ISF collection is lowest amongst the TSA areas. A “caretaker” is the generalized name for land-usage agreements different from landowners and tenants. Table 16 in Section 6-5 indicates that one of the reasons why farmers do not pay the ISF is due to mortgage payments owed. Therefore, this section focuses on land-usage agreements, which seem to be the crucial factor for unpaid ISFs. This section is mainly based on the

results from interviews with Professor Tolentino of the University of the Philippines Los Banos who specializes in rural sociology.

The interviews with the TSA leaders reveal that there are several types of land work agreements. This research finds that these complicated agreements are one of the critical factors contributing to the low ISF payment rate. This research examines that the reasons why the questionnaires could not reach all farmers registered on the BRISIA's list of TSA members and did not get returned for data collection, are related to a complicated system of agricultural work agreements. The author suspects that most likely many farmers did not want to tell the author (who came to the region with the BRISIA tricycle driver) about their work situation, because their work agreement is illegal.

Tolentino (2009) argues that before agrarian reform was instituted by Marcos in 1972, there were only two classification for farmers; 1) land owners (land loads) and 2) share tenants (kasama). The relationship between the two was equal in that they split the costs of farming and harvesting equally. At the time of the agrarian reform, a land load was equal to a land owner. After the agrarian reform, if a land owner used to own a piece of land less than 7 hectares, the right to use the land was subject to the "operation leasehold," which became the permanent lessees' benefit. The owner of the land under the operation leasehold is still a land owner, and s/he has both "the right of access" and "the right of ownership." However, after the permanent lessees receive "the right of access" to the land, they must pay a rent payment of 50-70 cavans per hectare per season to the land owner. The permanent lessees receive a fixed percentage of the harvest and bear all the costs of production. If the land owners would like to sell "the right of ownership," but the permanent lessees do not agree with the sale, the land owner cannot sell the land unless the new buyer agrees to allow the lessees to keep working on the land. This lessor-lessee relationship is based on the previous landowner-tenant relationship, and the lessee's work agreement is secured under the law (Aralar 2007).

On the other hand, a piece of land which exceeded seven hectares was subject to the "operation land transfer" which benefitted the own-operator. The seven hectares of land can be retained by land owners without being subject to the agrarian reform. Any own-operator could own land and cultivate the land. In this way, land work agreements can be classified as follows, 1) own-operator, 2) permanent lessees, and 3) share tenants. Own-operators are the owners of "the right of ownership" and "the right of access." Permanent lessees own "the right of access," to the land although they do not have ownership and need to pay rent of 50-70 cavans per hectare per season to the land owner depending on their agreement. Permanent lessees cannot be removed by landowners; this tenure is secured. In order to remove the permanent lessee, the landowner has to pay a certain amount of money to the lessee. A share tenant agreement is an illegal land work agreement, and they are to some extent owners of "the right of access," though they do not possess



ownership. They have to give some portion of their harvest to the landowner, and land owners and share tenants split the costs of farming evenly (Tolentino 2009).

Farmers had either “the right of ownership” or “the right of access to the farms” after the agrarian reform, but this does not necessarily mean that they cultivate the land (Tolentino 2009). There are also farm laborers who do not have “the right of access” to lands. The two rights of “the right of access” and “the right of ownership” can be sold. Permanent lessees can sell “the right of access.” In the case that the land owner wants to pay to obtain the land, landowners can pay about 150,000-200,000 pesos per hectare in exchange for “the right of access.” The landowner needs to agree on the lessee’s sale of “the right of access.” Even if the landowners do not want to agree with lessee’s sale of this right, the lessee is allowed to sell the right by paying their landowners. If a permanent lessee needs money, the permanent lessee can seek someone who wants to buy “the right of access” to his farm land. If the owner wants to take back the farm land, the owner has to buy “the right of access” from the permanent lessee. In this case, both rights will be owned by the landowner eventually.

The author’s interviews with the farmers revealed that there are four land work agreements: 1) land owners, 2) tenants, 3) care-takers, and 4) mortgagees. In the first agreement, the land owners are the owners of the land. In the second agreement, tenants pay some amount of their harvest as rent paid to the land owners. In the third agreement, the caretakers receive wages every day and 10% of the harvest after harvesting. There are also care-takers who only represent their land-owners in case they are in foreign countries. While a landowner is out of the country, the care-takers receive some portion of the harvest from the tenants.

The final agreement, mortgaging is prohibited under the laws of the Philippines, but there are many mortgagees among the farmers of the BRISIA. The mortgagees do not own land, but they cultivate the land. Some of the farmers lend and sell the rights of the land. The land which is mortgaged is either borrowed or under specific contracts. The mortgagees can get their land back if they can pay back the money to the land owners. The mortgagees have to pay the ISF to landowners. The ISF has to be paid to the BRISIA by the landowners who receive ISF payments from their mortgagees. The mortgagees can get some portion of the harvest yields. The portion of the harvest paid depends on the mortgage agreement. The land owners have to pay the ISF to the BRISIA, so how much of the ISF the mortgagees have to pay actually depends on each agreement made. Even if a mortgagee does not pay the ISF to their land owner, the land owners still have to pay the ISF to the BRISIA.

In Laguna, before the agrarian reform program was in effect, 63% of the paddies were under share tenancy contracts and in this area most landlords owned the land of less than seven hectares (Hayami and Kikuchi 2000). This area of Laguna may be more affected by the traditional tenancy relationships. Thus, this area may have more illegal land work agreements after the agrarian reform,

and have more agreements with a lessor and lessee relationship. As confirmed by interviews with farmers, there are various forms of land tenure including illegals ones. Professor Tolentino clearly classified the land work agreements that exist in Laguna as follows. Based on the interviews with the farmers that the author conducted, Tolentino (2009) classified land work agreements into four categories as follows:

- 1) *Land Mortgagee*: If land owner A does not have the capital to cultivate his own land, he mortgages his land to another farmer, farmer B. Thus, farmer B lends money to land owner A, and B cultivates the land instead of land owner A. The person B whose land was mortgaged needs to pay the ISF. If land owner A cannot pay back the money to the person B who cultivates the land, A often makes another agreement with another farmer, farmer C, to let C get his land mortgage and in exchange, land owner A borrows some money from C. Thus, the money paid by farmer C to landowner A will be paid to the farmer B who cultivates the land. Then, the mortgaged land goes to the farmer C according to the latest contract.
- 2) *Tenants*: Once a tenant gets tenancy rights, the tenant cultivates the land and gets 70% of the harvest yields while the 30% of the harvest yields go to the land owners. The tenants have to pay the ISF. The conditions of the tenancy depend on the agreements between the tenant and the land owner. The tenants are “co-workers” of the land owners, so the tenants cannot be removed by their land owners. Even though the land owners would like to sell their land to others without agreements between tenants and land owners, the land cannot be sold. Even though the land owners and tenants can agree to sell the land, the tenants have to receive a service fee payment equivalent to the number of years they worked on the land.
- 3) *Caretakers*: The caretakers provide services for people who have any type of land work agreement. Caretakers have contracts or agreements with land owners, but are paid by the people working for the land owners. Caretakers usually receive 250.50 Philippine pesos per day. Typically, caretakers cannot work for others while under contract with land owners. The caretakers can be removed even before the end of the agreement. There was a case in which a land owner was abroad and did not pay the salary to the caretaker, and the caretaker eventually became a tenant who split 30% of the harvest with the land owner.

The interviews disclosed that caretakers cannot work for others. According to Professor Tolentino, there is a “debt-bonding” relationship, in which those who have debts cannot be freed from the person from whom they borrowed money.

The caretakers do not own “the right of access” to the land, so they can never be farmers, but they are just called labor. The caretakers are responsible for farming after transplanting and before cultivating, such as when picking up snails, controlling water flow,

etc. On the other hand, those who have “the right of access,” such as tenants, are responsible for the whole process of farming. The caretakers are paid in cash and they are not paid with harvest yields.

- 4) *Added Labor*: Added labor are hired only temporarily, such as for harvesting, and they are paid daily.

From the interviews, this research reveals that there are mortgagees, caretakers, and seasonal labor besides “tenants.” Professor Tolentino explanation shows how the mechanism of farmers’ work agreements can become even more complicated and how farmers can accumulate debts, which inhibit them from paying the ISF.

With respect to mortgaging, an own operator in need of capital, mortgages their land to borrow money from another person (a mortgagee), and temporarily the ownership of the land is transferred to the mortgagee. It could also happen that “the right of access” is given to the own-operator, or the right can be also transferred to the mortgagees. Both the own operator and mortgagees can mortgage “the right of access.”

For example, suppose that an own-operator needs some money, and mortgages both rights to borrow money. If the person who made the land mortgage agreement with the own-operator has a non-farming job, he can make an agreement with the original own-operator to let him cultivate the land. In this case, the original own-operator can become a share-tenant. In the case where a permanent lessee mortgages his right of access to a third party, and if there are share tenants already on the farms, a conflict can happen between the land owner and the permanent lessee. Without informing the land owner, the permanent lessee might mortgage his right of access secretly. There is a possibility that the permanent lessee can get the property back eventually before the land owner knows the secret.

