THE UNIVERSITY
OF ADELAIDE
AUSTRALIA

HUMAN AGENCY, POWER, AND DISCOURSE: ACCOMPLISHING FARM WORK THROUGH SHORT MESSAGING SERVICE (SMS) IN THE PHILIPPINES

Ronan Guanzon Zagado

Submitted to the
Faculty of Social Sciences and Humanities of the University of Adelaide
in fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY
(Media Studies)

October 2013

TABLE OF CONTENTS

THESIS ABSTRACT

This thesis examines how rice farmers accomplish their farm work using short messaging service (SMS) technology in the Philippines. Currently, sixty percent of rice-farming households in the country use mobile phones, mainly for SMSing. Analysis draws on empirical data to reveal the relationship between new media and agriculture using the Farmers' Text Centre in the Philippines as a case study. The analysis uses a social constructivist framework as its interpretive lens.

Results of the study indicate SMSing is central to the accomplishment of farm work. The analysis further reveals that this particular use of SMS in agriculture must take into account the interplay of human agency, power, and discourse. SMSing is found to be constituted and operating not solely according to its technical logic but by the dynamic interplay of the people involved (human agency), their will to achieve outcomes (power), and the system that governs their interaction (discourse). SMSing is seen here as a reflexive phenomenon in that it comes about through a complex process of structuration.

Three areas were identified where the reflexive nature of SMSing has become manifest. These are: rice cropping, knowledge production, and farmer's everyday life. Rice cropping is no longer linked to, and affected by, the local conditions per se but also by social influences from faraway. This temporally and spatially differentiated condition has ushered in new means and structure of accomplishing farm work. SMSing offers farmers an alternative platform that allows efficient farm work all year round at all stages of rice cropping. The technology is

particularly found to be useful in addressing ‘contingent’ issues occurring on the farm. Moreover, analysis also reveals that SMSing has allowed farmers to have access to a ‘negotiated’ knowledge rather than a standard scientific recommendation vis-à-vis the solution to their farm issues. The term ‘negotiated’ implies that farmers are actively involved in knowledge production via SMSing. ‘Textholder’ is coined in this thesis to describe farmers and agricultural specialists as co-creators of knowledge in SMSing, as opposed to their traditional role as knowledge generator and user respectively. Lastly, it was discovered that SMSing is embedded in the everyday life of the farming community as a new form of social action in terms of community and household relations. The household relationship of farmers, their children, and spouse in relation to SMS use has been particularly instrumental in the accomplishment of farmers’ farm work.

In conclusion, agricultural extension is a system intended to facilitate the delivery of innovations to improve farmers’ farm productivity. From the analysis, implications are identified for how agricultural extension can be enhanced and become more relevant to the current highly mediated Filipino way of life. Finally, this thesis offers a set of recommendations on how to fully optimize the potentials of SMSing in agricultural extension.

COPYRIGHT DECLARATIONS

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institutions and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future. Be used in a submission for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

I give consent to this copy of my thesis when deposited in the University Library, being made available for loan and photocopying, subject to the provisions of the Copyright Act 1968.

I also give permission for the digital version of my thesis to be made available on the web, via the University's digital research repository, the Library catalogue and also through web search engines, unless permission has been granted by the University to restrict access for a period of time.

RONAN GUANZON ZAGADO

ACKNOWLEDGMENTS

This piece of work would have not been possible without the support of the following:

The University of Adelaide, through the Adelaide Scholarship International, for giving me the opportunity to pursue postgraduate study in Australia;

My supervisors, Dr Michael Wilmore (principle) and Associate Professor Andrew Skuse (co-supervisor), for their expert advice and guidance. I also extend my gratitude to Dr Rob Cover, who was of great help in the earlier phase of my research;

My research participants, the farmers of Barangay Caganganan, Banaybanay, Davao Oriental, Philippines, for trusting me and sharing their experiences. This thesis predominantly represents their voice and stories;

PhilRice, especially the OpAPA Team headed by Ms Olive Rose M. Asis, for the provision of data required for my thesis and for helping me out during my field work in the Philippines;

Mr Glen Ylar, PhilRice senior research specialist, for checking the technical validity of any rice related information in this thesis;

My friends, Stuart Mathews, Jeff Hurrell, & Jonathan Heng, for their wonderful friendships, not to mention for helping me proofread this manuscript;

My family, who has been my source of inspiration and strengths. I dedicate this achievement to them;

Above all, my God, my creator and my source of knowledge. I am forever grateful for the gift of life He has given me.

LIST OF FIGURES

LIST OF TABLES

LIST OF TEXT EXTRACTS

LIST OF ACRONYMS

AFMA	-	Agriculture and Fisheries Modernization Act
BAS	-	Bureau of Agricultural Statistics
CMPCI	-	Cruzian Multipurpose Cooperative, Inc.
CY	-	Cropping Year
DA	-	Department of Agriculture
DAS	-	Days After Seeding
DBS	-	Days Before Seeding
DA-AMAS	-	Department of Agriculture - Agribusiness and Marketing Assistance Service
FGD	-	Focus Group Discussion
FTC	-	Farmers' Text Centre
ICT	-	Information and Communication Technologies
ISU	-	Isabela State University
LCC	-	Leaf Color Chart
MOET	-	Minus-One Element Technique
NEDA	-	National Economic and Development Authority
SMS	-	Short Messaging Service
OpAPA	-	Open Academy for Philippine Agriculture
PAC	-	Pampanga Agricultural College
PhilRice	-	Philippine Rice Research Institute
PSB	-	Philippine Seedboard
PSB Rc	-	Philippine Seedboard Rice
SOA	-	School On the Air
AUD	-	Australian Dollar

PART I:
THE REFLEXIVITY OF SMS AND AGRICULTURE – THE OBJECTIVE, CONTEXT, THEORIES, & METHODS

Chapter One: The Objective & Context

> A familiar scene in rural Philippines these days is a farmer staring at his mobile phone while walking along the paddy, or sitting or resting on a bamboo bench in the shade during break time, with the same concentration as if fumbling with rosaries. Traditionally, a farmer – clad in a worn out shirt showing evidence of mud stains over loose-fitting trousers, half-folded up to the knees purposely done to ease quick movement, and topped with a *salakot* (a native hat made of straw) – is simply equipped with a machete tied around his waist, a buffalo as his everyday ally on the farm, and word of mouth as his predominant mode of communication. (Personal observation)

This thesis builds on my personal observations of the farmers' contemporary way of life, like those in the epigraph of this opening chapter, to examine the integration of new media technology in agriculture in the Philippines. I was involved in a project called the Farmers' Text Centre while working for the Department of Agriculture - Philippine Rice Research Institute or DA-PhilRice (a rice research and development organization in the Philippines) when I was exposed to this interesting agricultural development. The Farmers' Text Centre is a program implemented by the Philippine Government to enhance the delivery of agricultural information services to the farmers and other stakeholders with the use of short messaging service (SMS) technology (see details in Chapter 1.3.). As a development communication practitioner, I look at this SMS phenomenon as

suggestive of cultural production on the farm rather than as a mere communicational revolution. I am particularly interested in how this western communication technology becomes integrated into the local farming culture in the Philippines. According to Pigg (1992), this kind of integration is a form of 'ideological encounter' (p. 492). In Pigg's study, she was analyzing a development project being integrated into a Nepalese village. Pigg postulates that the nature of interaction between the development project and the village is dialectic and definitive of Nepal's national identity.

Following Pigg's postulation, the question that this thesis seeks to address is how SMS technology and agriculture interact and create meaning that would become part of and alter a farmer's way of life.

To establish the grounds and context of this work, this introductory chapter lays out an overview of the SMS technology to demonstrate its pervasiveness as an emerging discourse in agriculture not just in the Philippines but globally. This thesis, however, focuses on the experience of the SMS application in the Philippines with an aim of unpacking the nuances of the new media use in agriculture.

1.1. The SMS phenomenon

The SMS, popularly known as 'texting', is one of most widely used mobile phone services with approximately 200,000 text messages being sent every second

across the globe (International Telecommunication Union 2010). This unprecedented height of technological penetration stems from the SMS's capacity to reach out to mass populations especially in developing countries that can hardly buy computers, or worse, be connected to traditional networks of landline phones (Townsend as cited by Geser 2004). The key driver is the inexpensive text messaging rates (Acision 2010).

The Philippines is one of the world's largest SMS markets. Reports indicate that SMS has been by far the most successful technological innovations in the country with a penetration rate of 75 per cent (Acision 2010) – much higher than was the case when radio and television were first introduced (Pertierra 2009). Since its launch in the late 1999 (Roman 2006), SMS has been used intensely by Filipinos who send an estimated 1.8 billion text messages daily (Paul Budde Communication 2011) at a cost of less than $US 0.02 per message (Acision 2010). Mobile phone subscribers in the country are estimated to be numbered at 73 million today, up from just 6 million in 2000 (Research On Asia Holdings 2008). Because of this, the Philippines has gained the moniker as the 'texting capital' of the world (Acision 2010). The country being a texting capital is well described as follows:

> 'Texters are right out in the throng. Malls are infested with shoppers who appear to be navigating by cellular compass. Groups of diners sit ignoring one another, staring down at their phones as if fumbling with rosaries. Commuters, jaywalkers, even mourners – everyone in the Philippines seems to be texting

> over the phone. Most use English, as messages can be typed more quickly than in *Tagalog*.' (Arnold 2000)

Not only has SMS become a craze in the metropolis, but it has also been enthusiastically adopted by people from the remote, poorer rural areas in the country (Nagasaka 2007, Pertierra 2005). In an information and communication technology (ICT) ownership survey conducted in major rice farming areas in the Philippines, it was found that 66 per cent of the farming households have owned and used mobile phones mainly for texting (Malasa, Velayo, & Francisco 2006). In addition, according to Pertierra (2005, p.41), most, if not all, rural households have a mobile phone with an average household ownership rate ranging from 0.9 to 1.4.

Research shows that the interplay between socioeconomic and cultural factors has driven the abrupt integration of this technological innovation into the value system of Filipinos (Nagasaka 2007). According to Rodolfo Salamina, senior vice president at Globe Telecom, 'Filipinos are very gregarious; we love to talk a lot' (Arnold 2000). At a minimum cost, one can send a text message to a distant friend or relative. Not only that, 'Filipinos love a good bargain' (ibid). Mobile companies have done a great job in fitting their marketing strategies to the bargaining behaviour and socioeconomic status of majority of the Filipinos. Nagasaka (2007) outlines some conditions that have propelled mobile companies to create a gigantic market even among people with lower income and coming from poorer rural areas in the Philippines. He points out that the 'Electronic load (E-load), the first strategy introduced by Smart Telecom in 2003 for instance, has allowed prepaid mobile

subscribers who usually come from low income group to buy as low as PhP30 worth of loads or credits, which they used to get through prepaid card at a cost of PhP300. Not only that, the E-load strategy could give everyone who would wish to become an e-load retailer an opportunity to earn a small profit. Another strategy mentioned by Nagasaka is the *'Pasa Load*' in that the mobile subscriber could share prepaid credits with a friend or relative through the texting service. The attitude of sharing is another strong cultural Filipino value that the mobile companies have taken into account in their marketing strategies.

1.2. SMS application in agriculture

SMS is not solely used as a medium for social communication. Several studies have revealed its significant value and use in industry. Mobile phone based services, such as SMS, have been found to have offered opportunities 'to improve the quality, efficiency and cost effectiveness of services, as well as extending new services to poorer and geographically more remote people who have in the past been overlooked by the formal economy' (Poate 2010). Poate adds that mobile phone-based services have not only offered advantages over traditional means, but also over other forms of new media. The advantages he mentions are' cost-effectiveness and the technology's capacity to reach less literate, geographically constrained people'. Poate elaborates that mobile technology has been particularly applied in the following areas:

- ‘Agricultural information services – to enhance the flow of information to farmers as part of extension services, as well as to enable farmers to access more accurate and timely information on market prices at different stages in the value chain;
- Mobile monitoring and reporting – to enhance the speed, accuracy, efficiency and to reduce the cost of reporting;
- Mobile banking (m-banking) – to offer easy access to cost-efficient (and therefore cheaper) banking services; services which will appeal especially to lower income clients;
- Education and literacy – to enable people to communicate within groups and to practice and maintain literacy skills, as well as to deliver education and training; and
- Anti-corruption – to give citizens the opportunity to report wrongdoing and to give feedback on the performance of public and private services.’

In agriculture, the mobile application has been found to have a wide range of functions, such as providing market information, increasing access to agricultural extension services, and facilitating market links (Qiang, Kuek, Dymond, & Esselaar 2011). Its impact is principally seen in terms of improving agriculture supply chain integration, such as better access to information, better access to extension services, and better market links and distribution networks, and better access to finance (ibid).

The application of SMS in agriculture is particularly prominent in the following countries.

1.2.1. International setting

In India. Mobile phone use has created a major impact in delivering productivity improvements through mobile-enabled information services where farmers get to access information that can increase their yields and lead to better prices for their crops (Gandhi, Mittal & Tripathi 2009). Three factors were identified as having driven the phones impact in Indian agriculture. They are: easy access to customised content, mobility, and convenience due to time and travel savings. Reports show that farmers were able to avert crop potential losses by reacting quickly to weather and disease information provided by the mobile-enabled information services (p.28). Also, weather information received through text messages informed farmers in Maharashta when to adjust irrigation levels (ibid). Seeds, market, and fertilizer application were some of the frequently accessed information by the farmers (p.27). In terms of economic benefits, farmers estimated 5-25% of earnings with the larger gains from adopting better planting techniques (p.29). Moreover, the farmers said mobile use has allowed them greater flexibility, resulting in work efficiency. An example cited was a fisherman who benefited from the information service regarding good fishing location while at sea (ibid). Farmers found mobile not just as a convenient means of communication, but also as a time and travel savings device. A farmer disclosed that his savings, which stemmed from avoiding local travels range from Rs. 100-200 per trip. Another mobile benefit, according to Gandhi, Mittal & Tripathi, is

the 'farmers' ability to make better decisions about where to sell their produce after getting market prices from a variety of local and distant market' (ibid).

In Bangladesh. SMS has been used as a popular and effective tool for e-commerce in Bangladesh. The CellBazaar is an example of this SMS success in mobile trading. With more than 3.5 million subscribers, CellBazaar is a mobile-based market platform that enables everyone to sell and buy different kinds of products and services including agricultural products (Zainudeen, Samarajiva & Sivapragasam 2011, p.65). A collaborative project between Telenor (a telecom service provider in Norway) and Grameen Telecom Corporation, this grassroot-level initiative allows farmers to sell their goods and earn a reasonable income due to access to good market information (Telenor 2012). To avail herself or himself of this mobile market service, a farmer has to call or send message to a designated number (3838). According to Zainudeen, Samarajiva & Sivapragasam (2011, p.72), the successful use of mobile technology in e-commerce in Bangladesh can be attributed to the following factors: high level of mobile access in the country, low transaction cost, the exclusive partnership with the largest mobile operator, and the entrepreneurial culture in the country.

In Africa. An SMS-based trading service is likewise running in western Africa. The project is called ‘Xam Marse’. Implemented by a private company called Manobi, Xam Marse provides farmers and fishermen free access to real-time market data, such as market prices, availability of products and inputs, and fluctuation rates of market prices. To do so, Manobi collects approximately 80,000 pieces of information from 10 markets everyday and uploads them on the

system in a readily accessible format within a few seconds. Farmers can text Xam Marse to request for market prices, or transact businesses. With a variety of information on market prices at hand, farmers can negotiate better prices and eventually make a reasonable profit from their produce. The project has been serving some 40,000 customers who signed up during the project's launch. Feedback indicates that the project has resulted in a profit increase of at least 30 per cent. Profit is also gained through savings from transport. (Manobi 2012)

In Australia. SMS has been found to be a potential solution to the problems faced by the irrigators in terms of access to water irrigation scheduling advice through the Irrigation Scheduling Decision Support Systems (DSS). DSS is a water management system that allows irrigators in Australia to have access to information that facilitates water use efficiency. DSS, however, used Internet network to gather and disseminate information. Experience indicates that the DSS system despite its well designed platform and operational model is constrained by the interface's complex and inefficient infrastructure as well as inappropriate information thus resulting in low uptake. The use of SMS was experimented. Results indicate that all the 72 Australian irrigators involved in the experiment were satisfied with the daily messages that they received via SMS regarding water management advice for the entire growing season. The low cost deployment and portability of SMS were mentioned as central to the success. Moreover, feedback reveals that the use of SMS suits the irrigators who are always outdoor, as opposed to the original DSS interface which could only be accessed through a web-based software. Results of the experiment further show that the simplicity of

use and the prompting effects of intrusive delivery (phone ringing) had created a huge impact on successful uptake. (Car, Christen, Hornbuckle & Moore 2012)

The increasingly worldwide application of SMS in agriculture, as substantiated by the aforementioned cases, suggests the crucial role of the technology as an emerging platform for agricultural development. The impacts of SMS on agriculture are particularly factored in on efficient farm decision making through improved access to information and profitability through better trading system and savings incurred from lesser transaction cost.

1.2.2. National setting

In the Philippines, one of the first applications of SMS was tested on rice through the Open Academy for Philippine Agriculture (OpAPA) Program. The OpAPA Program was implemented in response to the country's goal of modernizing Philippine agriculture as reflected in the Republic Act No. 8435 or otherwise known as Agriculture and Fisheries Modernization Act (AFMA) of 1997 (AFMA 1997). AFMA asserts the necessity for the agriculture sector to be transformed into a modernized, globally competitive, and technology-based industry such that it becomes more responsive to the needs, and eventually promotes, the welfare of the Filipino farmers (Ibid). A five-year program that commenced in 2003 and ended in 2008 (Barroga 2009a), OpAPA was

> 'a research-cum-development program implemented by a virtual network of 22 local and international agencies with the PhilRice as the

> lead agency. It aimed to: 1) educate, train, and mobilize the extension workers and farmers in agriculture using ICT and distance learning to bring about agricultural modernization; 2) provide e-extension services, advisory, and general knowledge on agriculture through online training; and 3) package available knowledge and information into relevant e-learning modules. During its five years of operations, OpAPA has developed and made available ICT-based services designed to benefit the agricultural extension workers and farmers in terms of faster access to information and technologies. It employed various platforms and strategies to ensure that information is made available to extension workers, farmers, and other stakeholders.' (PhilRice 2009)

One of the major objectives of the OpAPA Program was to pilot test the application of SMS in agriculture through the Farmers' Text Centre (ibid). As mentioned earlier, SMS has become pervasive and intensely used not only in the urban but also in the rural, farming areas. Several experiments were conducted to determine the potentials of SMS in farming.

Results of the experiments indicate that SMS applications in farming come in various ways (ibid). The pilot testing was done in partnership with the local government units, state universities and colleges, and farmers' cooperatives. Cyber communities were set up across the country to serve as test-beds for the OPAPA services including the Farmers' Text Centre (Figure 1) (ibid). The Pampanga Agricultural College (PAC) in collaboration with the Cruzian

Multipurpose Cooperative, Inc. (CMPCI) and the local government of Pampanga, for instance, experimented with a combined approach integrating SMS with radio and Internet (Gonzales, *et al.* 2009, p.142). The viability of this integrated approach was tested through the conduct of school on-the-air (SOA) radio program. Aired on the DWEE FM 107.1 (Radyo Magalang), the SOA produced at least 1,000 farmer-graduates. The experiment shows that radio remains one of the most effective sources of information especially in the rural, farming areas. The integration of SMS, however, created a huge impact on radio broadcasting as a tool for receiving feedback and disseminating bits and pieces of farm advisories. Moreover, the Internet was also found to have a crucial role as source of up-to-date information for the radio anchor. Results of this field experiment were forwarded to the local government and the recommendation was made to integrate the new media such as SMS and the Internet as standard core components of the local agricultural extension services (p.156). In other areas especially in the northern Philippines, SMS was found by the farmers to be an effective tool in price monitoring. The PhilRice Batac Branch collaborated with the Department of Agriculture - Agribusiness and Marketing Assistance Service (DA-AMAS) Office in providing daily market prices of major crops as well as farm inputs to the local farmers (Catudan 2009, pp.108-111). In her report, Catudan says 'access to up-to-date market prices of their farm outputs enables the farmers to make informed decisions on where and when to sell their produce' (ibid).

Another use of SMS that was explored by the Isabela State University (ISU) was its ability to strengthen the relationship between farmers and the agricultural extension workers through the exchanges of messages (Balderema, *et al.* 2009,

p.115). Moreover, SMS was also tested as a tool for conducting surveys or opinion polls. During the pretesting, PhilRice sent out the survey question 'what is the most popular rice variety in your region' to all registered clients of the Farmers' Text Centre. Result shows that, in order to receive high survey turnout, incentives or tokens must be offered. Likewise, the SMS was found effective as an e-commerce platform, allowing clients to transact business via SMS (Pascual, Zagado, Asis, Domingo & Maloles 2010). Most importantly, SMS was tested and found effective in providing quick, science-based information support not just to farmers but also to other stakeholders, such as students, extension workers, researchers, and professionals (ibid).

For infrastructure and system development, the use of SMS was first tried out by extension workers using a simple Nokia 3210 handset with a contact number 0920-911-1398. In 2005, OpAPA explored the use of GMS (global system for mobile communication) modem device with windows-based user interface developed by the Department of Science and Technology-Advanced Science Technology Institute (DOST-ATI). With funding from PAN Asia, OpAPA pilot tested the GSM device on the project of real-time seed stock inventory through text messaging by seed dealers and growers (Barroga, 2009b). In December 2005, the Smart Communications, Inc. offered the Centre a free trial of their web-based texting service. Smart gave OpAPA fancy number called 700RICE (or 700423 when typed on the mobile phone keypad) to carry out the trial. However, the 700RICE was rather complicated. Clients found the number confusing, as it requires syntax to type and send a text message. Texters have to follow certain keywords to send a message, such as *binhi* (seeds), *palay* (rice), and *peste* (pests).

This SMS service, however, encountered some technical issues and was therefore suspended (Pascual, Zagado, Asis, Domingo & Maloles 2010; Barroga 2009a&b).

At present, the Farmers' Text Centre operates using an InfoTEXT messaging software developed and managed by the GiveMeUnlimited Inc. using the same contact number. Capitalizing on the GSM technology and the Internet, the InfoTEXT software is capable of sending, receiving, storing, and categorizing text messages (Figure 2). It has also the mechanisms to create automated replies, queue messages for scheduled or real-time sending, and generate SMS reports. The software is also easy to access because it is web-based. Not only that, it can also house an enormous amount of data and allows multiple users, enabling several operators to be on board to provide quick response to numerous text messages simultaneously received especially during peak seasons. (Pascual, Zagado, Asis, Domingo & Maloles 2010)

Source: PhilRice 2010

Figure 1. The cyber communities established across the country (in yellow dots), which serve as the test beds of the Farmers' Text Centre. These were managed by PhilRice stations (orange dots) in partnerships with neighbouring State Universities and Colleges (blue dots)

Source: PhilRice 2010

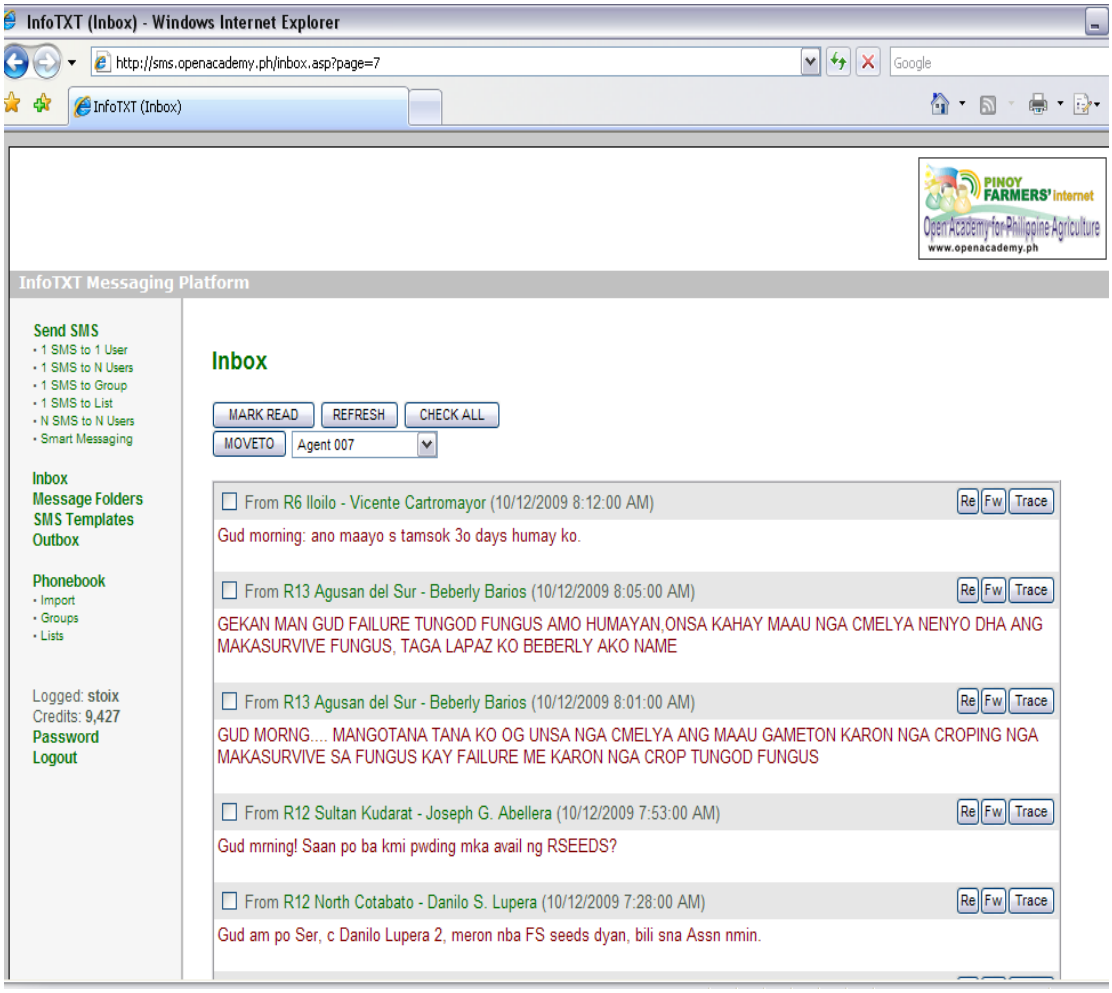


Figure 2. The interface of the InfoTEXT software used by the Farmers' Text Centre

1.3. The Farmers' Text Centre as farmers' support hub

The Farmers' Text Centre now operates in full, providing real-time, quick response to queries on rice production and other related topics by farmers, extension workers, and other stakeholders. Managed by PhilRice, the Centre is operational eight hours a day from Monday to Friday, and sometimes beyond the office hours and on the weekends especially during farm peak seasons. Its central hub is based in the Central Experiment Station of PhilRice in Maligaya, Science City of Munoz, Nueva Ecija. The Central hub covers regions and areas that speak Filipino/Tagalog. Other areas are handled by the PhilRice branch stations situated across the country (Figure 3).

A message sent to the Farmers' Text Centre costs a minimum of 2 pesos (0.05 AUD). Text messages received by the Centre cover in a wide range of topics and are written in different dialects. When a text message gets into the Farmers' Text Centre software, the text agent on duty analyses the nature of the question in terms of language and content and replies to it as quickly as possible given he understands it and knows the answer. Otherwise, the text agent routes it to the other agents responsible for the region from where the text message came or to the expert-agent if the question is complicated and requires technical expertise. A database, which contains frequently asked questions on rice and rice-related topics, is available for use as reference for the text agents. These text agents are development communication specialists who are trained in rice production before being deployed at work. Figure 4 shows the Farmers' Text Centre Operational

Flow. A central agent is designated to look after the whole operation. It is his main responsibility to ensure the text queries are given with the needed response within 24 hours. Since the messaging software used is centralized and accessible via the Internet, it is easier to monitor whether queries are answered correctly and quickly. On the software, the color of the text message appears red when it has had a reply (see Figure 2). There are some text messages, however, that are hard to answer promptly because they require further diagnosis. Examples of these messages include queries on pest and disease infestation. Clients are asked to take and send a photo of the crop problem. At times, the expert has to go to the actual site to check the problem to be able to come up with an accurate diagnosis and advice for the problem (Pascual, Zagado, Asis, Domingo & Maloles 2010). All text messages received and answered are added into the database, which is housed and published at the Rice Data and Information Portal (www.dbmp.philrice .gov.ph) (Figure 5). This web-based database managed by PhilRice not only serves as reference for the text agents, but it is also used as a source of benchmark information for research and development work of the Institute. Print copies of this Q&A material are also produced and distributed as part of the PhilRice communication-extension strategy.

Source: PhilRice, 2010

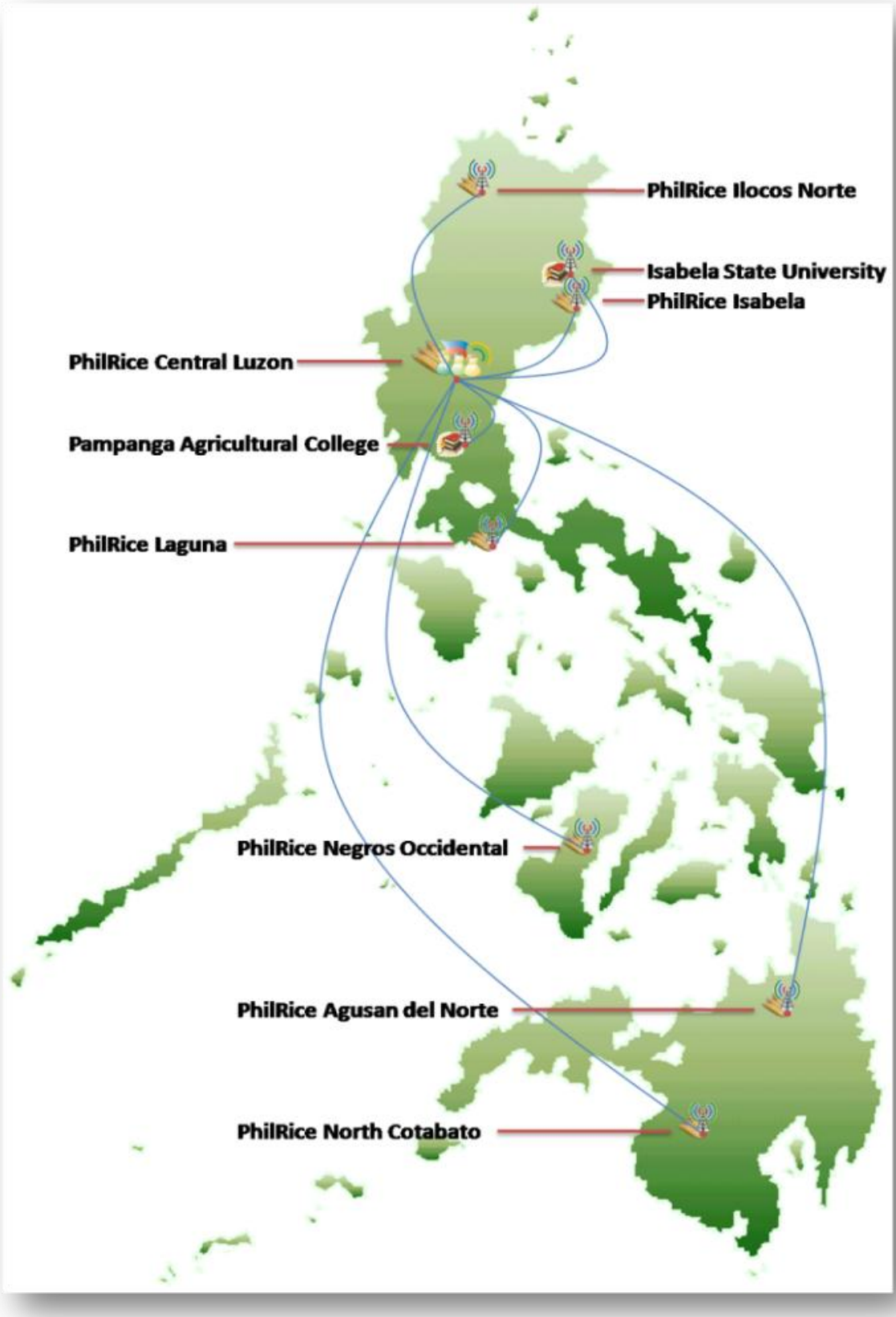


Figure 3. The operational hubs of the Farmers' Text Centre

Source: Pascual, *et al.* 2010

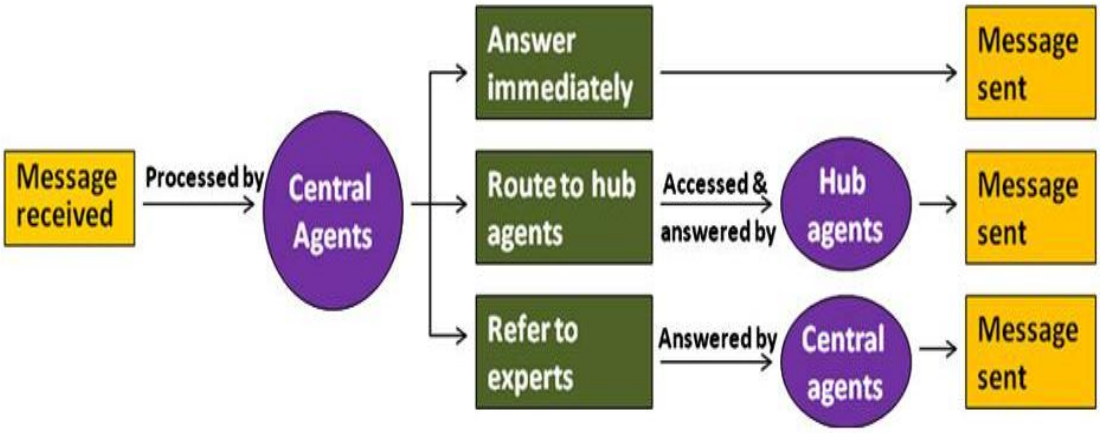


Figure 4. Operational Flow of the Farmers' Text Centre.

Source: PhilRice 2010

Figure 5. Database of the Farmers' Text Centre

1.4. SMS and agricultural challenges in the Philippines

Agriculture is the lifeblood of the Philippine economy. It accounts for 20 per cent of the gross national product, or one-fifth of the country's economy (National Economic and Development Authority 2004). It constitutes 33 per cent of the country's labour force with a wage rate of 122.01 pesos per day (around 3.5 AUD at 40AUD/1peso exchange rate) (Bureau of Agricultural Statistics 2011). Geographically, agriculture occupies about 32 per cent of the country's total land area (ibid).

According to Balisacan and Sebastian (2006), success in agriculture can be measured in terms of sustained increases in the agricultural sector's productivity. At present, agricultural productivity growth in the country particularly in rice is faced with major challenges (ibid). Rice is an important commodity among Filipinos. Not only does it provide the bulk of Filipinos' daily major caloric intake, but it also serves as the major source of livelihood (Department of Agriculture 2012). More than two million households depend on rice for a living (ibid).

While there has been an increase in rice production at a rate of three per cent per annum after a slowdown in 1990s, the number of mouths to feed is growing. Reports show that the Philippine population is 92.34 million with a growth rate of 1.90 per cent annually, which means two persons are added per year for every 100 persons in the population (National Statistics Office 2010). The local rice production cannot cope with the burgeoning population of the country. As a

result, the country resorts to importation (Balisacan & Sebastian 2006). Statistics indicates that imports as a proportion of consumption went up to 16.4% in 2006-2010, from less than 1.4% in 1991-1995 (Department of Agriculture 2012). Importation of rice in the world market, however, is not easy because it is subject to export bans or restrictions (ibid). The rice commodity is sparsely traded and world trade is extremely concentrated (ibid). Only seven per cent of the global production is sold outside national borders (ibid). Moreover, the world market is susceptible to hoarding behaviour, keeping the commodity over a long period. In 2007-2008, for instance, the country had almost declared a rice crisis after having difficulty getting rice supplies from the world market. One of the dilemmas of the so-called rice crisis then was the heightening of the world price of rice, which eventually affected the country's local market.

One way to ensure food self-security in the country is to intensify its local rice production. Balisacan and Sebastian (2006) outline some important factors that are critical to strengthening the local rice industry. These are: closing yield gaps through the use of technologies, investment in research and development, improving rice market policies, land reform, rural finance, and agricultural extension. By agricultural extension, it refers to the 'the provision of training, information, and support services by the government and non-government organizations to the agriculture and fisheries sectors to improve the technical, business, and social capabilities of farmers and fisher folk' (Agriculture and Fisheries Modernization Act 1997). In their report, Balisacan and Sebastian (2006) stress that agricultural extension accounts for 15 per cent of the overall contribution to increase rice production. They reported, however, agricultural

extension in the country is constrained by the following impediments: weak research-extension linkage, absence of subject matter specialists' support by the Department of Agriculture to the local government units (LGUs), top-down approach to extension delivery, and weak technical capacities of LGUs.

Agricultural extension in the country operates in a highly bureaucratic and structured manner (Figure 6a). From knowledge generators, extension interventions in the form of either services or information on new technologies are packaged and delivered to the end-users (the farmers) through the local government units (LGUs). The mainstream extension approaches employed include (but are not limited to) the following: Farmers' Field School, Technology Demonstration, and School-on-the-Air. These approaches are predominantly face-to-face. The Farmers' Field School, for instance, allows farmers to attend to a season-long series of field activities characterized by a mixture of formal classes and fieldwork through the conduct of field experiments.

The LGUs, as indicated in the Republic Act 760 (otherwise known as the Local Government Code of 1991), are the key implementers of the agricultural extension in the country. This devolution of agricultural extension to LGUs was designed to be able to implement location-specific extension activities suitable to the needs of a particular community. National agencies, including state colleges and universities, as well as private companies, have to collaborate with the LGUs in the implementation of their extension agenda.

The linkage between national agencies (the knowledge generators) and LGUs, however, is constrained by weak infrastructure and the geographical conditions of the country. The Philippines is an archipelagic country in which municipal communities are dispersed across the islands. As a result, the turnover of agricultural services or technologies from the national agencies down to LGUs is slow and ineffective. In addition, the top-down approach in extension is also seen by Balisacan and Sebastian (2006) as a major impediment in agricultural extension. By top-down approach, it refers to extension initiatives introduced by national agencies to local communities. The tendency of this approach is to disseminate standard recommendations, which may not be relevant to some farming communities that have unique needs and farm conditions.

Not only that, Balisacan and Sebastian (2006) also stress that LGUs lack the technical capacity to deliver extension activities. There are only around 17,000 LGU-based extension workers who are expected to reach out to over 2.5 million Filipino rice farmers (PhilRice 2009, p.3). Worse, most, if not all, of these extension workers are not experts in agriculture. Most of the agricultural experts are based in the national agencies as well as in the state colleges and universities. For rice, for instance, the experts are based in PhilRice.

Furthermore, with the growing demand and complexity of the production issues on the farm, conventional interpersonal extension methods are no longer adequate. Access to appropriate agricultural services and technologies are critical to addressing farm issues and eventually increasing farm productivity. The major challenge is how to reach geographically dispersed farming communities and help

improve their farming activities. New extension approaches that allow the provision of quick and effective extension services despite geographical disparity are necessary. (PhilRice 2009)

The Farmers' Text Centre is designed and implemented as a strategic approach to address the country's current extension constraints. Capitalizing on SMS, it 'empowers individuals and groups separated by time and space to engage in a real-time, productive interaction' beneficial for farm improvement (PhilRice 2009, p.3). It provides an alternative route for extension activities with the new media at the core of its operating system, enabling rice farmers and scientists to communicate and create farm solutions (agricultural knowledge) without being constrained by the boundaries of their farms and laboratories, or any organizational structure (Figure 6).

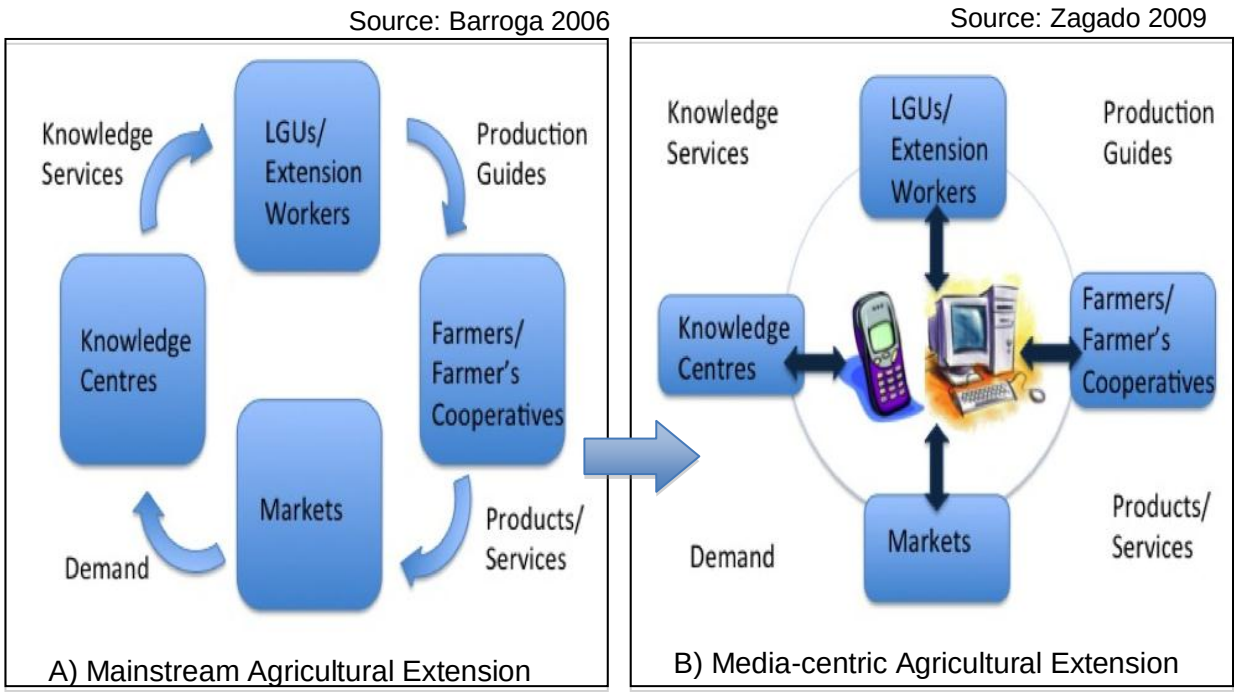


Figure 6. Media-centric agricultural extension framework of the Famers' Text Centre

1.5 Agricultural knowledge as problematic

Agricultural extension in the Philippines, as discussed earlier, is focused on providing rural advisory services aimed at strengthening capacities, empowering rural people, and promoting innovations (Saliot 2012). In simple terms, agricultural extension is a process of 'extending knowledge from a centre of learning to those presumed to be in need of that knowledge' (Pretty & Chambers 1994, p.190) using various communication channels and modalities, such as training, technology demonstration, farm and business advisory, and information and educational communication (Saliot 2012). The country's agricultural extension however, as invoked in Chapter 1.4, operates in a highly bureaucratic, output-based, and unidirectional framework. In other words, the country's agricultural extension system is structured using the socio-economic rationality with well-designed input and output mechanisms. Agricultural knowledge is viewed with pre-specified functions and impact, and comes with standard socioeconomic yardsticks to measure its impact. Agriculture as a whole is seen as a 'technical activity' (Cornwell, Guijit, & Welbourn 1994, p.99) that follows general rules and conduct. It is driven by the development goal of 'persuading farmers to follow technical recommendation in order that they may move up the rungs of the technical development ladder' (Drinkwater 1994, p. 33).

The Farmers' Text Centre, for instance, is implemented to hasten the delivery of information services useful for the farmers and other stakeholders using the SMS technology. Its impact is focused and measured in terms of efficiency and effectiveness (such as on-time response to SMS queries and appropriateness of

answer) of the SMS services provided to their clients (Pascual, Zagado, Asis, Domingo & Maloles 2010).

This thesis views this positivistic view of agriculture as constrictive and problematic. By positivistic (used interchangeably with 'deterministic' in this thesis) function, I am referring to the role of the technology as a tool that has pre-envisaged functions in the society (Williams 1990, Chandler 1995). Moreover, the positivistic perspective views society as being determined and shaped by the intrinsic abilities of the technology (ibid). Moreover, the School of Positivism (or Empiricism) believes that human knowledge evolves in a single positive direction, constantly augmented with the enhancement of human life in all of its material and cultural aspects (Golinski 1998, p.7). Moreover, positivists assert that knowledge is an objectively true statement about the world created based on sound empirical methodology - one that leads to progressive and valid, adaptive lessons (Leeuwis 2004, p.100; Richard 1994, p.170).

Viewing agriculture from a positivistic perspective per se is somewhat limited as it fails to address the social dimension or it fails to take into account the societal context in which the technology operates (Williams 1990). By only focusing on the effects of the technology, according to Geser (2004), one fails to grasp the greater social and cultural world that it reflects. Technologies (mobile phones) are no mere 'technological artefacts' (Bell 2005), but they are social and cultural technologies (Jones 1997, Moores 2000, & Flew 2005). In other words, they do not only lead to their predetermined effects, but they also 'alter the social and organizational fabric of our world' (Zuboff 1984 as cited by Geser 2004), or they

'provide materials for new ways of life' (Williams 1990), or better yet they serve as 'sites for cultural production' (Humphreys 2005). Most importantly, Geser (2004) points out that these effects of the technologies are not direct but are negotiated or socially constructed.

An example of an agricultural program in the Philippines that demonstrates the positivistic view is the Philippine Rice Self-Sufficiency Plan (PRSP) for 2009-2013. Objectives and targets set in the PRSP are based on extrapolation using the experimental data generated by the Bureau of Agricultural Statistics and PhilRice. Having said this, the PRSP had set a five-year goal to achieve 100% rice sufficiency of the country by increasing the rice production level to 21.5 million metric tons through integrated and holistic farming approaches (Department of Agriculture 2009). One example of the agricultural knowledge promoted by the government to achieve this program is the PalayCheck System, a package of rice crop production technologies (ibid). The PalayCheck System is composed of key checks (referring to the standard crop management practices) that guide the farmers to achieve best results (Yabes 2008). It was based on the RiceCheck System in Australia, which was reported to have resulted in an increase in yield of 10 tons per hectare in 2000 (ibid). Another example of agricultural knowledge promoted by the government to advance the country's rice food self-sufficiency is the hybrid rice technology. Hybrid rice is a modern rice variety developed using an unconventional breeding technique (PhilRice 2005). The way hybrid rice technology was promoted was it carried a key message saying that it can increase yield by 15-30% (Malabanan 2006).

Agricultural knowledge, in this respect, is highly constricted within the terms and logic of scientific rationality (Scoones & John 1994, p.19; Long & Magdalena 1994; p.49). It is defined as a cohesive, external intervention ready for adoption with a set of standard parameters (Cornall, Guijit, & Welbourn 1994, p.98). The PalayCheck System, for instance, serves as a guide for farmers to follow. Although location-specificity of agricultural knowledge (that is, the integration of local farmer's knowledge into the system) is given premium in the PalayCheck System, it is being integrated and measured using the yardstick of scientific method. A farmer's knowledge is assumed to be an 'easy-definable body or stock of knowledge' ready for extraction and incorporation (ibid). According to Scoones and John (1994), a farmer's knowledge or even scientific knowledge cannot be regarded as unitary bodies or stocks of knowledge (pp. 17-18). They represent contrasting epistemologies produced within different settings (ibid). They cannot therefore be simply integrated without looking into their contexts of production.

This thesis subscribes to a dynamic, context-bound view of understanding agricultural knowledge, rather than the 'transportational paradigm', which as discussed above assumes 'knowledge dissemination and utilization as involving a unidirectional transfer of a body of knowledge from one individual or social unit to another' (Long & Magdalena 1994, p.42). Long & Magdalena (1994) argue that the meaning of agricultural knowledge varies depending on the context of its use (p.47). Moreover, it 'emerges as a product of the interaction and dialogue between specific actors' (p.43). The concept of technology transfer, which heavily relies on the conventional view of science as dealing with deterministic laws

(Drinkwater 1994, p.33), is a limited paradigm in understanding agricultural knowledge. As stressed by Long & Magdalena (1994), new knowledge or discourses could emerge within the already existing knowledge systems in the course of their interaction. Hence, to view knowledge processes as merely transportational disallows this opportunity of knowledge discovery. Informed by the social constructivist perspective (see discussions in Chapter 1.2), I assume that agricultural knowledge is socially constructed rather than a stock of knowledge ready for transfer and adoption (p.49). It is always loose, contingent, and multiple, and not static, cohesive, and singular (p.43). 'Knowledge is never complete or nailed down' (James as cited by Moser & Vander, 1978).

In sum, I assume in this thesis that knowledge in the Farmer's Text Centre is not shared but rather co-created by the texting participants. SMSing as a discursive action arises through the instantiation of power difference and struggles over knowledge (see Chapter 1.2. for further discussion of knowledge, power, and discourse). This process is never-ending. It is linked to the dynamics of human social processes. Everyday, humans display and execute their needs and views in life as a means of survival. The texters involved in the Farmers' Text Centre are co-creators of knowledge, rather than categorized as a 'source' and a 'receiver'.

The main objective of this thesis is to offer empirical evidence of these theoretical claims concerning the production of agricultural knowledge with the use of new media (the SMS technology, in this case).

Chapter Two:
Meanings, Assumptions, and Relationship of SMS and Agriculture: The Theoretical Setting

2.1. SMSing as a social construction

This thesis draws out of the assumption that the SMS technology is not just a tool but a social construction. Social constructivism is a paradigm of understanding human knowledge. It postulates that knowledge does not advance in a single positive direction, as presupposed by the positivistic paradigm discussed in the preceding chapter (Krogh, Ichijo & Nonaka 2000). Constructivists believe that knowledge is dynamically created based on human action and is highly dependent on the situation and people involved (ibid). In other words, knowledge is a human creation rather than simply revelation of a natural order that is pre-given and independent of human action' (Golinski 1998, p.6). It is not something that is given or inherent in the SMS technology, in this case. But it is formed through social and cultural norms that operate in the lives of the technology users (Creswell 2007). Constructivism therefore is interested in people's subjective meanings of their experience with meaning presumed to be varied and multiple rather than singular and universal (ibid).

Hence, it is the interest of this thesis to look into the complexity of meanings of the SMS technology rather than to understand and narrow them into categories using the universal positivistic yardsticks (ibid). The main contention of this constructivist perspective is that human beings play an active role in the

construction of knowledge (Golinski 1998, p.6) about their experience (of the SMS technology, in this case).

Largely influenced by the constructivist perspective, this thesis assumes that the integration of SMS in agriculture in the Philippines does not only pose issues that are communicational (in a positivistic sense) but also socio-cultural (relating social and cultural production) in nature. The socio-cultural issue that this thesis is particularly interested in is how is the SMS technology used and integrated into farmers' in the Philippines. Also, how is this technology affecting the dynamics of the mainstream agricultural extension system of the country? These issues cannot be addressed, however, if analysis of the SMS technology would be merely viewed using a limited, positivistic approach as discussed above. Situating it into the milieu where it operates can better address these socio-cultural inquiries about the technology. This thesis, therefore, aims at understanding how the SMS technology produces meanings in relation to the context where it operates. According to Jones (1997), the meaning of any technology is never separate, but rather a part of, or integral to, the organization of human action.

2.2. SMSing and agriculture as dialectic

The agricultural system in the Philippines, as discussed Chapter 1.4., is complex. It operates in an environment that is not simply governed by agronomic conditions but also by ecological, economical, and political factors. The interest

of this thesis is to unpack meaning systems produced in the relationship of the SMS technology with this complex agricultural system.

However, this thesis being viewed from a non-positivistic perspective sees this SMS integration in agriculture not in a unidirectional manner as in that of technology transfer or diffusion of innovation. In the theory of diffusion of innovations, an innovation (be it a technology or idea) is communicated in a unidirectional manner from a source to a receiver through certain channels over time (Rogers 1983, p.11). The basic tenet of this theory is that the receiver improves with the influence of the source.

In this thesis, the relationship of SMS technology with agriculture is assumed to be 'dialectic', which means that one's meaning can only be understood in relation to the other (Williams 1973 as cited by Pigg 1992). In other words, their meanings are instantiated in the course of their interaction. Applying this theory into the specific interest of this thesis, it is assumed that the meaning and impact of the Farmers' Text Centre is a product of interpretation of the relationship between the SMS technology and agricultural system where it operates. In other words, this thesis postulates that it is in the dialectic interaction of SMS and agriculture that their meanings and impacts would surface.

2.3. Human agency and structures as constitutive of SMSing

To further discuss the meaning construction concerning the integration of SMS in agriculture, we need to discuss the role of the technology in that process. As mentioned earlier, this thesis assumes SMSing as a social phenomenon rather than a 'technological artifact' (Fortunati 2005). I explored Giddens' Theory of Structuration here to elaborate this complex nature of SMSing as a social phenomenon.

In his Theory of Structuration, Giddens (1984) asserts that the relationship of human agency and social structure is constitutive of the society. By human agency, he refers to 'people's capability of doing things' (p. 9), while social structure relates to

> 'a set of rules and resources recursively reproduced and organized as properties of social system. Rules here refer to techniques or generalizable procedures applied in the enactment or reproduction of social practices, while resources refer to structured properties of social systems drawn upon and reproduced by knowledgeable agents in the course of interaction (*e.g.*, language, metaphors, grammar, and social norms that are drawn upon in interaction)'. (p.25)

According to Giddens, structures are something internal rather external to individuals (ibid). They are in a certain sense exist either as a memory trace or etched in social action that the individuals recursively accomplish and organize in

their day-to-day activities (ibid). Giddens elaborates that a social system doesn't have a pre-constituted structure but rather it exhibits structuring properties (ibid). He adds that the structure only exists in the instantiation of those structuring properties (ibid). Furthermore, these structuring properties have dual function in that they are 'both medium and outcome of the practices they recursively reproduce' (ibid). The term 'medium' here does not imply the deterministic meaning (that is, as a tool), but rather as an active agent that 'constrains and enables the production of meanings or instantiation of social action. Moreover, the act of structuration is a 'homeostatic' or self-sustaining process continuously or recursively produced, maintained, and monitored by the agents (p.27). In other words, a social system is achieved through this reflexive monitoring of day-to-day activities. In addition, it is (re)created by intentional activities but it is not an intended project (ibid). It operates with a great deal of 'looseness and permeability'. Most importantly, it is shaped and reshaped based on everyday, contingent circumstances.

The text messages received and addressed by the Farmers' Text Centre that are constructed and communicated through interaction in the form of SMS exchanges are constitutive of SMSing as a social discursive action. Every text message received serves as an important resource in the operation of the Centre. Informed by the duality of structure as mentioned above, the text messages are not only outputs but also inputs at the same time. This reflexive character of SMS is reflected in the dynamic act of exchanges of text messages instantiated by the texters. The texters actively and collaboratively organize SMSing through the application of their knowledge and intention, and in the course of this discursive

action, a new form of discourse is produced (Scoones & Thompson 1984, pp.24-25).

Moreover, every SMS encounter is a construction and reconstruction reflexively organized by the texters. It is an ongoing or 'recursive' (to use Giddens' term) process driven by texters' intentions and knowledge. This fluid or permeable character of SMSing is reflected in the frequency and continuous flow of messages received by the Farmers' Text Centre everyday. In the structuring of social action, Giddens calls this process 'reflexive monitoring' where social agents continuously monitor, improve, and revise their routine practices. New forms of social actions (or discourses, in this thesis) are (re)produced in every encounter. By encounter, Giddens refers to a sequenced phenomenon where reflective monitoring of social conduct takes place (1984, pp.71-72).

In social encounters, Giddens (1984, p.83) stresses that individuals tend to position themselves or strategically find their place in the situation. Giddens calls this incidence social positioning, which he defines as:

> "a specific intersection... or a specification of a definite 'identity' within a network of social relations... It is best understood as positioning, which involves many subtle modalities of bodily movement and gesture, as well as more general motion of the body through the regional sector of daily routines. The positioning of actors in the regions of their daily time-space paths, of course, is their simultaneous positioning within the broader regionalization of societal

> totalities and within intersocietal systems whose broadcast span is convergent with the geopolitical distribution of social systems on a global scale." (pp. 83-83)

The Farmer's Text Centre therefore as a form of social encounter can be akin to a 'map' (to use Pigg's (1992) term, p.492) that pinpoints social positions and a 'compass' (p.499) that allows its users to orient and position themselves in the situation. Every encounter in SMSing allows individuals to define or (re)construct their identity in relation to others to be able to fit with the situation. Michel Foucault (1988) calls this mechanism of identity (re)construction as 'technologies of the self', which he defines as the 'specific techniques that human beings use to understand themselves'. This concept of 'technologies of the self' is widely applied and in fact redefined in many studies of identity and selfness. Matthews (as cited by Gauntlett 2006, p.125), for instance, has defined 'technologies of the self' as the ways or mechanisms employed by individuals and society, which perpertuate the public consumption and regulation of individuality'. Like Foucault (as cited Gauntlett 2006, p. 128) however, I did not intend to study identity in this thesis to investigate truthfulness about it, but as a strategy of making sense of the realities constituted by the SMS technology.

2.4. SMSing as an ethnomethodological account

To further understand the process of constituting of SMSing is to understand its underlying structure or how it is structured (Handle 1982, pp.45&51), or to

investigate what is 'account-able' for making it (Have 2004, p.19). This process of 'accounting' to understand meanings is called Ethnomethodology. Ethnomethodology is a research tradition that is interested in meaning and how it is achieved in practical actions in a particular context or point of view (Handel 1982, Garfinkel 1967, & Have 2004). Methodologically, it lends itself well in the 'accounting' or 'explication' of what constitutes a particular practice as lived by people everyday (Have 2004, p. 14 & 17). It, specifically, looks into the formulation of 'general rules, statements, practices, or procedures used in the constitution of local social orders' (p.22), and 'structure' of everyday experience (Handel 1982, p. 42). I interchangeably use this process of 'accounting' in this thesis with 'sense-making' (p.50), referring to an act of production of social structure that SMS users (farmers, in this case) recursively reproduce in accomplishing their everyday lives.

Hence, to study the sense-making process of the SMS users is to study their everyday lives. I mean everyday life here as a periodic 'orientation' or pattern of 'commonsense' events characterized by practical, fluid, and loose actions, which are 'not based on standards of traditional logic' (pp. 42&51). It is in these ordinary, locally situated, and time-bound activities or what Garfinkel (1967) calls 'indexical expressions' that we understand the natural rather than the objective construction of reality.

Therefore, I analyzed the everyday life of farmers who participated in the Farmers' Text Centre in this thesis using the ethnomethodological paradigm. Ethnomethodology posits that any everyday situation is composed of accounts

characterized by three forms of structures, which are 'reflexivity', 'indexicality', and 'let-it-pass'. 'Reflexivity' refers to the premise that 'all accounts are part of the situation that they organize' (Handel 1982, p.51). 'An account that is reflexive means that it defines reality and at the same time it is that reality' (p. 39). 'Indexicality' means 'dependence of an account upon the context in which it occurs for its meaning' (Handel 1982). By indexicality, 'Garfinkel denotes local, time-bound and situational aspects of action' (Have 2004, p.20). This is based on the 'axiomatic premise that any account is only part of the total account of a situation; we act on it based on information available to us; every account is incomplete; is technically loose or indexical' (Handel 1982, p.43). Finally, 'let-it-pass' refers to commonsense knowledge or practical actions that are not based on standards of traditional logic. This is based on the 'assumption of commonsense reasoning that the world exists with characteristics imposed independently of our definition' (pp. 46-47). 'When confusion arises, when events appear ambiguous, the commonsense belief is that there is some determinate truth to the matter' (p. 46).

Informed by the ethnomethodological principles discussed above, I assume that the farmers' sense-making process is constitutive of the SMS phenomenon, and vice versa. Moreover, I also hypothesize in this thesis that the SMS phenomenon is an everyday account that is indexical in nature embedded in people's (in this study, farmers') loose, local communicative expressions. Its meaning is time- and context-bound, and is defined by farmers' local language. Lastly, I also looked at farmers' 'commonsense attitude' or actions to understand the SMS phenomenon. I particularly investigated the farmers' mechanisms in coping and accomplishing

their everyday lives. The goal was to elicit the social rules and resources that govern the constitution of the SMS phenomenon as an everyday experience (p.51).

2.5. (Agricultural) knowledge, power, & discourse

As discussed above, the act of SMSing is organized and accomplished in the course of the interplay between the human agency and social structure. Giddens elaborates that this interplay is constituted through the application of knowledge possessed by the agents (the people) (1990, p.38; 1984, p.22;). He argues that 'every human is social theorist on the level of discursive consciousness and methodological specialist on the level of both discursive and practical consciousness' (p. 18). However, as discussed earlier in Chapter 1.5., human knowledge is not something given or static. It is constructed and reconstructed in the day-to-day enactment of social life.

Moreover, Giddens underscores that 'to be an agent is to be able to deploy a range of causal powers' (1984, p.15). By power, Giddens defines it 'in terms of intent and the will as the capacity to achieve desired and intended outcomes' (ibid). Any social action, according to Giddens, involves power in the sense transformative capacity (ibid). Humans act and define their everyday life according to their needs, intentions, and worldviews about life and world they live in. Power is something that is performed as a form of 'strategy' (Foucault as cited by Mills 203, p.35) in the realization and accomplishment of human will and intentions. It

is not a 'possession' held by certain authorities to control others (ibid). According to Foucault, 'individuals are the vehicles of power, not its points of application' (ibid). Foucault adds that 'power is a major force in all relations within the society that is constantly performed rather than being achieved' (ibid).

The Farmer's Text Centre is an example of a place where relations of power are continuously executed and negotiated. The farmers and agricultural specialists involved in SMS exchanges are 'not passive dupes but they are active agents' (p.34). They both have the capacity to perform and constitute the SMS interaction. In other words, they are both accountable for whatever that turns up in the SMS conversation.

Furthermore, a power relation does not operate in a vacuum. It occurs in certain constraints, rules, and conditions of possibility, which I call in this thesis as 'discursive conditions'. By discourse, I am not simply referring to a form of interaction per se nor as a human representation of something signified through language. Adopting Foucault's definition, I mean discourse here as a set of conditions that enables and constrains the production of social knowledge (McHoul & Grace 1993); it is a system that structures the way we view and define reality, or where meanings reside (Mills 2003 & Saludadez 2004). Moreover, discourse is viewed in this thesis as a 'social practice' rather than merely as a 'form, meaning, or mental process' (van Dijk 1997 as cited by Colombo 2004).

Following this meaning of discourse, I assume in this study that every SMS encounter in the Farmers' Text Centre is a discursive action where farmers and

the agricultural specialist communicate, negotiate, and create solutions to the farm issues discussed. According to Long and Long (1992 as cited by Scoones & Thompson 1994), ‘it is on this battlefield of knowledge through the dynamic process of contestation and assimilation that innovation and knowledge creation operate’ (p.25).

Power differences and struggles over knowledge occur because people wear varied interpretive lens or schemas and live in different situations and thereby view things differently. Giddens defines interpretive schemes as 'modes of typification incorporated with actor's stock knowledge and applied reflexively in the sustaining of communication' (1984, p.29). Sociologists call these interpretive schemes ‘lifeworlds’, which means 'constituted of various forms of social knowledge, intentions, and evaluative modes, and types of discourse and social action, through which actors attempt to order their worlds' (Schultz as cited by Leeuwis 2004). According to Leeuwis, lifeworlds are 'the products of past experiences and personal and shared understandings, and are continuously reshaped by new encounters and things' (p.97). A wide expanse of literature informs us of several factors that affect and build up one's lifeworlds. These factors are social, cultural, and political in nature. Socially, Leeuwis underscores that the a lifeworld is influenced by 'one's wider social background, his concrete political contexts and group interests, and the individual interests in specific interaction settings' (p.98)

Moreover, knowledge conflict occurs when people have different interests. For example, a manager of a fertilizer company may want to know what combination

of fertilizers can be best applied in maize production in a region of Tanzania; local farmers, however, want to develop a cropping system that minimises the use of chemicals (p.107). Another example cited by Leeuwis is the 'farmers who may regard elephants as a plague that destroys their crops, while the conservativists look upon the animals as endangered species' (p.99). Culturally, the production of knowledge is as influenced by religious, tribal, and regional beliefs, which are very variable as in the case of Africa (ibid). 'In the Netherlands, farmers of different religious denominations hold different views about acceptability of working on religious holidays (including Sunday), which affect the organization and planning of agricultural work' (ibid). In Peruvian society, crop growing does not solely involve technical farming pattern, but also the observation of the sky and moon (Salas 1994). According to Bentley (1994), the epistemological differences can be attributed to different styles of observation, the importance of importance, and the ease of observation, as discussed below:

> *1) Style of observation*: For example, the scientist learns that ear rots cause maize ears to lose weight by weighing a random sample of damaged and healthy ear, but the farmer learns the same thing by hefting ears while harvesting. 2) *The importance of importance*, means that people (including scientists and peasant farmers) pay more attention to things that are culturally and economically important. For example, entomologists have identified virtually all agricultural insect pests, and many of their enemies, while innocuous forest arthropods are poorly documented. In the same way, farmers understand weeds better than many harmless plants. 3) *The ease of*

observation: People perceive more about things that are easy to observe.

Moreover, people's social position has also some bearing on knowledge construction (Matose & Mukamuri 1994, p.70). In Zimbawe, for instance, decision making is highly differentiated as a result of the social and political hierarchy over control, access to, and ownership of resources (ibid). According to Matose & Mukamuri, women have fewer rights than men in terms of land allocation (ibid). Likewise, poorer members of the community show greater concern for the environment than rich people (ibid). In addition, 'knowledge about particular resources is common to people who occupy certain niches (ecological, sociological, economic, or political) in society' (pp.70-71). Matose & Mukamuri aver that 'knowledge about effects of certain tree species on crops for instance is best explained by people in nutrient-deficient sandy soil areas; while people in nutrient-rich, heavy-soil areas have less interest in tree humus and just quickly accept the destumping of all trees from their fields' (ibid). Generally, in the discourse of agricultural development, knowledge conflict occurs because farmers and extension workers have different meaning systems. Extension workers are driven by scientific influences, while farmers are 'guided by a rich and refined intuition and contemplative attitude' (Salas 1994, p.65). In other words, they have different theories of doing and knowing. Differences in knowledge perspectives is a reality rather than a problem to be solved (Leeuwis 2004, p.99).

This thesis submits to this pluralistic view of knowledge, rather than answering the question: What is the truth or the real meaning of it? I acknowledge the

multiplicity of meanings of agricultural knowledge in this thesis, and critically examine the nature rather than the truth of such differences.

Chapter Three:
Research Questions, Methods, & Analytical Scope

3.1. Research questions

Giddens (1991) points out that the meaning and impact of a technology must be grounded in certain experience or social context. In this thesis, the Farmers' Text Centre in the Philippines is used as a case study to investigate the relationship between new media and agriculture. This thesis specifically seeks to address the following questions:

1. How does SMS become relevant to rice farming?
2. How is agricultural knowledge produced via SMS?
3. What kind of knowledge is produced via SMS?

Moreover, to fully understand the SMS phenomenon in agriculture, this thesis also examines the lived experience on the ground – how the technology has been assimilated into the everyday life of a farming community. As hypothesized earlier, SMSing is an ethnomethodological account. Its meaning is achieved in practical actions in a particular context (Handel 1982, Have 2004). In doing ethnomethodology, Moerman (1965 & 1967 as cited by Turner 1974, p.62) suggests to focus on the 'how' to understand the 'who' and 'what'. Hence, this study looks into methods and processes or the social rules that the farming community use to ascribe something (Turner 1974, p.67) in their everyday life. It particularly addresses the following questions:

4. How do farmers accomplish their everyday life using SMS?
5. How do they use and make sense of the SMS technology in their daily life?
6. How are the farmers' daily activities (re)structured with SMS?

To examine the value of the local SMS experience, this thesis also attempts to situate the results of the analysis into the broader discourse of related knowledge. The question being addressed is how the local experience influences the mainstream discourse of new media consumption in agriculture. Finally, this research draws some important implications of the value of SMS in agricultural extension – how the potential of SMS can be well optimized in agricultural extension in the Philippines.

3.2. Interpretive qualitative as the research design

To address the above research questions, an interpretive qualitative method was employed. Interpretive qualitative research is a research tradition interested in the 'construction of contextual or local knowledge rather than universal laws or rules' as in postpositivist research (Willis 2007, pp. 99). In other words, it aims to elicit not truth but situated or contextual (hermeneutic) understandings (p. 188). This kind of inquiry is based on the assumption that 'knowledge is situated in a context and is dependent on that context' (p.120). Its output is practical wisdom or understanding in context rather than abstract, universal wisdom (pp. 120-212).

This thesis, therefore, does not intend to arrive at generalizations but rather an understanding of the constitution of phenomenon (the Farmers' Text Centre, in this case) in the context where it operates. Grounded Theory was particularly applied in this project. Grounded Theory is a type of interpretive research that lends itself well in theorizing based on ground data. Since SMS is a new, emerging discourse in agricultural development, Grounded Theory allows the explication of theoretical accounts that explain its existence (Charmaz 2008, p.157). As mentioned in Chapter 1.3., the Farmers' Text Centre is one of the first SMS applications in agriculture in the Philippines implemented to hasten the delivery of information services to the farmers and other stakeholders through texting. With the use of Grounded Theory, this thesis provides an abductive analysis of how the Farmers' Text Centre being a pilot project of the SMS application in agriculture in the Philippines has transpired and become integral within the agricultural system it operates. The interest of this thesis, however, is not on the deterministic but on the social construction aspect of the SMS technology (see social constructivist view of the technology in Chapter 2.1).

The Farmers' Text Centre, as mentioned in Chapter 1.3., was pilot-tested in rice. Rice, after all, is the main agricultural crop of the country, not to mention the staple food eaten at least three times a day by Filipinos (Castillo as cited by Vergara & Banat 2004, pp.19-20). Hence, this thesis used rice as a case study in looking at the relationship of SMS with agriculture. Agricultural data analysed and discussed in this thesis therefore concerned issues or topics on rice production that were communicated in the Farmers' Text Centre.

This section of the thesis provides the 'audit trails' (Willis 2007, p.221) to show how the whole research process was undertaken in the quest for understanding of the phenomenon studied. Generally, the methodological framework of this thesis could be defined as iterative, emergent, subjective, and reflective. By iterative, it means that the whole research process is recursive and nonlinear in that 'data collection, data analysis, and interpretation occur throughout the study and influence each other' (p.202). It is emergent in the sense that the research is open to and informed by the circumstances in the research site and setting (p.162). The research process and result are not based on pre-specified variables and theories. The subjective framework, which assumes that reality is not fixed and objective but socially constructed, means that the research is based on the researcher's interpretations of the context and historicity of the observed or experienced empirical data (pp. 95, 99, & 203). Another methodological tool that is related to this subjective concept applied in this research is the reflective model. The reflective model refers to thoughtful innovation of the researcher rather than application of technical rationality in addressing a particular social issue (p.204). It assumes that 'many social problems cannot be treated as well-informed issues and solved with preformed solutions' (p.204). Therefore, 'it calls for decisions in context and on the fly rather than relying on the use of planned sequences of action' (ibid).

3.3. The researcher as research instrument

As earlier mentioned, this thesis is a piece of subjective research. Hence, I (being the researcher of this thesis) did not play an external, objective investigator role, but I was part of the whole research meaning-making process. Or technically speaking, I serve as the 'research instrument' of this thesis (p.202). One pertinent quality that a researcher must possess in conducting interpretive research is his knowledge of and familiarity with the phenomenon under study. According to Charmaz (2008, p.162), researchers cannot assess how well their analysis fit their data unless they have intimate familiarity with the empirical world or the phenomenon under study. To demonstrate this notion of subjectivity, the use of 'I' and other subjective expressions are used and evident across the texts in this thesis.

To wit my background in relation to this research, I am by training a development communication specialist in rice. I worked for PhilRice for eight years. My academic background is in development communication, specializing in development journalism and community development. At PhilRice, I worked for the technology promotion, which is now called their knowledge management and sharing program. In agricultural discourse, this kind of job falls under the category of agricultural extension. My specific jobs at PhilRice were on information packaging & delivery, documentation, and community relations. Aside from packaging scientific information and converting it into different communication materials such as brochures and posters, my work also involved documentation of farmers' farming stories. I interviewed farmers and wrote and

published stories about their farming ventures. Moreover, my employment at PhilRice also included carrying out some community-based projects, such as campaigns, to help farmers address some farm issues. One of the development communication programs that I managed at PhilRice was the OpAPA Program. OpAPA, as mentioned in Chapter 1.2., is a research-cum-extension program that designs and tests strategies to hasten the delivery of agricultural information services to extension workers, farmers, and other stakeholders. The Farmer's Text Centre is one of the project components of the OpAPA Program. I, being the overall in-charge of the program, is quite familiar with the ins-and-outs of the program both at the management and field operation level. Research wise, I have a background in communication studies, particularly in content development & analysis, communication surveys, and evaluations. My research interest, however, is in meaning construction using the interpretive qualitative research framework. My master's degree thesis was an investigation of farmers' constructions of information and communication technologies (ICTs).

3.4. Data collection

Field site. The fieldwork was conducted from January to March in 2011 in the Philippines to collect the data for this thesis. The first site visited was the Philippine Rice Research Institute (PhilRice) based in Maligaya, Science City of Munoz, Nueva Ecija, Philippines. PhilRice, a government owned-and-controlled corporation responsible for the country's rice research and development program, is the lead agency implementing the Farmer's Text Centre. A meeting with the

Farmers' Text Centre implementing personnel was held to discuss the thesis project. The results of this meeting were verification of the scope of the research, modification of the research questions, and identification of the data to be used as well as research site where to conduct a field study. The research context was also defined and verified during the meeting. The research context refers to the systems where the Farmers' Text Centre operates and in which the analysis of this research would be made. Three specific areas in rice agriculture were identified that would serve as the contexts of the research. These are: crop production (rice cropping), information (agricultural extension), and culture (organization of farmers' everyday life).

In that meeting, the details of the field research were thoroughly discussed. The researcher asked the Farmers' Text Centre staff of the site where to conduct an ethnomethodological field study to address the ground-level or cultural issues of the research. A briefing of the ethnomethodological research was provided. In summary, the researcher pointed out that ethnomethodology is an ethnographic approach designed to elicit people's meaning system though their actions and experiences (see discussion of Ethnomethodology in the previous Chapter 2.4.).

Three sites were initially recommended by the Farmers' Text Centre staff. These sites - Davao Oriental, Pampanga, and Ilocos Norte - were the top three active cyber communities among the 12 (PhilRice 2009). The selection of the study case was guided by the following criteria: 1) access to rich data; 2) the community being geographically contained in a compact area for ease of study; 3) willingness of the community to be studied; and 4) the accessibility and security of the site

ensuring the researcher's safety. Among the three sites recommended, the Barangay Caganganan in Banaybanay, Davao Oriental was chosen. The site selection was collaboratively done by the researcher and the Farmers' Text Centre personnel during the meeting. Only one community was chosen so the researcher could hold a thorough investigation of the depth rather than breadth of the farmers' experience of the SMS technology.

Data collection. Consistent with the methodology of conducting interpretive research, the fieldwork process was semi-structured and flexible to suit the conditions of the community studied. Practicality and participants' convenience were at the top of the criteria for the selection of the data collection method. Staying for three weeks in the community, my goal was to capture the practical everyday actions and views of the local people with regard to their experience of the SMS technology. The data collection methods employed were individual interviews, focus group discussions, photographs, participant observation, and transect walks (Figure 7). During the fieldwork, a holistic approach or what Fetterman calls a 'big net' approach was employed. This approach allowed me to have a sense of the whole or the big picture before looking into the microscopic aspects of the phenomenon studied (Fetterman 1990, p.43). Done through 'mixing and mingling with everyone in the field' (p.42) or what is generally called participant observation, the big net approach helped refine my focus and aided me in understanding the finer details of the phenomenon studied (p.43). By mixing and mingling with everyone, I had to eat, talk, laugh, and play with the farmers or participate in their activities. Fieldnoting, as advised by Nazroo & Arthur (2003), was done in that I roughly jotted down all my observations as well as reflections.

Reflections are thoughts or interpretations that became evident from the observed empirical data (Willis 2007). Journaling, according to Willis, helps a researcher to organize and refine or reconstruct his thoughts if necessary. Moreover, I shared my reflections with my research participants to confirm their validity (ibid). In sum, the fieldwork generally took place in what Schon (as cited by Willis 2007) calls reflection-in-action manner, where data analysis is held simultaneously with data collection. Grounded Theory calls this process 'iterative' as discussed above.

Interviews were done in a non-structured manner to allow local stories to be revealed rather than responses based on standard questions. Following the advice of Legard, Keegan & Ward (2003), I facilitated the interviews in a natural setting, such as going to my interviewee's house or farm, or at the waiting shed or the *sari-sari* (convenience) store where the local people usually gather. Moreover, I did the interviews in a casual manner, avoiding formality in the conversation. To do this, I usually commenced the conversation by generating 'small talks' to relax my interviewee and to encourage him or her to speak. Succeeding questions were determined based on my interviewee's answers. I would then focus the conversation towards the topic once I established rapport with the interviewee. The structure of the interview depended on the situation. At times, interviews were held over meals; at other times, while the interviewee was on the farm. Some interviews were held not in an exclusive manner or one-on-one; rather family members or others may have been present. At the onset of the interview, I made my intention clear to my interviewee that I wanted nothing but to know about her/his thoughts, feelings, views, and experiences with regard to the use of SMS. Probing was applied to elicit the depth of the interviewee's answers. A

similar strategy was employed in focus group discussions except that more interviewees or participants were involved in a focus group. The group discussion was facilitated to allow the explication of the depth rather than breadth of information about the phenomenon studied through facilitating knowledge interactions among the participants (Finch & Lewis 2003).

Before conducting any interview, a study briefing was done. An information sheet (Appendix C) explaining the objectives of the study, as well as the consent (Appendix D) and complaint (Appendix E) forms were handed to the interviewee. The consent form was signed by my interviewees as proof of their willingness to take part in the study. The compliant form was also provided to the interviewees in case they have questions or issues to raise during and after the interview. Contact information about where to address any complaint was indicated in the form.