It could also happen that a permanent lessee might mortgage his right of access to one party and get 150,000 Philippine pesos, and turn around to mortgage his right of access to another party to borrow 200,000 pesos. Then, the permanent lessee can repay the first mortgagee and earn 50,000 pesos. In this way, the permanent lessee can have accumulated debts by borrowing money from one to another by mortgaging his right to access. At the end of the day, the original permanent lessee would not get the land mortgaged back but have big debts to repay. Then, the mortgagee must work as waged labor under a different title than originally agreed. This process is called “decomposition”, in which the farmer has been changed into another status of society with the termination of all relationships as a farmer. In another case where the land owner has abandoned “the right of access” by going abroad, s/he would not be paid by anyone (Tolentino 2009).

In reality, tenants should no longer exist, but the NIA classified farmers into two types, 1) land owners and 2) tenants. In this classification, land owners own land, and tenants cultivate land.

Also we suspect that farmers in general are using the term “tenant” to represent permanent lessees. It could also be a term for permanent lessees, farmers who have mortgaged the “right of access” to become “share tenants” by sharing the 30% of the harvest yield with land owners. The word, “buwisan” is equal to “buwis,” which means paying rent for the use of land. This word can also mean payment by a permanent lessee, however, this word could be confused as meaning the payment from a share tenant.

### **6-8-1 Farming Operations and Land Work Agreements**

Professor Tolentino also explained how the complete farming operation is carried out through land work agreements. Land preparation and transplanting are paid in “pakiyao” (contract labor), which means cash. Weeding is called “gama”, which means paid-in-kind. Land preparation (plowing, harrowing, and pantay (leveling)) are paid in pakiyao (in cash). A gama worker can harvest, and they get 1/10 or 1/11 of the harvest from the parcel they weeded during harvesting. One can of palay (1cavan = 4 cans of palay) is the weeding fee and harvesting payment. Applying fertilizers, water control and other activities are the responsibilities of the farmers or the caretakers. If the caretaker carries out those activities they usually receive ten cavans per hectare per season depending on their agreement. Farmers can hire labor and they supervise the labor. The labor just comes only to weed or harvest, but the caretakers usually need to come to the farm every day to check the water level and pest situations. The caretakers can easily be removed, but gama workers work every year and they cannot be removed. Usually, caretakers get their salary in kind (Tolentino 2009), but the interviews revealed that the caretakers are paid in cash.

### **6-8-2 Land Tenure and ISFs**

“Land owners” registered by the NIA might have already mortgaged the “right of ownership” or “the right of access” without reporting to the NIA, so they can argue that they do not need to pay the ISF. The water users have to be own-operators, but an own-operator might have already mortgaged their rights. In this situation, the original own-operator might have felt that it is not their responsibility to pay the ISF though the account is under the own-operator’s name. This situation seems prevail in the BRISIA.

### **6-9 Ways to Earn Capital**

It is also important to clarify the ways farmers to earn capital in this final section, because the ways to get financial resources play an important role in assessing social capital. Receiving money from someone implies a strong relationship with that person. In the Philippines, farmers borrow money from relatives or friends in the most cases. Many Filipinos have family members in

foreign countries and often receive payments from abroad. The questionnaires disclose that most of the farmers expect that individual money lenders would lend them money if an emergency were to happen.

However, in the situation where payments from abroad are not received, and there are no other sources of income, so payments are always made after harvest, and if the interest is high, they might borrow money from the money lender called “5-6”. According to interviews, if one borrows money from “5-6” he has to return a 10%-20% monthly interest along with the actual amount they borrowed. In order to borrow money from the Rural Bank individuals have to own property that can be mortgaged.

A NIA staff member explained about the Land Bank system in the Philippines<sup>12</sup>. There are Land Banks in the Philippines, but they are only available for cooperatives, not for individuals. Cooperatives can borrow money from a Land Bank. The local government has agencies that distribute technology for agriculture to farmers and they sometimes subsidize the cost of fertilizer to farmers. Unfortunately, the organizations of farmers do not have any financial arrangements nor are they registered with the Cooperative Development Agency. Thus, the organizations of farmers can neither be called as cooperatives nor can borrow money from a Land Bank.

Land Banks have a program to accept applications from cooperatives and irrigation associations. The staff of the NIA Region 4 compose a workers’ association, and they are allowed to borrow money from the Land Bank. The Land Banks expanded the borrowing program to let farmers who have capital borrow money from their funds in order to buy farming inputs. However, the farmer applicants cannot owe any ISF payments and they have to be good payers of ISFs. Thus, the beneficiaries of the program are limited to only the land owners who have enough capital. The farmers who do not have enough capital are excluded from official money lending systems in the Philippines.

---

<sup>12</sup> The contents in this section are based on interviews with a NIA PILA officer, whose name will remain anonymous in this thesis.

# Chapter 7

## Conclusion

---



Downstream of Balanac River Irrigation System  
(Photo taken Feb 25, 2009 by the author)

## 7-1 Attesting Hypotheses

This research aims to analyze the relationship between the ISF payment rate and social capital by studying the key factors that affect the ISF payments of the Balanac River Irrigation Association (BRISIA). This study examined three major hypothetical relationships: 1) the farmers' motivation for the ISF payment is related to the institutional arrangements for preparing a water sharing system, 2) the institutional arrangements are promoted by strong social capital, and 3) there is a relationship between social capital and incentives for ISF payment. These types of social capital were examined: bonding, bridging and linking. Also, the possible key factors related to social capital: bayanihan, the relationship with barangay, and farmers' perceptions about the government were examined to find the relationships with the ISF payment rate.

This research yielded several key findings. The first of these findings is the relationship between functionality of the BRISIA and the ISF payments rate of BRISIA. The ISF collection efficiently of the BRISA is lower than the national or regional averages though the IA has been recognized as one of outstanding IAs in the Philippines. The BRISIA has solid institutional arrangements to maintain and operate irrigation, and it also has the mechanisms to incentive farmers to pay the ISF and disincentives non-payment. The BRISIS provides the water distribution calendar (crop rotation calendar) every crop rotation season, but the generally high dissatisfaction with water distribution among downstream farmers in the perceptions of the TSA leaders implies that the water distribution plan does not achieve the a fair water sharing. Thus, this research finds that the ISF payments by farmers cannot be simply incentivized only by the punishments or discount mechanisms but it is disincenitized by several factors.

Focusing on the four midstream TSAs where the ISF payment is lower than the average of the BRISIA and which do not appear to have strong bonding social capital, this research finds a plausible causal relationship between weak bonding social capital and a low ISF payment rate. This study did not observe the farmers' cooperative behavior to satisfy the needs for water of all farmers in spite of its relative geographical advantages to receive water, though the ISF payment rate among the farmers who answered questionnaires was high. This phenomenon can be explained by the low degree of the bonding social capital, which does not allow farmers to trust the colleagues in their neighborhood at the high level. However, the scope of this research is too limited to reach a firm conclusion about the impact of social capital on the ISF payment.

With respect to the relationships between the functionality of the TSAs and social capital, a clear relationship was found. The downstream TSAs which apparently have weak social capital, exhibit cooperative behavior that allows them to make use of scarce water reaching downstream and to realize fairer water sharing among the farmers. The divergences in relational ties among the farmers that look to weaken the social capital actually increase the need for cooperation and induce

the organization of functioning institutional arrangements. Also, the downstream TSAs which exhibit the lowest ISF payment rates have more bayanihan practices in their agricultural lives and the water rotation systems, so it is clear that the less privileged downstream users show more cooperative behavior. This suggests a counterintuitive relationship between social capital and the ISF payment. Also, this result shows a counterintuitive relationship between the ISF payment and the water rotation system; the downstream TSAs experience lower ISF payment and higher dissatisfaction with water supply implement the water sharing system.

This thesis also examined several relationships between various factors of social capital and the ISF payment. Firstly, the relationship between the trust levels of the midstream farmers in the governmental institutions and the ISF payments is positive, but the trust levels of the TSA leaders in the government institutions were not found to be in a relationship with the ISF payment. Thus, the thesis does not see the relationship between corruptions as perceived by farmers and the ISF payment as particularly strong or clear though many TSA leaders do not trust this relationship.

Secondly, the relationship between barangays and the ISF payment was not found in this research. Even though the geographical boundaries of the agricultural lives and non-agricultural lives of farmers overlap, the roles of the barangay captains do not play an important role in agricultural lives of the TSA leaders. Thus, this research refutes the relationship between the relationship with the barangay and the ISF payment.

Thirdly, with respect to the relationship between bayanihan practices and the ISF payment, the relationship was not found in this research. This research found that almost all TSA leaders have some kind of the “neighborhood bayanihan” practices, and that the frequency of agricultural bayanihan practices is related to the strength of social capital and not with the ISF payment. Thus, this research refutes the direct relationship between bayanihan practices and the ISF payment.

Lastly, this research also examined the several factors in relationships with the ISF payment: land tenure, yield and participation to the canal rehabilitation projects. The relationship between the yield and the ISF payment was not clarified in this research. The relationship between the canal rehabilitation projects and the ISF payment was suggested by the data on downstream TSAs. However, this relationship is not clarified by the data on upstream and midstream TSAs. Thus, further studies are necessary to argue the positive relationship between them.

The biggest contribution of this thesis is in the finding about the relationship between the land tenure and the ISF payment. This research argues that the land tenure of the farmers is the key factor that affects the ISF payment. The land tenure that exists in reality in this area is not always legal tenure as the law in the Philippines prohibits mortgages. The illegal tenure complicates the responsibilities of ISF payment and it also hides the locations of the payers. The interviews with the farmers by the author disclosed that there are four land tenures, 1) land owners, 2) tenants, 3) care-takers and 4) mortgagee. The farmers who do not have capital are excluded from the official

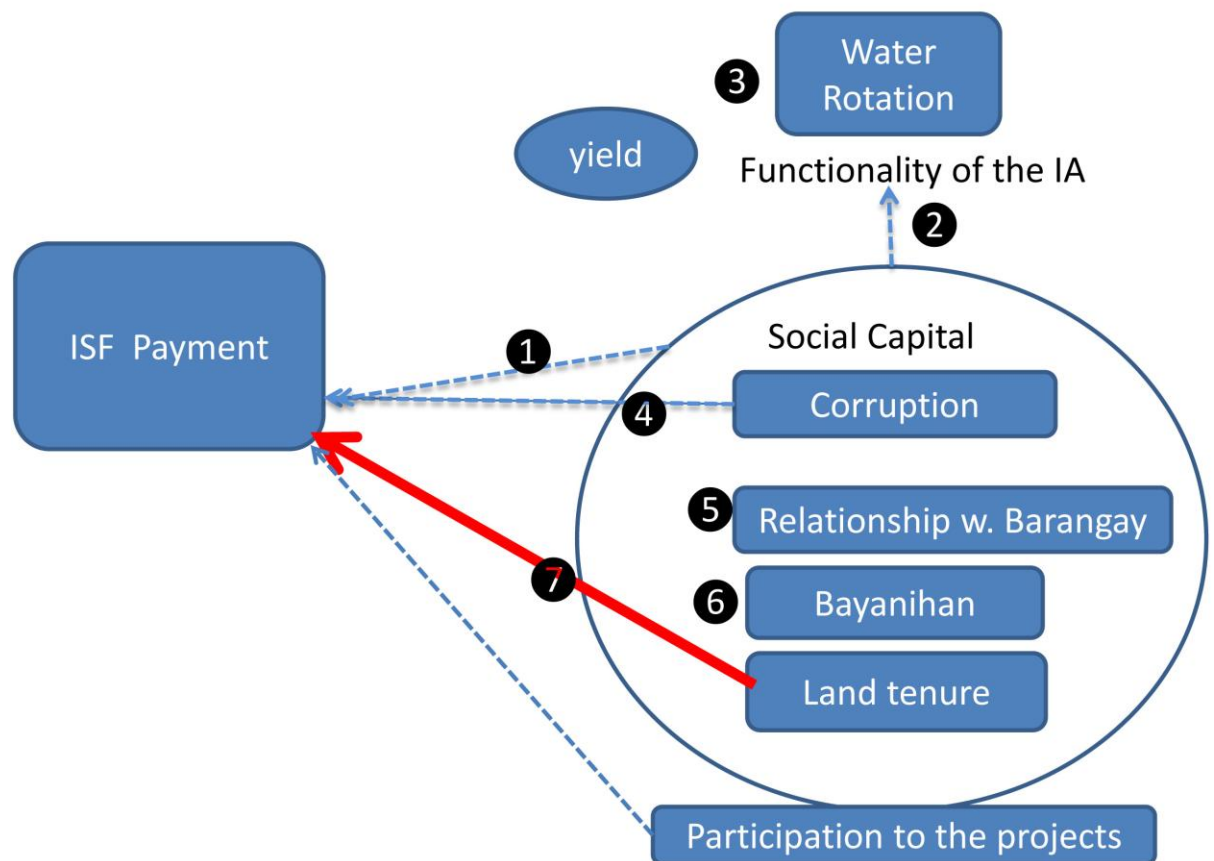


money lending systems in the Philippines, and they transact the rights attached on their land tenure: “the right of ownership” and “the right of access”. Also, there are types of land tenure that are excluded from the official registration process as members of an irrigation association, and they are not recognized by the BRISIA or the NIA. Thus, they are not accessible by the BRISIA and their responsibilities about paying the ISF are complicated and not clear. This research concludes that this complicated relationship among the farming population makes it difficult to figure out who actually should pay and, the BRISIA and the NIA have difficulties reaching the people who would need to pay. Therefore, this research argues that there is a strong relationship between the land tenure and the ISF payment.

Therefore, the conclusions (Figure16) are;

- 1) **Hypothesis1: The irrigation association with strong social capital has the high ISF payment rate.** The relationship in the first hypothesis was partly explained but is not clear; the irrigation association lacks bonding social capital and seems to have a low ISF payment, but the studied social capital is limited in scope.
- 2) **Hypothesis 2: An irrigation association with stronger social capital creates a more functional irrigation association.** The relationship in the second hypothesis is found but the causal relationship sounds to be counterintuitive; the finding of the relationship between the social capital of an irrigation association and the functionality of the organization was that the downstream users with weak social capital creates a high functioning organization that coordinates a fair water distribution.
- 3) **Hypothesis 3: The irrigation association with a water rotation system has a better ISF payment rate.** The third hypothesis was refuted; the downstream irrigation associations that experience scarce water supply and the low ISF payment have the water rotation system.
- 4) **Hypothesis 4: The irrigation association with strong perceptions of corruption in the Philippines government (low linking) has low ISF payment rates.** The fourth hypothesis is not clarified; the relationship between the negative perception of the government and the ISF payment is not clarified to be strong.
- 5) **Hypothesis 5: The relationship between an irrigation association and Barangay affects the ISF payment rate.** The fifth hypothesis was refuted; this research did not find a relationship between barangay functions and the ISF payment.
- 6) **Hypothesis 6: Irrigation associations with stronger Bayanihan have a higher rate of ISF payment.** The sixth hypothesis was refuted and this research does not find a relationship between bayanihan practice and the ISF payment.
- 7) **Hypothesis7: Whether there are any other possible factors of social capital that affect the ISF payment.** This research could not explain the positive relationship between the amount of the yield and the ISF payment. It suggests a possible relationship between the

participation to the rehabilitation projects and the ISF payment. It finds the strong relationship between the land tenure of the farmers and the ISF payment.



**Figure 16 Findings of the research**

## 7-2 The issues remained unsolved

There are several issues that remain unsolved with respect this thesis. As the previous sections explained several relationships were found unclear and warrant further study: 1) relationship between social capital and the ISF payment, 2) the relationship between social capital and the functionality of the irrigation associations, 3) the relationship between corruption and the ISF payment, and 4) the relationship between the participation to the projects and the ISF payment.

The problems this thesis encounters to find these relationships can be broken into two categories: 1) methodological difficulties (the sample size of the studied IAs) and 2) the difficulties in quantifying social capital. This thesis only focused on one irrigation association. It was possible to compare the characteristics of the 33 TSA groups within the irrigation association however, this thesis could not study two or more irrigation associations due to the time constraints.

Also, this thesis disclosed several plausible factors that affect the rate of the ISF payment. However, it experienced difficulties in quantifying the level of strength for each type of social capital, and another difficulty was determining the strength of ties of social capital. This study had difficulties collecting data of social capital, which is dependent on the subjective perceptions of the individuals and to select the indicators (questions for questionnaires and interviews) to measure each type of social capital. Additional studies should consider more carefully about the methods used to measure the types of social capital (especially bridging and linking social capital) qualitatively and quantitatively.

In addition, this thesis did not consider the technical aspects of the irrigation issue: whether the irrigation canals and equipment installed satisfy the conditions to achieve efficient water allocation. Also, the data about the water supply to each TSA was not available for this research to prove what volumes of water the farmers actually receive and this research relies on the data of the perception of the farmers about the water supply to discuss the water supply. Though I obtained all accumulated data at the NIA PILA, which owns the head gate and the dam of the BRISIA, and accessed the data of BRISA, the historical data of the volume of water coming to each TSA was not found. In reality, the turnouts that divert water flow to each TSA do not have any gauges to measure the water flow they receive. Though it is financially difficult to install, the installments of the gauges at turnouts would help the study that considers the technical aspects that find factors of the ISF payment, which was not discussed in this thesis.