Figure 7. Fieldwork activities

Research participants. Since this study looked into the depth rather than the breadth of the phenomenon under study, the number of research participants in the field research conducted was not established based on statistically significant or representative figures used in quantitative research which aims to arrive a generalization, but rather on the basis of information richness aiming at 'elucidating the particular or the specific' under study (Pinnegar & Daynes 2006 as cited by Creswell 2007, p.126). Guided by Grounded Theory, the identification of participants interviewed stopped where the point of 'data saturation' was reached. Sampling methods used were purposive, opportunistic, and snowball. Purposive sampling means that the research participants are selected based on its purpose (Ritchie, Lewis & Elam 2003). The purpose set in this thesis as earlier outlined was to understand the experience of SMS in a farming community, using the Farmers' Text Centre as the study case. Research participants, therefore, refer to anyone including the farmers, their housewives, their children, neighbours, or any member of a farming community (the Barangay Caganganan, in this case) who participated in the Farmers' Text Centre. As earlier discussed, the Barangay Caganganan in Davao Oriental, Philippines was selected as the community under study. The objective was to elicit the community's views, perceptions, and insights regarding the use of SMS (referring to the Farmers' Text Centre service) in farming.

While individuals or groups of individuals were interviewed in this research, the analysis of this thesis was centered on eliciting the community's shared views rather individual views. In other words, the community's views served as the unit of analysis of this thesis. See Appendix A for the list of the farmers interviewed

during the fieldwork. Initial participants were identified with the help of PhilRice and the Caganaganan Municipal Agriculturist Office. A courtesy call to the community leaders, such as the Mayor, the Barangay Captain, and the City Agriculturist was done before conducting any research activity in the community to explain the research objectives and significance, as well as to get their permission to carry out the study in their community. These community leaders could not decide on behalf of the members of the community to participate in the research. As local political authorities, however, they could endorse the conduct of external research in their community. Unless consent was acquired from the identified participants, an interview was not done. Unwillingness and withdrawal of the research participants for any valid reason also served as the legitimate criterion for exclusion. Likewise, identified participants who asked for payment were excluded from the study.

A snowball technique was applied to determine more research participants in the community through referrals (ibid). With snowball sampling, I asked the farmer-participant about other individuals in the community who could share some experiences about SMS use. The opportunistic sampling technique was also used in that I took advantage of every opportunity where I could get relevant information. These opportunities include talking to any local folk who I met either over lunch, or while waiting for transportation by the waiting shed (where most local people gather), or while riding on a motorcycle (the main means of transportation in the community). While it was mentioned earlier that the sample of this thesis was limited only to the community members who have experience with the Farmers' Text Centre Service, others members of the community were

also interviewed. Ritchie, Lewis, & Elam (2003, p. 85) calls this supplementary sample for use not for triangulation purposes or to conduct a variability analysis but to illuminate the context of the research participants' views.

3.5. Data

Three primary data sets were used in this study (Table 2). First is the SMS usage reports generated from the pilot testing of the Farmers' Text Centre project from 2006 to 2010 to understand the pattern of SMS use in agriculture particularly in rice cropping in the Philippines. Second is the Farmers' Text Centre text messages data from June to December of 2010 to analyze how farm solutions are generated in SMSing or text exchanges. The SMS data from June to December was selected as it constituted issues covering a whole rice-cropping season in the Philippines. From this data set, hundreds of text messages were analysed. Aside from explicating the nature of farm topics discussed across the cropping season in SMSing, the objective of the text analysis was also to understand the dynamics and complexities of SMSing as a production site of farm knowledge solutions. The text analysis likewise aimed at seeking empirical evidence or representative quotes to help explain the figures and statistics of SMS usage in farming reported by the Farmers' Text Centre. The third data set is field data acquired through an ethnomethodological field research conducted in Barangay Caganganan, Davao Oriental, Philippines. The field data gathered was composed of interview transcripts, field notes, photographs, and council documents and reports. Since the field research was ethnomethodological, the data sought was a description of the

'how-to' or 'action' experience or of how the farming community lives their everyday life with SMS. It is worth mentioning here that this data was not predetermined nor was acquired based on prespecified research requirements. Consistent with the 'iterative and emergent' principles of interpretive qualitative research discussed above, they became known in the course of the study and helped to shape or render the structure of the thesis (pp.156, 157, & 162). The guiding rule in the identification of data was to use anything that would be suggestive or indicative of the farmers' SMS experience.

Table 1. Research data

Data	**Types of data**	**Source**
PhilRice Farmers' Text Center data from 2006 to 2010	Statistics; Figures; Pictures; Reports	PhilRice
More than a hundred Farmers' Text Centre text messages from July to December 2010 (in Excel files)	Document	PhilRice
OPAPA Process Documentation Program	Book/document	PhilRice
Overview of the Rice Production Situation of the Philippines	Document	PhilRice
Participant Observation	Fieldnotes (description of field observations; notes from interviews); Photos	Caganganan Community
Interviews	Interview Transcript	Caganganan Community member/s
Focus Group Discussion	Interview Transcript/Audio; Fieldnotes; Photos	Caganganan Community

3.6. Data analysis

All the data materials - although they come in different forms - were generally analyzed using the same analytical tool, that is, the interpretive approach. As defined earlier, the interpretive approach consists of the process of induction, iteration, reflection (or what Grounded Theory calls abductive reasoning), thematization (or theorizing in Grounded Theory), and collaboration. Generally, it refers to the process of making sense of the data not in terms of looking at categories or themes in the sense of regularities and commonalities as in postpositivist research but of essence (Tesch 1990). In this thesis, the essence is defined or measured in terms of what constitutes the performance of SMS in agriculture particularly in rice cropping in the Philippines. Analysis was deeply grounded on empirical data rather than on some predetermined theories or parameters (induction).

As mentioned earlier, data analysis began at the stage of data collection (Courtenay, Merriam & Reeves 1998, p. 68). This process, however, did not proceed in a linear order but rather iteratively in that the 'research went back and forth between the data or from field to researcher's site until the revelatory meaning was arrived' (Charmaz 2008, p. 161). A series of reflective or abductive activities was carried out during this phase. This process of abduction allows for intuitive interpretations of empirical data (p.157). It was done through mental sketching, or 'reflective journaling' (Willis, 2007; p.221), or idea mapping. In the case for interview transcripts, 'memoing' (Strauss, 1987) was done. In Grounded Theory, this activity is called theoretical sampling, which is defined by Charmaz

(2008) as ‘a method of sampling data for the development of theoretical categories’. Generally, the data analysis was carried out guided by the following three major steps of Grounded Theory:

> ‘First is the Open Coding, which aims to analyze data in detail by comparing single descriptions for both differences and similarities. Descriptions that are considered to be similar in nature and/or meaning are grouped under the same concept (Strauss & Corbin 1988). Second is the Axial Coding. In here, categories are related to subcategories thereby reassembling the data that were fractured during Open Coding. However, Open and Axial Codings are not necessarily sequential. Indeed, during Open Coding, the structure of relationships between categories begins to emerge when coding descriptions into categories (Strauss 1987; Strauss & Corbin 1988). The emerging relationships between categories allow distinctions to be drawn between main categories and their subcategories. Subcategories describe properties and dimensions of the phenomena represented by the main categories. Third is Selective Coding, where the major categories are refined and integrated to form a more abstract theoretical scheme or theory (Strauss & Corbin 1998).’ (Oliver & Lunt, 2002:p. 248)

In interrogating the data, I was guided by my theoretical assumptions about the phenomenon studied (laid out in Chapters 1 & 2). (By interrogating as technique in grounded theory, I closely examined, probed, and reflected on the empirical data until theoretical accounts about the subject matter were obtained.) As

discussed in Chapter 2.1, this thesis would be viewed from a constructivist perspective. Hence, interpretations were focused in looking at the SMS technology not as a tool but a social construction or part of the organization of human action with a reflexive nature. The SMS technology with a reflexive nature means that it defines reality and at the same time it is that reality. In analysing the pilot project reports of the Farmers' Text Centre concerning the use of SMS in rice cropping, the SMS technology was assumed to have a significant relationship with the rice cropping. Analysis then was focused on how that relationship was formed or how the SMS technology becomes relevant to rice farming. In the textual analysis done for the Farmers' Text Centre SMS text messages data, the data were examined with the assumption that SMSing is not just a passive form of information delivery, but as an active site of knowledge production. For the ethnomethodological data, SMS was investigated as integral to the everyday life of the farming community rather than an external intervention introduced.

Figure 8 illustrates the analytical process undertaken in this thesis. As mentioned earlier, this interpretive research aimed at understanding the subject matter in context. Hence, I first carried out a deeper investigation of the rice agricultural situation in the Philippines from which, as earlier mentioned, analysis for this thesis would be situated. Through literature review and interviews, I took heed of the culture and practices of rice cropping in the Philippines - from the macro to the micro agro-ecological circumstances of rice. It was in these contexts the meaning of the SMS data from the Farmers' Text Centre as well as the SMS experience of the community surfaced. This interpretive analytical approach was

highly influenced by 'hermeneutics', which presupposes the meaning of a text resides not in the text but in the context (Willis 2007, p. 104).

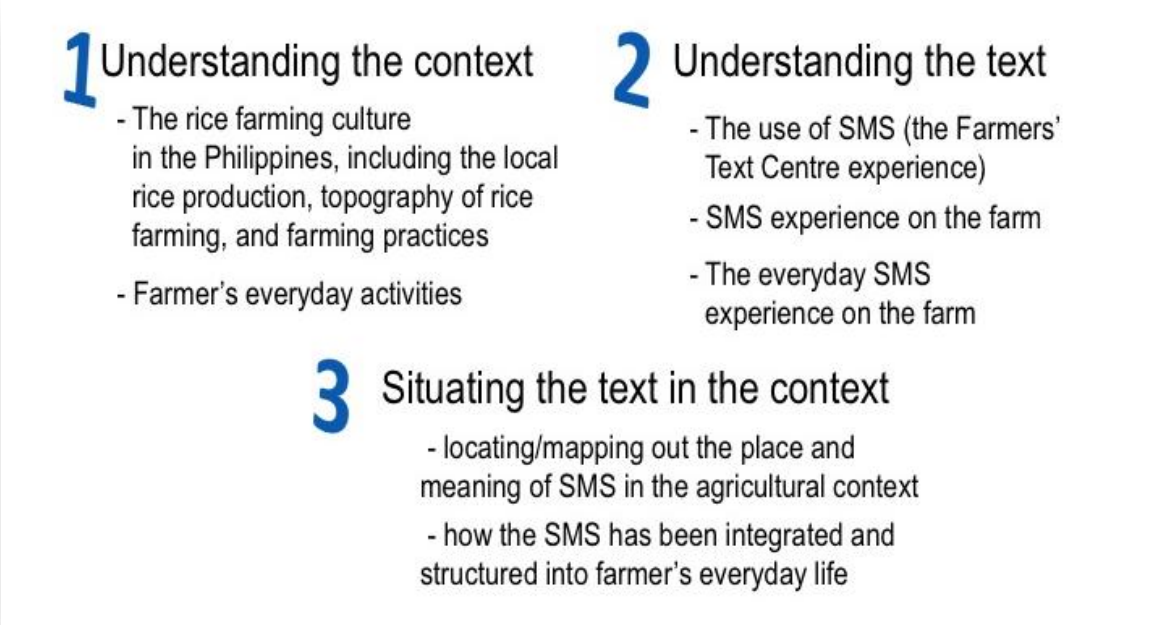


Figure 8. The Research analytical process

Moreover, since I was looking at shared meanings or what Carbaugh (1986 as cited by Saludadez & Garcia 2001) calls the 'intersubjective conventions more than the subjective intentions' in this thesis, the analysis was held collaboratively. By collaborative analysis, I mean that the data interpretation was not done solely by myself but with my research participants as well as with my research supervisors, 'aiming at intersubjective agreement' (Maxwell 1992 as cited by Saludadez & Garcia 2001). This collaborative undertaking is useful as this ensures credible, plausible, and bias-free results (Fetterman 1989, p.21). Data analysis was stopped once theoretical saturation was arrived. Theoretical

saturation, according to Charmaz (2008, p.168), refers to the degree of analysis where cohesion for the emergent analysis was reached.

To bring the emergent analysis into the level of abstraction, it was then situated into the existing theoretical realms. Review of relevant literature was launched. A chapter was dedicated to highlight the interplay between the local knowledge (the emergent analysis of this thesis) and the mainstream discourse of SMS technology in relation to agricultural development. Borrowed from the theory of semiotics, this 'intertextual' reading between the empirical and the theoretical was intended to see the value of the emergent analysis by fitting it into the broader body of knowledge. Moreover, some qualitative scholars would do this theoretical cross-checking as a means to increase the plausibility of the interpretations. Here, the literature was not utilized as a yardstick but as an equally important body of data to strengthen the knowledge claim.

3.7. Presentation of results

Presented in Part Two, the results are structured in a thematic manner following the theoretical categories arrived at. They are compartmentalized into three sections. The first section lays down the emergent analysis from the reports of the Farmers' Text Centre with regards to SMS use in relation to rice cropping. The second section accounts for how farm solutions and knowledge are generated in SMSing. The third section talks about the everyday SMS experience on the farm.

Discussions come with representative quotes and figures to show evidence of the knowledge claim. Moreover, they are expressed in local, popular language to emphasize local experience. The use of 'I' and other subjective expressions is evidenced across the texts to emphasize the researcher's voice in the analysis.

As this is grounded theory research, discussions are mainly based on the emergent, subjective analysis, devoid of cross-referencing with other studies to highlight the local knowledge derived in a context set in this thesis.

Another chapter though was created that situates the local experience into the broader theoretical body of knowledge. The objective was not to conduct triangulation to gauge the validity of the results (in quantitative terms) but to see if the emergent theorization of the SMS technology based on the local experience is plausible and creates connection and significance to the boarder related discourse of knowledge.

While this thesis does not intend to generalize, it cannot be denied that some of the emergent results of this thesis may appear similar or applicable to other areas. Moreover, coming from a constructivist perspective, I believe there are many accounts and stories that can be told about the impact of SMS not just in agriculture but also in other sectors. This thesis therefore is one of the stories that can be told about the SMS technology.

PART TWO:
THE CENTRALITY OF SMSING TO THE ACCOMPLISHMENT OF FARM WORK

This part demonstrates the reflexive nature of SMSing – that is, how the messaging technology becomes part of the dynamic process of structuration in agriculture in the Philippines based on the empirical data analysed. Structuration, as discussed in Chapter 2.3., is a social process that involves a dynamic (re)organization of human actions. This part of this thesis particularly underscores how SMSing becomes central to the accomplishment of farm work. The discussion of this use of SMS in farming is categorized into three areas, namely: rice cropping (crop production), knowledge production (information), and a farmer's everyday life (culture).

Chapter Four:
SMS And Rice Cropping in The Philippines

This chapter discusses the application and use of SMS in agriculture particularly in rice cropping in the Philippines. The overarching question that this chapter seeks to address is how SMS becomes relevant and useful to farming. Drawing on the data from the Farmers' Text Centre, this section specifically attempts to map out the actual application of SMS in rice cropping. Theoretically, it seeks to understand the relationship of SMS with rice production. How is this interconnection taking place? And what impact does it create?

4.1. Rice cropping in the Philippines

To begin, it is important to understand the rice cropping system where the SMS technology operates. In the Philippines, rice is grown either as a monocrop or intercrop with some high-value crops, such as vegetables and fruits. Rice cropping varies across the country, depending on soil type and location as well as the availability of water. There are 4.52 million agricultural lands in the country grown with rice; 67% of which are irrigated, 32% rainfed, and 1% rainfed upland (Bureau of Agricultural Statistics 2009). In some areas especially when irrigation is available, rice can be grown twice (or sometimes thrice) a year; however rice can only be grown once in areas with semi-arid conditions (Figure 9). But generally, there are two rice cropping seasons in the country: the wet season, which runs from June to October, and the dry season, from December to April (Figure 10). The length of rice cropping also depends on the kind of rice variety

grown. Some varieties are early maturing; others are late maturing. Hence, a better understanding of the agronomic characteristics of rice varieties is imperative for varietal selection. On average, though, it takes 110 days to grow rice.

Rice farming constitutes a series of activities – from land preparation, to crop establishment, to harvesting, and to marketing. It is an intensive process with complex knowledge requirements, such as what variety to grow (variety selection), what fertilizer to use and how much amount to apply (fertilization), how to avoid and control pests and diseases (pest and disease management), and how to ensure quality produce (harvest and postharvest techniques). Moreover, every stage of the crop specifically entails a unique set of management requirements. In seedbed/seedling preparation, for instance, a farmer is confronted with the challenges of seed soaking, land preparation, fertilizer application, and transplanting. Once the crop is transplanted and growing, another set of activities comes into the picture. A farmer has to deal with various pests and diseases that may attack his crop. He also has to closely monitor his plants to see whether they are healthy or stunted. The condition of his standing crop will tell him if he needs to apply more fertilizer or not. Irrigation is another critical element that must be considered. Water levels in the paddy, if not well managed, can have a tremendous effect on the crop. It can either cause abnormal or stunted growth of the rice plant, or create the likelihood of the crop becoming vulnerable to pest attack. Continuous monitoring is necessary. Come harvesting, timing is a crucial factor. A farmer has to ensure that he harvests his crop on time. Early or late harvesting can affect the quality of the produce. Postharvesting is another critical

stage. Drying, milling, and marketing can all be major challenges. Ineffective handling of these aspects could result in low revenue for the farmers. In sum, a farmer does a lot of decision-making in farming (Figure 11). Not only is he concerned with the crop's agronomic issues, he is also affected by his socio-cultural and economic means, the weather, the market where he buys his inputs and sells his produce, and the country's political situation where the agricultural research and development (R&D) agenda keeps changing depending on the ruling government.

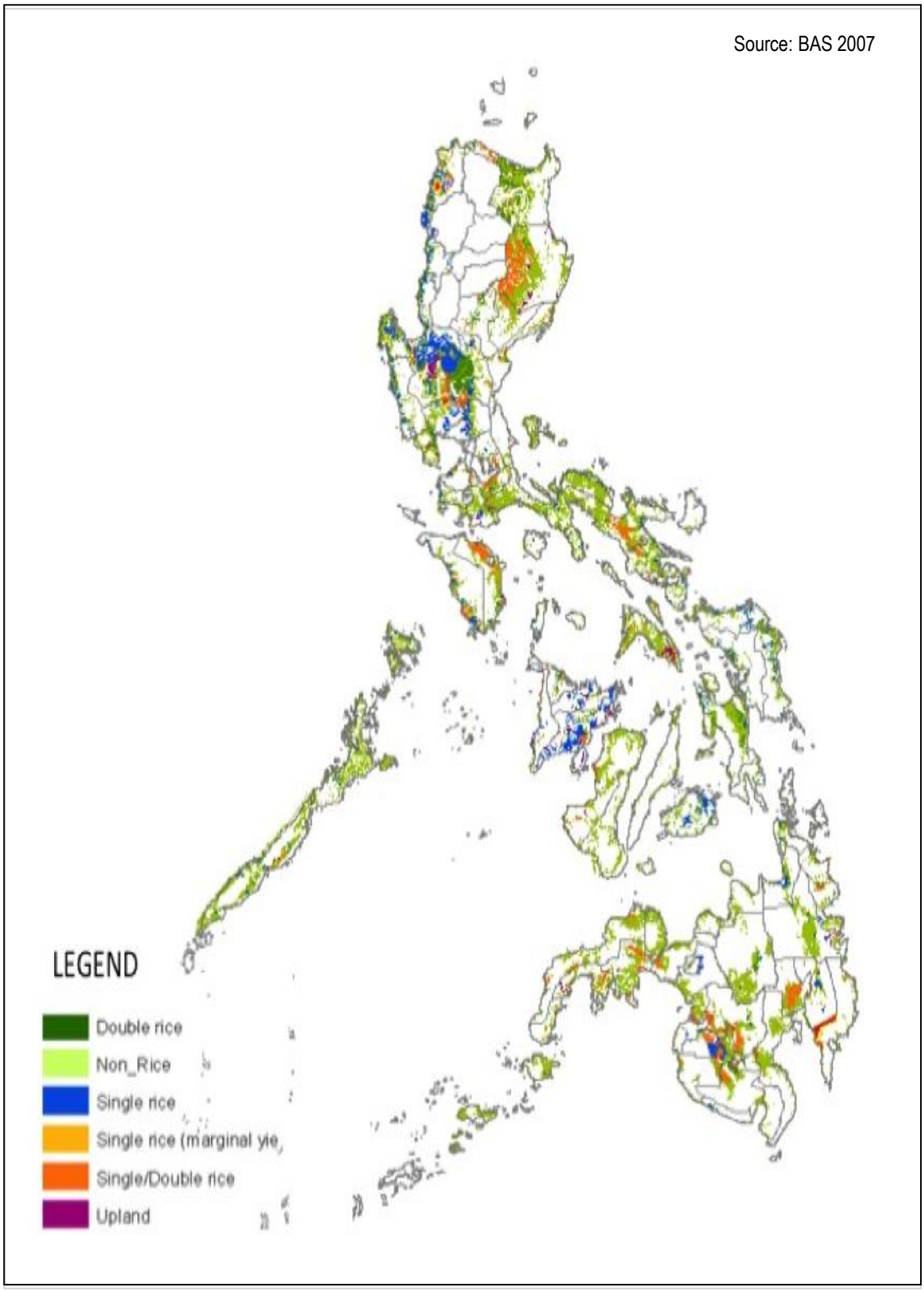


Figure 9. Rice areas in the Philippines

Source: Caganganan FGD 2011

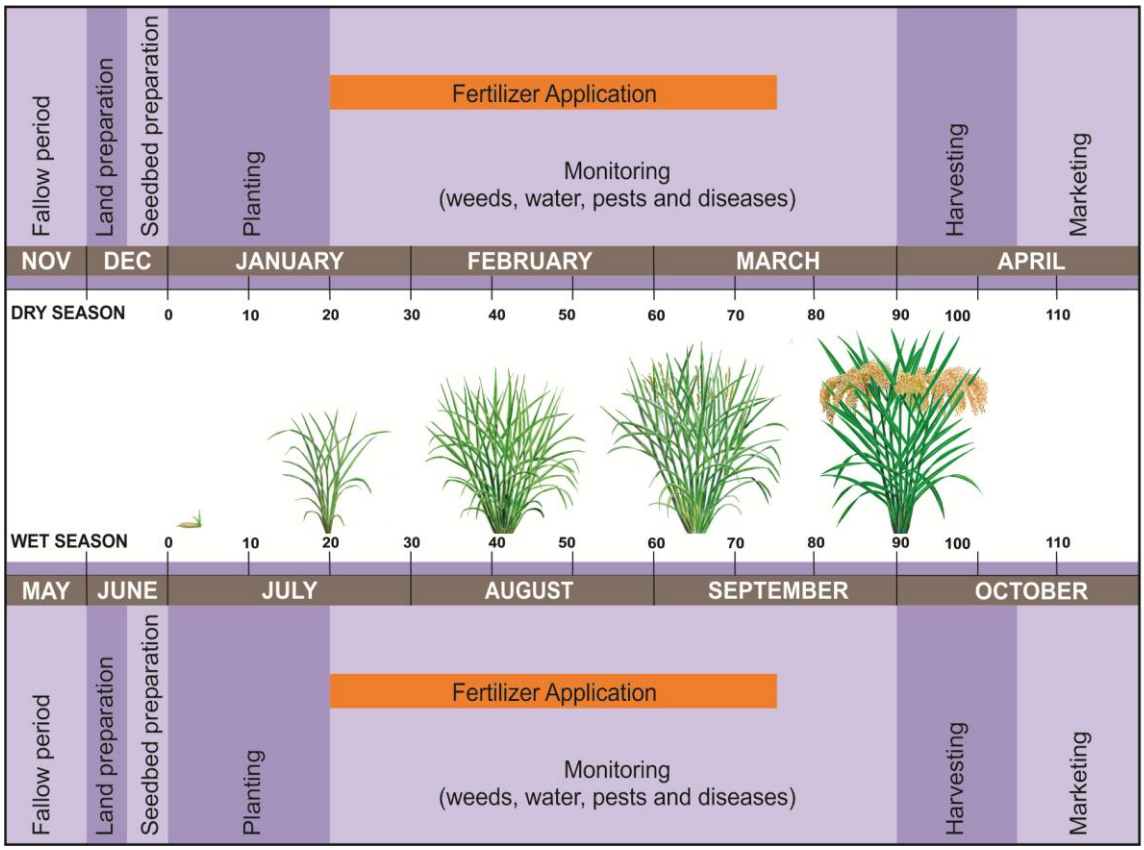


Figure 10. The rice cropping pattern in the Philippines

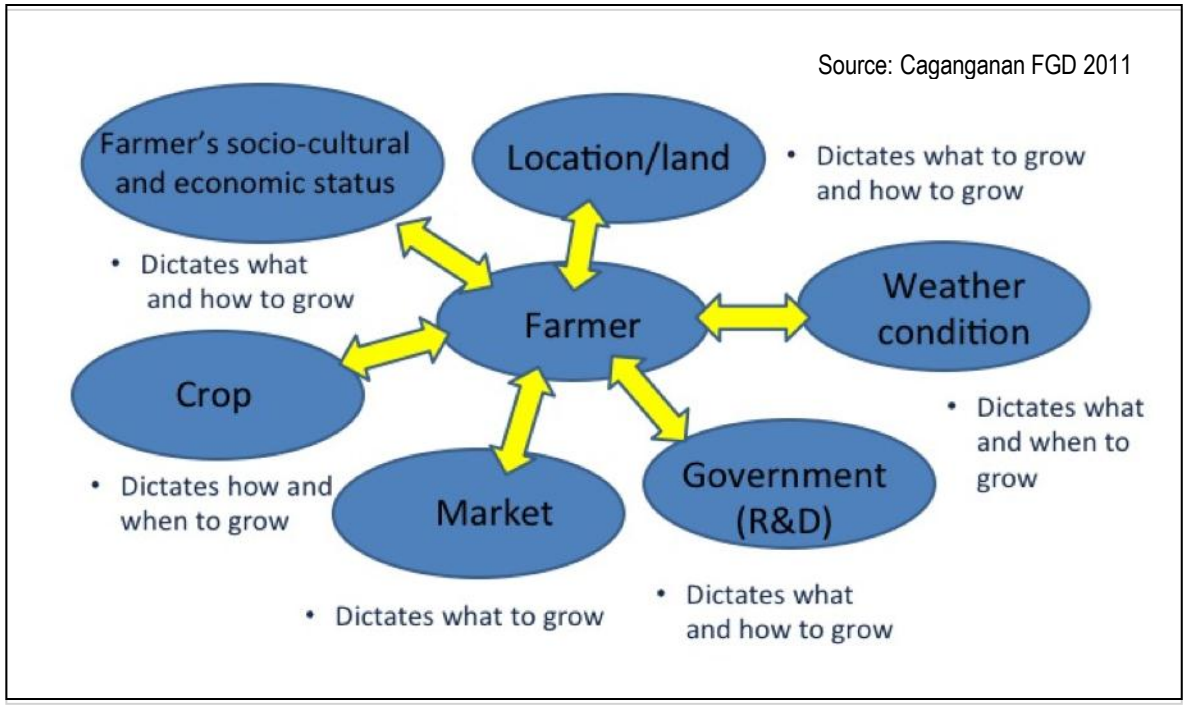


Figure 11. Factors that affect farmer's decision-making

4.2. Pattern of SMS usage in rice farming

From 11 text messages during its launch in 2006, the Farmers' Text Centre has subsequently attended to more than 100,000 text queries in 2010 (Pascual *et al.* 2010). Based on the information in the phonebook list of the Farmers' Text Centre software, the Centre clients predominantly come from the major rice-growing areas across the country and are mostly composed of farmers, followed by extension workers, professionals, students, and researchers (ibid).

The increasing pattern of text messages received by the Farmers' Text Centre from 2006 to 2010 is shown in Figure 12. As indicated in the data, the text messages received by the Farmers' Text Centre were spread across the year, implying that SMS has been used the whole year round. This analysis suggests that farmers still use SMS even during fallow periods. The data, however, shows some variation in the distribution of text messages across the year. SMS is higher from June to November, than from December to May. August has the most SMS received, while January has the least.

To explain this variability of SMS usage, the data was plotted against the rice cropping pattern discussed earlier. It is observed that heavy SMS traffic transpires during the critical stages of the rice crop. June to October on the rice-cropping calendar is the wet cropping season in the country, while December to May covers the dry cropping season. Comparing the two cropping seasons, the wet season is more critical with numerous issues emerging on the farm. During this period, the weather is unfavourable. The incidence of pest and disease infestation

is higher as bacteria are dispersed by the rain. Moreover, the crop's nutrient absorptive capacity is lower due to minimal sunlight. It is not only rainy and wet during this time, but it is also the period where typhoons usually hit the country. Nestled within the Pacific typhoon belt area, the Philippines experiences an average of 20 typhoons per year (Hilario 2011). August, specifically, is the most critical month as this is the peak period where tropical cyclones visit the country (Figure 13). It is also the time when the crop is in its delicate, vulnerable stage (vegetative stage). The crop can then begin to manifest symptoms, such as leaf discoloration either due to nutrient deficiency or pest infestation. January, on the other hand, is a more relaxed time on the farm. The crop is usually established, and its tillers are beginning to develop and flourish. There are not many activities and problems at this stage of the crop except for the need to keep an eye on the irrigation, and perhaps handpicking of some emerging, foreign species that may soon become a threat to the crop if not managed. These threats include weeds and egg masses of golden apple snails sticking on the sheath of the growing rice plants.

Source: Caganganan FGD 2011

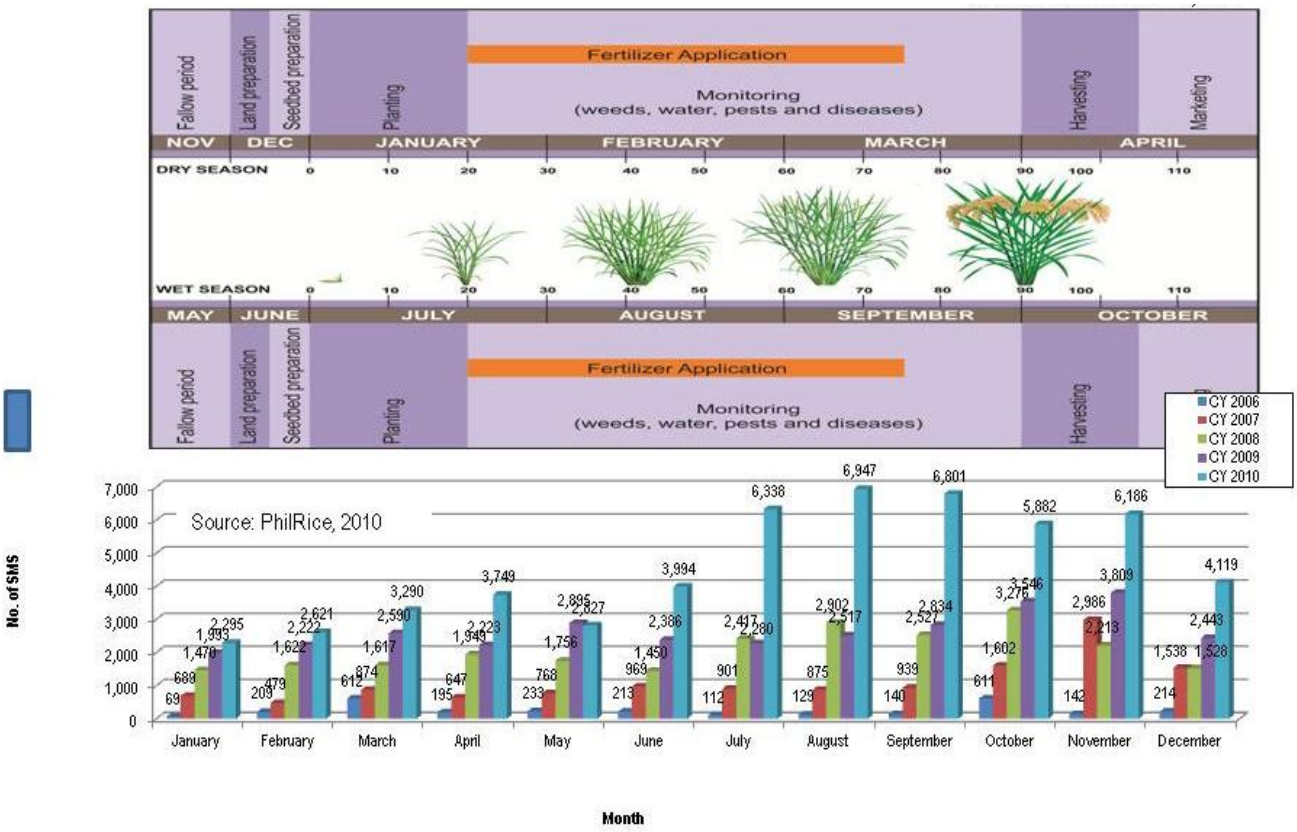


Figure 12. Distribution of text messages received by the Farmers' Text Centre in 2010

Source: Caganganan FGD 2011

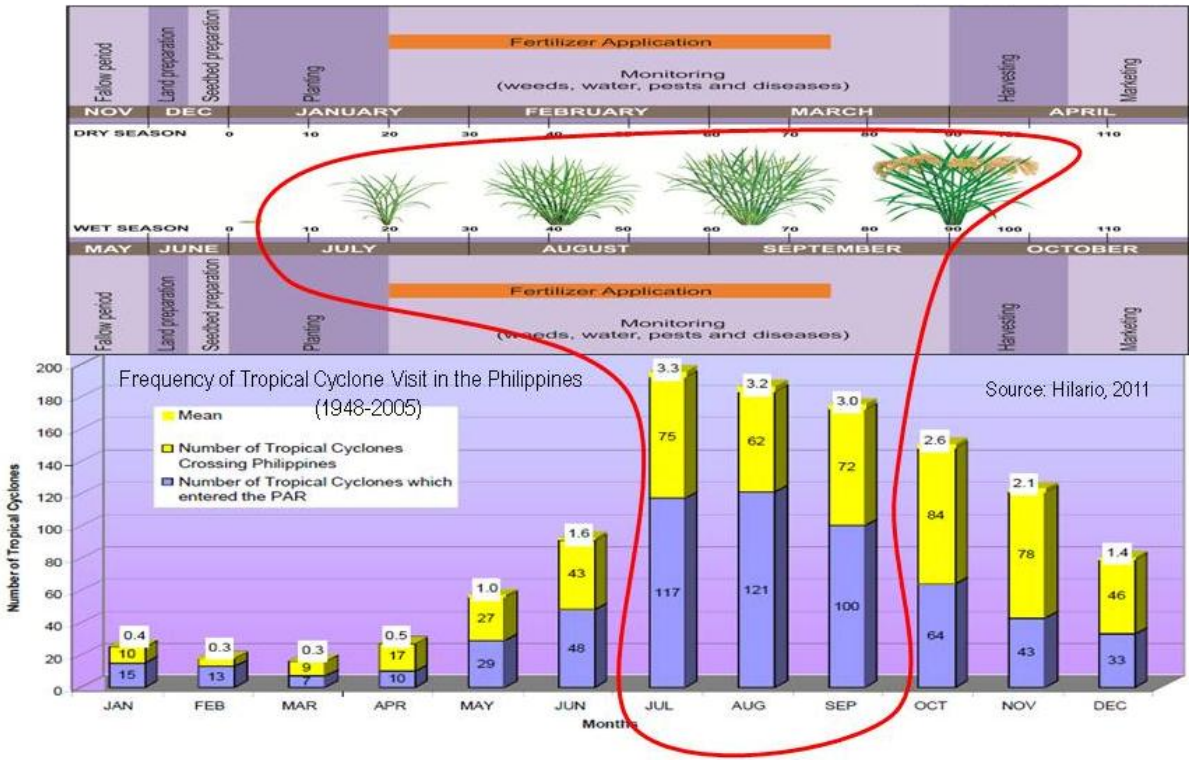


Figure 13. Frequency of typhoon visit in the Philippines

Aside from agronomic reasons, the low SMS rates in January can also be explained by the economic condition down on the farm. In the Philippines, January is figuratively akin to '*tagtuyot*' (drought period) for most Filipinos. The flow of hard cash dries up, and everyone is struggling financially, following spending during Christmas and New Year's celebrations. Farmers are not only short of money but also tied up with loans. Farmers in Banaybanay, Davao Oriental in a group discussion pointed out that the income that they will earn from the incoming crop's harvest is no longer something to be excited about as it is already tied up to pay for their debts.

Moreover, the plateauing of SMS not only in January but throughout the whole period of the dry season as compared to that of the wet season, as shown in Figure 12, can also be attributed to higher farming cost in this period. The higher cost is due to the higher input requirements. The crop's photosynthetic activity in this season is higher, hence requiring a great amount of fertilizer. In addition, according to the farmers in Banaybanay, household expenses are also higher in this period of time due to school requirements for children. The Valentine's Day celebration for the month of February and the commencement/graduation exercise for the month of March are two major school activities cited by the farmers that incur some extra spending.

On a daily basis, SMS peak hours highly depend on the activities on the farm. Based on the Farmers' Text Centre data, heavy SMS traffic transpires around 10-11 in the morning and 2-3pm in the afternoon (Stoix Pascual [Farmers' Text Centre Agent], personal communication, January 15, 2011). On the farm, these

are break times from the farm's work. During these times, farmers once used to rest either behind the bush at the farm or at their house sometimes listening to the radio, or having a chat with fellow farmers or neighbours. But in recent times, they would also use these periods to text via SMS. Moreover, in the text analysis, it was observed that some of the text messages are sent to the Farmers' Text Centre as early as 4 am and as late as 11 pm (Texts 1&2). Looking at farmers' everyday routine, they usually wake up early in the morning, and sleep around 9pm. This implies that farmers use SMS before they go to farm in the morning perhaps while having breakfast, and before they go to sleep perhaps while having dinner or watching TV. Although response time in the Farmers' Text Centre was within five minutes not only during office hours but also during weekends and non-office hours (Asis O, *et al.* 2010), in the text analysis some response delays were observed (Text 2). The different timetables of farmers and text agents of the Farmers' Text Centre may be one potential reason for this delay. PhilRice, who manages the Farmers' Text Centre operation, opens office at 9am, with shifts from 9am to 12pm in the morning, and then 1pm-5pm in the afternoon, with one-hour lunch break in between. Farmers, on the other hand, begin their day as early as 4am and retire around 10pm. With the text messages received outside of the farmer's farm working period, it can be inferred that farmers' productive time has gone beyond covering what used to be referred to as non-farming time normally spent doing other household chores. In an interview with farmers in Barangay Caganganan, Banaybanay, Davao Oriental, Philippines they said they would text even while watching TV or listening to radio, or even during mealtime.

Moreover, delays in the Farmers' Text Centre message response can also be attributed to the complexity of the question asked. Some of the text messages received by the Centre are hard to answer. Text 2 shows a sample of a text message that is hard to answer. As indicated in the data, a longer response time is observed. Usually, it only takes five minutes or less to answer a text query.

Text 1. Time of texting (early)

Texter	Time received	Message	Reply	Time Replied	Respon se Time	Classifica-tion
Isagani Combis (Region 3 – Aurora)	1/12/20 10; 4:18am	pwd po b iulit ung rc14 ngaun.ung naani ko ngaun.wl kc pambili certfied binhi knti lng naani. *[Can I plant PSB Rc14 (a kind of variety) again in this cropping season?]*	maaari nman po xang gamitin ninyo ulit kung wla po tlaga kayong pambili. *[Yes, you can use it if you don't have money to buy new seeds.]*	1/12/2010 5:04pm	00:46	Varietal informatio n

Source: PhilRice 2010

Text 2. Time of texting (late)

Texter	Time received	Message	Reply	Time Replied	Respons e Time	Classifica-tion
R3 Bulacan - Cris Andrade	7/3/10 11:23 PM	Gd eve.pu pwdng mg hng! Ng impormation about paspalum ito uri ng damu na knakain ng ruminant kng anu ang katangian nito na mahlig ang buffalo plz rply thankz *[Good evening. May I request for information about 'Paspalum'? It's a kind of grass that is eaten by ruminants. Please reply. Thanks]*	ayon s nabasa q s internet,Paspalum is a genus of the grass family (Poaceae). I perennial American grasses. They are most diverse in subtropical and tropical regions. Commonly known as paspalums, bahiagrasses or dallis grasses most are tal *[According to what I read from the Internet, Paspalums belong to a genus family Poaceae. They are most diverse in subtropical and tropical regions. Commonly known as paspalums, bahiagrasses, or dallis grasses.]*	7/5/10 1:31 PM	1/1/00 14:08	Pest

Source: PhilRice 2010

4.3 SMS as farming input

The question then is what kind of text messages or queries are communicated to and from the Farmers' Text Centre, or what kind of knowledge inputs does the Centre offer to farmers?