Lastly, in this research the exemptions of the ISF payment, which often happens downstream, were not counted in when the author constructed the data set of the ISF payments of the three crop rotation seasons because of the not all data of exemptions were stored at the NIA or the BRISIA. If the data becomes available, the actual ISF payment rates of the downstream TSAs would grow higher than the rates this research used. Thus, the further study should be conducted taking into exemptions of the ISF payment account.

### **7-3 Suggestions for Improvement of BRISIA**

Balanac River System Irrigation Association (BRISIA) is one of few successful irrigation associations that have successfully entered into all types of contracts of the IMT with the NIA. Also, this irrigation association was recognized as an outstanding irrigation association by the NIA. This

organization shows various functions as a problem solving institution to achieve the sustainable irrigation management. However, the critical problem of the BRISIA is in the low rate of the ISF payment, which generally remained below 50%.

This thesis found that the land tenure is composed of the illegal tenure has an important relationship with the ISF payment and collection. The findings of the study imply that identifying who has “the right of ownership” and “the right of access” attached to the land helps clarify who has the responsibilities to shoulder the ISF payment, and who is responsible for the back account of non-payment to the ISF. Since the NIA and the BRISIA recognizes only either landowners or tenants and ignore the presence of other land tenure that structures the social capital and complicates the relationships among the farming population. The knowledge of the ISF collectors of BRISIA is biased towards the categorizations constructed by the NIA. It is important to renew the data of the membership list of the BRISIA and to clarify at least who are the present land owners to whose name the back account accumulates for non-payments. Since the actual relationships under the land tenure are complicated, it is difficult to identify who has “the right of ownership” in reality, but that would help increase the ISF.

In addition, the water distribution calendar (crop rotation calendar) of the BRISIA does not seem to contribute the fair water sharing given that the perception of the water supply of the downstream farmers are obviously lower than the that of the midstream and upstream. As Ostrom and Gardner (1993) articulate one of the solution to solve the “the state of nature” where the geographical asymmetry exists between upstream and downstream farmers causes the dissatisfaction of the downstream users with water distribution. Also, they argue that introduction of a water rotation calendar that can bring irrigation water downstream first before the upstream farmers start to use water should be one of way to increase the bargaining position of the downstream farmers and to satisfy the needs for the water of the all irrigators.

The finding of this research is that though the upstream farmers comply the calendar, the amount reaching downstream is scarce and the mostly downstream farmers do not follow the calendar. Therefore, it should be important to implement a crop rotation calendar that is fair to the downstream, which allows directing water to downstream first for several weeks and then allows the upstream farmers to receive water. If the BRISIA could implement the system to distribute more fairly to the downstream, which should help improve the ISF payment by the downstream farmers.

## **7-4 Implication for International Cooperation**

This thesis leads to two implications for future studies and aiding projects for international cooperation. First of all, contrary to popular application of theories of social capital to actual

policies and aiding projects, as this research experienced the difficulties are in analyzing the strength of social capital. There are no units in measuring social capital, and it is difficult to synthesize the different types of data of social capital. The future academic study should be more focused on refining the measurements of social capital rather than finding phenomena that would be explained by the abstract concept.

Another problem revealed by this research is the difficulties to access the data that can measure social capital in rural areas of developing countries. This study clarified that the data and knowledge that foreign researchers can access are distorted by the views the agencies that first collect the data. Also, the field study found that there were no logistics to access the proper individuals in order to distribute the questionnaires. Also many of the questionnaires distributed were not answered because of the presence of the illegal land tenure. Thus, further studies that aim to study social capital in rural areas in developing countries should recognize this barrier.

Secondly, this thesis shed new light on factors that affect the ISF payment. Existing studies have not focused on the land tenure as a factor of non-payment of the ISF. This thesis finds that that is the key factor affecting the ISF payments in BRISIA. The irrigation association strengthening projects are popular projects for foreign donors, so this research suggests a careful consideration on the land tenure is hidden from the surface. However hard they invest in strengthening the irrigation associations based on the categorizations used by the implementing agencies, unless they capture the right stakeholders, who may be hidden under the categorizations, the investment would not achieve the transforming the organizations.

Lastly, the issue of the low payment rate of the ISF is one of the key issues of any irrigation associations to improve operation and maintenance of the irrigation systems in the Philippines, where many irrigation systems in the Philippines have been not successfully turned over to the farmers yet. Also, the agricultural population experiences the absolute poverty in the Philippines. The issues in the Philippines are common in other developing countries. Therefore, the last policy implication for the irrigation associations which are in the same difficulties in the other countries would be to sort out the historical impacts of the agrarian reforms to find out the land tenure existing on the ground, which would eventually help improve the irrigation management and the help solve the poverty in rural areas.

## References

### a) Literature

- Abad, Ricardo G. 2005. Social Capital in the Philippines: Results from a National Survey. *Philippines Sociological Review*.
- Agapay, Ramon B. 2008. *Ethic and the Filipino: A Manual on Morals for Students and Educators*. 2<sup>nd</sup> ed. Mandaluyong city, the Philippines. National Book Store.
- Andres, Tomas D. 1994. *Dictionary of Filipino Culture and Values*. Quezon City of the Philippines, A Giraffe Book.
- Aralar, Reynald B. 2007. *Agrarian Reform, Cooperatives and Taxation*. 2007ed. Mandaluyong City of the Philippines: National Book Store.
- A.V.B Printing Press CO. 2007. *Primer on the City, Premier on the Province, Premier on the Barangay, Premier on the Municipality with Guidelines for Barangay Elections*. Manila.
- Bagadion, Benjamin U. 1991. and Frances F. Korten, Developing Irrigator's Organizations : A Learning Process Approach. Ed. Michael M. Cerea. IN *Putting People First: Sociological Variables in Rural Development*. Oxford University Press.
- Bagadion, Sr. Benjamin U. 2002. Role of Water Users Association for Sustainable Irrigation Management. IN *Organizational Change for Participatory Irrigation Management*. Report of the APO seminar of Organizational Change for Participatory Irrigation Management, Philippines, Asian Productivity Organization.
- Ballescás, Maria Rosario Piquerro. 1995. Towards a Genuine Agrarian Reform in the Philippines. Tokyo: Kokusai Shoin Ltd. Trans.Takako Kadotani.
- Balisacan, Alcenio M. and Nozawa Katusmi. 1994. Agrarian Reform and Rural Development of the Philippines. IN *Structure and Reform of the Philippines' Rural Development* (in Japanese) Chapter 2, Tokyo: Ajia keizai kenkyusyo. p33-93.
- Bardhan Pranab and Dayton Johnson Jeff. 2002. *Unequal Irrigations: Heterogeneity and Commons Management in Large-Scale Multivariate Research*. National Research Councils, Institutional for Managing the Commons project.
- Borras Jr, SaturninoM. 2001. State-Society Relations in Land Reform Implementation in the Philippines. *Development and Change*. 32(3): 545-575
- Bos, Marinus G. Performance indicators for irrigation and drainage. 1997. *Irrigation and Drainage Systems*, 11(2):119-137
- Bos, Marinus G., Murray-Rust.D.H., Merrey.D.J., Johnson.H.G., and Snellen.W.B., 2004. Methodologies for Assessing Performance of Irrigation and Drainage Management. *Irrigation and Drainage Systems*. 7(4): 231-261.

- Busto, Arellano V. 2008. *Rules and Regulations Implementing the Local Government Code of 1991*. Manila: A.V.B. Printing Press.
- Cabling, Jesusa M. and David C. Dawe. 2006. Filipino farmers receive high palay price. IN *Why does the Philippines import rice? Meeting the Challenges of trade liberalization*. Chapter2. Ed. David C. Dawe, Piedad F. Moya and Cheryll B. Casiwan. Metro Manila: International Rice Research Institute and PhilRice, 9-12.
- Calimlim R.D. and Orden. Ma. E.M. 2004. Determinants of Irrigation Service Fee Payment among Rice Farmers in the talavera river Irrigation System. *CLSU scientific Journal*. 24(2):1 July/Dec.
- Casiwan, Cheryll B., Jesusa M. Cabling, Mary Jane R. Nievera, Alice B. Mataia, and David C. Dawe. 2006. Rice Farmers are better off than many other farmers. IN *Why Does the Philippines Import Rice? : Meeting the Challenges of Trade Liberalization*. Chapter 5. Ed. Dawe C. David, Piedad F. Moya and Cheryll B. Casiwan. IRRI and PhilRice. Metro Manila: the Philippines. 29-42.
- Coleman, James S. 1998. Social Capital in the Creation of Human Capital. *American Journal of Sociology*. 94(1): S95- S120
- Cramb, Rob A. 2005. Social Capital and soil conservation: evidence from the Philippines. *The Australian Journal of Agricultural and Resource Economics*. 49: 216-226.
- Cusi, Mio. 2004. The national irrigation system: Thirsting for better irrigation services. *Madrid Agribusiness Digest*. 14(9) January: 8-10.
- Dahal, Ganga Ram and Krishna Prasad Adhikari. 2008. Bridging, Linking and Bonding Social Capital in Collective Actions: The Case of Kalahan Forest Reserve in the Philippines. Washington: International Food Policy Research Institute, CAPRI (Collective Action and Property Rights) working paper. 79: 1-23
- Easter, K. William. 2000. Asia's irrigation management in transition: A paradigm shift faces high transaction costs. *Review of Agricultural Economics*. 370–388
- Eleasar, Luis P., Jpes A. Galvez, Verda Imperial-Saw, Roger C. Lazaro and Alfredo Waldstein. 2005. Participatory Approaches to Irrigation Development and Management in the Philippines: The Next Generation. IN *Asian Irrigation in Transition: Responding to Challenges*. Eds. Gnesh P. Shivakoti, Douglas L. Vermillion, Wai-Fung Lam, Elinor Ostrom, Ujjwal Pradhan and Robert Yoder. Sage Publication India. 291-309.
- Facon, Thierry. 2000. Improving the irrigation service to farmers: A key issue in Participatory Irrigation Management. IN *Asian Productivity Organization Seminar on Organizational Change for Participatory Irrigation Management*. 23–27
- Freeman, David M. 1992. Irrigation Management Project HMG/USAID/Nepal Technical Assistant Team. Computer Assisted Development, Inc. USA and GEOCE, Nepal.” Creating a Supportive Policy Environment for Irrigation System Turnover and Joint Management. His

- Majesty's Government Ministry of Water Resources, Department of Irrigation, Irrigation Management and Water Utilization Division. Research and Training Branch and System Management Branch.
- Fujie Masako. 2003. Government and Local Communities in the Management of shared Resources.- Case study of Official Irrigation System in Philippines. *Journal of International Development*, 2(4): 47-63
- Fujiie, Masako, Hayami Yujiro and Kikuchi Masao. 2005. The conditions of collective action for Local commons management: the case of irrigation in the Philippines. *Journal of International Association of Agricultural Economists. AGRICULTURAL ECONOMICS*, 33(2): 179-189.
- Gargiulo, Martin and Benassi, Mario. 2000. Trapped in Your Own Net? Network Cohesion, Structural Holes, and the Adaptation of Social Capital. *Organization Science*, 11(2): 183-196.
- Gelia T.Castillo. 2006. *RICE IN OUR LIFE A Review of Philippine Studies*. Manila: Cover & Pages Corporation.
- Genilno William R. Jude. 2004. Community-Based Communication: A New Approach to Development Communication. GBP, pp.108
- Greenlands D.J. 1997. The Sustainability of Rice Farming. IN Maintaining Water Supplies for Rice. Chapter 6. CAB International Rice Research Institute, pp.142.
- Groenfeldt, David. 1997. Transferring Irrigation Systems from the State to Users: Questions of Management, Authority, and Ownership. Paper presented at the 96th annual meetings of the American Anthropological Association. 19 Nov 1997, Economic Development Institutions, the World Bank.
- Groenfeldt, David. 1998. The potential for farmers participation in irrigation system management. *Irrigation Drainage Systems*. 2: 241-257
- Grootaert, Christiaan and Thierry Van Bastelaer. 2002. *Understanding and Measuring Social Capital: A Multidisciplinary Tool for Practitioners*. Washington DC, The World Bank.
- Guillermo, Aretmio R. 2010. *The A to Z of the Philippines*. The Scarecrow Press Inc.
- Hardin, Garrett. 1998. Tragedy of the Commons. IN Managing the Commons. 2 nd ed. Ed. Baden, John A. and Douglass S. Noonan. Bloomington and Indianapolis: Indiana University Press.
- Harriss J.. 2002. *Depoliticizing Development: The world bank and social capital*. Anthem Studies in Development and Globalization. Anthem Press.
- Hayami, Yujiro and Masao Kikuchi. 2000. *A Rice Village Saga: Three Decades of Green Revolution in the Philippines*, London: Macmillan Press Ltd. Barnes and Noble and International Rice Research Institute.
- Hollnsteiner, Mary R. 1963. *The Dynamics of Power in a Philippine Municipality*. Quezon City of the Philippines, Community Development Research Council, University of the Philippines



- IBON Facts and Figures. 2002. *Irrigation*. 31 October, 25(20): 1-5.
- Jacano, Landa F. 2001. *Anthropology of the Filipino People IV: Filipino Value System A Cultural Definition*. Metro Manila of the Philippines: Punlad Research House Inc.
- Japan Bank for International Cooperation (JBIC) and Koei Research Institute. 1996. *Effectiveness of Poverty Reduction with Participation of Farmers: Irrigation Evaluation of Participatory Approach* (in Japanese).
- Japan International Cooperation Agency (JICA). 2003. Special Case Survey: The Republic of the Philippines. Special Training Organizational System and Reform of Operation and Maintenance of Irrigation Association (in Japanese).
- Japan International Cooperation Agency. 2001. Preliminary Survey of Official Irrigation Association Program, the Philippines (I/A) Report (in Japanese).
- Japan International Cooperation Agency. 2002. Social Capital and International cooperation: Aiming for Sustainable Results: Analysis of Case Study, Chapter 2, Agricultural and Rural Development and Social Capital (in Japanese). 77-160
- Japan International Cooperation Agency. 2003. The study on the irrigators association strengthening project in national irrigation systems: Main Report. Nippon Koei LTD. Aero Asahi Corporation. 2.
- Kakuta, Ieko. 2007b. An Example of the Result of Social Survey at Development Projects: Case study of “A” irrigation project ( in Japanese). Southeast Asian Regional Development (1). *Journal of Asia Research Institution*. Asia University. 61-92
- Kakuta Ieko. 2000. Community Organization in the Project of Community Participation: Case of Bohol Irrigation Projects in the Philippines ( in Japanese). *Journal of international relations*. Asia University. 9(1/2): 137-173
- Kakuta Ieko. 1998. Development Project and Local Institution: An Irrigation Project in the Philippines ( in Japanese). *Journal of International Development*. Research of International Development. 7(2): 63-81
- Kakuta Ieko. 2007a. Management of Development Projects: Introduction of “Modern Management” into Irrigation Development Project and its Localization and Bohol Irrigation Projects in the Philippines ( in Japanese). Southeast Asian Regional Development (2). *Journal of Asia Research Institution*, Asia University. (1):95-126
- Kakuta Ieko. 2011. Outcome of Participatory Irrigation Maintenance: Case studies of Two Irrigation Systems in Province Bohol, the Philippines ( in Japanese). Volume of 20<sup>th</sup> Anniversary of international relation department, *Journal of international relation*, Asia University, 20(1): 289-335.
- Kakuta, Ieko. 2010. The Establishment and Problems of Participatory Irrigation Management (PIM) at National Irrigation Administration (NIA) in the Philippines ( in Japanese). *Journal of*

- Asia Research institution*. 37 (2010):53-123.
- Kakuta Ieko. 2009. The Evaluation of the result of WUA (Water Users Association) strengthening activities at an irrigation project in Bohol, the Philippines. *Journal of Asia research institution*. 36 (2009): 193-249
- Kakuta Ieko. 2007c. The Influence of Local Culture on the Management of an Irrigation Development Project and the Change of the Local Culture in Bohol Province, Philippine. Southeast Asian Regional Development (3). *Journal of Asia Research Institution*. Asia University. 47-79.
- Kakuta Ieko. 1994. Small Irrigation Project and Social Cultural Factors: Case Study of Philippines. IN *Social effects of Aids* ( in Japanese). Ed. Satoh, Kan. Chapter 7. Institute of Developing Economies. Japan External Trade Organization. Tokyo.166-199
- Kakuta, Ieko. 2001. Irrigation Association and Social Capital. IN *Aid to Social Capital* ( in Japanese). Ed. Satoh Kan. Chapter 8. Institute of Developing Economies. Japan External Trade Organization. 173-202,
- Kakuta, Ieko. 2008. The outcomes of the participatory irrigation management in an irrigation project in Bohol, the Philippines ( in Japanese). Professor Kakuta gave me this paper.
- Kasuya, Yuko. 1995. The 'Failure' of Agrarian Reform in Transitional Democracy, Philippines 1986-1992. Working Paper Series No.194. Institute of Social Studies, the University of Tokyo. 1-39.
- Kikuchi Masao, Dozina •Jr•Geronimo, and Hayami Yujiro. 1978. Economics of Community Work Programs: A Communal Irrigation Project in the Philippines. *Economic Development and Cultural Change*. The University of Chicago Press. 26 (2): 211-225
- Kikuchi Masao, Maruyama Atsushi, and Hayami Yujiro. (2003). Phases of irrigation Development in Asian Tropics: A case study of the Philippines and Sri Lanka. *Journal of Development Studies*. 39(5): 109–138
- Kikuchi Masao, Fujita Masako, Esther Marciano and Yujiro Hayami. 1996. Deterioration of a National Irrigation System in the Philippines: A preliminary Appraisal. Social Sciences Division Discussion Paper 4/96. Social Sciences Division. International Rice Research Institute. Manila: Philippines.
- Kikuchi Masao, Fujita Masako, Esther Marciano, and Yujiro Hayami. 1998. State and Community in the Deterioration of a National Irrigation System. Discussion Paper Series. No.98-05, Social Science Division, IRRI.
- Kikuchi, Masao. 2005. 50 Years of Rice Farming in Tropical Asia Monsoon: Focusing on the Experience of Sri Lanka and the Philippines. IN *Theoretical Economics and Agriculture: Fifty Years of Analysis*. Ed. Yoichi Izumida. Chapter 9. Tokyo Agriculture and Forestry Statistics Association. 233-274.
- Knack S. and Keefer P. 1997. Does Social Capital Have an Economic Payoff? : A Cross-Country