Reports show that the Centre caters to a variety of text messages ranging from topics according to its novel use, to salutations and thank-you notes, to registration messages, and to random, funny messages with intention of creating a 'network of intimacy', such as 'can you be my textmate' (Pascual *et al*. 2010). To summarize, these text messages that the Centre received are composed of the following: farm queries, greetings/thank-you notes, registrations, and others (ibid). The 'others' messages, according to Pascual *et al*., are messages that are not relevant or not relating to farming, and those that contain incomplete text characters. Queries regarding rice farming and related topics, however, constitute the bulk of the text messages sent to the Centre. There are also some messages concerning other agricultural topics, such as livestock, vegetables, and other high-value crops that are sent to the Centre. In response, these are answered with or routed to the concerned expert bureaus of the Department of Agriculture. Table 3 shows the kinds and classifications of rice-related messages received by the Centre (ibid).

Moreover, a text analysis conducted reveals that the nature of information services that the Farmers' Text Centre offers is in the form of: farm advisories, technology updates, access information, how-to-do, and farm insights. Based on

the Centre data from 2006 to 2010, the top three frequently asked farm related topics are seeds & varieties, nutrients, and pests (Figure 14) (Pascual *et al*. 2010; Asis *et al.* 2011). In rice farming, these topics are highly critical; failure to come up with sound decisions on these matters can significantly affect the success of crop production. Inquiries on seeds and varieties, as shown in Figure 15, are predominantly higher during the fallow period (that is, around May-June for the wet cropping season and October-November for the dry cropping season, as discussed earlier). The high density of text messages during the fallow period is also due to the fact that farmers are not only freer to text at this time but also they have the financial resources to buy mobile phone credits having just sold their produce from the previous cropping. Text messages about nutrients and pests, on the other hand, are mainly communicated during the crop's tillering period (*i.e.*, around mid January to mid March for the dry cropping season and around mid July to mid September for the wet cropping season).

Table 2. Classification of FTC text messages concerning rice topics *(Source: Pascual, et al. 2010)*

Classifications	Scope	Sample Queries
Palayamanan	Agricultural crops other than rice, livestock, fisheries	What medicine should I use for my pig? It has a flu and a fever.
Statistics	Information on rice statistics, production, importation, return of investment	How much does it cost to plant one hectare of inbred rice as compared to hybrid varieties?
Knowledge products	Books, rice techno bulletins, field guides, DVDs, CDs, PhilRice newsletter	I want to subscribe to your PhilRice newsletter. How much will it cost me?
Machines	Machines used for rice production, its cost, manufacturers	How much is your rice combine harvester?

Classifications	Scope	Sample Queries
Food products	Information on rice delicacies, its preparation, rice chemistry	Can I have a recipe of your rice wine and its procedure?
Training	Rice production training, information and communications training	I want to learn more about rice. Do you have trainings? How much?
Varieties and seeds	Information on rice varieties – traditional, inbred, hybrid – its availability, characteristics, costs, kinds	Do you have available varieties for fields that are usually penetrated by salty water?
Crop physiology, management, and establishment	Rice physiology, its growth, crop management, establishment (direct wet seeding, transplanting, dapog)	How many leaves does a rice plant have?
Water management	Information on the depth of water, time of irrigation, drought	After transplanting, how many days before I will irrigate my field?
Integrated nutrient management	Nutrient information, fertilizers, its kind, quantity, and soil/nutrient problems	When is the best time to apply 0-0-60?
Integrated pest management	Pest information, its management, kinds, insect pests, diseases, beneficial insects and organisms	My rice plant is stunted and its leaves turns reddish. What medicine will I spray?
Postproduction	Information on drying, milling, storing	How long will I dry my newly harvested rice seeds?
Research and general information	Information and issues on rice research	What nutrients will I get from golden rice?
PhilRice	General information about the Institute, address, applications	Do you have job vacancies in PhilRice?
Other agencies	Issues that can be answered by other agencies	Why did the NFA reject our rice?

Notes: Text queries were translated into English for ease of understanding (Actual messages were in the vernacular with some of them written using shortened, 'text' language)

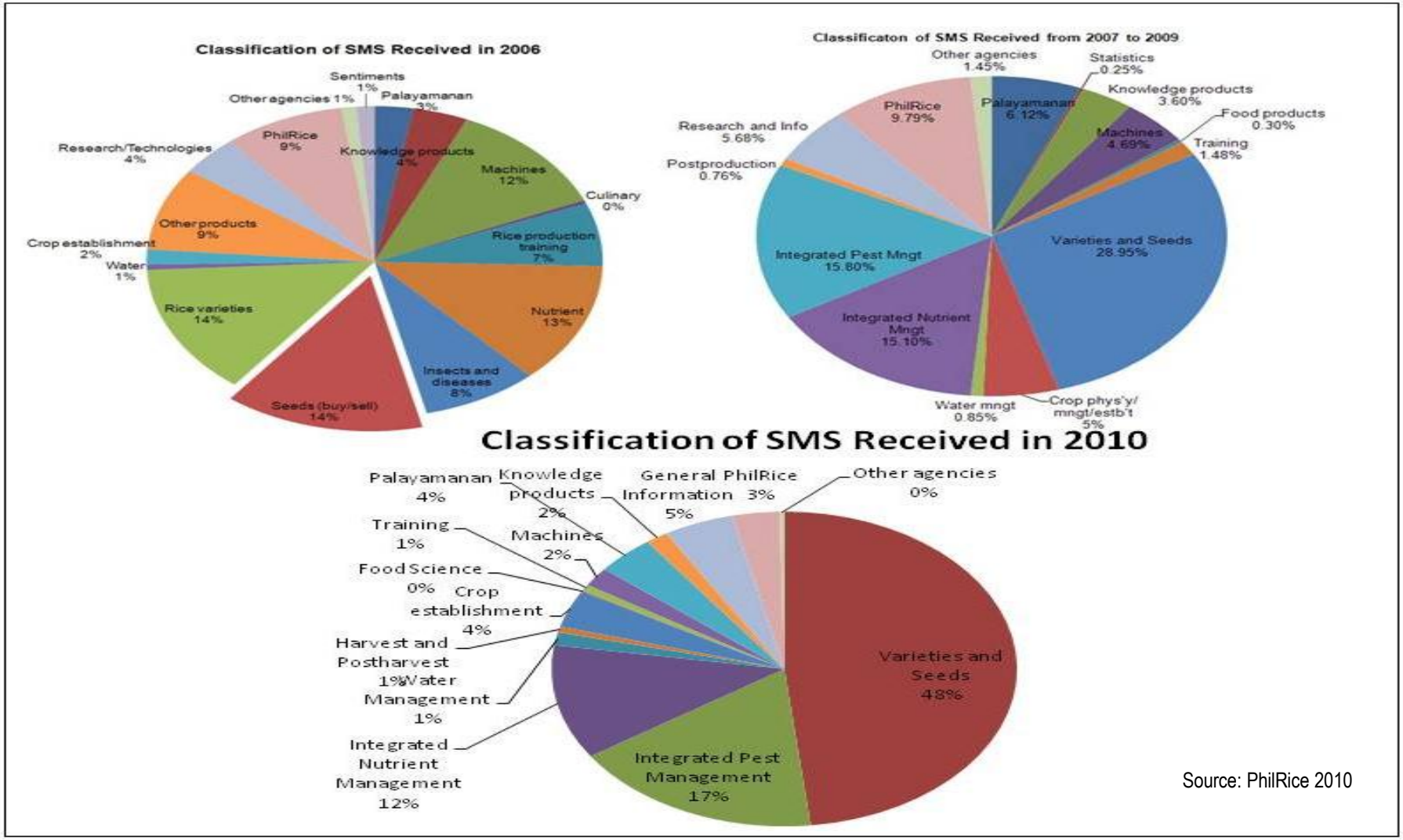


Figure 14. Classifications of text messages received by the Farmers' Text Centre from 2006 to 2010

Source: Caganganan FGD 2011

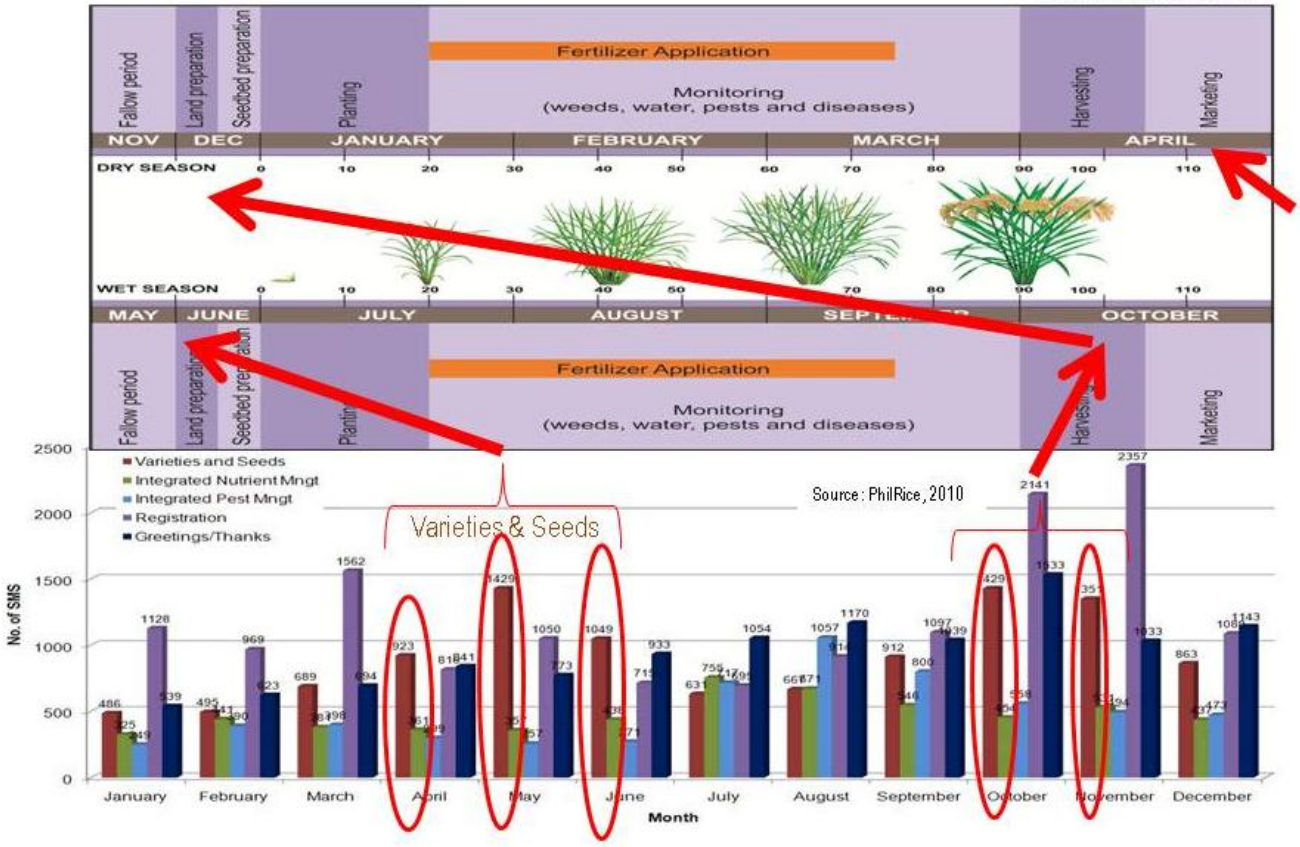


Figure 15. Distribution of text messages received by the Farmers' Text Centre in 2010

On farm advisories. Most of the Farmers' Text Centre text messages come in the form of queries seeking advice on farm issues. In varieties, for instance, queries regard varietal identification, such as what to grow in a particular area and which variety possesses a particular agronomic characteristic. Agronomic characteristics of rice varieties most often asked to the Centre concern site adaptability (Text 3a), yield potential (Text 3b), pest resistance (Text 3c), maturity (Text 3d), and eating quality (Text 3e). Most of the topics on pests and nutrients, on the other hand, are basically about the emerging symptoms manifested on the farmers' standing crop. In Text 4, for instance, the farmer was asking for advice on how to manage the

infesting stem borer on his farm. In just a matter of minutes, he was able to get the solution to his problem. Previously, they still have to go to the town's counsel office to consult with the local agricultural extension officer. The problem sometimes is that the local extensionist cannot properly diagnose the specific problem and provide an appropriate solution because of lack of expertise and training. As discussed in Chapter 1.4., some of these extension workers are not agricultural experts.

Text 3. Text messages on farm advisories (varietal identification)

	Texter	Time received	Message	Reply	Time Replied	Response Time
3a	Jerry Rose Catubay (Regio 6 – Negros Occidental)	4/12/2010; 8:58am	Anu po ang angkop na rice seeds sa palayan na pinapasokan ng tubig dagat? *[What are the varieties suitable for saline-prone areas?]*	gud am po.Sorry for the late reply.ang mga sumusunod po ay ang mga varieties na para sa mga lugar na pinapasukan ng tubig alat.PSB Rc48 (HAGONOY) PSB Rc50 (BICOL) PSB Rc84 (SIPOCOT) PSB Rc86 (MATNOG) PSB Rc88 (NAGA) PSB Rc90 (BUGUEY) NSIC Rc106 (SUMILAO) NSIC Rc108 (ANAHAWAN) NSIC Rc182 1) NSIC Rc184 (SALINAS 2) NSIC Rc186 (SALINAS 3) NSIC Rc188 (SALINAS 4) NSIC Rc190 (SALINAS 5) *[Good am. Sorry for the late reply. Here are the varieties suitable for saline-prone areas: PSB Rc48 (HAGONOY) PSB Rc50 (BICOL) PSB Rc84 (SIPOCOT) PSB Rc86 (MATNOG) PSB Rc88 (NAGA) PSB Rc90 (BUGUEY) NSIC Rc106 (SUMILAO) NSIC Rc108 (ANAHAWAN) NSIC Rc182 1) NSIC Rc184 (SALINAS 2) NSIC Rc186 (SALINAS 3) NSIC Rc188 (SALINAS 4) NSIC Rc190 (SALINAS 5)]*	5/12/2010; 7:54am	22:56
3b	Arnold Balon (Regio 5 – Camarine	6/12/2010; 11:48am	Pls gve potential yield of rc 222	NSIC Rc222 (Tubigan 18). If transplanted, average yield is 6.1 t/ha; maximum yield is 10 t/ha. Matures in 114 days. If direct seeded, ave yield is 5.7 t/ha	6/12/2010; 11:52am	00:04

	s Norte)					
3c	Milagros Lagrosa (Region 6 – Iloilo)	9/08/2010; 12:58pm	gud afternoon ask lang k latest updates sa uariety of rice resistant sa pests and disease *[Good afternoon, I would like to ask for updates of the latest rice varieties resistant to pests and diseases?]*	anong pest or disease po ba gusto nyong malaman pra macheck nmin if matibay (resistant) ba i2 sa mga bagong varieties? *[Which pests and diseases? So we can check our list of varieties that are resistant to them.]*	9/08/2010; 2:31pm	1:33
3d	R3 Nueva Ecija - Orlando S. Gadula	3/12/2010 18:50	Gud eve po, ilan arw po b maturity ng nsic rc 216. *[Good evening. How many days does NSIC Rc 216 mature?]*	Gud eve po. Ang maturity ng nsic rc216 ay 112 days kung lipat tanim at 104 days naman kung sabog tanim. tnx po. *[Good evening. Maturity of NSIC Rc216 is 112 days for transplanting and 104 for direct-seeding. Thanks]*	12/3/10 21:24	1/0/00 2:34
3e	R3 Nueva Ecija - Danilo Bonifacio	9/1/10 3:04 PM	Ano po ang pinaka latest var.n mlakas umani kpag tag araw at mganda ang milling recovery at masarap kainin? *[What is the latest rice variety that could give higher yield during the dry season, good milling recovery, and good eating quality?]*	sa pagkaalam ko Rc160 po *[As far as I know, it's Rc160]*	9/1/10; 3:06 PM	0:02

Source: PhilRice 2010

Text 4. Text messages on farm advisories (pest & diseases)

	Texter	Time received	Message	Reply	Time Replied	Response Time
_a	Jeff Pablo (Region-3; Nueva Ecija)	01/12/2010; 3:04pm	1/2Gd p.m sir meron po white stemborer sa punla nmin ano pwede ispray t.y *[1/2 Good pm. Sir we observed stem borers on the farm. What*	Ano po variety nyo at ilang araw na palay mula pgkatanim ng butil? Anong sira ginagawa ng stemborer sa palay nyo ngaun? Ilang percent tinamaan? *[What variety did you plant on your farm and how many days since planting? What kind of damage did it cause? What*	01/12/2010; 3:24pm	O:20

			to spray to control them?]	*percent of your crop is infested?]*		
		01/12/2010; 3:30 pm	2/2Arize tej 9 days p po punla wala pa visible n sira Makita ngaalala lang kami. Ty *[2/2 I planted Arize tej (Rc10). It has been 9 days since planting. There's no visible damage though. We are just worried about the presence of the stemborer on our farm. Thanks]*	Gude eve po. Tungkol pos a stemborer, mas mainam po ang handpicking ng mga itlog ng stemborer sa seedbed pa lang. I-monitor ang mga punla, tingnan kung may mga itlog, tanggalin ang mga itlog at pisain. Di po mamamatay ang mga itlog sa spray kasi may protective covering po ito. Tnx po *[Good evening. To control stemborers, handpick any eggs you see even during seedbed. Monitor your growing rice plants. Get rid of any eggs you see by crushing them. You cannot kill the eggs by spraying pesticide as they have protective covering. Thank you]*	01/12/2010; &:32pm	4:02

Source: PhilRice 2010

On technology updates. The technology updates, on the other hand, are shared either as 'push or pull' messages. The 'push' text messages refer to the 'techno tips' regularly sent by the Farmers' Text Centre to its registered clients. The 'techno tips' are concise information about the latest updates on rice science and technology (S&T). They are either farming products or techniques generated through scientific research. The broadcast schedule of these 'techno tips' is timed with the farm activities or when they are most needed on the farm. Examples of these techno tips are provided in Table 3. The purpose of this 'Techno Tip' SMS service is to give farmers advance knowledge of what to do on the farm. As discussed in Chapter 1.2., the Centre uses a messaging software called InfoTEXT to queue messages for scheduled or real-time sending (Pascual *et al*. 2010). The 'pull' messages, on the other hand, are rice S&T updates that the Centre sends out

based on demand (Text 5). In Text 5a, for instance, the farmer was seeking new, effective management control for pests and diseases. In Text 5b and 5c, the farmer was asking for the latest breeds of rice.

Table 3. Examples of 'techno tips' sent by the Farmers' Text Centre to its clients

Rice Technology Tips (0 to 30 days before seeding)
A. Water Management
1. Irrigate the field at 21, 14, and 7 DAS with a water depth of 5 cm.
B. Land preparation
2. Plow the field at 21 DBS.
3. Harrow the field at 14 DBS.
4. At 7 DBS, harrow the field and construct canalets to facilitate handpicking f snails and their eggs.
5. At 0 to 2 DBS, harrow and level the field thoroughly to ensure stable seedling establishment and good crop management.
C. Seed preparation and seeding
6. Select a suitable variety.
7. Pre-germinate the seeds at 0 to 3 DBS. Soak seeds in clean water for 24 hours, drain, and incubate for 24-26 hours.
8. Synchronize seeding at the right time within one month in a community to minimize the occurrence of pests and prevent yield loss.
D. Integrated Nutrient Management
9. Apply rice straw and other crop residues before plowing for these materials to be fully decomposed.
10. Apply fully decomposed organic materials before last harrowing so it can be mixed thoroughly with the soil.

Source: PhilRice 2013

Text 5. Text messages on technology updates (based on client's demands)

	Texter	Time received	Message	Reply	Time Replied	Response Time
5a	09173733 219	1/12/2010; 5:38pm	gud pm,po! Ano po ung magandang gamut sa palay n natutuyo ung tulod? *[Good pm. What's the best control for 'tulod'?]*	Gud am. Ano and tulod? Baka kulang and rice nio tubig? O sobra sa tubig? Anong variety at anong edad? Taga saang province po kayo? Ty *[Good am. What's tulod? Perhaps your paddy doesnt have enough water, or otherwise? What variety did u grow and how old is it now? Which province/region are you from? Thank you]*	2/12/2010; 7:32am	13:54
5b	R5 Albay -	3/09/10	Good pm po ano po	gud pm po.ang latest variety	3/09/10	1/0/00

	Delia Oane	13:30	ang latest palay variety approved ng phil seedboard?ty *[Good pm. What's the latest rice variety approved by the Philippine Seedboard?]*	po ay ang Rc222 sir.kung nais nyo pong malaman ang characteristics nito..itext lang po ang Rc222 at isend sa numerong ito.salamt po *[Good pm. The latest approved rice variety is Rc222, Sir. If you want to know its characteristics. Just type Rc222 and then text it to us. Thank you]*	13:32	0:02
5c	*R2 Isabela - Ramon Galindez*	*12/8/10 8:10 AM*	*What hybrid rice seeds that have the highest yield? Can u give ne at least 5 hybrid rice seeds available in the market today. Thanks.*	*#LONG# 770201 NSIC Rc204H(Mestiso 20) has the highest maximum yield,11.7 t/ha.Ang mga common na available na hybrid seeds ngyon sa market ay M1,M7,M20,SL 8, at PHB 71 po.as of now,M1 ang available na hybrid seeds d2 PhilRice Isabela po.tenks*	*12/8/10 8:40 AM*	*1/0/00 0:30*

Source: PhilRice 2010

On access information. Another way in which the Farmers' Text Centre has become helpful to farmers is the provision of access information on farm inputs and markets. As discussed in Chapter 1.4., knowledge access was previously constrained by the country's archipelagic geographical setting and bureaucratic structure, as well as poor farm-to-market infrastructure in rural areas. SMS alleviates these constraints, allowing farmers to have access to a wide range of farm information. The SMS-based market information service was as discussed earlier carried out by the Farmers' Text Centre in the northern part of the Philippines. There, the main concern of farmers was not about production but about the market, such as where to buy farm inputs and sell their produce. Examples of text messages on access to farm inputs and technologies are matrixed in Text 6.

Text 6. Text messages on access information

Texter	Time received	Message	Reply	Time Replied	Response Time
R4b Occidental Mindoro - Conrado Espejo	9/1/10 4:19 PM	Gud p.m. Meron na ba tayong foundation na rc 82?tnx *[Good pm. Do you have available foundation seeds of Rc82? Thanks]*	Gud p.m. din sori po wala tayong foundation na rc 82 ty *[Good pm. Sorry we don't have foundation seeds of Rc82 at the moment. Thank you]*	9/1/10 4:31 PM	1/0/00; 0:12
R5 Masbate - Vincent V. Flores	3/09/10 13:53	Magkano ang drum seeder at san makakabili malapit sa bikol *[How much is the drum seeder and where to buy it?]*	gud pm po.P6500 po ang unit price ng drumseeder..wala po kaming outlet sa bicol area po.. *[Good pm. It costs PhP6,500. We don't have outlet in Bicol area..]*	3/09/10 14:22	1/0/00; 0:29
R13 Agusan del Norte - 09198444329	6/12/2010 10:25	Gud day,s phil rice, bani.mangutana inta ko kung naa mo baligya nga similya nga humay? Salamat *[Good day, PhilRice. I just wanna ask if you are selling rice seeds? Thanks]*	Rc18 and Rc122 registered seeds po ang available sa PhilRice Agusan. P40 per kilo po *[We have Rc18 and Rc122 registered seeds available in PhilRice Agusan. It costs PhP40 per kilogram.]*	6/12/2010 11:17	0/01/1900 0:52

Source: PhilRice 2010

On farm how-to's. Farming, as discussed earlier, has a complex set of knowledge requirements, not to mention a handful of contingent issues occurring across the crop stages. SMS has lent itself well to this dynamic and complex situation on the farm. By way of example, in the Farmers' Text Centre, most of the text exchanges are discussions on how-to's either on new farming techniques or technologies (*e.g.*, crop establishment technique for new variety, such as the hybrid rice), or on control management for emerging farm issues (*e.g.*, pest and disease infestations). In Text 7, the farmers were asking how to control the infesting pests on their farm, such as rice blast, tungro, and bacterial leaf blight. SMS serves as important platform where farmers can get immediate responses to their how-to queries.

Text 7. Text message on farm how-to's

Texter	Time received	Message	Reply	Time Replied	Response Time
R3 Nueva Ecija - Rogelio C. Recometa	9/1/10 10:32 AM	Ano p0ng dpt k0ng gwin s palay ko mrmi n p0ng rice blast tp0s mkulimlim p *[How to control rice blast?]*	kung rice blast po ay kelangan nting patubigan kc ayw po ng blast s tubig.tenks *[If they are rice blasts, all you have to do is to irrigate your farm. Rice blasts don't like water. Thanks]*	9/1/10 10:41 AM	1/0/00: 0:09
R8 Leyte - Inocentes Aruta	9/1/10 2:52 PM	What are the symptoms of tungro? How could i control it? *(Note: original text)*	Gud am po. ito po symptoms ng tungro: leaves turn yellow to red-orange simula sa tip ng dahon pababa. kalat-kalat din ang distribution ng pamumula ng dahon sa palayan. Ang tungro ay sanhi ng virus at mga Green leaf hopper ang carrier ng virus. di natin macontrol ang virus pero pwede natin macontrol ang carrier nito sa pamamagitan ng pag spray ng insecticide with active ingredient na cypermethrin. ty po. *[Good am. Here are the symptoms of Tungro: 1) leaves turning into yellowish to red orange starting at the tip. Tungro is caused by a virus that is carried by Green leaf hoppers. We can't control the virus, but we can control the carrier by means of applying insecticides with active ingredient called cypermethrin. Thank you]*	2/09/10 8:13	1/0/00 17:21
R8 Leyte - Reynilda Monteza (FAO-RSO)	3/09/10 15:23	An0 p0 pwd c0ntr0l sa sakt na bacterial leaf blight.? *[How to control bacterial leaf blight?]*	management sa bacterial blight: 1) tanggalin or i-drain muna ang tubig sa bukid. 2) Magsplit application o pakonti-konting magapply ng pataba. 3) use copper-based fungicide kung kinakailangan bago mag 40-50 araw pagkatanim. *[Management of bacterial blight: 1) Drain the field with water; 2) Apply fertilizer; 3) Use copper-based fungicide if needed before 40-50 days after transplanting.]*	3/09/10 15:33	1/0/00 0:10

Source: PhilRice 2010

On farm insights. The Farmers' Text Centre not only provides farmers with the opportunity to learn practical information but also theories and principles behind all aspects of rice production. In Text 8, for instance, the farmer was asking how the tungro pest develops (Text 8a), why rice plants have white grains during the crop's flowering stage (Text 8b), and why rice grains (especially those of NSIC Rc222) fall off easily during the dry season (Text 8c).

Text 8. Text messages on farm insights

	Texter	Time received	Message	Reply	Time Replied	Response Time
8a	Rwshyl Laruda (Region 8 – Leyte)	10/12/2010; 11:35am	Panu b ung tungro nagccmula? *[How does tungro (disease) begin?]*	Sintomas ng tungro: pgkabansot at paninilaw o pagkukulay dalandan ng mgs dahon ng halaman. paninilaw ay nagsisumula sa dulo ng dahon at maaaring umabot hanggang sa blade ng palay. Ang tungro virus ay kinakalat ng GLH. *[Symptoms when your crop is infected by the rice tungro disease: Stunting and discoloration of plant leaves. The leaves usually turn into greenish yellowish brown or orange or reddish brown. The discoloration starts at the tip of the leaf and extend to the lower part of the leaf blade.]*	10/12/2010; 11:38	00:03
8b	R2 Nueva Vizcaya - Ulysis Insulia	2/08/2010 9:10am	Gud am po!t tanong ko lang po kung bakit may mga puti na butil ng palay sa panahon ng flowering stage? Tnx. *[Good am. Why rice plants have white grains during flowering stage? Thanks]*	gud am po.yung kulay white na butil ay ito po yung covering ng flowers..ito din po ang nagiging butil na palay. *[Good am. The white grains that you saw are the cover of the flowers, which eventually would become the rice grains.]*	2/08/2010 10:59am	1:49
8c						

	Region-2, Isabela (09167547954)	3/12/2010; 11:10	Gud am ask ko lng po if madaling malagas ang butil ngaung tag araw ang nsic rc 222? Salamat *[Good am. I just want to ask if the crop grains especially those of NSIC Rc222 easily shatter during dry (sunny) season?]*	Gud po, pagsobra napo ang pagkahinog madali pong maglagas dapat anihin po sa tamang panahon 80-85% nap o ang hinog na. *[Good pm. Shattering of standing crop grains only occur when they are over-ripe. Make sure to harvest them at the right time, that is, when 80-85% of the crop grains are already ripe.]*	3/12/2010; 14:44	3:34

Source: PhilRice 2010

4.4 Benefits of SMS use in farming

From the discussions above, it can be inferred that SMS is significantly relevant to rice farming. The use of the messaging technology particularly appears to be significant in the production of timely, appropriate solutions to farm issues across the cropping season. The Farmers' Text Centre data above showing the SMS usage all year round suggests the importance of SMS in every stage of rice cropping. In particular, texting was found to be highly optimised in the following cropping aspects: varietal identification and seed access, pest and disease management, and nutrient management. The Centre provides this farm support in the form of farm advisories, technology updates, market information, how-to's, and other farm insights. This information is made available to farmers in a real time setting. A farmer invariably gets the information he needs for his farm within five minutes. Although farmers could acquire this information previously through

conventional means (that is, through their local extension workers), it is not as quick as via SMS. The agricultural extension system, as discussed in Chapter 1.4., is highly constrained due to its bureaucratic structure, the country's geographical setting, and lack of infrastructure on the ground. SMS serves as an alternative extension platform where farmers can acquire useful information resources for use in farm decision-making. In particular, these useful pieces of information are: what variety to grow, where to buy farm inputs, and how to control pests on the farm.

Moreover, a study conducted by Antonio (2011) shows that the use of SMS particularly the availability of the Farmers' Text Centre service could give farmers an additional income of up to PhP39,730 (around 956 AUD at 42 AUD/peso exchange rate). Surveying 100 Farmers' Text Centre active users listed on the Centre's phonebook, Antonio found out that the economic benefit of the use of SMS is derived from the savings on knowledge search & transaction cost, increase in input productivity due to the application of knowledge accessed via the Farmers' Text Centre, and higher income due to accessibility to better markets. The report shows that among these economic factors identified the savings from transaction cost has the biggest contribution to the total economic benefit of the use of SMS with 55% share, followed by input productivity with 29% share, savings from knowledge search cost (12%), and lastly increase in selling price of rice (4%). Although the respondents interviewed were not statistically representative of total Farmers' Text Centre clients, the study was conducted basically just to have an understanding of SMS use by farmers, who as reported earlier constitute the bulk of Farmers' Text Centre clients.

On knowledge search. The major determinants identified by the study that drive the farmers to use SMS in acquiring knowledge are the distance of farmers' houses to the Agricultural Extension Office and their desire for lower expenses. Instead of going to the extension office, which takes them both time and money, farmers would rather text their queries to the Farmers' Text Centre. The savings that farmers get from SMS mainly come from the expenses that may be incurred in transportation, food/snacks, and gifts. In addition, farmers said they get more reliable knowledge from the Farmers' Text Centre as it is based on expert advice. Although the economic savings matter to the farmers, it is not the sole driving force that compels farmers to use SMS. Antonio reported that most of the farmers are highly enthused in availing themselves of the Centre service because it provides them with a quick, credible response on their queries.

On input productivity. Access to and application of knowledge gained from the Farmers' Text Centre resulted in input productivity with a yield increase of 5-30% (p.53). The farmer-respondents surveyed who gained an increase in input productivity by using SMS got a mean benefit of PhP11,080, which is about what a casual government employee earns in a month (p.52). Some of the knowledge that farmers acquired from the Centre (either through the 'techno tips' service or as responses to their queries) and applied on their farm include the use of certified seeds, proper land preparation, timing of fertilizer application, and tips to manage and prevent pests (p.51). Moreover, the study reveals that the closer distance of the farm to rice mills, to the farmers' houses, and to the agriculture office; living in provinces with high rice production and area planted to rice; and living in urban villages; all have a direct relationship to the input productivity gained through the

Centre. This makes a lot of sense. For instance, a farmer whose farm is near to his house can closely monitor his crop. If he is near the agriculture Office, he can verify information advised by the Farmers' Text Centre, such as the availability of seeds. Also, living in areas with high rice production could also possibly help as there are usually a lot of support systems in these areas. For example, the central experiment station of PhilRice is situated in Nueva Ecija, which is considered the rice granary of the country.

On transaction costs. Most of the farmers reduced the transaction costs incurred in either dealing with the buyers of their produce, or supplier of their inputs, or transacting with their tenants with a mean benefit of PhP380 (p.54). According to Antonio (2011), this amount of PhP 380 is roughly1% of both the average income and expenses of the interviewed farmers per season per hectare. Besides, the cost of texting is very minimal and sometimes insignificant due to unlimited text promos (p.56). The farmers said they are even willing to pay PhP 2 per text message if that spares them from the hassle of travelling and walking (ibid). Moreover, they stressed that they have used the time saved from using SMS in other productive activities at home or on the farm (p.57). Finally, the study argues that the benefit of SMS on transaction cost is associated or highly dependent on the following factors: farmers' years in farming, extent of farm work, number of texts per day, number of calls per week, farm size, distance of farm to house, annual net income from rice, volume of rice produced in the province, provincial area planted to rice, and home village population (p.91).

On the selling price of rice. In her study, Antonio further points out that the great opportunity to sell their produce at higher price gives the farmers the drive towards using SMS. Aside from production technologies, the Farmers' Text Centre allows farmers to acquire market information. In effect, this results in better, informed decisions about getting a good market for their produce and on the production side - telling farmers what to grow and when to harvest. Through a simple economic analysis, the study reveals that the 'use of mobile phones to look for buyers leads to an average economic benefit of PhP453, which comes in the form of higher income through a higher selling price of rice' (p.92). The economic benefit, according to Antonio, is particularly gained as a result of the following: identification of markets that give a better price, identification of other potential markets, the ability to adjust output based market needs, ability to adjust timing of sales and harvest, and the elimination of the middlemen (p.58). Quite a number of the farmers, however, said they did not fully benefit from SMS with regard to canvassing of output prices. Their main reason is that the buyers want to see a sample of their produce before they offer them a price quotation (p.59). Moreover, the study found out that the SMS benefit on crop selling prices is increased when the farmers are attending a number of training sessions, such as Farmer' Field School and Farmers' Forum and Consultation. This is likely because during these occasions farmers can interact with fellow farmers and can verify market information gathered from the Farmers' Text Centre. The other factor identified by the study that is positively correlated with the SMS benefit on selling prices is the farmers' education attainment (p.81). This can be explained by the fact that farmers who are professionals have more connections and therefore have more avenues to sell their produce. Also, it was found that farmers who are not full time

farm workers or have tenants benefit greatly from the SMS with regard to selling prices rather than those who are full-time farm workers. The reason is that those who are not hands-on farmers apparently have more time to text than those who are full-time workers.

Chapter Five:
SMSing as a Discursive Approach in the Production of Agricultural Solutions

The previous chapter outlines the actual application and relevance of SMS in rice cropping. In summary, it arrives at the conclusion that the messaging technology has been of benefit as an effective mechanism that enables an active production of network knowledge useful in addressing farm issues. This chapter addresses how SMS facilitates production of solutions to farm issues or how agricultural knowledge is produced in SMSing. It is interested in understanding how farmers communicate with agricultural specialists via SMS. Through text analysis of the Farmers' Text Centre 2010 SMS data, this chapter particularly addresses the following questions: What are the languages used and the rules that govern their discussion? Do they observe the same set of rules as in face-to-face communication and in other mainstream extension channels? Moreover, this chapter also aims to shed light on the issue of power relations in knowledge production in SMS exchanges. Whose voice is privileged in SMSing? Do farmers accept all SMS advice by the agricultural specialist?

5.1. SMSing as site of knowledge production

The series of text messages sent back and forth by farmers and agricultural specialist in the Farmers' Text Centre suggests a dynamic process of negotiation characterized by the interplay of human agency, power, and knowledge, rather than passive information sharing. SMSing as an act of negotiation is reflected in

the following sample SMS exchanges in the form of either querying (Text 1), couching (Text 2), consulting (Text 3), confirming (Text 4), or enlightening (Text 5).

These five forms of negotiation identified are not mere instances of technology transfer. They are discursive approaches used by the farmers for the production of knowledge in SMSing. Discourse, as discussed in Chapter 2.5., is a site where production of meanings resides. A display of power interplay is demonstrated in the data texts whereby farmers did not simply passively acquire knowledge from the Farmers' Text Centre, nor did the Centre offer ready-made recommendations. As evidenced by the dynamic exchanges of text messages, the farmers and the attending FTC staff engaged in an active, productive encounter.

Querying as a discursive approach. In Text 8, for instance, the farmer put forth his knowledge of a particular rice variety, which set the discursive tone of the interaction. The FTC through its attending agricultural specialist responded to his query. The specialist's advice however, while influenced by his scientific knowledge, is produced only by intersecting with the knowledge requirements provided by the farmer. On the farmer's query about what is a good variety to grow in the next cropping season, the specialist offered rather generic yet useful information that would help the farmers to make a decision for themselves. The specialist said 'if it's for the dry season and if irrigation is available all varieties are ok'. Although in the end of his statement he recommended a variety in lieu of the one identified by the farmer, which was out of stock, it was loosely stated as evidenced by the word 'try', suggesting the final decision is left up to the farmer.

Consulting as a discursive approach. The same dynamics transpires in the data texts on consulting. The text messages sent by farmers to the Farmers' Text Centre are not blank slates devoid of knowledge. According to Malasa *et al.* (2009), most of the farmer-clients of Farmers' Text Centre have been in farming for more than 20 years. They have a vast amount of knowledge of farming acquired either from their forefathers, or from themselves through long years of experience, or from their fellow farmers, or from the agricultural extension specialist assigned to their locality. To illustrate this claim, in the farmer's text message in Text 9, the farmer knew of the possible threat that the 'stemborer' might cause on his farm. He used consulting as a discursive approach to gain some knowledge resources that he can use to arrive at solutions to prevent the possible damage that the pest might create to his crop. The Farmers' Text Centre specialist responded accordingly based on the discursive requirements. In his reply, probing (as a mechanism to allow the production of a well grounded, relevant solution to the issue) was deliberately used. The exchange of knowledge resources by the two allowed the formation of knowledge in the form of assurance on the part of the farmer that the problem was not serious yet.

Confirming as a discursive approach. Moreover, in Text 10, the farmer used 'confirming' as a tool to see agreement of ideas in the light of his interaction with the Farmers' Text Centre. In his message, the farmer was confused by the contrasting information about the maturity of a particular rice variety. His experience didn't agree with the information provided by Philippine Seed Board. The resulting knowledge in that SMSing was important to the farmer as it would tell him whether to grow the variety or not.

Coaching as a discursive approach. Another discursive approach used in the Farmers' Text Centre was coaching (Text 11). Unlike the other approaches where the object of knowledge is unknown, in this instance it is known. In the text, the farmer was trying out a technology called 'Observation Well' (a water management tool) on his farm with the real-time guidance of the specialist from far away. Coaching through SMSing allows the farmer to see and have a feel of the actual functions and meaning of the technology.

Enlightening as discursive approach. Lastly, topics discussed in Text 12 are emergent issues about which farmers wanted to be enlightened. The emergent farm issues here play a crucial role in the enactment of SMSing and eventually production of knowledge. The farmer learnt something based on his experience on the farm (practical knowledge) and by articulating this with the Farmers' Text Centre (discursive knowledge).

Text 8. A text message that demonstrates querying as a discursive approach

Texter	Time received	Message	Reply	Time Replied	Response Time	Classification
Ronie Samoy (Region 1 - Ilocos Norte)	9/09/2010; 6:15pm	Ok naman palay namin.ano ba maganda variety ng palay pang 2nd crop.meron po ba kayo RC 20? *[Our rice plant is growing pretty well. What's a good variety to grow for the second cropping season? Do you have Rc20?]*	gud am po.sir Ronie sa dry season po basta maganda ang irrigation nyo ay almost all varieties are ok to use,kailangan lamang po nating malaman kung adaptable ba sa ating area yung variety na gagamitin natin..try nyo pong mag hybrid sir.sir wala pong available na rc20 dito sa Philrice nueva ecija as of 9/10/2010 8:05:00 AM *[Good morning, Sir Ronie. For the dry cropping season, all varieties should be fine to use in as*	10/09/2010; 8:05am	13:50	Variety

			long as your farm is irrigated. You just have to make sure that the variety is suitable to your location. Give hybrid rice a try. Sir, we don't have Rc20 available in PhilRice Nueva Ecija at the moment.]			

Source: PhilRice 2010

Text 9. A text message that demonstrates consulting as a discursive approach

Texter	Time received	Message	Reply	Time Replied	Response Time	Classific a-tion
Jeff Pablo (Region-3; Nueva Ecija)	01/12/2010; 3:04pm	1/2Gd p.m sir meron po white stemborer sa punla nmin ano pwede ispray t.y *[1/2 Good pm, Sir. I observed some white stemborers on my farm. Any recommendation how to control them? Thank you.]*	Ano po variety nyo at ilang araw na palay mula pgkatanim ng butil? Anong sira ginagawa ng stemborer sa palay nyo ngaun? Ilang percent tinamaan? *[What variety did you plant on your farm and how many days was it already since planting? What kind of damage did it cause? What percent of your crop is infested?]*	01/12/2010; 3:24pm	O:20	Pest
	01/12/2010; 3:30 pm	2/2Arize tej 9 days p po punla wala pa visible n sira Makita ngaalala lang kami. Ty *[2/2 I planted Arize tej (Rc10). It has been 9 days already since planting. There's no visible damage though. We are just worried about the presence of the stemborer on our farm. Thanks]*	Gude eve po. Tungkol pos a stemborer, mas mainam po ang handpicking ng mga itlog ng stemborer sa seedbed pa lang. I-monitor ang mga punla, tingnan kung may mga itlog, tanggalin ang mga itlog at pisain. Di po mamamatay ang mga itlog sa spray kasi may protective covering po ito. Tnx po *[Good evening. To control stemborers, handpick any eggs you see even during seedbed. Monitor your growing rice plants. Get rid of any eggs you see by crushing them. You cannot kill the eggs by spraying pesticide as they have protective*	01/12/2010; &:32pm	4:02	

			covering. Thank you]			

Source: PhilRice 2010

Text 10. A text message that demonstrates confirming as a discursive approach

Texter	Time received	Message	Reply	Time Replied	Response Time	Classification
Glenn Nicolo Miguel (Region 2 – Cagayan)	1/12/2010; 6:17pm	1/2 Bakit po ung psb rc 96 itinanim naming nung june umabot lang po ng 104 days balak po naming itanim uli kya lang nakita sa talaan ng phil. Seed board na 136 *[1/2 Why is it that the PSB Rc96 (a kind of rice variety) that we grew last June only matured for 104 days, as opposed to the 136 maturity days information that we saw on the list of varieties of the Philippine Seedboard. We intend to use it again for the next cropping season. Will it really take that long if we plant it in December?]*	Gud eve po. 136 days nga po ang rc96. Yun ang maturity days na registered sa Philippine seed board. Kung nakatanim nap o ang karamihan sa inyong lugar, baka mahuli nap o tlga kayo kasi late maturing poi to eh. Tnx po. Godbless! *[Good evening. Yes PSB Rc96 has 136 maturity days as registered in the Philippine Seedboard. I'm afraid you will be late to harvest as this variety is late maturing and especially if most of the farmers in your area had planted earlier. Thanks and Godbless (Note: this reply denotes some warning to the farmer of the possible consequence of late harvesting, such as pest attack being the only one left in the open field]*			
		2/2 days cya di kya tumagal po cya kung itatanim naming ng December? *Note: See above for the consolidated English translation*				

Source: PhilRice 2010

Text 11. A text message that demonstrates coaching as a discursive approach

Texter	Time received	Message	Reply	Time Replied	Response Time	Classification
Romly Gamboa (Region 3 – Tarlac)	2/12/2010; 13:26	Kung malaki n bung palay dun lang b ilalagay ung well? Ilang days ng palay kaya bago ilagay ung at para malaman ung pag start ng patubg	Gudpm mga early tillering po pd na maglagay ng observation well or 1 week after mag-aapply ng herbicides	2/12/2010; 13:56	00:00	Water

		[Are we going to put the 'observation well' (a water management technique) only when the plant is grown up? How old should the plants be before we place the 'observation well? So, we also know when to start irrigating]	*[Good pm. Place the 'observation well' in your paddy when the your plant is at early tillering or one week after you apply herbicides.]*			
	2/12/2010; 14:04	Sir pag naubos n bung water sa well magpaptUbig pa rin b? *[Sir, are we going to irrigate only when the 'observation well' has run out of water]*	Ok po. Kapag wala nap o kayong mkitang tubig sa loob ng inyong observation well, it means kailangan nyo na pong mag patubig. *[Yes. If you see that the 'observation well' has already been drained of water it means you need to start irrigating.]*	2/12/2010; 14:08	00:04	Water
	2/12/2010; 14:09	so ung water ng wel hangGng kelan mag eEnd para hnd mag irrigate wt stage ng palay? *[How long does the water in the 'observation well' last? And when do we end irrigating? At what stage of the crop?]*	Ang huling pagpapatubig ay isang lingo bago umani sa galas na lupa at dalawang lingo bago umani sa lagkiting lupa. Ty po *[Stop irrigating one week before harvest for sandy soil, and two weeks before harvest for the clay soil. Thanks]*	2/12/2010; 14:14	00:05	Water

Source: PhilRice 2010

Text 12. A text message that demonstrates enlightening as a discursive approach

Texter	Time received	Message	Reply	Time Replied	Response Time	Classification
Region-2, Isabela (09167547954)	3/12/2010; 11:10	Gud am ask ko lng po if madaling malagas ang butil ngaung tag araw ang nsic rc 222? Salamat *[Good am. I just want to ask if the crop grains*	Gud po, pagsobra napo ang pagkahinog madali pong maglagas dapat anihin po sa tamang panahon 80-85% nap o ang hinog na. *[Good pm. Shattering of standing crop grains only occur when they*	3/12/2010; 14:44	3:34	Variety

		especially those of NSIC Rc222 easily shatter during dry (sunny) season?]	*are over-ripe. Make sure to harvest them at the right time, that is, when 80-85% of the crop grains are already ripe.]*			
Rwshyl Laruda (Region 8 – Leyte)	10/12/2010; 11:35am	Panu b ung tungro nagccmula? *[How does tungro (disease) begin?]*	Sintomas ng tungro: pgkabansot at paninilaw o pagkukulay dalandan ng mgs dahon ng halaman. paninilaw ay nagsisumula sa dulo ng dahon at maaaring umabot hanggang sa blade ng palay. Ang tungro virus ay kinakalat ng GLH. *[Symptoms when your crop is infected by the rice tungro disease: Stunting and discoloration of plant leaves. The leaves usually turn into greenish yellowish brown or orange or reddish brown. The discoloration starts at the tip of the leaf and extends to the lower part of the leaf blade.]*	10/12/2010; 11:38	00:03	Pest
R2 Nueva Vizcaya - Ulysis Insulia	2/08/2010 9:10am	Gud am po!t tanong ko lang po kung bakit may mga puti na butil ng palay sa panahon ng flowering stage? Tnx. *[Good am. Why is it that rice plants have white grains during flowering stage? Thanks]*	gud am po.yung kulay white na butil ay ito po yung covering ng flowers..ito din po ang nagiging butil na palay. *[Good am. The white grains that you saw are the cover of the flowers, which eventually will become the rice grains.]*	2/08/2010 10:59am	1:49	Gen Information

Source: PhilRice 2010

5.2. Agricultural knowledge as discursive accomplishment

The clients of Farmers' Text Centre, as mentioned in Chapter 4.2., come from the different places with different socio-cultural backgrounds and different worldviews, not to mention different needs. From this account, it can be inferred that every encounter in SMSing involves a unique set of social, cultural, and agroecological issues addressed by the participants. Therefore, the meaning of agricultural knowledge resides and evolves within the contexts and conditions of the SMS interaction. In other words, knowledge produced in SMSing is no singular, fixed and standard, but rather multiple, contingent, and situated.

Agricultural knowledge is not singular and fixed, but multiple and fluid. This claim is elicited from the text messages on rice varieties. The topic on varieties was the most popular text message that the Farmers' Text Centre received across the year (see Chapter 4.2.). SMS discussion on this topic ranges from varietal identification, seed access, to information on the varietal agronomic traits (Text 13). For the types of rice varieties, for instance, there are now more than 100 with different agronomic characteristics (PhilRice 2009). Agronomic characteristics of rice varieties most often discussed in the Farmers' Text Centre are categorized according to yield potential, pest resistance, maturity, location/ecosystems, and eating quality (Text 3). With regard to seed access, there are a number of seed growers and distributors across the country. Knowledge derived from SMSing may it be on varietal identification, seed access, or varietal agronomic traits varies depending on the discursive requirements. In Text 13, for instance, the farmers were asking the Farmers' Text Centre for a variety to grow suitable for their

respective areas. The varieties identified in one SMS interaction, however, were different from the ones produced in other interactions. The first text message, for instance, had arrived at identifying crop varieties fit for saline-prone areas, while the other suggested varieties suitable for wetlands.

Text 13. Text message on varietal identification

Texter	Time received	Message	Reply	Time Replied	Response Time	Classifica-tion
Jerry Rose Catubay (Regio 6 – Negros Occidental)	4/12/2010; 8:58am	Anu po ang angkop na rice seeds sa palayan na pinapasokan ng tubig dagat? *[What are the suitable varieties for saline-prone areas?]*	gud am po.Sorry for the late reply.ang mga sumusunod po ay ang mga varieties na para sa mga lugar na pinapasukan ng tubig alat.PSB Rc48 (HAGONOY) PSB Rc50 (BICOL) PSB Rc84 (SIPOCOT) PSB Rc86 (MATNOG) PSB Rc88 (NAGA) PSB Rc90 (BUGUEY) NSIC Rc106 (SUMILAO) NSIC Rc108 (ANAHAWAN) NSIC Rc182 1) NSIC Rc184 (SALINAS 2) NSIC Rc186 (SALINAS 3) NSIC Rc188 (SALINAS 4) NSIC Rc190 (SALINAS 5) *[Good am. Sorry for the late reply. Here are the varieties suitable for saline-prone areas: PSB Rc48 (HAGONOY) PSB Rc50 (BICOL) PSB Rc84 (SIPOCOT) PSB Rc86 (MATNOG) PSB Rc88 (NAGA) PSB Rc90 (BUGUEY) NSIC Rc106 (SUMILAO) NSIC Rc108 (ANAHAWAN) NSIC Rc182 1) NSIC Rc184 (SALINAS 2) NSIC Rc186 (SALINAS 3) NSIC Rc188 (SALINAS 4) NSIC Rc190 (SALINAS 5)]*	5/12/2010; 7:54am	22:56	Variety
Darwin Dulatre (Regio 3 - Nueva Ecija)	5/08/2010; 8:41am	Wt variety po ng rice ung suitable sa wetland	gud am. ang ibig mo pong sabihin sa wetland ay irrigated rice field? marami tayong varieties for irrigated like Rc158, 160, 172, 212, 214, 216, 222, 220, 218	5/08/2010; 9:14am	00:33	Variety

		[What variety suitable for the wetland?]	*[Good am. What do you mean by wetland? Is that Irrigated rice field? If so, here are the varieties for the irrigated farms: PSB Rc158, Rc160, Rc172, Rc212, Rc214, Rc216, Rc222, Rc220, and Rc218]*			

Source: PhilRice 2010

Agricultural knowledge as contingent. Another characteristic of agricultural knowledge is exemplified in Text 14. In the text, the farmers were consulting with the Farmers' Text Centre about the emerging symptoms manifesting on their standing crop. As implied in the text, they didn't seem to expect the incidence. According to Scoones & John (1994), a farming community is 'a complex, risk-prone environment' (p.21). The complexity of farming, however, is not only driven by agronomic but also by economic, political, and environmental factors. The farmer in Text 15, for instance, despite the fact that he already knows that repetition of seed use is not advisable as it can cause crop vulnerability to pest infestation may still re-use the seed for economic reasons. Moreover, as substantiated in Text 16, the kind of technology or farming practice that farmers adopt is influenced by the government's programs. In the text, the farmers were asking about the hybrid rice technology (a), its seedbed preparation (b), its economic benefit (c), and seed access (d). This hybrid rice – which is a new, scientifically bred rice variety with high-yielding potential over inbred/ordinary varieties – was made known to the farmers across the country as part of the National Food Self-sufficiency Program of the Department of Agriculture (Malabanan 2006). Finally, the environmental condition is another knowledge shaping factor identified (Text 17). In Text 17a, for instance, the farmer was

asking about what to grow or how to maximise his farm with no water/irrigation available. Text 17b, on the other hand, was talking about a farmer asking for weather updates seemingly anxious as his crop was already at the critical stage (vegetative). If you look at the date of the text message, it transpired during the wet season in the Philippines where natural calamities like typhoons usually hit the country (discussed in Chapter 4.2.). The last environmental issue that the farmer raised in SMSing was whether it was correct to apply fungicide on a rainy day (Text 17d).

Text 14. Agricultural knowledge as contingent (agronomic)

Texter	Time received	Message	Reply	Time Replied	Response Time	Classifica-tion
Romeo Cadahin (Region 4b – Occidental Mindoro)	13/12/2010; 13:24pm	Kxe pu my tmutUbong azolla sa playan naming. Beneficial bA eun sir/mam? *[There is an azolla growing on our farm. Is this beneficial?]*	Gud pm. Ayun pos a aming expert ang Azola ay magandang source ng Nitrogen...kaya beneficial 110ap o110. Siguraduhin nga lang po nating azolla 110ap o110 sir. *[Good pm. According to our expert, Azolla is a good source of nitrogen. Hence it is beneficial.]*	13/12/2010; 15:18pm	01:54	Nutrient
Benjamin Abrea (Region 4b – Palawan)	12/11/2010; 1:20pm	Gud am, may problema po ung palay nmumula and dhon? Ano po ang dahilan. *[Good am. Our rice plant is exhibiting some leaf discoloration. The leaves become reddish. What could be the cause of this?]*	Gud am po Sir Benjamin sorry for the late reply. Ano po ang variety po ninyo? Ang pamumula po ba ay pulo pulo o malawakan po. Babad po bas a tubig ang inyong palayan? Pandak po ba ang laki ng palay na namumula kumpara pos a hindi po namumula? *[Good am, Sir Benjamin. Sorry for the late reply. What variety did you plant? Is the discoloration in patches or widespread? Is your rice paddy submerged?*	13/11/2010; 9:30am	20:10	Pest

			Does the discolorated rice plants have stunted growth compared to the unaffected?]			
Teofisto A. Trapal (Region 4b - Oriental Mindoro)	4/07/2010; 4:47pm	May tanong lang po ako ang punla ko 10 days plang ngaun prang n22yo po ung dulo ng dahun ng palay angelica po ung bnhi ko *[My question is that my seedlings are now 10 days old but I observed that the leaves are drying especially at the tip part. I planted 'Angelica' variety.]*	halos lahat po 111ap o halaman nio? Nagpataba 111ap o kayo? If yes, ilang sako at ano inilagay nio po? Sapat ba ang patubig o sobra o kulang. Ilang araw 111ap o ito? *[Are all your seedlings affected? Did you apply fertilizer? If yes, how many sacks of fertilizers did you apply? Did you have enough irrigation on your paddy? How many days have you been observing it already?]*	4/07/2010; 4:47pm	00:00	Nutrient
	4/07/2010; 4:52:00pm	Hnde naman lahat ngaun lng ako nagpataba ten days n.ang abuno ko 21-0-0-24S.Spat naman p2big nya *[Not all seedlings have dried leaves. I only applied fertilizer for 10 days ago. I used 21-0-0-24S. Irrigation is adequate. Ok. Thanks Godbless]*	hindi naman po tungro? i-observe po muna natin. sana right amount lang ang nailagay niong fertilizer kasi kung sakit yan bad if maraming pataba ang nailagay	4/07/2010; 5:07:00pm	00:15	Nutrient
	4/07/2010 5:22:00pm	ok slamt.GOD BLSS				

Source: PhilRice 2010

Text 15. Agricultural knowledge as contingent (economic)

Texter	Time received	Message	Reply	Time Replied	Response Time	Classifica-tion
Isagani Combis (Region 3 – Aurora)	1/12/2010; 4:18am	pwd po b iulit ung rc14 ngaun.ung naani ko ngaun.wl kc pambili certfied binhi knti lng naani. *[Can I plant PSB Rc14 again this time? I don't have enough money to buy certified seeds as I didn't earn much last cropping season.]*	maaari nman po xang gamitin ninyo ulit kung wla po tlaga kayong pambili. *[Yes you can use it if you don't really have the means to buy new seeds.]*	1/12/2010 5:04pm	00:46	Varietal informatio n

Source: PhilRice 2010

Text 16. Agricultural knowledge as contingent (political)

	Texter	Time received	Message	Reply	Time Replied	Respon se Time	Classifica-tion
16a	R6 Negros Occidental - Jonel	16/09/2010; 1:57pm	Anu po b yng hybrid n snasbi sir? *[What is that rice called hybrid?]*	A hybrid rice variety, also referred to as the F1, is the product of crossing two rice plants with superior qualities.	16/09/201 0; 2:01pm	00:04	Hybrid rice
16b	Richard dela cruz (Region 3 – Bulacan)	20/12/2010; 11:57am	Puede itxt nyo ang tamang pagpupunla ng hybrid rice. *[Can you text me the ways to grow hybrid rice?]*	gud pm po.sir timing po ba ng fertilizer application ang inyong tinatanong?ang first application po ay 10-14 days pag katanim ang susunod po ay sa mid t... *[Good pm. Sir are you asking for the right time of fertilizer application? The first application is 10-14 days after planting, and then next application is in the mid …]*	20/12/201 0 ; 2:33pm	2:36	Crop establish ment/hybri d rice

16c	R11 Compostella Valley - Dennis Ybañez	1/08/2010 9:32:00 AM	Gud mrning, ask lng po ako tungkol s hybrid rice... An0 po ba tlga ang economic imp0rtance when gr0wing hybrid. *[Good morning. What is the economic importance of growing hybrid rice?]*	gud am po.sorry for the late reply. Hybrid rice is one of the key technologies that can make the country self-sufficient in rice.A minimum yield increaseof one mt/ha through hybrid rice cultivation in the 800,000 ha irrigated rice area in the country can result in an additional rice production of 1.6 mtof palay (960,000 mt milled rice), easily making the country self-sufficient in rice.have a nice day	2/08/2010 9:35:00 AM	1/1/00 0:03	
16d	Abraham Genova (Region 4b – Palawan)	8/08/2010; 9:23am	Saan makakabili ng hybrid na binhi at magkano ang halaga bawat kilo. *[Where can we buy seeds of hybrid rice and how much per kilogram?]*	sir gud am po.maarin po kayong mag inquire sa mga seed growers po dyan sa inyong luagr sir.usually po ay may available din po sa municipal agri office.tyvm *[Sir good am. You can ask the seed growers, or better yet the Municipal Agriculturist Office in your area about the hybrid rice seeds. Thanks very much]*	8/08/2010; 9:28am	00:05	Hybrid Rice/Seed

Source: PhilRice 2010

Text 17. Agricultural knowledge as contingent (environmental)

	Texter	Time received	Message	Reply	Time Replied	Response Time	Classifica-tion
17a	Silna Noriel (Region 5 – Sorsogon)	1/09/2010; 8:19pm	Anu p0,b ang dpat gawin s palayan n hndi ntamnan	Gud am po. pwede po kayong magtanim ng munggo as	2/09/2010; 8:24am	12:05	General Informatio n

			ngaun,dhl s wlang 2bg anu po b ang mainam na pansmantalang pnanim s playan? *[What to do with my ricefield? I can't grow rice at the moment for lack of irrigation. Any recommendation what to grow just to make use of the land?]*	alternate crop habang wala pang tubig sa palayan ninyo. ty po *[Good am. You can grow mung bean as an alternate crop while there's no irrigation on your farm. Thanks]*			
17b	Marciano Ramil Jr. (Region 2 – Isabela)	3/09/2010; 9:05am	Gud am po. Pwede po bng mgpa-update ng weather condition. Nsa fl"wering stage n po palay nmin. Thanks po *[Good am. Can you update us of the latest weather condition? Our rice plant is at the flowering stage now. Thanks]*	Ang Luzon at Kabisayaan ay makakaranas ng mga pag-ulan dulot ng habagat samantalang ang Mindanao ay magkakaroon ng madalas na maulap na kalangitan na may kalat-kalat na pag-ulan at pagkulog-pagkidlat.tenks po.gud am *[The Luzon and the Visayas regions would experience rain due to southwest moonson while Mindanao would experience mostly cloudy skies and moderate rain and thunderstorms. Thanks]*	3/09/2010 9:11:00 AM	00:06	Weather
17c	Pedro Corado (Region 8 - Eastern Samar)	9/09/2010; 9:53am	Gud morning dn po..unfortunately hindi kami naka pag tanim ng palay dahil sa el nino..dependent kc kami sa ulan *[Good morning, too. Unfortunately,*	gud am po.sorry to hear that sir..anyway kung may katanungan po sila about rice production text lang po kayo sa amin..have a nice day po. *[Good am. Sorry to hear that, Sir.*	9/09/2010; 10:04am	00:11	Weather/climate

			we weren't able to grow rice due to El Nino. Our farm is dependent on rain for source of water.]	*Anyway, if you have queries on rice production, just text us. Have a nice day.]*			
17d	Sherwin A. Duldulao (Region 1 Ilocos Norte)	9/09/2010; 11:00am	Gud am.pwede po bang mag apply ng fungicide kahit umuulan? *[Good am. Can we apply fungicide even if its raining?]*	gud am po.wag po kayong mag aapply ng kahit ano kapag umuulan..ma wawash away lang po ito.sayang lang po *[Good am. Don't apply anything if it's raining. It will only be washed away. Worse, it will go to waste.]*	9/09/2010 11:04am	00:04	fertilization

Source: PhilRice 2010

Agricultural knowledge as situated. This simply suggests that the meaning of agricultural knowledge is determined in reference to the situation where it is being produced. The situational condition in SMSing, however, is different from the conventional sites of knowledge production (that is, a farm for farmers and a laboratory for scientists). SMSing is characterized by a complex, dynamic relationship of time and space, as opposed to the conventional mode where 'space and time are linked together' (Giddens 1991) and observes common norms and pattern of events. Take a look at Text 18. A random texter was asking for a solution for the drying of the plant part, which he labelled '*tulod*'. The specialist did not know what '*tulod*' was, which apparently is a vernacular term used in a particular region. Although he tried giving some generic, probable advice, the specialist was not sure about it as he/she couldn't zero in on the specific issue and context of problem. Hence, he/she probed to elicit more background information, including the whereabouts of the text sender. People interacting in SMSing have

different socio-cultural settings. In the text, the specialist does not have the feel and look of the actual situation of the farmer, and vice versa. Also observed in the data is that the farmer and the specialist had different timetables. Their text messages were sent at different times. As indicated in the data, the time difference was 13 hours, 54 minutes.

Knowledge in SMSing is a product of temporally and spatially differentiated interaction. It is produced depending on the way participants interact and address this highly complex discursive condition. Some interactions in SMSing occur in real-time with only insignificant time differences, and are very active and productive in that they result in quick resolutions to farm issues raised by the farmer, as substantiated in Text 11. The success parameter was typified through the exchanges of 'thank-you and welcome' messages. Others are a bit slow and time-consuming either caused by the complexity of the topic discussed (Text 19), or different timetables (also demonstrated in Chapter 4.2.), or technological glitches (Text 20). Worse, some interactions naturally end up without parting words and resolutions (Text 21).

Text 18. Text message that discuss socially and culturally differentiated topic (spatial issue)

Texter	Time received	Message	Reply	Time Replied	Response Time	Classification
09173733219	1/12/2010; 5:38pm	gud pm,po! Ano po ung magandang gamut sa palayn natutuyo ung tulod? *[Good pm. What's the best control for 'tulod'?]*	Gud am. Ano and tulod? Baka kulang and rice nio tubig? O sobra sa tubig? Anong variety at anong edad? Taga saang province po kayo? Ty *[Good am. What's tulod? Perhaps your paddy doesnt have enough water, or otherwise? What variety did you grow and how old is it now? Which province/region are you from? Thank you]*	2/12/2010;7:32am	13:54	Pest

Source: PhilRice 2010

Text 19. SMSing that is constrained by the complexity of the topic discussed

Texter	Time received	Message	Reply	Time Replied	Response Time	Classification
Ogie Gamboa (Regio 3 – Bulacan)	8/08/2010; 9:31am	Gud am po, ano po b gamot ang mainam s natu2yo dahon pti suwi apektdo? *[Good am. How to address drying of rice plants' leaves. Even their tillers are affected.]*	sir Ogie madami pong dahilan kung bakit natutuyo ang ating palay.kaialangan po muna nating malaman kung anong dahilan nito.madali po bang mabunot ang puno?paisa isa lang po ba ao buong bukid ay apektado? paki tignan po kung may uod sa loob ng stem. sir medyo nangingitim po ba yung base at may amoy?meron po bang camera ang inyong cellphone.papapicturan po sana namin para maipadala nyo sa 09064570810 para po makita naman ang talagang sitwasyon. *[Sir Ogie, there are many causes of leaf drying. Hence, we have to first know the cause of it. Is the rice plant easy to pull out from the ground? Is leaf drying in patches or widespread across the*	8/08/2010; 9:42am	00:11	Pest/Nutrient

			farm? Have a look if there's worm inside the stem. Did the plant base turn blackish? Has your mobile phone got camera in it? If so, please take a photo of the affected plants then send it to us so we can properly diagnose the problem.]			
	8/08/2010; 9:47am	Buo bukid ay apektdo, mdli bunutin un mga suwi ang naapektuhan *[The whole farm was affected. And the rice plants are very easy to pull out. The plant tillers are affected.*	paki tignan po kung may uod sa loob ng stem. *[Have a look if there are worms inside the stem.]*	8/08/2010; 9:48am	00:01	
	8/08/2010; 9:52am	Wla po uod, tuyo n po pg binunot d po nka2sama un ugat *[There are no worms. Once the plants are pulled out, the roots wouldn't come along.]*	sir medyo nangingitim po ba yung base at may amoy?meron po bang camera ang inyong cellphone.papapicturan po sana namin para maipadala nyo sa 09064570810 para po makita naman ang talagang sitwasyon. [sir, *did the plant base turn blackish and smelly? Has your mobile phone got camera in it? If so, please take a photo of the affected plants then send it to us on 09064570810 so we can properly diagnose the problem.]*	8/08/2010; 9:53am	00:01	

Source: PhilRice 2010

Text 20. Knowledge production in SMSing that is constrained by technological glitch

Texter	Time received	Message	Reply	Time Replied	Response Time	Classifica-tion
Miguel I. Lomberio (Region 5 - Camarines Norte)	8/09/2010; 11:33am	Paki ulit naman agro.charactrstic rc 192 palpak carrier la laman message! *[Please send again the agronomic characteristics of NSIC Rc192. Your reply didn't have anything in it. It's all blank.]*				
	8/09/2010; 3:52pm	1/2 Ok na po naresib ko na reply. Tenks po sa suggestion. Add ko tanong if rc 192 is also called aerobic rice and pwede ba ito sa irrigated lowland n how do *[1/2 It's ok now. I got it. Thanks for the information. One more thing, is NSIC Rc192 also called Aerobic rice and is this suitable for irrigated lowland. How does it perform?]*	yes po, pwede po sa irrigated lowland ang NSIC Rc192. Average yield is 3.7 t/ha and maximum yield is 5.50 t/ha. Matures in 106 days. Height is 109 cm.Susceptible to bacterial leaf blight and tungro. Intermediate to blast, and green leafhopper. Moderately susceptible to brown planthopper. *[Yes, NSIC Rc192 is good for irrigated lowland…]*	8/09/2010; 4:08pm	00:16	
	8/09/2010; 3:52pm	2/2 es it perform? *Note: see consolidated translation above*				

Source: PhilRice 2010

Text 21. Text message with no proper ending and no resolution arrived

Texter	Time received	Message	Reply	Time Replied	Response Time	Classification
092157941 22 (Region 8 – Leyte)	9/08/2010; 7:51am	1/2 Gud am sir,maam unsay tambal s ako hybrid rice pioner, yelowish ang udlot mga laos ang mga dahon hangtod mamatay, 18 days frm planting na og nag abono na *[1/2 Good am. The young leaves of my plant (hybrid rice pioneer) turned yellowish, and then dried up and eventually died. It's been 18 days now since planting, and I already applied fertilizer. How to address this?*	gud am po.sori for the late reply.sir buong bukid po ba ay nalalanta ang dhaon ng palay?babad po ba sa tubig ang inyong palayan? *[Good am. Sorry for the late reply. Sir is it happening across the farm? Is your farm submerged?]*	9/08/2010; 9:48am	1:57	General Info

Source: PhilRice 2010

5.3.The governing discursive structures of knowledge production in SMSing

This study also looks into the underlying structure of SMSing as a discursive action – that is, what governs the production of knowledge in SMS Exchanges. As discussed in Chapter 2.3., structure refers to a set of rules and resources recursively reproduced and organized as properties of a social (knowledge) system. In this thesis, I interchangeably use structure with discourse or discursive condition, discussed in Chapter 2.5. From the data, four structural properties were elicited to be operating in the SMS knowledge production by farmers and agricultural specialists. These are: technical, socio-cultural, agronomic, and psychological.

Technical. Results of the text analysis indicate that the way the message is composed, the way the space on the technology is maximised, and the time of use are critical elements in the production of knowledge in SMSing. The text data below exemplifies three kinds of message framings and how they mediate the process of knowledge production. The Text 22 shows a farmer describing his text message in a concise, direct-to-the-point manner yet with a complete thought. His interaction with the Farmers' Text Centre was smooth sailing with the attending agricultural specialist responding to his query immediately. The response time was four minutes. Text 23, however, shows a farmer with concise yet incomplete message. In response, the Farmers' Text Centre had to probe for further information to be able to properly diagnose the problem and eventually provide appropriate advice to the farmer. Moreover, Text 24 shows an instance where the agricultural specialist sent a long message back to the farmer. The message

however was cut as it exceeded the space limit of the system and was therefore sent off in instalments. The cut message somewhat disrupted the productive ambience of the conversation as instantiated by farmer's reaction *'send nyo ulit reply, naputol kc text nyo'* (send your reply again as it was cut). Time is an important resource in knowledge production. Delays affect the efficiency of the knowledge produced. The messages that farmers sent to the Farmers' Text Centre are all connected to activities on the farm. Issues particularly critical with time are issues on pest infestation and availability of seeds. Failure to come up with timely solutions on these issues will have a tremendous effect on crop production. The value of this temporal element is acknowledged by the Farmers' Text Centre. The term 'sorry' for the late reply in Text 25 signifies the importance of time in knowledge production. Another element that has paramount influence on knowledge production in SMSing is the technical design of the mobile phone technology. As observed in the extracts, the text messages come in short, limited sets of characters with a different syntax (Table 4). According to farmers, they create a message as concise as possible to fit in to the limited space on the mobile phone (see details in Chapter 6.4.).

Text 22. Text message stated in concise, direct-to-the-point manner

Texter	Time received	Message	Reply	Time Replied	Respon se Time	Classifica-tion
Arnold Balon (Regio 5 – Camarines Norte)	6/12/2010; 11:48am	Pls gve potential yield of rc 222	NSIC Rc222 (Tubigan 18). If transplanted, average yield is 6.1 t/ha; maximum yield is 10 t/ha. Matures in 114 days. If direct seeded, ave yield is 5.7 t/ha	6/12/2010; 11:52am	00:04	Varietal Information

Source: PhilRice 2010

Text 23. Text message stated in a concise yet with incomplete information

Texter	Time received	Message	Reply	Time Replied	Response Time	Classifica-tion
Alberto de Guzman (Region 1 – Pangasinan)	6/08/2010; 11:33am	Gud a.m. Ask ko lang po ung 21-0-0 *[Good am. I just want to ask about the 21-0-0 (kind of fertilizer)?]*	ano po yung itatanong nyo s 21-0-0 o ammonium sulfate?nilalagay po ito s ating lupain kung kulang po ito s sulphur *[What's your question about 21-0-0 or ammonium sulphate? Do u apply this when your soil is deficient of sulphur?*	6/08/2010; 11:38am	00:05	Fertilizer

Source: PhilRice 2010

Text 23. Text message with a long yet cut message

Texter	Time received	Message	Reply	Time Replied	Response Time	Classific a-tion
09203772333 (Region 8 Samar)	8/12/2010 8:34:00 AM	Magandang umaga.tan0ng lang po ako bkit sa LCC recomendati0n ang direct planting nasa 3 ang reading kung mg apply ng N fertilizer.4 naman sa direct planting? *[Good morning. Just want to ask why is it that in LCC (leaf color chart) the application of nitrogen fertilizer is recommended when the reading is at 3 for direct planting and 4 for transplanting.]*	Magandang umaga din. kaya 3 ang reading ng LCC sa direct seeding ay kailangan nang magpataba dahil mas marami ang population ng direct seeded plants. pangalawa, yan ang resultang lumabas sa pag-aaral ng mga dalubhasa kung kelan kailangan na ng pataba ang mga rice plants. reading kung mg apply ng N fertilizer. Ty *[Good morning. The reason for the LCC reading at 3 for the direct planting (which is a bit earlier than that for transplanting) is because there is more plant population to fertilize in direct seeded farm. This technique was tested through experimentation by our experts. Thanks]*	8/12/2010 8:47:00 AM	00:13	Nutrient
	8/12/2010 8:55:00 AM	Send nyo ulit reply.naputol kc txt nyo. *[Send it again. It*	...e applied as basal and the remaining 25-50% of the total K requirement at early panicle initiation stage.	8/12/2010 9:16:00 AM		

		was cut]				

Source: PhilRice 2010

Text 25. Text message with late reply

Texter	Time received	Message	Reply	Time Replied	Response Time	Classification
Rovelinda V. Paraguison (Region 4a – Laguna)	31/07/2010; 06:15am	Sa ngayo tag ulan at ganito ang panahon laging makulimlim ano ano nutrient ng palay ang ok. *[On rainy season or when the weather is gloomy like nowadays, what nutrients are good to apply on rice plants?]*	gud pm po.sori for the late reply.hindi po natin binabase maam ang uri ng fertilizer na ating iaaply sa panahon.ipa analyze nyo po ang inyong lupa para malaman kung anong fertilizers ang kailangan nito.salamt po *[Good pm. Sorry for the late reply. We cannot determine what fertilizer to apply based on the weather condition. All you need to do is have your soil analysed so you know what nutrients are needed. Thank you]*	31/07/2010; 4:55pm	10:40	Nutrient

Source: PhilRice 2010

Table 4. Text language used in SMSing

Text language	**Complete word**	**Text Source**
k	Ok	Jessico John B. Campos from Region 13 – Surigao del Norte on 13/12/2010
Tnx/ty	Thanks/Thank you	Appeared in most of the texts
Gud am	Good am/morning	Frank Calumpit from Region 3 – Bulacan
Na22yo	Natutuyo (drying)	Teofisto A. Trapal (Region 4b - Oriental Mindoro) on 4/07/2010
frtlizer	Fertilizer	Maribel Borata (Region-8, Eastern Samar) on 01/12/2010

Source: PhilRice 2010

Socio-cultural. Interaction in SMSing is also governed by the norms observed within the gemienschaft type of social relationships wherein 'one can drop in, have a friendly chat, receive some advice about a problem, argue politics, and interact with other people who might otherwise remain strangers' (Rheingold as cited by Jones 1997). As invoked in the extracts, most of the text messages begin with a greeting, such as 'Gud am' (short-cut for Good morning) and end with 'ty po' (ty stands for thank you; 'po' is a trademark Filipino expression to show politeness/formality). Honorifics, such Sir and Ma'am, are also demonstrated in the texts to convey esteem to the person texted (see Text 26). Despite the limited space of the mobile phone technology, farmers and specialists still manage to exchange pleasantries and courtesies deliberately expressed not as side, insignificant jargon but as important discursive resources that facilitate the smooth articulation of knowledge in SMSing. Take a look at Text 27. The expressions *'wala pong anuman* Sir' (no worries/welcome, sir), 'thanks a lot po', 'Godbless' are indicative of the productive interaction in SMSing. This analysis denotes that the interaction in SMSing despite being mediated and impersonal is constituted by highly personal forms of discursive practices.