- Investigation. *Quarterly Journal of Economics*. 112(4): 1251-1288.
- Kolavalli, Shashi and Brewer, Jefferey D. 1999. Facilitating user participation in irrigation management. *Irrigation and Drainage Systems*. 13(3): 249–273.
- Korten, Frances F. and Siy, Robert Y. Jr. 1989. Transforming a Bureaucracy: The Experience of the Philippine National Irrigation Administration. Quezon City, the Philippines: ATENEO DE MANILA UNIVERSITY Press.
- Lam, Wai Fung. 1998. *Governing Irrigation Systems in Nepal Institutions, Infrastructure, and Collective Action*. Institutional Contemporary Studies Oakland, California.
- Lauraya, Fay M. and Antonia Lea R. Sala, A. 1994. *Iternative Support Systems to Strengthen Irrigator's Associations in Bicol, the Philippines after Irrigation Management Turnover*. Irrigation Water Management Institute Publications..
- Lauraya, Fay. M. and Antonia Lea R. Sala 1995. *Performance Determinants of Irrigators Associations in National Irrigation Systems in Bicol, the Philippines: An analysis*. Bicol University. National Irrigation Administration. United States Agency for International Development and International Irrigation Management Institute (IMMI).
- Lin Nan. (2001). *Social Capital: A Theory of Social Structure and Action*. Cambrdge University Press.
- Macalalad, Rechel Corachea. 2005. Economics of Balance River Irrigation System (BRIS). Agricultural Economics 200. Bachelor of Science in Agricultural Economic Major in Agricultural Finance and Cooperatives. University of the Philippines Los Banos. College of Economics and Management College, Laguna.
- Madabed, Jong. 1990. The need for rural infrastructure. *Farm News and Views*. A bi-monthly publication of the Philippines peasant institute. Vol.4, Vol.5, Sep-Dec.1-5.
- Magallanes, Josefino M. 1992. Developing social learning framework of performance indicators system: a study for effective Irrigaiton Management at Pulangul Irrigaiton System. Central Mindanao University, Journal of Science. 5(2):8-21.
- Maruyama Atsushi, Fujie Hitoshi, and Kikuchi Masao. 2001. Development Phases of Irrigated Agriculture in Monsoon Asia: The Case of the Philippines (in Japanese). *Nettai Nogyo (Tropical Agriculture)*, 45(3): 216-224.
- Mascariñas, Alnolfo. 1991. Credit Behavior of Farmers in Four Rainfed Barangays in Albay. The University of the Philippines at Los Banos.
- Mase,Toru.1994. *Asia made by Water* (in Japanese). Tokyo: Ieno Hikari Kyokai.
- Matous, Petr. 2007. Relational of Slum Dweller's Social Capital and Their Gains from Community-Based Infrastructure Development: The Case of Water Supply in Manila, Philippines. Doctorate dissertation. Graduate School of Engineering. The University of Tokyo.
- McKean, Margaret A. 2000. Common Property: What is it, What is it good for, and What Makes It work?

- IN *People and forests: Communities, institutions, and governance*. Ed. Clark C. Gibson, Margaret A. McKean, and Elinor Ostrom. MIT Press, 27-51.
- Meinzen-Dick, Ruth. 1997. Farmer participation in irrigation: 20 years of experience and lessons for the future. *Irrigation and Drainage Systems*. 11(2): 103–118.
- Ministry of Agriculture, Forestry and Fisheries (MAFF). 2007. Social Capital at Rural area: Into Sustainability and Regeneration of Wealthy Relationship ( in Japanese). Research committee of Social Capital at Rural area.
- Mizutani, Masakazu. 2002. Water and Social Environment in Monsoon Asia IN *Decentralization of water management in Large-scale irrigation systems* (in Japanese). Ed. Fujita Kazuko. Chapter 9. Sekaishisousya. 233-257
- Moya, Tolentino B. 1979. Factors affecting water distribution within the teritiaries of a gravity irrigation system. The graduate division of the university of Hawaii in partial fulfillment of the requirement for the degree of master of science in agricultural engineering.
- Narayan, Deepa. 1999. Bonds and Bridges: Social Capital and Poverty. Washington: The World Bank.
- Narayan, Deepa. and Pritchett, Lant. 1999. Cents and Sociability: Household Income and Social Capital in Rural Tanzania. *Economic Development and Cultural Change*. 47(4): 871-897.
- Nozawa Katsumi. 2001. Agricultural Development and Irrigation Policy under the Estrada Administration in the Philippines. *Journal of international relations*. Asia University. 10(3): 1-39.
- Nozawa, Katsumi. 2002. Indigenous Irrigation System and its Roles for Rural Development: A case study on Zanjera in the Philippines ( in Japanese). *Journal of international relation*. Asia University. 11(2): 167-216.
- Nozawa Katsumi. 2003. Indigenous Irrigation System and Participatory Irrigation Management in the Philippines: A Case Study in the Province of Ilocos Norte (in Japanese). *Journal of international relation*. Asia University. 12(3): 7-42
- Nozawa Katsumi. 2006. Indigenous Irrigation Systems and Risk Management in the Philippines: A Case Study in the Province of Ilocos Norte (in Japanese). *Journal of international relation*. Asia University, 15(2): 1-34.
- Nozawa, Katsumi. 2009. Story on the prototype of Zanjera in the Philippines: Indigenous Irrigation System and Development ( in Japanese). *Journal of International relations*. Asia University, 18(1/2): 37-99.
- Ofrecio, Bayani P. 2005. Participatory Development and Management: A Cornerstone of Philippines Irrigation Program. In Present Situation on the Sustainable Management of Water Resources for Human Survival and Bioproduction, and the Role of Agro-Environmental Education Today. Chapter6.” The Asia-Pacific Program of Educational Innovation for Development (APEID), Agricultural and Forestry Research Center, University of Tsukuba. 59-63
- Ostrom, Elinor. 1990. Governing the Commons: The Evolution of Institutions for Collective

- Action. Cambridge University Press.
- Ostrom, Elinor. 2000. Social Capital: a fad or a fundamental concept? IN *Social Capital: A multifaceted Perspective*. Ed. Dasgupta, Partha and Ismail Seregeldin. Washington, USA, The World Bank. 172-214
- Ostrom, Elinor and Gardner Roy. 1993. Coping with Asymmetries in the Common: Self-Governing Irrigation Systems Can Work. American Economic Association. *Journal of Economics Perspective*. 7(4): 93-112.
- Ota Katsuhisa. 2007. Free Rider Phenomenon in Communal Irrigation Systems in the Province of Bataan, Philippines. The Faculty of the Graduate School University of the Philippines Los Banos in the Partial Fulfilment of the Requirements for the Degree of Doctor of Philosophy.
- Panopio, Isabel and Adelisa Raymundo. 2004. Rural Communities. IN *Sociology: Focus on the Philippines*. 4th ed. Chapter15. Quezon City, The Philippines, National Book Store.
- Portes, Alejandro. 1998. Social Capital: Its Origins and Applications in Modern Sociology. *Annual Review of Sociology*, 24(1): 1-24.
- Putnam, Robert D. 2001. *Making Democracy Work: Civic Traditions in Modern Italy*. Trans. Jyunichi Kawada. Tokyo: NTT Press.
- Quinones Jr, Benhamin R. and Hans Dieter Seibel. 2000. Social Capital in Microfinance: Case Studies in the Philippines. *Policy Science*. 33: 421-433.
- Raby, Namika. 1997. Participatory Irrigation Management in the Philippines: The Learning Process Approach in the National Irrigation Systems. International Workshop on Participatory Irrigation Management. <http://www.worldbank.org/wbi/pimelg/case2.htm>. March2, 2009 Accessed.
- Robert D, Putnam. 1995. *Turning In, Turning Out: The strange disappearance of social capital in America*. The Ithiel de Sola Pool Lecture. PS: Political Science and Politics: 664-683.
- Ruttan, M. Lore. 2008. *Economic Heterogeneity and the Commons: Effects on Collective Action and Collective Goods Provisioning*. Elsevier Ltd. World Development, 36(5):9969-985.
- Samad, M. and Douglas Vermillion. 1999. An Assessment of the Impact of Participatory Irrigation Management in Sri Lanka. *Water Resources Development*. 15(1/2): 219-240.
- Satoh Katsumasa and Masayoshi Satoh. 2006. A Comparative Analysis of Service Charge Management in Irrigation Projects in Ghana ( in Japanese). *Journal of JSIDRE*. 242:75-83.
- Satoh Masayoshi, Kono Satoshi, Tassanee, Ounvichit, and Ishi, Atsushi. 2007. Principles and Methods for Participatory Irrigation Management. *Journal of JSIDRE*, 75(7): 615-620.
- Shivakoti, Ganesh P., Wai-fung Lam and Ujjwal Pradhan. 2005. Asian Irrigation Problems and Prospects”. IN *Asian Irrigation in Transition*. Ed. Ganesh P. Shivakot, Dauglas L. Vermillion, Wai Fung Lam, Elinor Ostrom, Ujjwal Pradhan and Robert Yoder. Sage