Text 26. Use of honorifics in SMSing

Texter	Time received	Message	Reply	Time Replied	Response Time	Classifica-tion
092157941 22 (Region 8 – Leyte)	9/08/2010; 7:51am	1/2 Gud am sir,maam unsay tambal s ako hybrid rice pioner, yelowish ang udlot mga laos ang mga dahon hangtod mamatay, 18 days frm planting na og nag abono na *[1/2 Good am. The young leaves of my plant (hybrid rice pioneer) turned*	gud am po.sori for the late reply.sir buong bukid po ba ay nalalanta ang dhaon ng palay?babad po ba sa tubig ang inyong palayan? *[Good am. Sorry for the late reply. Sir is it happening across the farm? Is your farm*	9/08/2010; 9:48am	1:57	General Info

		yellowish, and then dried up and eventually died. It's been 18 days now since planting, and I already applied fertilizer. How to address this?	*submerged?]*			

Source: PhilRice 2010

Text 27. Use of pleasantries & courtesies in SMSing

Texter	Time received	Message	Reply	Time Replied	Response Time	Classifica-tion
Ian V. Testado (Region 12 – North Cotabato)	13/12/2010; 14:32am	Ganun po ba. Maraming Salamat uli xa mga info at advices nyo *[Is that right! Thank you very much again for the information and advice you have extended]*	No problem sir. Welcome po	13/12/2010; 14:37am	00:05	thanks
Bot Roque (Region-5 – Camarines Sur)	13/12/2010; 15:48am	Ok po. Maraming salamat po. I will try to use half inorganic, half organic. *[Ok. Thank you very much…]*	Cge po. Godbless and merry Christmas *[ok…..]*	13/12/2010; 16:03am	00:15	thanks
Ruben P. Abando (Region 1 - La Union)	5/08/2010; 9:28am	Tks a lot for ur advice	welcome po.	5/08/2010; 9:37am	00:09	Thanks

Source: PhilRice 2010

Local farm conditions. Analysis also shows that the SMS-based production of agricultural knowledge despite having a new form of discursive order constituted by the distanciated space and time is still linked with and fuelled by the dynamism of its local spatial and temporal conditions. On a daily or yearly basis, the kind of knowledge generated in the Farmers' Text Centre comes in a wide range of topics

(see Chapter 4.2.). This complexity of knowledge production in SMSing is directly related with the complex knowledge requirements of the crop production on the farm. As reported by the Farmers' Text Centre, the volume of text messages received by the Centre varies across the year and is highly dependent on the crop stages and conditions on the farms (reported in Chapter 4.2.). Text 28, for instance, is about a farmer consulting with the Centre about a symptom manifesting on his crop. Take note of the time the farmer sent the message. It was around 10:53 a.m.. On the farm, this is the time when farmers usually take a break from farm work. As discussed in Chapter 4.2., the farmer sometimes uses this time to text. This data suggests the crucial role of the local conditions in the production of knowledge in SMSing.

Text 28. Topic on pest infestation (sent early in the morning)

Texter	Time received	Message	Reply	Time Replied	Response Time	Classifica-tion
R12 Sultan Kudarat - Onofre Cuyong	2/08/2010; 10:53am	Gud am, tanong lng po ako kng anong kulang na elemento sa lupa na naninilaw ang bagong labas na dahon ng palay lalo na sa dry seeded rice (DSR), tnx. *[Good am. I just want to ask what nutrient is deficient on the plant where the budding leaves are yellowish on dry-seeded rice (DSR)? Thanks]*	gud am po,maari pong sulfur deficient yang lupain nyo kc based po d2 s palaytandaan ang symptoms ng kulang s sulfur ay bansot n palay,malilit at naninilaw ang bagong dahon ng palay at mahinang mgsuwi *[Good am. It could be that your plant is sulphur deficient. According to our source here, the symptoms of sulphur deficiency are: plants have stunted growth, with reduced plant height, yellowing of young leaves, and with reduced number of tillers.]*	2/08/2010; 11:01am	00:08	Nutrient

Source: PhilRice 2010

Psychological. Another structural or constituting property of knowledge production in SMSing as substantiated in the data is the mechanism of trust. Not only the trust vested in individuals but in the abstract (technical) capacities (Giddens 1990, p.26). The Farmers' Text Centre is akin to what Giddens refers to as 'expert system', 'a system of technical accomplishment or professional expertise that stabilizes social relations across indefinite spans of time-space' (1990, p. 27). This claim is evidenced in the following metaphors spoken by the farmers during the interviews: '*...magtetext na lang ako'* (all I have to do is to text); '*itetetxt ko nalang*' (I will just text it). These metaphors are suggestive of the technical capacities of SMSing in the production of farmer's farm solutions. Moreover, in an interview with the farmers, they said that the reason why they text to the Farmers' Text Centre is because it is efficient in that it gives them with quick responses to their queries. As earlier discussed, most of the farming issues are emergent and require quick and contingent solutions. Examples of these issues are varieties, pest infestation, and nutrient deficiency (in Chapter 4.2., these are reported as the top three text messages received by the Centre). In Text 9, for instance, a farmer was consulting about how to manage stemborers infesting his farm. SMSing allows the production of timely solutions of these contingent farm issues across the country. Moreover, the metaphors also imply that the physical time and space are no longer pre-requisites in the accomplishment of discursive action. The conventional way is that whenever farmers have problems on their farm they usually see and consult with their local agricultural specialist.

5.4 Understanding the knowledge contexts in SMSing

This analysis also looks into the knowledge contexts of the SMS exchanges between farmers and the Farmers' Text Centre. It is by understanding these contexts that we understand the kind of knowledge produced in SMSing. Results indicate that the way knowledge is articulated in SMSing is linked to the following knowledge systems:

Scientification. In Text 29, the farmer was asking for the right amount of fertilizer to be applied on the seedbed. The 'right amount' there is a scientific term that suggests quantification and exact measurement. In conventional practice, the technique in fertilization is guided by the principle of 'the more fertilizer you apply the better and the more effective it is'. Science, however, disregards this principle and advises that farmers should only apply the kind and amount of nutrients deficient in the crop. This scientification puts agricultural knowledge in a hierarchical position, putting farmer's farm practices on a lower premium as 'primitive, unscientific, and wrong' (Scoones & John 1994, p.17), while the scientific knowledge is the dominant, legitimate, and correct form of knowledge. This hierarchical view of knowledge is reflected in the way the farmer composed his text messages, or the way he communicated with the Farmers' Text Centre (Text 30). In the text, the farmer was consulting with the Centre about the proper timing of topdressing (fertilizing), the kind of fertilizers to apply, and conducting soil analysis as a method to determine soil nutrient deficiency. This tendency of 'scientifising' farming knowledge is largely influenced by the way agriculture is viewed and operationalized in the country. As discussed in Chapter 1.5.,

agriculture in the Philippines highly operates within the terms and logic of scientific rationality. Agricultural knowledge is objectively defined with standard variables. As demonstrated by the example above, agricultural knowledge as viewed by the farmers is something that comes with proper method of application, which is apparently a scientific discourse.

Text 29. Text message about exact measurement in fertilization

Texter	Time received	Message	Reply	Time Replied	Response Time	Classification
Maribel Borata (Region-8, Eastern Samar)	3/12/2010; 10:35	Gud am po! Ilan po dapat ang ga2mitin naming oa organic frtlizer para sa seedbed 231 sq.m. pano po naming ilalagay? *[Good am. How much of organic fertilizer do we need to apply on a 231 sq.m. seedbed? And how to apply?]*	Pwedeng 10 bags organic material sa punlaan nyo po. Idistribute nyo lng i2 sa punlaan kasama ang lupa sa seedbed. *[You can use 10 bags of any organic materials. You just have to mix it with the soil and evenly distribute on the seedbed.]*	12/3/2010; 10:57	00:22	Nutrient

Source: PhilRice 2010

Text 30. Text message about the scientific way of fertilization

Texter	Time received	Message	Reply	Time Replied	Response Time	Classifica-tion
Herminio A. Tomas (Region 1 – Pangasinan)	8/08/2010; 10:26am	Ngaung panahon po ng pagsaka, mga ilang araw pagkatapos ng matransplant ang palay ang pagtopdres at anong klase ng abono at ilang bag sa 1 ektarya? *[In this cropping season, how many days after*	*Gud am po.we strongly recommend na ipa 130at g130e nyo po ang inyog lupa para malaman ang kakulangan nito.mas magiging accurate poa gn abonong ilalagay natiat 0.5 sako 16-20-0. Sa pglilihi ng palay, 0.5 sako 0-0-60.have a nice day* *[Good am. We strongly recommend that you*	8/08/2010; 10:35am	00:09	Nutrient

		transplanting do we need to do topdressing? What kind of fertilizers to apply? And how many bags per hectare?	*have your soil analysed so you know what nutrients are lacking and you need to apply. That way, you can be sure that you're applying the right nutrients. But generally, just apply 0.5 bags of 16-20-0 during early panicle initiation, and 0.5 sako 0-0-60 (during flowering stage)]*			
	8/08/2010; 10:31am	At kung mamulaklak na ang palay anong abono o pataba ang dapat iaplay ? Anong klaseng abono kung meron para gumanda ang ani ! Tnx so much *[And when the rice plants reach the flowering stage, what fertilizer to apply? What fertilizers do you recommend so we get a good harvest. Thanks very much]*	gud am po.i2 po ang general rekomendasyon per hectare kung kulang ang lupa nyo sa NPK pra 131at g-ulan: 10-14 days aftr transplanting, 4 sako 14-14-14-12S n kung alam po natin ang kulang nito. *[Good am. Here is the general recommendation per hectare if the soil is deficient of nitrogen,* potassium*, and phosphorus (NPK) for the wet season: 10-14 days after transplanting, apply 4 sacks of 14-14-14-12S.]*	8/08/2010; 10:35am	00:04	Nutrient
	8/08/2010; 10:39am	Maraming salamat po. *[Thank you very much.]*	X	x	x	Thanks
	8/08/2010; 10:58am	Ano po ba ang mas mainam na pangtopdres urea or ung 16-20-0 ? Tnx *[What's the best fertilizer to topdress, urea or 16-20-0? Thanks]*	sir Herminio gud pm po.sorry for the late reply.ang abono pong ilalagay natin ay depende po sa kakulanagn ng ating lupa.ipa analyze nyo po ang inyong lupa para po malaman ang kakulangan nito.. *[Sir Herminio, good pm. Sorry for the late reply. The fertilizers to apply have to be based on what nutrients are*	8/08/2010; 1:56pm	2:58	Nutrient

			lacking in the soil. Have your soil analysed so you know what's lacking.]			
	8/08/2010; 2:52pm	Ganon po ba, magkano naman po kaya ang magastos sa paganalyze at sanpo dapat ? Tnx *[Is that right! How much does it cost to have the soil analysed? And where is it?]*	kung laboratory analysis, maaring meron ito sa provincial agriculture office nio. u can also inquire from your municipal agroculture office po kung saan puede magpa-soil analysis tykung gamitan nio ng MOET for soil analysis, P175 isang kit. *[If through laboratory analysis, you have it in the provincial Agricultural Office in your area. Better yet ask your Municipal Agriculturist about soil analysis. If you use MOET (Minus-One Element Technique), it will cost you P175 per pack.]*	8/08/2010 5:54:00 PM	3:02	Nutrient

Source: PhilRice 2010

Localization. While scientific knowledge was predominantly articulated in SMSing, it was not recommended as it is. Instead it was being tailored to fit with the knowledge requirements of the inquiring farmers. This view of taking into account the farmer's view in the production of knowledge is well substantiated in Text 31. Farmer-first, as it is called, is an emerging knowledge paradigm that 'involves local people as active partners in all aspects of research and development processes' (Scoones & Thompson 1994, p.2). Moreover, the Farmer-first believes that the 'solution to agricultural issues lies on farmers' own capacities and priorities' (pp.1-2). In the text, the Farmers' Text Centre through the attending agricultural specialist has articulated this principle by asking farmer

about his specific knowledge requirements. The specialist's intention was to make sure that the technology fits with the farmer's needs.

Text 31. Text message about the production of need-based knowledge

Texter	Time received	Message	Reply	Time Replied	Response Time	Classifica-tion
Milagros Lagrosa (Region 6 – Iloilo)	9/08/2010; 12:58pm	gud afternoon ask lang k latest updates sa uariety of rice resistant sa pests and disease *[Good afternoon, I just to ask for the latest updates on rice varieties resistant to pests and diseases]*	anong pest or disease po ba gusto nyong malaman pra macheck nmin if matibay (resistant) ba i2 sa mga bagong varieties?	9/08/2010; 2:31pm	1:33	Variety

Source: PhilRice 2010

Chapter Six:
SMSing as an Everyday Farming Practice

The meaning and impact of SMS on agriculture cannot be simply understood by looking at its value on crop production or on knowledge production and dissemination, but it also requires closer examination of how it is entwined in the everyday life of the users (farmers, in this case). As discussed in Chapter 2.4., everyday life refers to a periodic 'orientation' or pattern of 'commonsense' events characterized by practical, fluid, and loose actions, which are 'not based on standards of traditional logic' (Handel 1982, pp. 42&51). It is in these loose, ordinary everyday activities or what Garfinkel (1964) calls 'indexical expressions' that we understand the natural rather than objective construction of reality – in this case, the role of SMS in the organization of farmers' everyday life. Drawing on the SMS experiences of farmers from Caganganan, Banaybanay, Davao Oriental, Philippines, this chapter outlines a case of how SMS has become integral in the daily (re)structuring of activities in a farming community.

6.1. Accomplishing everyday life on the farm

6.1.1. The Caganganan farming community

Caganganan is a typical example of a small farming, rural community in the Philippines. Situated in the south of the country under the Municipality of Banaybanay, Davao Oriental (Figure 16), it covers a total land area of 292.06

hectares of which 88.47% (around 258.4 hectares) is utilized for agriculture. Of the community's agricultural land, 167.60 hectares are used for growing of rice. Rice farming, in other words, serves as a basic source of income for the community of 1,987. The local population is composed mostly of single males with an average age of 55 years old, who speak *Cebuano,* and embrace Roman Catholicism as their main religious denomination. Most of the households, which are composed of four members, are directly engaged in rice farming, tilling an average of 1.2 hectares per household. (Barangay Caganganan 2011)

The community is surrounded by vast rice fields with the resident areas as well as the local government entities nestled in the middle (Figure 18). Most houses are scantily constructed with basic materials such as woods, although there are noticeably a few built of concrete materials. One's economic status in the community is said to be determined by the type of material one's house is built from. People with houses that are built of concrete materials are considered affluent. Those with houses built otherwise are categorised as impoverished. The community's description of poverty is also based on one's eating capacity. One is considered poor if he/she is incapable of having a decent meal three times a day. A decent meal, according to the local people, includes rice as the main course. In the community, however, despite the fact that average income is low, staggered, and seasonal (especially for those who depend on farming as source of livelihood), the majority claims to have the capacity to feed themselves regularly. Only about 25% of the residents don't have such a capacity. But generally, having fertile soil and a good, overflowing source of water, the community can be food self-sufficient. Most, if not all, of the households have their own gardens at their

rear sown with several kinds of vegetables and spices, and raise fish and some livestock, such as chicken and pigs.

Roads and walking pathways are rough and can be muddy if it rains. The community is located 4 kilometers away from Banaybanay (nearest town where the locals purchase their basic needs), 159 kilometers to the Davao City (nearest large metropolitan city), 1,562 kilometres to Manila (the main central business district of the country), and 1,707 kilometers to Farmers' Text Centre in Nueva Ecija (Figure 16). Motorcycle is the common means of transport used for commuting in and out of the community to the nearby town. *Kalesa,* a cart pulled by buffalo, however is still evident in the community. *Kalesa* is traditionally used by farmers to transport their farm paraphernalia. Some farmers, however, would use it as their family vehicle. A farmer together with his wife and their children riding on the *Kalesa* is a common sight in the community.

Compared to urban living, life in the community is rather simple and relaxed. People live a slow-paced everyday routine, unless it is busy on the farm. Farming, in other words, regulates social mobility as well as work intensity in the community. The magnitude of daily work on the farm depends upon the stage of the crop. During planting and harvesting, you see farmers heavily engaged on the farm as these are critical periods that farmers should give full attention to, otherwise they will suffer the consequences. For instance, in land preparation for irrigated areas, they have to know the schedule for irrigation and then work accordingly. At times, this would require them to be awake over night to watch and ensure that the water is running smoothly or evenly distributed across their

field. During harvesting, speed is an essential aspect of farm activities. Farmers must make sure that their produce after harvesting is not left in the open field (where birds may attack and eat the grains, or the rain wets and deteriorates it) but rather should be immediately and properly threshed, dried, and stored. On a regular day, however, the farmers labour on the farm early in the morning as much as possible, because it is still cool and comfortable to work. They endeavour to finish everything or at least half of the work before the day gets hotter usually around 10 o'clock in the morning. They get back to work around 2-4 o'clock in the afternoon when the sun is less intense.

Weather apparently is another important factor that defines the local people's actions. Not only on the farm but generally in the whole community, people's movements and actions are linked to the local weather conditions, which is relatively tropical and maritime characterised by high temperature and humidity, as well as frequent rainfalls. The general pattern is to see people outside their respective houses, either doing some outdoor household chores or chatting with neighbours in early morning and late afternoon. Roads and alleys are filled with people walking at these times of the day. Children are playing everywhere. But during midday when it is sunny and hot, people tend to stay inside their respective houses or behind the sheds doing some indoor activities, such as watching TV, listening to radio, playing cards either with family members, or relatives, or neighbours, and the new addition to their daily activities - texting. Figure 17 indicates the everyday activity clock of men and women in the community. In summary, men generally do the farm work, while women perform the household chores on a daily routine.

Farming practice in the community is a mixture of both indigenous methods that farmers learned from their forefathers as well as modern practices taught to them by both the government and non-government organizations through the agricultural extension program. While some farmers have embraced the modern farming practices introduced to them, they may still have keep and practice some traditional beliefs. For example, some of them still follow the lunar system belief as guide for rice planting. They believe that their crop will become healthier and more bountiful if they grow it during the full moon. Their strong Catholic beliefs are likewise highly influential on their practices and views of farming. They have strong faith in divine intervention and that they believe that rice is not just a product of human hard work but a blessing from God. Hence, before doing any chore on the farm they always pray for guidance and blessings from God.

The modern farming practices observed in the community, on the other hand, include the use of modern varieties, use of machinery, and application of some science-based farming techniques on crop establishment, pests and diseases management, and nutrient management. According to the farmers, these modern farming technologies help them reduce the cost of growing rice. For instance, the local farmers used to plant more seedlings per hill for a transplanted farming. The modern practice, however, recommends the use of 1-2 seedlings per hill only. A congested hill, according to what farmers have learned from science, would not result in more plants and eventually more grains, but rather it would yield poor seedlings and death of some of them due to nutrient and space competition. Farmers have learned that rice plants need enough breathing space to grow well.

This planting practice, according to the farmers, would not only reduce input use, but also facilitates healthy plant growth and eventually better yield. The use of modern varieties also creates a huge impact in yield increase. The popular varieties grown in the community are IR64, PSB Rc128, and hybrid rice. From only 40-60 cavans (55 kg per cavan) of rice per season that they used to harvest, farmers can now get yields as high as 120 cavans with modern varieties. Aside from modern varieties, the local farmers also have access to some farm machines and facilities, which according to farmers are very useful as these help ease farm drudgery (Table 5).

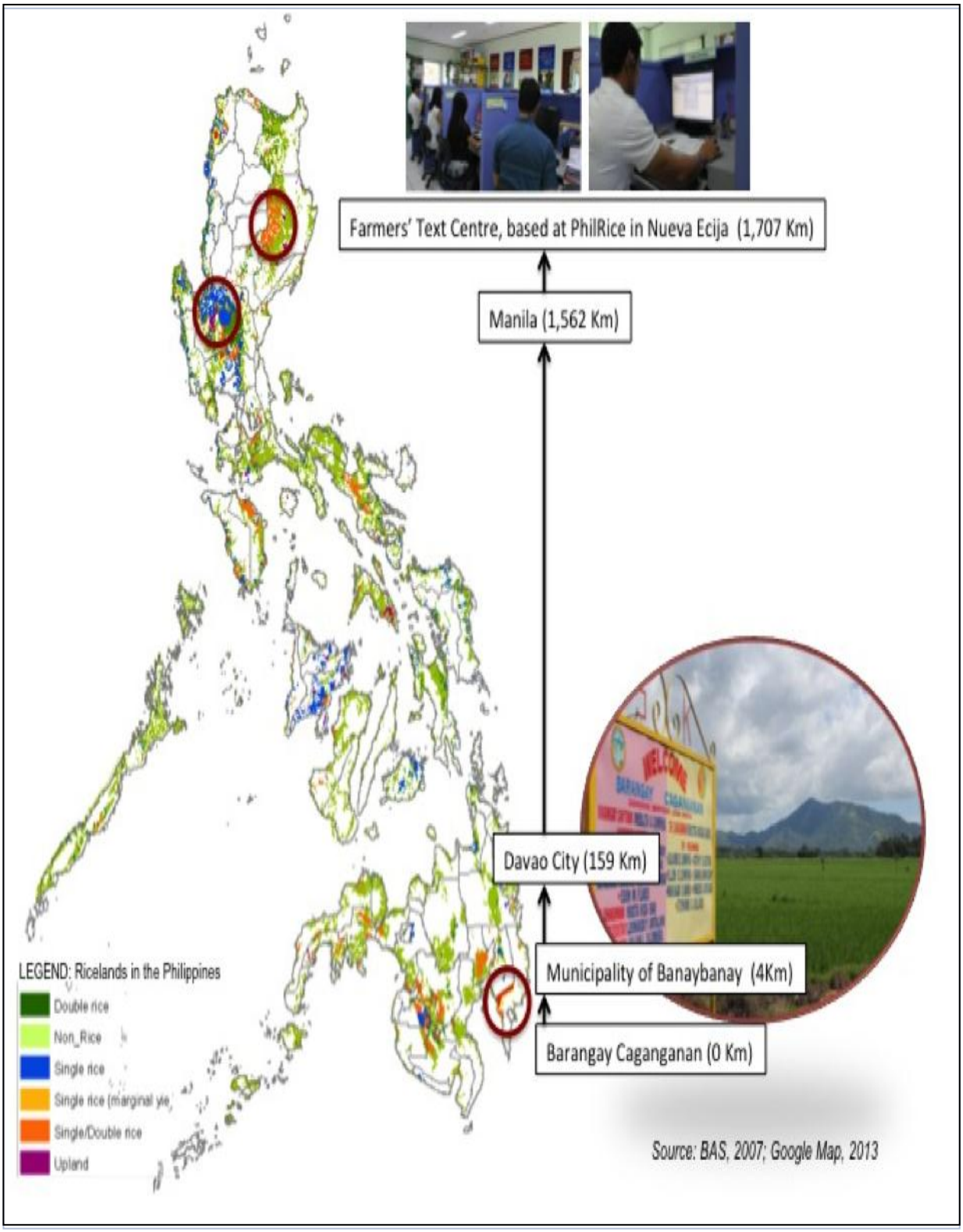
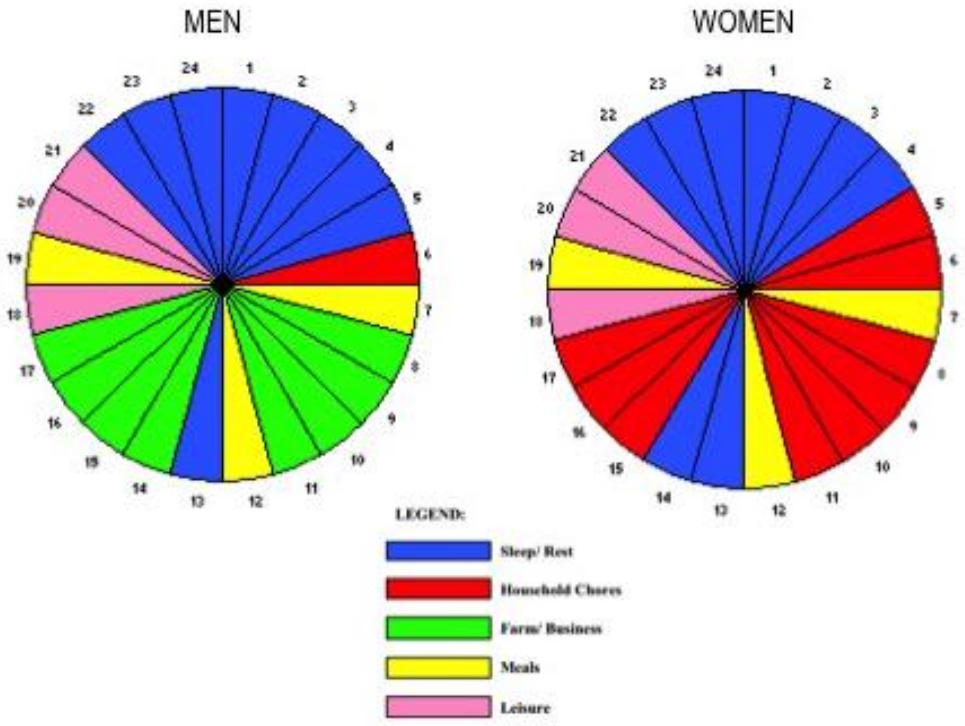


Figure 16. Location and Distance of Barangay Caganganan, Banaybanay, Davao Oriental, Philippines



Source: Barangay Caganganan Development Plan 2009-2013

Figure 17. Activity clock for men and women in the community

Table 5. Barangay Caganganan's Inventory of Farm Tools and Equipment

Facilities	Purok Anahaw	Purok Awa –aw	Purok Liko liko	Purok Malinawon	Purok Malipayon	Purok Rose Mabuhay	Purok San Francisco	Total
1. Thresher	1	3			5			8
2. Corn Sheller								
3. Trailer	1	3			5			9
4. Farm Tractor	1	3			6			10
5. Mill 5.1 Rice Mill 5.2 Corn Mill				1		1		2
6. Turtle/Mudboat	2	3			6			11
7. Solar Dryer		3	1	4		3		11
8. Plow	1	2					2	5
9. Harrow/Leveler		3						3
10. Sprayer	15	10	17	50	15	10	10	127
11. Cart	1							1
12. Others (bolo/ hatchet/spade etc.)	20	8	100	100	10	63	15	316

Source: Banaybanay Municipal Agriculturist Office as cited by Barangay Caganganan Development Plan 2009-2013

Figure 16. The Barangay Caganganan

Farmers' sources of farming information come in a variety of ways – word of mouth through their local agricultural extensionist, fellow farmers, radio, TV, printed materials, Internet, and SMS. The community was lucky enough to have computer and Internet access, being a recipient of the OpAPA Program (see Chapter 1.2 for the OpAPA Program). The Internet kiosk, which is sited at the Barangay Counsel Office (Figure 16), is open to everyone to search for information. An operator is available to assist in the use of the Internet (Figure 16). The only drawback with the Internet is the network being unstable and slow.

Among the modern communications technologies present in the community, the mobile phone has by far the highest penetration and use rate with more than one mobile phone per household. Not only is it popular and widely used by the younger generation but also by the middle-aged people in the community, such as the farmers. As demonstrated by the Farmers' Text Centre data in Chapter 4.2., farmers use SMS, so much so that they would rather text their farm queries to a distant knowledge provider than consulting with their local agricultural extension workers. Their reason is that they found texting not only very handy and convenient, but it also responds with quick, effective answers to their queries. The effectiveness and relevance of SMS in farming was earlier discussed in Chapter 4.

6.1.2. Texting as an indexical expression

The term 'text' has become a buzzword in the community. The local people say the word in their everyday life generally as a novel expression for communication.

Some, however, use 'texting' as a natural element of the existing communicative system of the community. Face-to-face communication, which is still the predominant form of communication in the community, is at times constrained by the fast-paced routine of everyday life usually when it is busy at the farm. Farmers especially during peak season at the farm are always on the go and therefore cannot hold longer talks. Texting fills up this communication gap. For instance, when someone says *'...text nalang kita'* (…I will just text you) it is a hint or a segue to smoothly end the face-to-face conversation and continue it later through SMS. Texting plays a crucial role in keeping (and expanding) the ongoing communicative action in the community. It never operates in isolation as another form of communication platform. In addition, it is not just an added vocabulary spoken by the community but most importantly it is part of their life experience. Like their other ordinary chores, farmers text almost subconsciously at times together with other activities. It is a common sight in the community to see a person holding a mobile phone either with one hand or two hands as if fumbling with rosaries. Figure 19 shows a farmer's daily activities with the inclusion of texting as either a separate or an integrated activity.

Source: Caganganan Farmers 2011

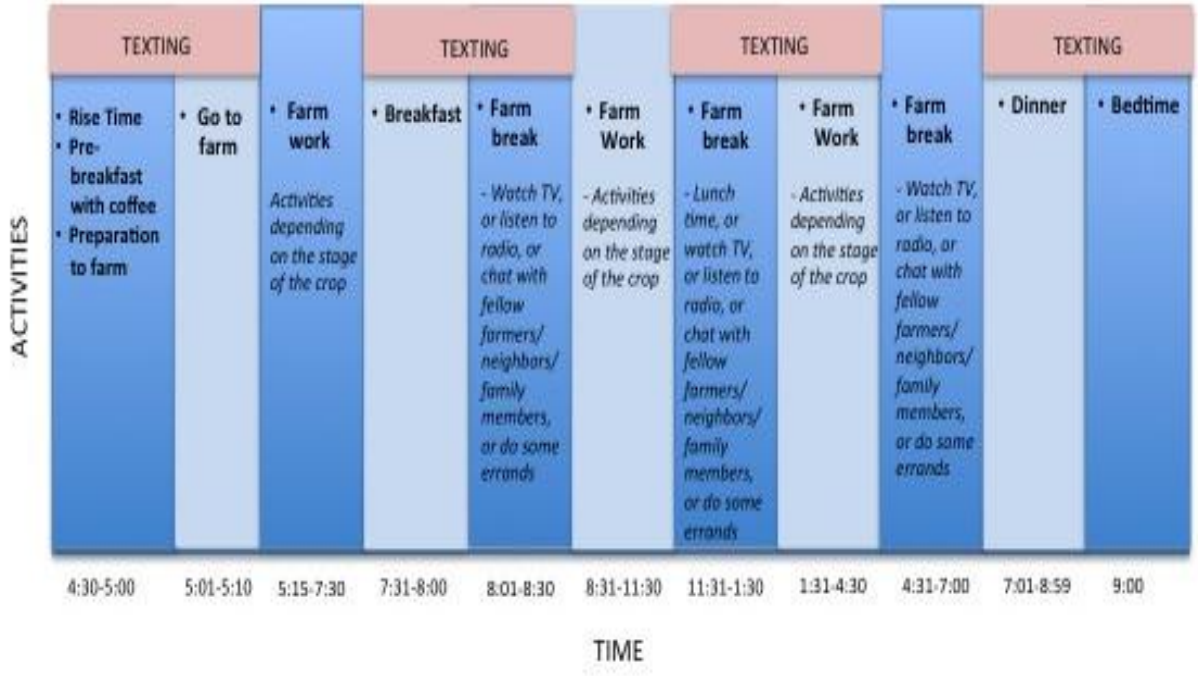


Figure 19. A farmer's typical everyday activities in Barangay Caganganan, Banaybanay, Davao Oriental, Philippines

There are many meanings that can be associated with 'texting'. To the local farmers, it is more than a communication tool. Table 6 shows how the farmers make sense of how SMS has created an impact in their life. Farmers describe their everyday life as dialogic of production, information, and interaction. Their main concerns are issues of what to grow (production), how to grow (information), and with whom (interaction). Their everyday life is accomplished through the interaction and dynamics of these circumstances. SMS plays a central role in this dynamic structuring of everyday life at the farm. Using the 'then & now' metaphor as a hueristic device to make sense of the impact of SMS, farmers view the role of the technology as reconstructing the discourses of production, information, and interaction. Quotations from farmers' interviews, such as *'ipapatext ko nalang'* (let someone do the texting for me) and *'magtetext nalang*

ako' (all I have to do is to text), are suggestive and indicative of these dynamics (Table 7). New rules and structures that govern the farming community are produced as a result of these dynamics (Table 8). The Rice farming system currently is viewed to have high precision, with a wider, expert-based knowledge system, and its means of transaction has become highly complex and impersonal. Previously, it was governed by an unstructured, trial & error system with high level of anxiety, and mainly relied on community knowledge and resources communicated via face-to-face interaction.

Table 6. Barangay Caganganan farmers' views of farming life vis-à-vis new media (in general including SMS)

Categories	Then (Conventional)	Now (with new media)
Production	Non-scientific/conventional farming practicies; Less access to agri knowledge services; High degree of uncertainties/high production risk; Less control; Less motivation; Low yield; Low income	Improved/science-based farming practices; Higher yield, Lower production cost; more access to knowledge/ production technologies; Low production risk
Information	Word of mouth (Fellow farmers, parents, agri technicians); radio; print media	Cellphone, computer/Internet, agri technicians, TV, radio
Interaction	Highly Face-to-face	Mediated

Source: Interviews with Caganganan Farmers 2011

Table 7. Barangay Caganganan farmers' views of the impact of the SMS Technology

'Cyber' metaphors/ expressions/actions used by the farmers	Impacts of SMS Technology		
	Production	Information	Interaction
1. ...'*Ipapa-text ko nalang*'... (...let someone text/SMS for me...)	A production input/service is available from somewhere and someone; there's sense of confidence and free from anxiety on the farmer.	A tool is readily available, but cannot use it without one's assistance	There's an ease of drudgery of work; no mobility needed; non face-to-face
2. ...'*Mag tetext nalang ako*' or '*itete-text ko nalang*'... (...all I have to do is to text/ SMS...)	-same-	A cheaper, effective means that farmer can use to get information or agricultural inputs	-same-

Source: Interviews with Caganganan Farmers 2011

Table 8. Rules & Structures governing the farming community nowadays

	Then (Conventional)	Now (with new media)
Production	Bricolage/Making do -no fast and hard rules -trial & error (with high level of anxiety) -based on experiences/supertitious beliefs	Knowledge System -with precise, hard recommendations -science-based/based on proven experiments (resulting in less anxiety)
Information	'Folk' media - community-based	'Expert' media -expert managed -readily available/accessible anytime - with infra requirement
Interaction	Farmer-Farmer; Farmer-Agri Extension Worker; Farmer-FarmerParent	Farmer-Cellphone-Experts; Farmer-Wife/child-Cellphone-Experts Farmer-Internet Farmer-Computer Operator-Internet

Source: Interviews with Caganganan Farmers 2011

6.2. Mobile phone ownership & household relations

Unlike in the metropolis where cellphone ownership is more or less per individual, mobile phone in the community is usually shared among members of the household. One farmer has disclosed that their cellphone has never been out of the house. If a text or call is received, someone on guard has to shout it out (a typical trait of rural folk) to the concerned member. He admits though that the cell phone is always at the hands of their children once they are at home. They use it either for texting or playing games. At home, the use of mobile phone is controlled for cost saving and to avoid any member's addiction to it that would lead to disruption of accomplishing household chores or studies for the kids. Rules for its usage are set, such as texting time. Breaking the rules can cause many dramas at home. Not only that, taking turns for the use of the mobile phone is another issue that wreaks havoc in the serenity of the house when not well managed. While it can cause some household commotion at times, the use of SMS can also foster some level of intimacy between the household members. A concrete example for this is a farmer who is asking any of his children or his wife to text someone for farm related reasons on his behalf. Whether viewed as an added household chore or a genuine favour asked, this action is producing new avenues for interaction at home between either the farmer and his child or his wife. One farmer recounts that at one time when the cellphone rang the attention of everyone in the family was glued to it and they were all excited in knowing what was the message about and for whom it was. The children, among the family members, are usually ones who are always excited about picking up the phone when it rings. The other members wanting to know what the message is about

would ask the child to read it aloud before them. The child (or anyone) who picks up the phone reads the text message. Often, this gives them a good source of laughter or agitation depending on the text message received.

Another related effect of SMS, mentioned by the farmers, is when their children would for ask money to buy phone credits. Generally, phone credits are not counted as part of the mainstream household expenses in farming households, therefore these are not automatically bought unless needed. Consequently, phone credits are purchased on a prepaid basis. Buying credits therefore is a privilege that children would have to discuss with their parents. And they have a clever attitude in doing so. The farmers said their children would deliberately caress them seemingly showing an attitude akin to asking for mercy just to gain some cash from them. Such behaviour by their children, as described by the farmers, can at times be awkward and annoying. Moreover, some farmers said their kids would rather go without their snacks at school and keep their pocket money for phone credits.

6.3. SMS use in the community

6.3.1. SMS users' profile

Roughly seventy percent of the heavy text users in the farming household are the wives, followed by the children (15%), and the husbands (who are generally the farmers) (10%). In the Philippines especially in the rural areas, wives still portray

the traditional female role, that is, as a housekeeper performing all the routine household chores. Not only that, they also manage the finances and budgeting. Therefore, wives are likely to have more control over the use of mobile phones than the other household members. Although the children are more enthused with texting, they are constrained financially and by the rules imposed at home. For households with grown-up and working children, however, children are the heavy text users. On this note, SMS use is therefore driven not just by one's passion for it but also by his/her economic and financial capacity.

In the Farmers' Text Centre data, it reveals that most of the SMS users are farmers, followed by extension workers, professionals, students, and researchers (Pascual, *et al.* 2010). The report, however, failed to account for the farmer's gender and whether the farmers did the texting themselves or not. The field data has disclosed that some farmers make use of and benefit from the technology through the instrumentality of either their children or wives. Whenever they need something, they would just ask their wives or children to do the texting for them. Some farmers, however, can text themselves. But generally speaking, most of them find the phone complicated to use. Some of the phone difficulties they faced include the letters on the keypad being too small to see when composing a message, and the phone's operating system being hard to follow. An example of a difficulty mentioned by the farmers is the buttons on the phone's keypad that have two commands. Before even attempting to use the phone, farmers already feel confused and intimidated by the complicated appearance. Apparently, farmers' use of SMS is affected by their age demographics. The average farmer in the community is 53 years old. In the group discussion, farmers said they were too

old to use this technology. They think that the mobile phone technology is designed for the younger generation.

6.3.2. Kinds of text messages

Regarding the kinds of text messages that the average farming household normally sends and receives, the farmer-respondents said the topics are generally about farm issues (50%), followed by greetings/friends (25%), family concerns (10%), and health related problems or questions (10%) (Figure 20). Regardless of time of year (be it a normal or busy day on the farm), the farm-related text messages are the same. These mainly consist of transactions with the market [either communicating with the input supplier or output buyer] (25%), with farm owners (10%), with farm labourers (10%), and agronomic issues arising on the farm (5%). The majority of the farmers claim that when it comes to matters concerning crop production, particularly anything that has to do with agronomic issues, they would text the Farmers' Text Centre. They believe that the Centre can offer them answers to their queries. They said they learned of the Farmers' Text Centre from the project on OpAPA Project implemented in their community. The OpAPA Project, according to the farmers, was introduced to help them access information that they can use for their farm via the new media, such as the Internet and mobile phone. Most of the SMS transactions at the farm level are related to market and coordination works. The farmers note that the use of this new media has allowed them to efficiently accomplish these previously geographically constrained everyday activities. Doing particular errands, especially those that require mobility, are never a pleasant job to anyone in the

Philippines, and more so, in the countryside. Aside from the poor transit system, farmers find it so uncomfortable to be active during the hot, humid weather. Not only does it give them discomfort, but it also encroaches on their precious time. One farmer recalled a time he went to the town to buy some planting materials. To his dismay after the long travel that cost him both time and money, he ended up purchasing nothing due to the unavailability of stocks. He said with SMS, prior arrangements could be made before travelling to the suppliers or the shops. SMS, according to the farmers, gives them relief as it frees them from the ordeal of the manual, labor-intensive everyday routines.