- publication. 21-41.
- Solis, Macario B. 1991. The irrigation system built the “bayanihan” way. *Philippine Panorama*.16-17.
- Sui Yan Tang. 1992. *Institutions and Collective Action Self-Governance in Irrigation*. Institutional for Contemporary Studies San Francisco, California.
- The Japanese Institute of Irrigation and Drainage (JIID). 1995. *A comprehensive history of Irrigation in the Philippines (in Japanese)*.
- The National Economic and Social Forum (NESF). 2003. The Policy Implications of Social Capital, Forum Report. No. 28, Dublin NESF. 1-148
- The World Bank. 1998. *Report on Irrigation Sector*. South Asia Region, Rural Development Sector Unit. Collaboration with the Government of India, Ministry of Water Resources, the Irrigation Sector. Washington D.C.: the World Bank.
- The World Bank. 2004. *Measuring Social Capital: an Integrated Qestionnaire*. The World Bank Working Paper No19. Wshington DC, The World Bank.
- Timbreza, Florentino T. 2008. *Filipino Philosophy Today: A Source Book in Teaching Filipino Philosophy*. Mandaluyong city, the Philippines, National Book Store.
- Timbreza, Florentino T. 2003. *Filipino Values Today*. Mandaluyong city, the Philippines, National Book Store.
- Umehara Hiromitsu, 1998. The government and farmers in Greeen Revolution of the Philppines. IN Actors and Organizations in Rural Development of East South Asia: In comparison with modern Japan ( in Japaense). Chapter 4. Ed. Hiroyoshi Kano. Institute of Developing Economies Japan Eternal Trade Organizaiton.
- Uphoff N. 1999. Understanding Social Capital: Learning from the Analysis and Experience of Participation. IN *Social Capital: A Multifaceted Perspective*. Ed.Partha Dasgupta and Ismail Serageldin. Washington, D.C. The World Bank. 215-249.
- Uphoff N. and Wijayaratna, C.M. 2000. Demonstrated Benefits from Social Capital: The Productivity of Farmer Organizations in Gal Oya, Sri Lanka. *World Development*, 28(11):1875-1890.
- Vermillion, Douglas L., Elinor Ostrom and Robert Yoder. 2005. The Future of Irrigated Agriculture in Asia: What the Twenty-First Century Will Require of Policies, Institutions and Governance.” IN *Asian Irrigation in Transition*. Ed. Ganesh P. Shivakot, Dauglas L. Vermillion, Wai Fung Lam, Elinor Ostrom, Ujjwal Pradhan and Robert Yoder. Sage publication, 21-41.
- Vincent, Linden. 1990. Sustainable Small-Scale Irrigation Development: Issues for farmers, governments and donors. *International Journal of Water Resources Development*, 6(4): 250–259.
- Wijayaranta C.M. and Dauglas L. Vermillion. 1994. Irrigation Management Turnover in the Philippines: Strategies of the National Irrigation Administration. Short Report Series on

- Locally Managed Irrigation Report No.4. International Irrigation Management Institute.
- Wittfogel, Karl A. 1956. The hydraulic civilizations: The Man's Role in Changing the Face of the Earth. 152-164.
- Wilfredo P. David. 2003. *Averting the Water Crisis in Agriculture: Policy and Program Framework for Irrigation Development in the Philippines*. Quezon City: University of the Philippines Press and Asia Pacific Policy Center.
- Wilfredo P. David. 2008. Impact of AFMA on Irrigation and Irrigated Agriculture. *The Philippine Agricultural Scientist*, 91(3): 315-328.
- Woolcock, Michael. 1998. Social capital and economic development: Toward a theoretical synthesis and policy framework. *Theory and Society*. 27(2): 151-208
- Woolcock, Michael and Deepa Narayan. 2000. Social Capital: Implications for Development Theory, Research, and Policy. *World Bank Research Observer*. 15(2): 225-249.
- Woolcock, M. 2001. The place of social capital in understanding social and economic outcomes', *Isuma: Canadian Journal of Policy Research* 2(1):1-17.
- Yoshinaga, Kenji. 2009. Analysis of Incentives and Penalties for Optimal Water Allocation in Irrigation Systems: Case study of Balanac River Irrigation System, the Philippines. International Region studies, Toyo University, Department of International Region. (12):1-20.
- Zulueta, Francisco M. and Nebres, Abriel M. 2008. The Land and the People. IN Philippine History and Government Through the years. Chapter 1. Mandaluyong city, The Philippines National Book Store.

#### **b) Website**

- Dolan, Ronald E. ed. 1991. "Philippines: A Country Study". Washington: GPO for the Library of Congress. 1991, <http://countrystudies.us/philippines/>, accessed on August 7<sup>th</sup>, 2011.
- Embassy of the Philippines (EoP). 2011. Philippines Records Highest GDP Growth in 34 Years. <http://www.philippine-embassy.org.sg/news/2011/02/philippines-records-highest-gdp-growth-in-34-years/>, accessed on May 1st, 2011.
- International Fund for Agricultural Development (IFAD) (b), "Rural Poverty in the Philippines". <http://operations.ifad.org/web/guest/country/home/tags/philippines>, accessed on August 7<sup>th</sup>, 2011.
- International Fund for Agricultural Development (IFAD) (a), "Statistics", <http://operations.ifad.org/web/guest/country/statistics/tags/philippines>, accessed on August 7<sup>th</sup>, 2011.

International Rice Research Institute (IRRI),  
<http://beta.irri.org/news/index.php/rice-news/philippines-government-plans-to-liberalize-rice-trading.html>, accessed on November 11 th, 2009.

Japan International Cooperation Agency (JICA). 2011. Projects Basic Information.  
<http://gwwweb.jica.go.jp/km/ProjectView.nsf/VIEWParentSearch/FDE8D6C6E07CA8C1492575D100353610?OpenDocument&pv=VW02040104> accessed on May 1 st, 2011.

Republic of the Philippines (RoP), The Congress of the Philippines, Republic Act 8435:  
<http://daweb.da.gov.ph/AFMA/>, accessed on July 20 th, 2009.

The government of the Philippines (GP). 2009. Census. UNEMPLOYMENT RATE POSTED AT 7.7 PERCENT IN JANUARY 2009 Results from the January 2009 Labor Force Survey (LFS).  
<http://www.census.gov.ph/data/pressrelease/2009/lf0901tx.html>, accessed on May 1st, 2011.

The World Bank, Philippines at glance, [http://devdata.worldbank.org/AAG/phl\\_aag.pdf](http://devdata.worldbank.org/AAG/phl_aag.pdf), accessed on August 28<sup>th</sup>, 2011.

The World Bank, Data, <http://data.worldbank.org/>, accessed on January 10 th, 2012

UC Filipino Curriculum Project (UCFCP), “Unit4 Pakikisama,”  
<http://www.language.berkeley.edu/ucfcp/unit4/intro.php>, accessed on August 7 th, 2011.

UN-Water. <http://www.un.org/waterforlifedecade/iwrm.shtml>, accessed on August 18 th, 2011.

### *C) Interviewees*

Gamboa, Renato S. at Department of Institutional Development Office, National Irrigation Administration interviewed by the author on 29<sup>th</sup> March, 2009.

Ofrecio, Bayani, at Department of Institutional Development Office, National Irrigation Association, interviewed by the author on 29<sup>th</sup> March, 2009.

Mayeth (her surname is unknown), at National Irrigation Administration Pila office, interviewed by the author on 23 and 24<sup>th</sup> March 2009.

Tolentino, Lutgarda, at the University of the Philippines Los Banos, interviewed by the author on 28<sup>th</sup> March, 2009.



## Appendix

### Questionnaires to TSA leaders (English)

\*The questionnaires distributed were all translated into Tagalog.

To be collected by \_\_\_\_/March/2009

*Dear Sir TSA President*

*This survey is for assessment of overall social interaction to make analysis on sustainable irrigation management. Your sincere and honest answer is very much appreciated. Your name and answers are strictly confidential to anybody but me. Thank you very much for cooperation!*

**Note: Please choose the as many answers applicable, if you do not know the answers please leave NK on the blank space.**

#### **1. President Profile**

Q1. Where do you live? Please write the name of the barangay and encircle the name of the municipality.