Source: Caganganan Farmers 2011

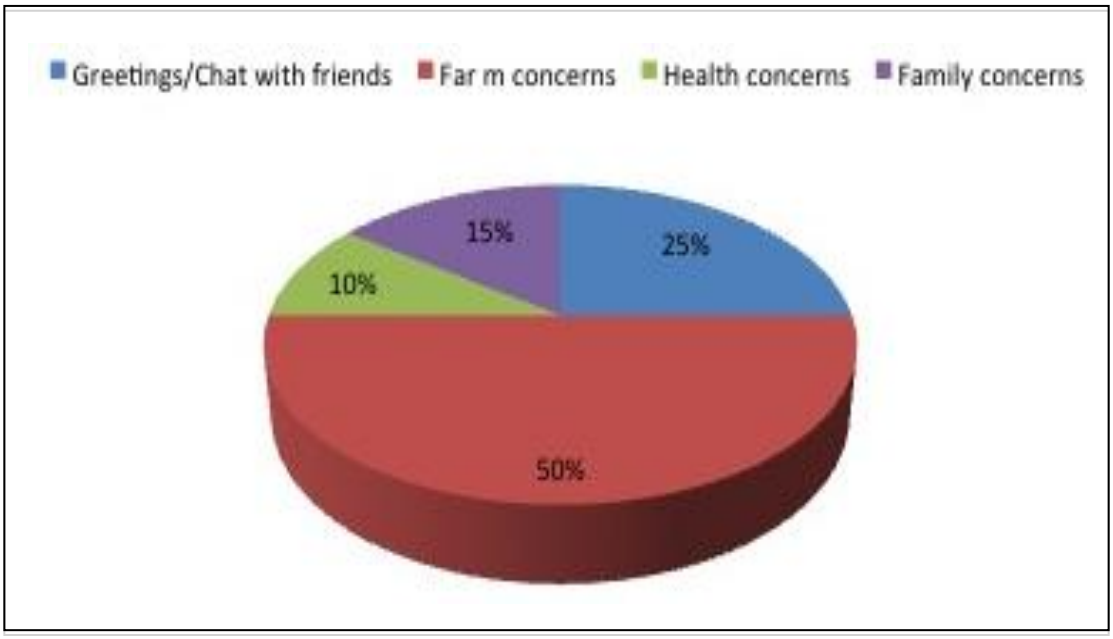


Figure 20. Kinds of messages farmers that normally send and receive

6.3.3. Farmer's textmates

Figure 21 shows the farmers' 'textmates', which are the people and organizations farmers normally communicate with via texting. Previously, farmers' contacts were limited by the boundaries of their community, but today, with the advent of SMS technology their network has expanded. Some of the farmers' textmates are already their long-standing friends but have been separated geographically with either personal, social, or work relationships. Others are business contacts introduced through referrals or met in meetings and conferences. Farmers said they have not seen some of their textmates in person. An example cited by the farmers was the Farmers' Text Centre. They said they have no idea what the Centre operators look like – whether they are female or male, or just a machine talking to them. All they know is that the text centre is being managed by PhilRice, and most importantly, it provides them with the information they need.

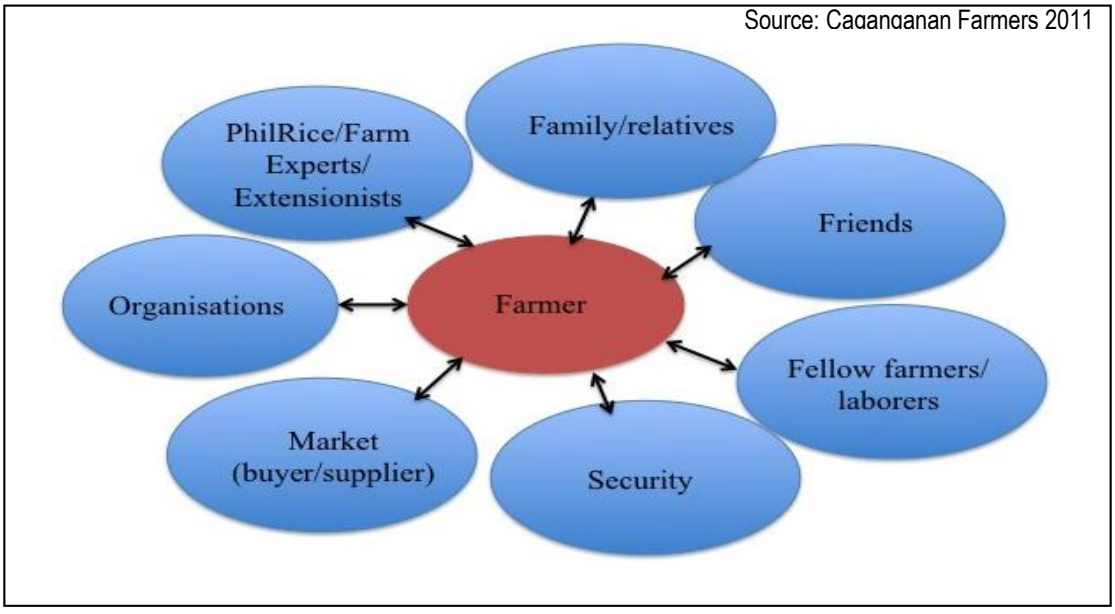


Figure 21. Farmer's textmates

6.3.4. Texting time

In terms of SMS usage on a daily scale, farmer's highest use of SMS is around 10am to 2pm (Figure 22). In a farmer's daily routine, these are times when they take a break from farm work. It is too hot for farmers to work in the field around these hours; hence they take a rest. They usually spend these idle times either chatting with their fellow farmers or neighbours, or listening to the radio, or watching TV, or grabbing a bite if hungry, or better yet taking a nap. Nowadays, farmers spend some of these times in texting ethier their friends or business contacts.

Source: Cagayanan Farmers 2011

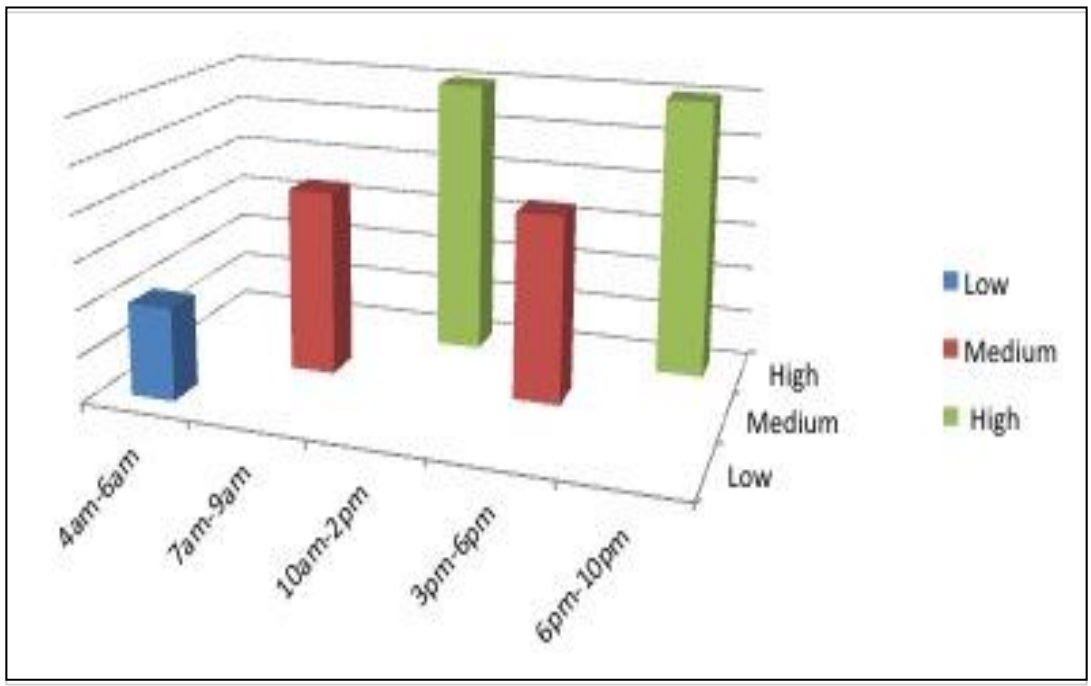


Figure 22. Farmer's daily SMS everyday

6.3.5. Texting cost

On a regular day, the farmers spend at least 10 pesos on mobile phone credits. This is about 10% of a farmer's minimum daily wage, which is 100 pesos (around 2.4 AUD at 42 AUD/1PhP exchange rate). According to a farmer's wife in Banaybanay, Davao Oriental, with the 10 pesos one can already avail himself of the unlimited prepaid text promotion offered by the service providers, such as Globe. Farmers spend more though during the critical stages on the farm – around PhP80-100 per day during harvesting and PhP40-50 during planting time. At these times, as earlier discussed, farmers perform a lot of coordinating work either with their suppliers (during the planting period) or buyers (during harvesting). In general, farmers estimate that the cost of their SMS usage comprises about 10% of their total household daily expenses (Figure 23).

Source: Caganganan Farmers 2011

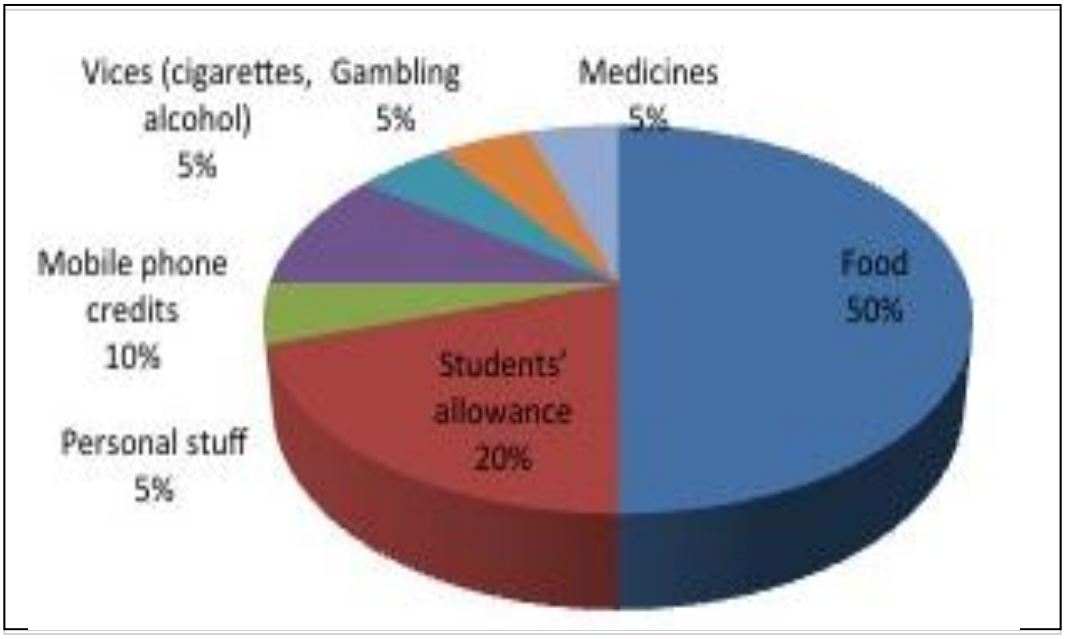


Figure 23. Farmer's daily expenses

6.3.6. Language used in texting

To compose a message on SMS, farmers use some distinct, odd wordings or language (Table 9). The text message is written in the vernacular or in English, or sometimes a mixture of the two languages but with an entirely different syntax. The idea, according to the farmers, is to create a message with concise yet understandable phrasing to fit in to the limited space on the mobile phone and also to facilitate quick communication. There are two ways they shorten the words. They either use symbols or figures, or write a word or two as they pronounce them, sometimes combining the aforementioned two languages. For instance, the 'where are you now' is written as '*wer u na'* – using both discursive expressions of English and Cebuano languages but shortened. The farmers find the result so amusing that according to them it is even used in face-to-face conversation. Early on, someone who spoke of the text language in real life was being bullied as being odd and elite. But nowadays, it has almost become an accepted part of everyday conversation in the community. One farmer points out that the text language has even become a measure of the degree of interpersonal relationships. One would know that two (or groups of) individuals are close when they speak of the text language in their actual conversations. Some people, though, would loosely use the language for fun purposes.

Table 9. Some of the text languages that farmers and their wives and children use

Good morning	Mrng/mwning
Who are you	Hu u?
Where are you	wer u
Ok	K
I'm or we're here already	Here na mi
Kumusta *(How are you)*	Muzta

Busy	Bc
Before	B4
Double words like Banaybanay	Banay2
Wala na akong load *(I don't have loads/credits anymore)*	l n load
Love	Luv
Pila ang presyo sa seeds karon *(How much does the seed cost now)*	Pla seds krn/now/nw
Kanus-a schedule sa tanum *(When is the planting schedule)*	Nus-a sked sa tanum

Source: Caganganan Farmers 2011

6.4. Social equality, power structure, women's role & other opportunities

Farmers acquire mobile phones generally on the basis of utility and handset price. It does not matter to them what brand the phone carries as long as it serves their purpose (that is, mainly for texting). However, the Nokia branded phones are the most popular mobile phone handset in the community as they are accordingly user-friendly. Smart and Globe, on the other hand, are the commonly used network service providers. It cannot be denied though that acquiring an expensive, branded handset can boost one's social standing in the community. According to the local farmers, if one owns a sophisticated mobile phone handset, he or she is looked up by the community as having greater status. He or she can even become the talk of the town. On the other hand, the absence of a mobile phone can cause inferiority and social disparity. For instance, in a casual gathering of community folk a conversation about new SMS promotions or new mobile phone features or handsets can isolate others in the group who don't own and use mobile phones. Another observation in the community in line with this incidence is the emergence of a social dichotomy between the mobile phone users and non-mobile

phone users. Not only do mobile phones produce some social strata in the community, but also network providers. At one time in the community, someone was talking to a bystander on the road saying, *'...ah hindi kita ititext kasi hindi ka Globe'* (...hmmm, I won't text you because you are not using Globe [a service provider]). Whether her reason was economically related (*i.e.*, it's a bit expensive to text to other network provider) or technically related with the other network provider (*i.e,*. response delay), her action for declining to communicate with the person was apparently related to differences in network providers. So aside from being divided into mobile phone users and non-mobile phone users, the community is also classified into Globe and Smart subscribers.

While the effects of these emerging social categories are not overly threatening to the community, they do create some dynamics and complexities in the locals' social and cultural landscapes. The power structure in the community, for instance, is influenced and determined based on who has the knowledge and access to the so-called new media. In the group interview with farmers, they stressed that the young people, such as their children, play a significant role in today's media-centric society. They stressed that they cannot optimise the full potential of SMS without the instrumentality of their children who are accordingly highly passionate and adept in using the technology. In the past, the children were the ones acquiring knowledge from their parents or from any elderly in the community; nowadays it's the other way around (Zagado 2006). Children who used to have an insignificant role have gained knowledge authority both at home and in the community. Children's use of SMS, however, can be constrained by some rules imposed at home as discussed earlier in Chapter 6.2.. The farmers'

wives are more in control in the use of SMS at the household level. This control is acquired in relation to their role as housekeeper. As mentioned in Chapter 6.3.1., the housewives control the use of SMS at home for economic reasons as well as to avoid overuse that would cause disruption of other household activities, such as studying for their children.

Moreover, SMS provides farmers' housewives an opportunity to make a living. A mushrooming of *sari-sari* stores (a convenience store) that sell mobile phone credits is evidenced in the community. The term 'sari-sari' means variety. Hence, the store sells a variety of commodities sold in retail at affordable prices. Displayed on a screen-covered window, the items sold are usually household goods and essentials, such as food and drinks, with phone credits being the new addition to the available items. The stores usually operate attached to the shopkeeper's house, and at times with benches and table in front of it. It is accordingly a favourite place for a drink or chat among community folk especially the farmers after a day's work. In addition, it is also another good source of income for farmers, and usually run by their wives. Josephine Dinaga, a farmer's wife and who owns a sari-sari store in Banaybanay, Davao Oriental, said the idea behind the *sari-sari* store is to give the community easy access to basic household commodities (Figure 24). She added that it's not a very lucrative business but it helps supplement their farming income, which comes on a seasonal basis. She pointed out that the store allows them to have access to everyday food for the family and gives them some petty cash for their daily expenses. Likewise, she said it is a good, productive activity to fill up her loose and flexible schedules. SMS, according to Dinaga, has not only increased her product range, and has also

augmented her family's income, and provided opportunities to expand her social network. On a rough estimate, Dinaga can earn at least PhP150-180 by selling phone credits on a normal day and even more on a productive day. Another benefit is that even if she's just at home she still can catch up with her distant friends and family, or transact business either for her business or for her husband's farming concerns. Furthermore, Dinaga averred that the SMS technology has allowed her to meet new friends. She disclosed that she has several textmates whom she has not even met. These people, according to her, just send her random text messages asking if they could be friends. Some of them are sincere with their intentions, while others are undignified, Dinaga added. She revealed though that she has made quite a number of good friends from texting. She further explained that everyday they would exchange pleasantries, inspiring quotations, and sometimes gossips. To her, albeit impersonal texting can make her feel better.

Figure 24. A *sari-sari* store in Davao Oriental that sells mobile phone credits

PART III:
SITUATING THE LOCAL SMS EXPERIENCE INTO THE MAINSTREAM THEORETICAL DISCOURSE

The preceding part reveals SMSing as central to rice cropping, farm knowledge production, and farmer's everyday life. The purpose of this part is to situate this analysis of the local experience of the SMS technology into the mainstream theoretical discourse of new media and agriculture.

There is, however, a dearth of literature that provides a constructivist analysis of the role of new media in the complex, dynamic process of structuration in agriculture. Most of the existing studies done are focused on the deterministic aspects, such as the ones presented in Chapter 1.2 concerning the applications of SMS in agriculture, wherein analysis is centred on determining the impact of the SMS technology as a tool that can increase efficiency and productivity in agriculture.

Antony Giddens' works on structuration and modernity are the best materials by far to provide a robust theoretical understanding of the role of new media in social organization in the present society. Hence, in this part, I use some of Giddens' concepts and postulations to substantiate my claims concerning the centrality of SMS to agriculture, particularly in the following areas: rice cropping, farm knowledge production, and farmer's everyday life.

Chapter Seven:
The Role of SMS in the Dynamic Process of Structuration in Farming

7.1. Rice cropping and the (SMS) technology

In an earlier time (agriculture period), farmers grew rice using a variety that thrived only in the highlands or dry lands and not in stagnant water using the slash-and-burn technology or otherwise known as 'Kaingin' system or swidden cultivation (Bulalacao, 1999; Barbosa, 1999). Over the years, changes in farming practices occurred with new technologies (Castillo 2006, p. 164; Gragasin & Kikuchi 1997, p.193). A more intensive method of rice farming, such as the wet-terrace rice agriculture, came into prominence. According to Barbosa (1999), this method 'involves both plowing and harrowing of fields, usually with the aid of carabao and native implements'. Postharvest technology, such as pounding of rice in wooden mortars called *lusong*, was also discovered (Castillo as cited by Vergara & Banta 2004, p.2). During the Industrial Age, notable changes took place in the structure of the society as brought about by the influx of not just gadgets but also innovations of various kinds (Ashton 1948). In agriculture, farmers were introduced to 'a series of technological changes, such as new crops, new crop rotations, new breeds of livestock, and farm implements and machines' (Overton as cited by Mathias & Davis 1996). In the 1970s, the Green Revolution Technology had ushered in drastic changes in rice farming in the Philippines (Kikuchi &Hayami, 1983). Kikuchi &Hayami (1983) stressed that with the introduction of new technologies, for example, new varieties and fertilizers came

various socio-political and cultural circumstances, such as increase in labor demand, land reforms, and population increase in the farming communities owing to labor migration.

With the coming of the Information Age, farmers are faced with another wave of technological revolution with the rise of the so-called new media or information and communication technologies (ICT). According to Flor (2009), this new era has been characterized by a remarkable shift of resources of power: from land, to labor, to capital and now to information. Currently, agriculture operates through information or knowledge in a form of 'texts' or abbreviated messages shared across distanciated space and time. Transactions come in a form of knowledge transmitted via electronic means. The exchanges of text messages in the Farmers' Text Centre wherein farmers and scientists have collaboratively communicated and created farm solutions in an active manner is indicative of this present condition, as discussed in Chapter 5.1.. The experience of the Farmers' Text Centre suggests that information is more than a set of messages, but it serves as a useful farming tool that facilitates the accomplishments of farm work. As reported in Chapter 4.2., farmers use the SMS technology to acquire information to address emergent issues at all crop stages throughout the year. Efficiency and economic benefits are two immediate impacts identified for this use of SMS in farming. With the SMS technology, access to farm knowledge can be obtained within 5 minutes, as discussed in Chapter 4.2. Not only that, according to Antonio, SMS could also give farmers an additional income of PhP39,730 (around 956 AUD at 42 AUD/peso exchange rate) (see Chapter 4.4.). Antonio stresses that this income is derived from the savings on knowledge search and transaction costs, increase in

input productivity due to the application of knowledge accessed via the Farmers' Text Centre, and higher income due to accessibility to better markets.

7.1.1. Deconstructing the notion of time and space of rice cropping

Previously, rice cropping was always linked to local conditions, and operated within the confines of the local knowledge system. Farmers' sources of knowledge are: the agricultural extensionist assigned to their community, their fellow farmers, radio, and some random private agricultural extensionists, as discussed in Chapter 1.4. They buy their agricultural inputs, such as planting materials and fertilizers, from the nearby market. After harvesting time, their produce is sold to the local trader, who offers them an uncompetitive price.

Currently, the agricultural system has become what Giddens (1991) calls 'phantasmagoric' wherein places or local instances have been stretched out across space and time '(19). Human action observes and follows a new set of rules and orientation of space and time, quite different from traditional types of social order (p.3). Giddens points out that the 'tearing of space from place has fostered relations between 'absent' others, locationally distant from any given situation of face-to-face interaction' (p.18).

The experience of the Farmers' Text Centre articulates this re-orientation of time-space relations in the agricultural sector. As mentioned in Chapter 4.2., the clients of the Farmers' Text Centre came from various parts of the country with text

queries concerning various topics of rice production. More so, the Centre reveals that they receive text messages at anytime of the day. This reality is an evidence of the notion of universality wherein agricultural transactions take place in an 'empty' space where people interacting with 'absent presence' (Pertierra 2005, Giddens 1990). The notion of time and space in rice farming has become universal, free from the hold of their local constraints. The farmer-client of the Farmers' Text Centre does not know and see with whom he is texting, and where exactly the person is located. All he knows is he is engaging in a productive communication.

This new order of agricultural transaction not only provides great opportunities to improving farm productivity, but it also produces a new means and structure of organizing and accomplishing activities on the farm. As discussed in Chapter 4.2., farmers have been found to have altered their value system of time and space. To cite an example, farmers used to take a break from farm work. The Farmers' Text Centre data, however, suggests that this supposedly farm break for farmers is being utilized for texting. The farmer's spatial milieu is no longer constrained by their immediate community.

7.2. Farm knowledge production

When a farmer sends a text message either to a distant person (say, to his fellow farmer or agricultural scientist), according to Giddens he extends his local milieu and allows himself to be penetrated by and shaped in terms of social influences from far away (1990, p. 19). Giddens describes this process as disembedding, which he defines as the 'lifting out of social relations from local contexts of interaction and their restructuring across indefinite spans of time-space' (1990, p. 21). There are two types of disembedding mechanisms intrinsically involved in the development of modern social institutions. Giddens discusses them as follows:

> 1) *Creation of symbolic token*, which refers to media of interchange which can be passed around without regard to the specific characteristics of individuals or groups that handle them at any particular juncture (p.22). An example of this is money. Money brackets time (because it is a means of credit) and space (since standardised value allows transactions between a multiplicity of individuals who never physically meet one another) (1991, p.18); and
>
> 2) *Establishment of expert system*, which means system of technical accomplishment or professional expertise that organizes large areas of the material and social environments in which we live today (1990,p.27). They are not confined to areas of technological expertise, but they extend to social relations

> themselves and to the intimacies of the self. They penetrate virtually all aspects of social life in conditions of modernity - in respect to food we eat, medicine we take, etc. (1991,p.18). For example, by sitting in my house, I am involved in an expert system, or a series of such systems, in which I place reliance (1990, p.27). An expert system disembeds in the same way as symbolic tokens by providing guarantees of expectation across distanciated time-space (p.28). Taken together as 'abstract systems, they all depend on trust (1991, p.18).

The Farmers' Text Centre is an example of an abstract system operating nowadays vis-à-vis production and distribution of agricultural knowledge. The information in a form of chopped messages serves as the symbolic token sent back and forth by the texters. The use of SMS serves as what Giddens calls the expert system that is governed by trust and confidence as the means of producing knowledge.

7.2.1. Trust as a mode of knowledge production

Unlike in laboratory or actual farming activity that follows and observes empirical evidence and standard procedure for knowledge production, knowledge production in SMS exchanges largely depends on trust. Trust, in view of the contemporary life, is not something that one would impose on a particular situation, but it is rather an instinctive characteristic of modernity equated by

Giddens as related to absence in time and space. (1990, p.26 &33). Giddens says 'there would be no need to trust anyone whose activities were continually visible and whose thought processes were transparent" (p.33). Nowadays, every human action is deeply bound up with the mechanism of trust in abstract systems (1990, p. 83).

In SMSing, people communicate by means of the technical expertise deployed by the abstract system (the Farmers' Text Centre), which has validity independent of the people who utilize it (Giddens, 1991; p.18). As demonstrated in Part Two, the farmer and agricultural agent of the Farmers' Text Centre do not see each other and yet they engage in such a non face-to-face interaction. In these modern days, Giddens stresses that people survive by means of this 'ontological security', which he defines as the confidence that most human beings have in the continuity and constancy of relations across indefinite spans of time and space (p.92).

7.2.2. Human agency, power, & discourse as central to knowledge production

As revealed in Chapter 5.1., the series of text messages sent back and forth by farmers and agricultural specialist in the Farmers' Text Centre suggest a dynamic process of negotiation, rather than passive information sharing as in the conventional agricultural extension. In the analysis, five forms of knowledge negotiations surfaced. These are: querying, coaching, consulting, confirming, and enlightening. A common theme that emerged among these forms of negotiation is that the farmers did not simply passively acquire knowledge from the Farmers' Text Centre, nor did the attending agricultural agent of the Farmers' Text Centre

offer ready-made recommendations. A display of agency and power was evidenced. As defined in Chapter 2.3., human agency refers to one's capacity for doing something, and power to one's transformative capacity to achieve desired and intended outcomes. The identity of farmer in SMSing is never a passive entity nor that of the agricultural specialist, and agricultural knowledge is never communicated or formed in a unilinear order. A 'dialectic of control' (p.16) is evidenced in the SMS exchanges where the participants contribute and co-create knowledge. The dialectic here is not in terms of human agency per se but also of knowledge. Agricultural knowledge serves as an input and at same time an output in SMSing. Hence, it can be inferred that knowledge production in SMSing is recursive interplay between the negotiators (actors) and the negotiated (knowledge).

Moreover, results of this thesis suggest that SMS interaction in the Farmers' Text Centre operates within certain discursive conditions. Discursive condition or discourse, as discussed in Chapter 2.5, refers to a system that structures the way people perceive and define reality. In social organization, Giddens calls this system as social structures, defined in Chapter 2.3.

As revealed in Chapter 5.3., there are four discursive structures that govern the Farmers' Text Centre as a production site for agricultural knowledge. They are: technical, socio-cultural, agronomic, and psychological. By technical, the analysis indicates that the way the text message is composed, the way the space on the technology is maximized, and the time of use are critical in the production of knowledge in SMSing. In addition, despite the mediated interaction SMSing is

still governed by the traditional norms observed within the gemienshaft type of social relationships wherein 'one can drop in, have a friendly chat, receive some advice about a problem, argue politics, and interact with other people who might otherwise remain strangers' (Rheingold as cited by Jones 1997). Results of the analysis also show that agricultural knowledge production in SMSing despite having a new form of discursive order constituted by the distanciated space and time is still linked with, and fuelled by, the dynamism of local agronomic conditions (*i.e,* the recurring events on the farm). Moreover, knowledge production in the Farmers' Text Centre is influenced by two existing knowledge paradigms: scientification and localization. Knowledge discussed in SMSing is negotiated through the interplay of these knowledge systems. Both scientific and local knowledge serve as a resource rather than an output. The resulting knowledge is an accommodation of these two bodies of knowledge, rather than privileging one over the other. The specialist's advice while influenced by his scientific knowledge is produced only by intersecting with the knowledge requirements provided by the inquiring farmer.

7.2.3. The nature of agricultural knowledge

The nature of agricultural knowledge. The character of agricultural knowledge as negotiated or a discursive accomplishment is revealed in the analysis discussed in Chapter 5.2. Particularly, it was found that agricultural knowledge as reflected in the SMS data of the Farmers' Text Centre is not singular or fixed, but multiple and fluid. A good example for this is the recommendation for which rice variety to grow. The SMS data shows there is no standard recommendation for this

matter. Recommendation varies depending on the knowledge requirements or the agro-ecosystem conditions of the inquiring individual. Moreover, agricultural knowledge is contingent in that it is highly driven not just by agronomic but also by economic, political, and environmental factors. Lastly, it was seen in the analysis that the meaning of agricultural knowledge is only determined in reference to the situation where it is produced. It is not predetermined and passively shared via the SMS technology. It is created in the course of SMSing.

The reflexive construction and reconstruction of agricultural knowledge. According to Giddens, the process of disembedding (of knowledge systems in this case) earlier discussed does not occur in a unilinear development where there are no reversals (p.19). Rather, he argues that 'like all trends of development, it has a dialectic feature' (ibid). Giddens elaborates that the disembedded systems can be recasted or reappropriated to their local condition of time and space through the process he calls re-embedding (p.79). This process of disembedding and re-embedding held in a continuous manner is what he describes as the theory of reflexivity. 'Knowledge spirals in and out of the universe of social life, reconstructing both itself and that universe' (pp.15-16). The exchange of text messages in the Farmers' Text Centre is an example of this reflexive application of knowledge. Everyday, the Centre receives and answers several queries of various kinds from their farmer-clients. The identification of what rice variety to grow is an example of the reflexive nature of agricultural knowledge. In the SMS data of the Farmers' Text Centre, this topic was the most frequently raised (see Chapter 4.2.). Varietal identification is a continuous process that is highly

dependent not just on agronomic but also on economic, political, and environmental factors as mentioned above.

In view of today's agriculture extension, the use of SMS plays a crucial role as a reflexive monitoring device where agricultural knowledge does not solely serve as an output but also an input of it. 'All knowledge claims are inherently circular - revisable (output) but also 'revised' (input) in a practical sense as they circulate in and out of the environment they describe' (p.177).

7.2.4. SMSing as a site of knowledge production

Knowledge produced in SMSing is different from the conventional sites of knowledge production (that is, farm for the farmers and laboratory for the scientists). SMSing is characterized by a complex, dynamic relationship of time and space, as opposed to the conventional mode where ‘space and time are linked together’ (Giddens, 1991) and observe common norms and pattern of events. As invoked in Chapter 5.2., knowledge in SMSing is a product of temporally and spatially differentiated interaction. Some interactions in SMSing occur in real-time with only insignificant time difference, and are very active and productive in that it results in quick resolutions to farm issues raised by the farmer. Others are rather slow and time-consuming either caused by the complexity of the topic, or different timetables, or technological problems.

7.3. Farmer's everyday life

Farmers' use of SMS is also manifested in the routines of their everyday life. The technology has become an everyday practice or an 'institution' (to borrow Moores' term 2000, p.12) embedded in the everyday pattern of household relations, identity formation, and production of social practices, as discussed in Chapter Six. This phenomenological account is a product of the process of disembedding and reembedding of social system where local experience is bound up with technological transformation (p. 36). Moreover, Giddens says that all social systems regardless of being mediated in light of today's media-driven society both express and are expressed in the routines of daily social life (1994, p. 36).

In farmer's household relations, the role of the juvenile has become a dominant discourse, and has been accorded authority in the production of everyday practices. As discussed in the Chapter 6.2., farmers make use of the SMS technology to acquire knowledge for their farm through the instrumentality of their children. Previously, children are the ones acquiring information from their parents or the elderly; nowadays, it's the other way around (Zagado 2006). Children are perceived to be more adept and inclined to the use of new media not only in the family but also in the community where they are accorded with authority when it comes to new media use. Women, particularly farmer's wives, also appear to have played a significant role in SMS use. While they may be less technological savvy than their children, their role is worth highlighting as it affects SMS consumption and eventually household relations. As discussed in

Chapter 6.3., farmers' wives are usually 'housewives' who manage any household related activities from housekeeping to budgeting. Mobile phone ownership in the rural, farming community is one per household. Everyone in the family shares the technology. Farmer's wives control the household phone usage for economic reason. Phone credits are purchased on a prepaid basis, and it is usually done only when it is necessary. Also, the mobile phone use is regulated as not to disrupt other household activities, such as housekeeping and studying for the children. The data reveals that hostility and aggression occur at home as a result of non-compliance with the mobile phone use regulation.

This 'restructuring' of household relations and redefining of roles in relation to new media consumption has been reported by Giddens as part of the character of modern society (1991, p.4). According to Giddens, the new media play a critical role in the constitution of society (p.4). Giddens highlights the organization of social relations as the crux in this highly dynamic modern society defined by the advent of new media. Moreover, he stresses that the new media not only reconfigure social circumstances, but they also the reconstitute personal life and one's identity. In the case of the farmer asking his child to do the texting for him, they are engaging in a discursive action that allows them to accomplish their task and at the same redefines their roles and identity. Such interaction has emancipated a previously insignificant voice in the family. A new form of knowledge authority is established as a result of the new media consumption. However, this identity once formed is not fixed. It only comes into being in the course of the interaction as mentioned above. Identity, according to Giddens, is a reflexive process that is continuously revisable (p.5). In addition, it is a social

position created in response to the social conditions of modernity enforced on all of us (p.12).

Furthermore, Giddens elaborates that the new media create a single world with a unitary framework where people can interact despite space and time, yet at the same time it produces some forms of fragmentation and dispersal (p.5). In the farming community, as discussed in Chapter 6.4., this issue of social divide becomes manifest in a form of social hierarchy and social dichotomy. According to the local farmers in Banaybanay, Davao Oriental, Philippines, one who owns an expensive, branded handset is looked up to by the community as being high-class. Absence of a mobile phone, on the other hand, can cause inferiority and social deviation. To cite an example as reported in Chapter 6.4., in a casual gathering of community folk a conversation about new SMS promotions or new mobile phone features or handsets has isolated others in the group who do not own and use a mobile phone. The emergence of social dichotomy is also produced by the difference in mobile phone network providers. Local people only text to people who share the same provider, as substantiated by this observation in the community: 'someone was talking to a bystander on the road saying '…*ah hindi kita itititxt kasi hindi ka Globe'* (…hmmm, I wont text you because you are not using Globe [a service provider]). Whether her reason was economically related (*i.e.,* it's expensive to text to other network provider) or technically related with the other network provider (*i.e,.* response delay), her action for refusing to communicate with the person was apparently related to differences in network providers.

Other opportunities that constitute farmers' everyday life in the light of the new media consumption include livelihood opportunity and expansion and production of networks of information, discussed in Chapter 6.4. A market has been produced to allow access to phone credits by the local community. A mushrooming of *sari-sari* stores (a convenience store) that sell mobile phone credits is evident in the community. Women's role takes centerstage in this opportunity. A *sari-sari* store is usually managed by a farmer's wife. It is run as a complementary income-generating activity for a farming household. SMS offers an additional income. Aside from that, SMS also offers an opportunity to expand household relations and network of information. SMS allows the farming household to connect with distant relatives and friends, create friends, and transact business without leaving their house.

Chapter Eight:
SMSing and Agricultural Extension –
A Reflection, Summary, & Implications

8.1. Emerging discourses in agricultural extension

Agriculture (in the Philippines) has now observed new rules and structures characterized by the distanciation of space and time in organizing and accomplishing any farm transaction brought about by the SMS technology. Knowledge in a form of text messages is particularly central to the operations of contemporary agriculture. As underlined in the preceding chapters, this emerging SMS paradigm has ushered in an entirely different view and process of agricultural extension particularly the production and distribution of agricultural knowledge.

To view agriculture extension as mere technology transfer therefore might be insufficient and no longer relevant. As revealed in this study, the issue is no longer about the dissemination of knowledge from knowledge generators to beneficiaries, but is rather centred on human agency, power, and discourse. This thesis argues that agricultural extension is not merely a diffusion of innovation. It is a 'social process', or is 'based on interactions' (Cornwall, Guijit & Welbourn 1994, p. 115; Winarto 1994, p.154). It is not a planned intervention, but part of the on-going negotiation with the people involved (Matose & Mukamuri 1994, p.73). Moreover, production of agricultural knowledge is associated with people who have social differences (Fairhead & Leach 1994, p. 77). Social difference can be

in terms of gender, age, ethnicity, class, farm agronomic conditions, agricultural activities, livelihood responsibilities, and social position (ibid).

Likewise, Long and Villareal (1994, p.49) share the same view of agricultural extension. They averred that 'knowledge processes are embedded in the social processes that imply aspects of power, authority, and legitimation'. Agricultural extension, according to them, is not just a 'matter of instrumentalities, technical efficiencies, or hermeneutics (i.e., the mediation of the understanding of others through theoretical interpretation of ourselves)' (ibid). It should also concern itself with analysing the transformation of meaning at the point of intersection between different actors' lifeworlds, as well as the kind of social interaction involved (ibid). Long and Villareal emphasize that knowledge emerges as a product of interaction, and not of linkage and transfer (ibid). Moreover, they have proposed that agricultural extension must be viewed in terms of discontinuity, not linkage, and transformation, not transfer of meaning (ibid).

In this study, this notion of 'discontinuity' has emerged as an important resource rather than a problem in the production of knowledge via SMSing. Discontinuities refer to the discrepancies in values, interests, knowledge, and power (pp.43-44). In Text 18, a random texter was asking for solution for the drying of the plant part, which he labelled '*tulod*'. The attending specialist of the Farmers' Text Centre did not know what '*tulod*' is, which apparently is a vernacular term used in a particular region (see Chapter 5.2.). This socio-cultural discrepancy has fuelled an active interaction through the exchanges of text messages and eventually led to the production of knowledge. The critical point where discrepancy takes place is

called social interface (Long & Villareal 1994). As reflected in the Text, social interface is an opportunity that leads to discursive action and eventually formation of knowledge never anticipated by both parties involved. Other discrepancies surfaced in this study are agronomic, economic, political, and environmental in nature (see Chapter 5.2.). Moreover, conflict on worldviews was also found in the SMS data as critical in knowledge production (see Chapter 5.4.). These worldviews include scientification and localization. Scientification refers to situating knowledge formation into the terms and methods of science, while localization means appropriation of knowledge based on the local needs and conditions. Knowledge production in this context means accommodation of conflicts rather making judgment of their legitimacy. As revealed from the analysis, the interaction of these contrasting worldviews via SMS exchanges has allowed the production of meaning that accommodates both views rather than privileging one over the other. This analysis suggests 'mediation as a means of conflict resolution' (Matose & Mukamuri 1994, p.74).

In addition, this study discloses negotiation is paramount in knowledge production in SMSing. By negotiation, it means the interplay of human agency, power, and discourse. SMSing illustrates this notion of negotiation through the dynamic exchanges of text messages. Farmers and agricultural specialists in the Farmers' Text Centre have shown active cooperation in SMSing in that they have co-created knowledge rather than shared or disseminated it to each other in a unilinear fashion. They are both active 'agents' as they are dynamically engaged in the generation of knowledge (Bebington 1994, p. 88). Hence, in this thesis, I postulate the notion of 'textholder' as a new collective role of agricultural

specialists and farmers, as opposed to their traditional, hierarchical role as knowledge generators and end-users respectively. By textholder, I am referring to one who has causal power or capacity to actively engage in the generation of knowledge. Power is viewed here as one's will and a strategy to achieve outcomes. It is not something that is earned, as viewed by traditional extension theory. As what van den Ban & Hawkins (1996, p.11) say, one of the objectives of agriculture extension is to empower farmers to become critical and capable of making decisions for their farms. This thesis, however, unpacks that farmers are not passive dupes. Results of the data analysis indicate that they have played an active role in knowledge production via SMSing (see discussion in Chapter Five). They did not not just passively receive information, but they dynamically participated in the exchanges of information useful in the generation of the desired knowledge. Hence, it can be inferred that power is a resource rather than an output in the production of agricultural knowledge. Another important element in SMSing, as revealed in this study, is the discursive condition that governs the knowledge production. Agricultural extension cannot be simply viewed as a linear communication, that is, as a simple process of transmitting information from a source to a receiver. It is a discursive action. In the course of their interaction as in the case of SMSing, farmer and agricultural specialist have drawn some rules and resources that constitute the system of their productive interaction. These rules and resources, in the case of this study, include the following: technical (referring to the effect of the technical design of mobile phone), socio-cultural (normative behaviours), agronomic (the emergent issues occurring on the farm), and psychological (issue of trust).

Finally, this thesis posits that the meaning of agricultural knowledge varies, and is accorded different meanings depending on its use to the user (p.47). As Richards (1994, p.169) notes, knowledge is socially differentiated; it is highly dependent on the social structure and cultural norms where it is used. An example of this socially differentiated meaning of knowledge in the SMS data analysed is the meaning of rice variety. As reported, 'which rice variety to grow' was the mostly frequently asked topic received by the Farmers' Text Centre. Identification of what variety to grow varies depending on the farmer's requirements. Some of the requirements revealed in the SMS data are yield potential, pest resistance, varietal maturity, location, and eating quality (see Chapter 5.2.).

8.2. Dichotomizing SMSing and extension

To better understand the implication of SMSing in agricultural extension, I have summarized the salient features of SMSing against extension based on the results of this study. I do not however intend dichotomizing them to create division or judge their legitimacy against each other. I use dichotomizing as a heuristic device to understand the unique characteristics of SMSing as an emerging practice and see its relationship with or better yet its integral role in agricultural extension. This study argues that SMSing is integral to rather than a replacement of agricultural extension.

8.2.1. Extension is a series of carefully planned and rational acts; SMSing is contingent, informal process.

While agricultural extension requires 'carefully planned and rational acts' to address farming issues (Scoones & Thompson 1994, p. 4), it cannot be denied that some of the farming issues are emergent that require quick, contingent solutions. SMS offers great potential in providing farmers with a readily available platform or sort of a lifeline that they can rely on when things go wrong on their farm. Although there may be some extension-information materials available in their houses, these may contain general information which may not be relevant to their specific queries. Moreover, extension workers are not present at all times in their midst to answer them. But with a cellphone at hand, farmers can get quick, even first-hand advice from real experts. Farmers also do not have to worry about going through the bureaucratic process and the formality of the extension system. It only takes them a few keystrokes to type and send their queries at a reasonable cost, and they get the answer right away. Also, the manner by which SMS exchanges is facilitated uses informal, layman's language, not to mention acronyms and shortened texts not just to maximise the limited phone space but also to allow fast communication. The interaction is likewise casual and less rigid unlike in extension, which is driven by a rigorous scientific procedure (example of which are the Farmer's Consultation, Focus Group Discussion, and Farmers' Field School). Although novel extension modalities, such as the ones mentioned, have employed participatory techniques to privelege everyone's voice, the formality and structure imposed on them scare or constrain some of the participating farmers. In SMSing, farmers avoid the personal or crowd encounter

as well as the formal Q&A structure to raise their queries. SMSing offers greater room for a loose, congenial, and genuine interaction. It can be akin to a community with a gemienschaft kind of social relationship where one drops in, has a friendly chat (sometimes to a stranger), argues about some issues, and receives some advice on a problem (Rheingold as cited by Jones 1997). This capacity of SMSing to generate knowledge in an informal, less structured setting allows the production of practical, appropriate farm solutions. SMSing does not follow the conventional communication format with the 'when, where, and what' requirements. It can occur anytime and anywhere as the need arises. The topic is dependent largely on the texting individuals, and the flow of the communication is structured not by the structure of any adoption or diffusion frameworks but by the natural flow of the exchanges of text messages, which are primarily based on the individuals' personal experience and knowledge.

8.2.2. Extension is knowledge sharing; SMSing is a mode of knowledge production.

Agricultural extension programs generally no matter how they have been presupposed to be adaptive, 'participatory', or a two-way process still operate in the same pattern as the traditional technology adoption (Long & Villareal 1994; p.51; Cornwall, Guijit, & Welbourn, 1994, p. 103). They have pre-envisaged input and output that are perceived in a unilinear fashion. Issues in farming, however, are highly complex and variable. Some issues are predictable and are easy to manage; others are not. Some of them require long-term solutions and others need quick ones.

While extension programs are tailored to respond to the needs of the farmers, these are mostly carried out with long-term goals. An example of this is the Philippine Rice Self-Sufficiency Program set for five years from 2009-2013, as mentioned in Chapter 1.5..

There are however contingent, pressing issues on the farm that need immediate answers. Extension though has some mechanisms to address contingent, pressing farm issues. Examples of these mechanisms are the Farmers' Consultation and office visits to the local extension worker or walk-in consultations to local extension workers. But these are very structured and bureaucratic, and hence can be slow in responding to the farmer's queries. SMSing provides quick solutions to a farmer's contingent, pressing farm issues. Based on the experience of the Farmer's Text Centre, the use of SMS can offer farm solutions within 5 minutes. SMSing also offers a dynamic discursive platform where information fed is not necessary fixed knowledge (output) passively shared but also an input that facilitates discussion and eventually production of a more useful, appropriate knowledge or a solution to the concern of the texting individual. SMS has a dynamic feature that faciliates interaction through exchanges of text messages in an unstructured manner as earlier discussed.

8.2.3. In extension, knowledge is shared based on empirical evidence and face value; in SMSing, knowledge is acquired based on trust and abstract system.

In agricultural extension, knowledge is commonly shared via personal means where agricultural extenionist engages in face-to-face interaction with the farmer-

clients. The most common extension modality is the Farmer' Field School where farmers attend a series of lessons coupled with actual work on the field. Farmers see what they have to learn through field demonstration. Knowledge is generated not only as a discursive but also a practical accomplishment. SMSing, on the other hand, operates through an abstract system distanciated by time and space (as discussed in Chapter 7.2.). Knowledge is produced through SMS exchanges transmitted via electronic means. The mode of production is highly based on trust, as discussed in Chapter 7.2.1.. The texters dont see each other, but they believe that they engage in a production interaction. But unlike Farmers' Field School, SMSing allows knowledge access regardless of time and space. Farmers can communicate with agricultural specialists anytime and anywhere through SMS.

8.2.4. Extension is based on local conditions; SMSing is held in varied time and space.

Extension is focused on dealing with the production and application of local and practical knowledge, while SMSing is dealing with the production and distribution of a mediated and socially and culturally differentiated knowledge, as demonstrated in Chapter 5.2.. SMSing is a complex process as it deals with the issue of time and space distanciation as well as the complexity of social backgrounds of the individuals involved. The Farmers' Text Centre, for instance as reported in Chapter 4.2., caters to a wide range of clients coming different parts of the country with different needs, background, and language.

8.3. Reconstructing agricultural extension

In the light of today's condition characterized by the distanciation of space and time brought about by new media, agricultural extension needs reconstructing to expand its meaning and function beyond technology transfer. Technology transfer, as discussed in Chapter 1.5., is a limited paradigm, as it only focuses on the technical delivery of agricultural technologies to the farmers' clients. As demonstrated in this research, agriculture is a social praxis rather than a technical exchange of knowledge. It is part of the complex, on-going social process where it operates. Results of this study reveal that the new form of temporal and spatial social order brought about the SMS technology has created a significant impact on rice cropping (agricultural production), knowledge production (agriculture extension), and the farmers' everyday life (culture). Farm work is no longer accomplished within the local conditions and resources, but it now operates with social influences from faraway. By SMSing, farmers can acquire knowledge they need to efficiently accomplish tasks on the farm regardless of time and space. Knowledge acquired is negotiated rather than a strict recommendation by an agricultural specialist. SMSing was found to be an effective site of knowledge construction. It is informal, readily available anytime for use, and quick. Not only that, it has an interactive mechanism that allows an active exchanges of messages required for the production of knowledge or solutions.

Some factors were identified central to the use of SMS for knowledge production. Mentioned earlier in Chapter 5.3, these are: 1) social (referring to interaction constituted by the discrepancies of social interests, values, power, and knowledge

of individuals involved); 2) technical (infrastructure or technological glitches); 3) psychological (referring to the issue of trust); and 4) agronomic (referring to the complex local conditions on the farm).

The current agricultural extension especially in the Philippines still embraces the old paradigm. As reflected in the country's Food Sufficiency Program (2009-2013), it can be said that the agricultural extension of the Philippines can still be defined as operating through a 'transportation information framework' (see Chapter 1.5.). Although it has employed some participatory approaches, it is defined and measured within the terms and logic of scientific rationality.

This thesis proposes a social constructivist framework, highlighting human agency, power, and discourse as constitutive of agricultural extension. Moreover, this thesis has legitimatized the significance of SMSing as an agricultural extension platform. As mentioned above, SMS possesses several characteristics that allow an active, productive interaction necessary for the production of agricultural knowledge useful for the farm. Moreover, this thesis reveals that the nature of agricultural knowledge is highly contingently shaped and reshaped by several discursive conditions, such as agronomic, political, cultural, and environmental. SMS has a mechanism to address this highly variable knowledge requirement.

Table 10 summarizes the discussions of the contrasting views of agricultural extension underscored in this thesis. Both views are valid, and deserve an equal treatment in the discourse of agricultural extension. I have highlighted the

constructivist view in this thesis. It does not mean however putting a lower premium on the other view. As put forth in Chapter Two, this thesis embraces the multiplicity of meanings. The intention of this thesis is to illustrate the constitutive role of the SMS technology in the production of meaning, especially of agriculture where the technology operates.

Table 10. Positivist vs social constructivist view of agricultural extension

	Mainstream View (Positivist)	Alternative View (Social constructivist)
Meaning	• Extension as technology transfer • Agricultural knowledge as singular, static, and standard • Scientist as technology generator; Farmers as technology users/adopter	• Extension as social praxis • Agricultural knowledge as multiple, contingent, and situated • Farmers and scientists as co-creators of knowledge
Mode of knowledge production	• Knowledge as a shared knowledge by scientist and farmers, yet measured using the scientific rationality • (Im)personal	• Knowledge as negotiated produced through the interplay of human agency, power, and discourse • Impersonal, trust
Objective/Function	• Knowledge transfer/sharing; empowerment	• Knowledge creation; facilitation
Process	• Unidirectional, formal/structured, hierarchical	• Interactive, informal/unstructured

8.4. Optimizing the potentials of SMSing in agricultural extension in the Philippines

This thesis provides insights into the role of the SMS technology in agriculture with analysis highly inspired by Giddens' work on social structuration. It provides an empirical evidence of the Gidden's theoretical claim of new media (SMS in this case) as constitutive of the on-going process of social structuration with agriculture being the social system investigated.

In summary, results of this study indicate that SMSing is more than simply information sharing – it is part of the farmers' way of life. The technology is found to be central to the efficient accomplishment of farm activities all year round at various crop stages. Farmers found it to be useful in addressing emergent issues on the farm especially on topics such as rice varieties, pest & diseases, and nutrient. Moreover, the SMS technology shows a great potential as an effective extension platform because it allows an interactive manner for the production of solutions on farm issues. Unlike in mainstream agricultural extension such as the Farmers' Field School, in SMSing farmers can consult with agricultural scientist regardless of space and time. This thesis also demonstrates that SMSing is a social praxis rather than a mere information tool. This social character of SMSing is particularly evident at the household relation, which as revealed in the analysis becomes significantly instrumental in the accomplishment of farm work. The role of the juvenile particularly emerges to be an important element in the effective use of new media in farming.

Moreover, this thesis also reveals that the use of SMS in agriculture must take into account the interplay between human agency (the people involved), power (their will and strategies of achieving outcomes), and discourse (a set of conditions that govern their interaction).

Analysis of this thesis, however, is only based on the experience of the Farmers' Text Centre implemented by PhilRice. A number of SMS-based agricultural programs are now being implemented in the country. A comprehensive, complementary research is proposed to provide more empirical grounding that would substantiate the analysis of this thesis.

Based on the findings of this thesis, the following are recommended to fully optimize the full potential of SMSing in agricultural extension:

Improving SMS infrastructure. Disruptions or delays in SMS response due to technological glitches have appeared to be a stumbling block in SMSing. A technological glitch can either be encountered when the mobile phone is clogged, or when the phone runs out of memory, or when the network experiences heavy SMS traffic (Pascual *et al.*, 2010). In the case of the Farmers' Text Centre that uses a web-based SMS platform to answer SMS queries, a glitch is either caused by technical (i.e., the network connectivity is down or the systems/software has problems) or ecological (caused by heavy rains and typhoons) problems (ibid). Delay is also caused by the different timetable of the Farmers' Text Centre and the clients. The Centre operates everyday but not around the clock. Reports,

however, indicate that the Centre has received text messages beyond its operational hours.

Serious investment must be made for the establishment and maintenance of a stable infrastructure. An intensive campaign must be done to orient and educate mobile phone users in the farming communities of the technical logic of mobile phones and how to manage basic phone problems, such as clogging and system bug down. Provision of 24/7 SMS service must be considered. An automated response has to be put in place during idle hours.

Capacity enhancement for extension workers. Most if not all of the agricultural extension workers (in the Philippines) were installed into office long before the advent of the modern communication technologies, such as SMS. In addition, their training or knowledge must have been still on the traditional paradigms of extension delivery. A retooling must be conducted to orient them with the complexity of modern society brought by modern technologies and equip them with new theories and methods. As recommended in this study, extension workers must play the 'textholder' role in that they are not simply knowledge disseminators but are contributors of knowledge in the production of agricultural solutions for farm issues via SMSing. As 'textholders', extension workers must learn the conventions and language used in SMSing.

Everyday as analytical framework for agricultural extension. Everyday life as revealed in this study is a site where meanings and impacts reside. The SMS technology, for instance, has been routinized in the farmer's everyday life and has

played a significant role in the reproduction of social practices and opportunities. Agricultural extension should not be strictly defined and carried out with a standard set of variables. As demonstrated by this thesis, meanings are made manifest through people's (farmers', in this case) methods of living their everyday life. Hence, an ethnomethodological approach must be employed as an agricultural research and development tool.

Accommodation of the constructivist view of agricultural extension. Agriculture is a highly dynamic and complex system. Situations at the farm level, for instance, are extremely unstable, continuously affected by not just agronomic but also political and environmental factors. Agricultural knowledge, therefore, should not be perceived as a set of standard practices, advisories, and recommendations, and measured using a universal, positivistic framework. Several realities on the farm are multiple and sometimes contrasting. Besides, they are not simply produced from nothing, but they are constructed and reconstructed by the people who are directly involved with them. Hence, it is proposed that agricultural extension must be seen as a social construction rather a strict rational system of knowledge production and distribution. SMSing shows great potential as a platform that allows active social construction of knowledge. Efforts to enhance the SMS operation must be done, such as development of conventions and practices that will facilitate a smooth and effective flow of knowledge production in SMSing.

Farmer's children and wives as support-actors in agricultural development. As revealed in this study, farmers' children and wives play an active role in SMSing. Although they are not directly involved in the agricultural work on the farm, their

intermediary role in SMSing has facilitated the accomplishment of the farmer's work. Agricultural extension should take into consideration this intermediary role when designing and implementing programs. Better yet, a household approach must be explored as a strategy of agricultural extension. By household approach, I mean leveraging the potentials of the household members to take part in agricultural development. Agricultural extension is always zeroed in on farmers per se. Realities on the ground indicate that everyday life on the farm is a collective rather than an individual effort.

BIBLIOGRAPHY

Acision 2010, 'Acision powers the world's first convergent fixed-mobile voice service at Globe Telecom Philippines: a case study', viewed 26 2011 <www.acision.com>.

Agriculture and fisheries modernization act or AFMA (Republic act no. 8435), 1997, viewed 24 September 2011 <http://www.da.gov.ph/images/PDFFiles /LawsIssuances/RA/afma.pdf>.

Antonio, H 2011, 'Phoning in farming: economic benefits of rice farmers in the Philippines from mobile phone Use', MS thesis, Wageningen University and Research Centre, The Netherlands.

Arnold, W 2000, 'Manila's talk of the town is text messaging', viewed 26 October 2011 <http://partners.nytimes.com/library/tech/00/07 /biztech/articles /05talk.html>.

Asis, ORM, Pascua, SNS, Domingo, OC, Baliuag, MA, Barroga, LJ, Cordova, Jr JAE., Maamo, ES, Maloles, JS, Orejudos, RD, Billano, JLC, Dela Cruz, JP, & Rodriguez RG 2010, 'PhilRice farmers' text center', *Philippine rice r&d highlights 2010*, Philippine Rice Research Institute, Maligaya Science *City* of Muñoz 3119, Philippines.

Ashton, TS 1948, 'The industrial revolution (1760-1830), New York: Oxford University Press.

Arthur, S & Nazroo, J 2003, 'Designing fieldwork strategies and materials', in Lewis, J & Ritchie, J 2003, *Qualitative research practice: a guide for social science students and researchers*, SAGE Publications: London.

Balderema, O, Temanel, B, Domingo, L, Domingo, A, Lazaro, L, Camba, E, Gaspar, M, Rebong, D, Gawat, N, Sudio, E, Baldovino, R, Flores, B Jr 2009, 'Isabela cyber community', *The open academy for Philippine agriculture: an innovation in accessing modern agricultural technologies*, Philippine Rice Research Institute, Maligaya, Science City of Munoz, Philippines, pp.113-118.

Barangay Caganganan 2011, 'Barangay Caganganan development plan (2009-2013),' Barangay Caganganan, Banaybanay, Davao Oriental, Philippines.

Barroga, R 2006, 'The open academy for Philippine agriculture program', a powerpoint presentation, Philippine Rice Research Institute, Maligaya, Science City of Munoz, Philippines

Barroga, R 2009a, 'Operational map of the open academy for Philippine agriculture program (2003-2008)', in *The open academy for Philippine agriculture: an innovation in accessing modern agricultural technologies*, Philippine Rice Research Institute, Maligaya, Science City of Munoz, Philippines, pp.32-33.

Barroga, R, 2009b, 'Development of an SMS-based rice seed stock inventory system for rice farmers', *An accomplishment report*, PAN Asia Networking Project of the International Development Research Centre (IDRC).

Bell, G 2005, 'The age of the thumb: a cultural reading of mobile technologies from Asia', in Glotz, P, Bertschi, S, Locke, C (eds.) 2005, *Thumb culture: the meaning of mobile phones for society*, Transaction Publisher, New Brunswick (USA) and London (UK).

Bureau of Agricultural Statistics (BAS) 2011, 'Philippine agriculture in figures', Bureau of Agricultural Statistics (BAS), Philippines, viewed 15 October 2012, < http://countrystat.bas.gov.ph/?cont=3>.

Car, N, Christen, E, Hornbuckle, JW, & Moore, GA 2012, 'Using a mobile phone short messaging service (SMS) for irrigation scheduling in Australia – farmers' participation and utility evaluation', in *Computers and Electronic in Agriculture*, Elsevier BV, 84 (2002), pp. 132-143.

Castillo, G 1979, *Beyond Manila: Philippine rural problems in perspective*, International Development Research Centre: Canada.

Catudan, B 2009, 'Ilocos Norte cyber community', in *The open academy for Philippine agriculture: an innovation in accessing modern agricultural technologies*, Philippine Rice Research Institute, Maligaya, Science City of Munoz, Philippines, pp. 102-112.

Chandler, D 1995, 'Technological or media determinism', viewed 24 February 2010, < http://www.aber.ac.uk/media/Documents/tecdet/tecdet.html>

Charmaz, K 2008, 'Grounded theory as an emergent method', in Hesse-Biber, SN & Leavy, P 2008, *Handbook of emergent methods*, The Guilford Publications, Inc: New York.

Colombo, M 2004, 'Theoretical perspective in media-communication research: from linear to discusive models', in *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *5*(2), Art. 26, viewed 14 April 2012, <http://nbn-resolving.de/urn:nbn:de:0114-fqs0402261>.

Cornall, A, Guijit, I, & Welbourn, A 1994 'Acknowledging process: methodological challenges for agricultural research and extension' in *Beyond farmer first: rural people's knowledge, agricultural research and extension practice*, Intermediate Technology Publications Ltd, London, p.98.

Creswell, JW 2007, *Qualitative inquiry & research design: choosing among five approaches (2nd ed)*, Sage Publication: USA.

Department of Agriculture. 2009. The Philippine rice masterplan 2009-2013: enhancing provincial rice self-sufficiency, Department of Agriculture.

Department of Agriculture (DA) 2010, 'Profile of the Philippine agriculture', viewed 13 April 2010, <http://www.da.gov.ph/newindex2.php?pass=about/profile. Htm>.

Dhamaja, A & Medury, U no date. 'Information and communication technology in the globalization era: the socio-economic concerns', Faculty of Public Administration Indira, Gandhi National Open University, New Delhi, India.

Dewdney, A & Ride, P 2006, *The new media handbook*, Routledge 2 Park Square, Milton Park, Abingdon, Oxon.

Drinkwater, M 1994, 'Knowledge, consciousness, and prejudice: adaptive agricultural research in Zambia', in Scoones, I & Thompson, J 1994 (eds), *Beyond farmer First: Rural people's knowledge, agricultural research and extension practice*. Intermediate Technology Publications Ltd, London, p.33.

Fetterman, D 1989 *Ethnography: step by step,* California: SAGE Publications.

Finch, H & Lewis, J 2003, 'Focus groups', in Lewis, J & Ritchie, J, 2003, *Qualitative research practice: a guide for social science students and researchers*, SAGE Publications: London.

Flew, T 2005, *New media: an introduction (2nd ed),* Oxford: Oxford University Press, pp. 20-39.

Flor, A 2001, 'ICT and poverty: the indisputable link', paper presented at the Third Asia development forum on 'regional economic cooperation in Asia and the Pacific', Asian Development Bank, Bangkok, 11-14 June 2001.

Fortunati, L, 2005. 'The mobile phone as technological artefact', in Glotz, P, Bertschi, S, Locke, C (eds.) 2005, *Thumb culture: the meaning of mobile phones for society,* Transaction Publisher, New Brunswick (USA) and London (UK).

Gandhi, S, Mittal, S, & Tripathi, G 2009, 'The impacts of mobiles on agricultural productivity', in *India: the impact of mobile phone,* a policy paper series, Vodafone Group Ptc, January 2009, pp. 21-33.

Garfinkel, H 1967, *Studies in ethonomethodology*, New Jersey: Prentice-Hall.

Gauntlett, D 2002, *Media, gender, and identity,* London: Routledge.

Geser, H 2004 2005, 'Towards a sociological theory of the mobile phone', University of Zürich, viewed 12 September 2005, <http://socio. ch/mobile/t_geser1.htm>.

Giddens, A 1984, *The constitution of society: outline of the theory of structuration,* Cambridge: Polity Press.

Giddens, A 1990, *The consequences of modernity,* Polite Press, Cambridge, UK.

Giddens, A 1991, *Modernity and self-identity: self and society in the late modern Age,* Cambridge: Polite Press.

Gonzales, DM, Sanchez, GC, Guinto, RN, Maliwat, JQ, Baustista, ND, Baltazar, RG, & Salenga, E 2009, 'Pampanga cyber community' in *The open academy for Philippine agriculture: an innovation in accessing modern agricultural technologies,* Philippine Rice Research Institute, Maligaya, Science City of Munoz, Philippines, pp. 134-157.

Golinksie, Jan 1998, *Making natural knowledge: constructivism and the history of science,* Cambridge University Press, United Kingdom.

Gragasin, M & Kikuchi, M 1997, *Land, labor, and livelihood in a frontier rice village in the Philippies during the green revolution period*. Tech. Bul. Fac. Hort. Chiba University.

Handel, W 1982, *Ethnomethodology: how people make sense*, New Jersey: Prentice-Hall Inc. Englewood Cliffs.

Have, P 2004, *Understanding qualitative research and ethnomethodol*ogy, London: Sage.

Hilario, F 2009, 'Climate variability and trends in the Philippines,' a paper presented during the National workshop on adaptation to Climate change in the Philippines, 19 October 2009, Torre Venezia Hotel, Philippines.

Humphreys, L 2005. 'Cellphones in public: social interactions in a wireless era', *New media society*, vol. 7, no. 6, pp. 810-833.

International Telecommunication Union 2010, 'The world in 2010: ICT facts and figures', viewed 25 September 2011 <http://www.itu.int/net/itunews/issues/2010/10/04.aspx>.

Kikuchi, M & Hayami, Y 1983, 'New rice technology, intrarural migration, and institutional innovation in the Philippines' in *Population and Development Review*, Population Councl, <http://www.jstor.org/stable/1973051 dated 08/04/2010.>, vol. 9, no. 2, pp. 247-257.

Krogh, Gv, Ichijo, K, & Nonaka, I 2000, *Enabling knowledge creation: how to unlock the mystery of tacit knowledge and release the power of innovation*, Oxford University Press, New York.

Legard, R, Keegan, J, & Ward, K 2003, 'In-depth interviews', in Lewis, J & Ritchie, J 2003, *Qualitative research practice: A guide for social science students and researchers*, SAGE Publications: London.

Leeuwis, C 2004, *Communication for rural innovation: rethinking agricultural extension (3rd ed)*, Blackwell Science Publishing, UK.

Long, N & Magdalena, V 1994, 'The interweaving of knowledge and power in development interfaces', in Scoones, I & Thompson, J 1994 (eds), *Beyond farmer First: Rural people's knowledge, agricultural research and extension practice*. Intermediate Technology Publications Ltd, London, pp. 41-52.

Malabanan, F 2006. 'Hybrid rice commercialization in the Philippines', presented at the Asian seed conference 2006, Kuala Lumpur, Malaysia, 12-15 November, viewed 30 March 2013, < http://www.apsaseed.org/docs/1172655e/Hybrid _Rice_Philippines2.pdf>.

Malasa, RB, Velayo, MC & Francisco, SR, & Quilang EJP 2006, 'Rice-based farm household information and communication technology status', Philippine Rice Research Institute (PhilRice), Maligaya, Science City of Munoz, Nueva Ecija, Philippines.

Manobi 2012, 'Manobi launches in Segegal a free-access SMS market information services', viewed on September 2012, < http://www.manobi.sn/sites/za/index. php?M=9&SM=20&Cle=54>.

Martin, LH, Gutman, H, & Hutton, PH 1988, *Technologies of the self: a seminar with Michel Foucault,* The University of Massachusetts Press.

Mathias, P & Davis, J (eds) 1996, *Agriculture and industrialization: From the 18th century to present*. Cambridge: Blackwell Publisher Ltd.

Matose, F & Mukamuri, B 1994, 'Rural people's knowledge and extension practice: trees, people, and communities in Zimbabwe's communal lands', in Scoones, I & Thompson, J 1994 (eds), *Beyond farmer First: Rural people's knowledge, agricultural research and extension practice*. Intermediate Technology Publications Ltd, London, pp. 69-75.

McHoul, A & Grace, W 1993, *A Foucault primer: discourse, power, and the subject*, Melbourne University Press, Australia.

Mills, S 2003, *Michel Foucault*, Routledge, London and New York.

Moores, S 2000, *Media and everyday life in modern society*. Edinburgh: Edinburgh University Press LTD.

National Economic and Development Authority (NEDA), 2004, 'Medium-term Philippine development plan 2004-2010', National Economic and Development Authority (NEDA), Manila, Philippines.

National Statistics Office 2010, 'the Philippine 2010 census of population and housing reveals the Philippine population at 92.34 million', viewed 11 June 2013, < http://www.census.gov.ph/content/2010-census-population-and-housing-reveals-philippine-population-9234-million>.

Pascual, SN 2009, 'Pinoy farmers' text centre and its accomplishment, in *The open academy for Philippine agriculture: an innovation in accessing modern agricultural technologies,* Philippine Rice Research Institute, Maligaya, Science City of Munoz, Philippines, pp. 79-84.

Pascual, SN, Zagado, R, Asis, OR, Domingo, O, & Maloles J 2010, 'Enhancing knowledge networking through short messaging service: the farmers' text centre experience', paper presenred at the 40th Crop science society of the Philipoines (CSSP) conference, Grand Regal Hotel, Davao City, Philippines, 15-20 March 2010.

Philippine Rice Research Institute (PhilRice) 2005, 'Question & answers on varieties and seeds', PhilRice brochure, Philippines.

Philippine Rice Research Institute (PhilRice) 2009, *The open academy for Philippine agriculture: an innovation in accessing modern agricultural technologies,* Philippine Rice Research Institute (PhilRice), Maligaya, Science City of Munoz, Philippines.

Philippine Rice Research Institute (PhilRice) 2010, 'Farmers' text centre data', Philippine Rice Research Institute (PhilRice), Maligaya, Science City of Munoz, Philippines.

Pigg, SL 1992, 'Inventing social categories through place: social pepresentations and development in Nepal', in *Comparative studies in society and history*, vol. 34, no. 3, pp.491-513, viewed 26 March 2010 <http:www.jstor.org/stable /178849 on 26/03/2010>.

Pertierra, R 2005, 'Mobile phones, identity, and discursive intimacy', in *Human Technology: an Interdisciplinary Journal on Humans in ICT Environments*, vol.1, no.1, pp.23-44, viewed 15 January 2012, < http://www.humantechnology. jyu.fi/articles/volume1/2005/pertierra.pdf>.

Pertierra, R, 2009, 'Technologies of transformation: the end of the social or the birth of the cyber network?', in Alampay, E 2009, *Living the information society in Asia*. ISEAS publishing, Institute of Southeast Asian Studies, Singapore & International Development Research Centre, Canada.

Pretty, JN & Chambers, R 1994, 'Towards a learning paradigm: new professionalism ans institution for a sustainable agriculture', in Scoones, I & Thompson, J 1994 (eds), *Beyond farmer First: rural people's knowledge, agricultural research and extension practice*. Intermediate Technology Publications Ltd, London, p.190.

Paul Budde Communication 2011, 'Philippines - telecoms, mobile, broadband and forecasts', viewed 27 October 2011 <http://www.researchandmarkets.com /reports/1934734/philippines_telecoms_mobile_broadband_and>.

Poate, D 2010, 'Study on potentials of mobile phones in investment and development projects: a working paper', Food and Agriculture Organization of the United Nation – Rome Investment Centre Division.

Qiang, CZ, Kuek, SC, Dymond, A & Esselaar, S 2011, 'Mobile applications for agriculture and rural development', World Bank (ICT Sector Unit), Wasington DC, USA.

Reseach On Asia (ROA) Holdings 2008, 'Philippines mobile market overview & 2007-2010 forcast', viewed 25 june 2011 http://www.researchand markets.com/ reports/1546309/philippines_mobile_market _overview_and_20072010.

Rheingold, H 2000, *The virtual community: homesteading on the electronic frontier (rev. Ed)*, London: MIT Press.

Richards, P 1994, 'Local knowledge formation and validation: the case of rice in Central Sierra Leone', in Scoones, I & Thompson, J 1994 (eds), *Beyond farmer First: rural people's knowledge, agricultural research and extension practice*. Intermediate Technology Publications Ltd, London, pp: 165-170.

Ritchie, J, Lewis, & Elam, G 2003, 'Designing and selecting samples', in Lewis, J & Ritchie, J 2003, *Qualitative research practice: a guide for social science students and researchers*, SAGE Publications: London.

Rogers, E 1983, *Diffusion of innovations (3rd ed)*, The Free Press: New York.

Roman, AG 2006, 'Texting God: SMS & religion in the Philippines', in *Journal of the Asian Research Centre for Religion and Social Communication*, vol.

3, no. 1, viewed 11 August 2011 <http://www.stjohn.ac.th/arc/texting %20god.pdf>.

Saliot, AP 2012, 'Role of rural advisory service in the Philippine innovation system,' paper presented at the the 3rd global forum on rural advisory services, Manila, Philippines, 26-28 September 2012.

Scoones, I & John, T 1994, 'Knowledge, power, and agriculture – towards theoretical understanding,' in Scoones, I & Thompson, J 1994 (eds), *Beyond farmer first: rural people's knowledge, agricultural research and extension practice*. Intermediate Technology Publications Ltd, London, pp.16-32.

Scoones, I & Thompson, J (eds)1994, 'Beyond farmer first: rural people's knowledge, agricultural research and extension practice', Intermediate Technology Publications Ltd, London.

Silverman, D 2006, *Interpretive qualitative data: methods for analyzing talk, text, and interaction* (3rd ed), SAGE: London.

Saludadez, JA 2004, 'Research collaboration stories: communication as constitutive of temporary organization', PhD thesis, Universiti Putra Malaysia, Malaysia.

Telenor 2012, 'CellBazaar – marketplace in your pocket', viewed 10 July 2012, < http://www.telenor.com/corporate-responsibility/initiatives-worldwide/ cellbazaar -marketplace-in-your-pocket/>.

Tesch, R 1990, *Qualitative research: analysis types and software tools*, UK, USA: The Falmer Press.

Moerman, M 1974, 'Accomplishing ethnicity', in Turner, R (ed) 1974, *Ethnomethodology: selected readings*, Harmondsworth : Penguin Education.

van den Ban, AW & Hawkins, 1996, *Agricultural extension (2nd ed)*, Blackwell Science Ltd.

Vergara, B & Banta,(eds) 2004, *Philippine rice centennial: research & development*, Philippine Rice Research Institute (PhilRice), Maligaya, Science City of Munoz, Philippines.

Williams, R 1990, 'The technology and the society', in Bennett, T (ed), *Popular fiction: technology, ideology, production, reading*, London: Routledge, pp. 9-12.

Willis, JW 2007, *Foundations of qualitative foundations: interpretive and critical approaches*, SAGE Publication, Inc.: USA.

Winarto, YT 1994, 'Encouraging knowledge exchange; integrated pest management in Indonesia', in Scoones, I & Thompson, J 1994 (eds), *Beyond farmer First: Rural people's knowledge, agricultural research and extension practice*. Intermediate Technology Publications Ltd, London, pp. 150-154.

Yabes, S 2008, *Palaycheck; field operation manual (planning and implementing the palaycheck system)*, Philippine Rice Research Institute (PhilRice), Philippines.

Zainudeen, A, Samarajiva R & Sivapragasam, N 2011, 'CellBazaar: enabling m-commerce in Bangladesh', in *Mobile Telephony* (special issue), USC Annenberg School for Communication & Journalism, vol. 7, no.3, pp. 61-76.

Zagado, R 2006, Farmers' constructions of information and communication technologies (ICTS), MS thesis, University of the Philippines Los Banos, Philippines.

Zagado, R 2009, 'ICT applications in Philippine agriculture: experiences and lessons,' paper presented at the 20th Federation of Crop Science Societies of the Philippines (FCSSP) Conference, Silliman University, Dumaguete City, Philippines, 17-22 May 2009.

APPENDICES

Appendix A. List of research participants in Barangay Caganganan, Banaybanay, Davao Oriental, Philippines

Name	Source of livelihood	Age	Gender	Access to ICT equipment						ICT Use					
				Cellphone			Computer with Net			Cellphone			Computer with Net		
				A	B	C	A	B	C	A	B	C	A	B	E
1. Wilie H. Cadagat	Farmer	40	Male	/	/				/	/	/			/	/
2. Ruel C. Regasajo	Farmer	37	Male	/	/			/		/	/			/	/
3. Corazon B. Sibongga	Farmer	55	Female		/			/			/			/	/
4. Jose M. Lusocon	Farmer	52	Male		/			/			/				/
5. Rennuel Amar	Farmer	36	Male		/			/			/			/	/
6. Elizabeth Dimpas	Farmer/Barangay Captain	46	Female	/	/				/	/				/	/
7. Carmelita D. Nodora	Farmer	56	Female		/				/	/	/			/	/
8. Girlie p. Garcia	Farmer	38	Female		/				/		/				/
9. Maty F. Doy	Farmer	56	Female	/					/	/				/	
10. Aida Respesyo	Farmer	43	Female	/						/					
11. Delia Magsoling	Farmer	48	Female	/						/					/
12. Willie Llagono	Farmer	40	Male	/						/					/
13. Celso Lasukon	Farmer	48	Male	/					/	/					/
14. Ricarte B. Duot	Farmer	54	Male						/						/
15. Nestor Abarco	Farmer	52	Male	/											
16. Hermas Matias	Farmer	70	Male	/					/	/					/
17. Eden M. Flores	Farmer	43	Female	/					/	/					/
18. Renelibeth Joy Sayson	Farmer/Brgy Councilor	23	Female	/					/						/

LEGEND: A – Personal/Self; B – Family member (kids); C – Neighbour; E – Barangay Computer Operator

Appendix B. Human research ethics project protocol

PARTICIPANT INFORMATION SHEET

My name is Ronan Guanzon Zagado. I am a 30-year old, Filipino student enrolled in the Doctor of Philosophy Program in Media Studies at the University of Adelaide, Australia. As a major requirement of my postgraduate program, I will do a research project titled "Construction of Cyber Community: An Ethnomethodological Study of Rice Farmers Participating in the Cyber Community Project in the Philippines". The Cyber Community Project is an agricultural development initiative in the Philippines that uses Information and Communication Technologies (ICTs) such as the Internet and cellular phone to facilitate effective delivery of agricultural information and services to farmers. I have learned that you or members of your family are active participants in the Cyber Community Project, so I would very much like to discuss this with you in more detail.

In the study, I am interested to learn your views about and experiences with the Cybercom Project, especially the use of ICTs in your working life. Some of the questions I will ask to you in the interview are: How is it like using ICTs in your daily work? How have you used them to help in your farming? These are just some of the questions I am interested in asking. I would greatly appreciate it if you could freely share with me your experiences, and talk about your own thoughts and opinions on this subject, because my study aims to document and privilege your stories. Anything you share with me will be kept strictly confidential and anonymous. I will not report your words to others in a way that would let them identify you.

Aside from interviews, I will also document your everyday activities through photographs and videos to help me understand the dynamics of people living in the so-called cyber community. Aside from the farmers, I may also interview other members of the cyber communities such the farmers' wives and children, their neighbours, the extension workers, the agricultural scientists, and anyone who participated in any of the Cybercom activities conducted by the sponsoring-agencies (for example, the Philippine Rice Research Institute (PhilRice)).

I believe this study is valuable as it will give us important information about how you and others in your community perceive the impact of ICTs on your lives. Moreover, using the result of this study, I aim to make important recommendations on how ICTs can be effectively used by farmers in accessing agricultural technologies and services provided by the government and non-government organizations in the Philippines and internationally.

If you are willing to participate, I would be very happy if you could please sign the attached consent form. On the consent form, a space is provided for you to write down any restrictions you might wish to add during the interview or field observation. Please note that you are free to change your mind or views, or withdraw any information provided during the course of the study. Also, please be assured that I will do my utmost to share my research results with you before they are submitted for examination and published.

Should you have any queries regarding the study, please feel free to contact me. Thank you very much!

CONTACT DETAILS

Mr. Ronan G. Zagado Postgraduate Student, Media Discipline Faculty of Humanities and Social Sciences The University of Adelaide North Terrace Campus, Adelaide, 5005 SA, Australia Email: ronan.zagado@adelaide.edu.au Telephone: +61 8 830 33735 Cellphone: +639497143004; +61425000528	Dr. Michael Wilmore Senior Lecturer & Student Supervisor Media Discipline, Faculty of Humanities and Social Sciences, The University of Adelaide North Terrace Campus, Adelaide, 5005 SA, Australia Email: michael.wilmore@adelaide.edu.au Telephone: +61 8 830 **34289; Fax: +61 8** 8303 4341

Appendix D. Consent form

NOTE:
This appendix is included on pages 212-213 of the print copy of the thesis held in the University of Adelaide Library.

NOTE:
This appendix is included on page 214 of the print copy
of the thesis held in the University of Adelaide Library.