A1. (brgy. \_\_\_\_\_ In Pagsanjan/Lumbun/ Magdalena/Sta.Cruz)

Q2. How long have been residing in you barangay?

A2. ( \_\_\_\_\_ ) years

Q3. What is the name/municipality of the barangay your rice paddies are located?

A3. (brgy. \_\_\_\_\_ In Pagsanjan/Lumbun/  
Magdalena/Sta.Cruz)

Q4. How much of yields of palay do you get in average in both wet and dry seasons?

A4. ( \_\_\_\_\_ cavan in wet/ \_\_\_\_\_ cavan in dry)

Q5. Do you think you have more yield/ha than the other farmers in your TSA?

A5.      a. YES                      b. NO

Q6. Do you have any administrative positions aside from TSA leader?

A6.                    a. Sitio office                    b. barangay office                    c. town office  
                          d. municipality office                    e. provincial office  
                          f. business

g. other association

$$\left( \begin{array}{c} \text{ } \end{array} \right)$$

Q7. What are your occupations aside from rice farming?

A7.

1. tricycle driver
2. other crops (vegetable, coconut etc)
3. livestock
4. fishing
5. others

$$\left( \begin{array}{c} \text{ } \end{array} \right)$$

Q8. What is your household's yearly income in average?

A8. pesos

Q9. Do you think you are better off than the other TSA members?

A9.      a. YES                      b. NO

Q10. If you are not landowners, how many cavans of paray are you paying for landowners?

A10. ( ) cavans

Q11. How long have you cultivated your rice paddies?

A11. ( ) years



Q18. Are there any farmers among your TSA members who are neither tenants nor land owners?

A18. a. YES b. NO

Q19. How many farmers of your TSA members are from the same barangay as your living place?

A19. ( ) persons

Q20. How many farmers in your TSA are residing in which municipalities?

A20. a. Pagsanjan: ( ) persons  
b. Lumban: ( ) persons  
c. Magdalena: ( ) persons  
d. Sta. Cruz: ( ) persons

Q21. How many of the farmers/ha of lands in your TSA have increased/decreased since you have become leader?

A21. Farmers: ( ) increase/ ( ) decrease  
Lands: ( ) increase/ ( ) decrease

Q22. How many many members in your TSA are included in One family?

A22. ( )

Q23. How often have you joined cleaning canals of Main canal with other TSA leaders, since you have become TSA leaders?

A23. a. Always b. not often c. never joined

Q24. How many friends to whom you can consult about your personal problems do you have in your TSA groups?

A24. ( )

Q25. How many of members in your TSA group are your family?

A25. ( )

Q26. Do you feel honored to be the TSA leader?

A26. a. YES b. NO

### 3. Bridging/ Groups beyond BRISIA

Q27. What are important groups/cooperatives/associations for your household? Please rank them 1-most to 3. (farming related groups/ religious groups/ political groups/ community groups/ job association are all inclusive).

A27 ( )Religious Group  
( )Job  
association  
( )  
)Political Groups  
( )TSA  
Group  
( )BRISIA  
( )iba pa, pakisulat ( )  
( )  
( )

Q28. How many members in your TSA are also members in the groups listed above?

A28. ( )Religious Group  
( )Job association  
( )Political  
Groups  
( )iba pa, pakisulat ( )

( )  
( )

Q29. How often are you having a meeting in the group you've mentioned above?

A29. religious group( times/ week month year )  
Job association( times/ week month year )  
Political groups( times/ week month year )  
Others  
( ) ( times/ week month year )  
( ) ( times/ week month year )  
( ) ( times/ week month year )

Q30. How do you sell the palay to market?

A30. a. through individual dealers b. to NFA  
c. others ( )

Q31. How much is the price of palay for the last crop rotation seasons?

A31. \*(Wet 2008 \*Dry 2008 )

Q32. How do your members sell the palay to market?

A32. a. through individual dealers b. NFA  
c. others ( )

Q33. (To whom answered a. through individual dealers in A37) Is that same person to whom you borrow the money to purchase inputs?

A33. a. YES b. NO

Q34. (To whom answered YES in Q33.) Is that person your friend or family?

A34. a friend b. family c. none

Q35. Do you have families in your neighborhoods of non-your TSA members?

A35. a. YES b. NO

Q36. Do you have close friends in your neighborhoods of non-your TSA members?

A36. a. YES b. NO

### 3. Trust /Strength of Ties

Q37. Whom do you come up with to get advice about agriculture?

A37. a. TSA members b. other BRISIA BOT  
c. BRISIA president d. municipal agriculturist  
e. others ( )

Q38. If you need a small amount of money enough to pay for one-week household, who would you expect to be a most expected provide this money beyond your immediate household?

A38. a. the chairman of barangay  
b. officer of barangay  
c. politician (Senator/ Congressman/ Governor/ Mayor/)  
d. BRISIA president  
e. BRISIA BOT member  
f. Your TSA members  
g. Fellow farmers non-member of IA  
h. Non-farmers friends  
i. Individual money lender  
j. Others ( )

Q39. If you suddenly faced harvest failure who beyond your relatives to take care of your life, do you think?

A39. a. the chairman of barangay  
b. officer of barangay  
c. politician (Senator/ Congressman/ Governor/ Mayor/)  
d. BRISIA president

- e. BRISIA BOT member
- k. Your TSA members
- l. Fellow farmers non-member of IA
- m. Non-farmers friends
- n. Individual money lender
- o. Others ( )

Q40. Do you feel that your barangay captain is effective in doing his duty as the leader of the barangay?

A40. a. YES b. NO

Q41. Have you ever received any foods or gifts served by current barangay captain?

A41. a. YES b. NO

Q42. What kind of people do you trust beyond families and relatives?

- A42.
- a. I only trust families and relatives
  - b. I trust neighbors
  - c. I trust those who money givers in emergency
  - d. I trust money lenders
  - e. I trust friends to whom I can talk easily
  - f. others; ( )

#### 4. Linking/ Relation over Social Strata

Q43. Do you have any ones in PILA NIA to ask helps when you need?

A43. a. YES b. NO

Q44. (If YES you answered in A43.) which position is the person in?

A44. ( )

Q45. Is he/she your families/ close friends?



A45. a. Family b. Friend c. None

Q46. How much do you trust the PILA NIA office?

A46.. Weak middle Strong  
|\_\_\_\_\_|\_\_\_\_\_|

Q47. Do you have any people in municipal offices to ask helps when you need?

A47. . a. YES b. NO

Q48. (If YES you answered in A47) Is it the mayor?

A48. a. YES b. NO

Q49. Is he/she your relatives/ close friends?

A49. a. Family b. Friend c. None

Q50. How much do you trust the municipal office?

A50. Weak middle Strong  
|\_\_\_\_\_|\_\_\_\_\_|

Q51. Do you have any ones in provincial offices to ask helps when you need?

A51. a. YES b. NO

Q52. (if YES you answered in A55.) Is it governor or vice governor?

A52. a. YES b. NO

Q53. Is he/she your relatives/ close friends?

A53. a. YES b. NO

Q54. How much do you trust the provincial office?

A54. Weak middle Strong

|\_\_\_\_\_||\_\_\_\_\_||

Q55. Do you have any ones of congressmen in district offices to ask helps when you need?

A55. a. YES b. NO

Q56. Is he/she your families/ close friends?

A56. a. Family b. Friend c. None

Q57. How much do you trust the district office?

A57. Weak middle Strong

|\_\_\_\_\_||\_\_\_\_\_||

Q58. Do you have any ones in NIA (the central office) to ask helps when you need?

A58. a. YES b. NO

Q59. (If YES you answered in A58) which position is the person in?

A59. ( )

Q60. Is he/she your families/ close friends?

A60. a. Family b. Friend c. None

Q61. How much do you trust the district office?

A61. Weak middle Strong

|\_\_\_\_\_||\_\_\_\_\_||

Q62. Do you have friends of senator/ cabinet to ask helps when you need?

A62. a. YES b. NO

Q63. (If YES you answered in A62) which position is he/she in?

A63. ( )

Q64. ( If YES you answered in A 68) Is he/she your relatives/ close friends?

A64. a. Family b. Friend c. none

Q65. How much do you trust the office?

A65. Weak middle Strong  
|\_\_\_\_\_|\_\_\_\_\_|

**Note: Please kindly let me know if you find some questions you can not answer, or if you find the choices are not applicable for you, when I collect the questionnaires.**

**MARAMING MARAMING SALAMAT PO!!!!**

**Thank you very much for your kind patience to answer all and sincerity in answering questions.**

**With sincere thanks to your kind cooperation I will send Melianda each of you from Japan to the next BOT meeting!**

**Please do not miss the next BOT meetings!! Thank you once more.**

***Sincerely Yours, Akie TANAKA, the University of Tokyo***