

Contracts and Marketing Decisions of Indonesian Potato Growers

by
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*In memory of my beloved father, T. Heru Wuryanto,
who now lives in the eternal life and will always be in my mind.*

Dedication

This thesis is dedicated to my family: my father, T. Heru Wuryanto who had always encouraged me to achieve higher education; my mother, Rumaikah who has been continually supportive and prayed for me, and has encouraged me throughout my years of study; and my brother and sisters, Bayu, Ima, Linda, and Bella who have given me inspiration to finish this thesis.

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Declaration

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 institution 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.

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Abstract

Numerous studies have examined modern supply chains particularly agribusiness firms in the agrifood transformation, but how the transformation excludes or includes growers and how social factors, particularly relationship quality, influence growers to participate are limited to be investigated. Focusing on Indonesian potato producers, this thesis addresses the literature in five essential ways. Firstly, most current studies use farmers' capacity and demography variables, but pay less attention to the social capital contributing to farmers' participation. Secondly, few studies utilize per capita income to analyze the impact of farmers' participation in modern supply chains. Thirdly, numerous studies examine the *ex post* perspective of potato farmers' motives to contract with modern supply chains; however, *ex ante* motives are seldom highlighted. Fourthly, the topic of relationship quality in relational marketing with buyers in the emerging markets has received little attention. Finally, limited research draws attention to women's roles in emerging markets and the gender differences related to agribusiness relational marketing.

This thesis addresses how the potato producers make marketing decisions and interact with their buyers and what influences them to engage in the modern supply chains to improve their business performance. The specific research objectives are to investigate: (1) the factors influencing farmers' participation in the modern supply chains and the impacts of contract farming with the modern supply chain on the potato farmers' income; (2) the motivations for the potato farmers to engage in contracting; (3) the determinants of trust as a construct of relationship quality within the groups of potato

farmers; and (4) the differences of relationship quality factors between males and females.

A farmers' participation model was developed. It includes socio-demographics, contextual characteristics, farm capacity, and incentives as determinant factors involved in the emerging markets. Furthermore, the farmers' participation is associated with an increased per capita income. The analysis from an *ex ante* perspective of farmers engaging in contracts shows four factors influencing farmers' motivations: (1) market uncertainty; (2) direct benefits; (3) economic motive; and (4) intangible benefits.

The research demonstrates the determinants of relationship quality between three groups of potato producers and buyers including communication, flexibility, dependence, and joint problem solving. In addition, this study finds relational variables which differ between male and female farmers among the groups i.e. communication, reputation, joint problem solving, price fairness, uncertainty, performance and organizational culture. Although the females' roles in production and marketing are significant, the females tend to rate the relational factors lower than the males.

The results of this study have crucial implications on how to enhance smallholders' participation in modern supply chains. The results confirm that integrating smallholders should be promoted as a strategic policy for assisting farmers to raise income. Developing and establishing relational quality between farmers and their buyers will create efficiency in marketing as it reduces transactions costs. Agribusiness firms or retailers need to maintain and improve the quality of their relationships with potato farmers. The government should pay attention to production and market infrastructure, and access to production inputs and credits through increasing national budget for

agricultural infrastructure and development to support small farmers' entrance into modern supply chains.

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List of Acronyms

ACIAR	the Australian Centre for International Agricultural Research
ANCOVA	Analysis of Covariance
ANOVA	Analysis of Variance
CGIAR	Consultative Group on International Agricultural Research
CIP	the International Potato Center
CO	Contract Oriented
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
FFS	Farmer Field School
GA	Genetic Algorithm
GFP	General Farmer Population
HSD	Honestly Significant Difference
HVAP	High Value Agricultural Products
ICASEPS	Indonesian Centre for Agriculture, Socio-Economic and Policy Studies
IFM	Indofood Fritolay Makmur
IMR	Inverse Mills Ratio
IPM	Integrated Pest Management
IVEGRI	Indonesian Vegetables Research Institute
KMO-MSA	Kaiser-Meyer-Olkin Measure of Sampling Adequacy
MANCOVA	Multivariate Analysis of Covariance
MANOVA	Multivariate Analysis of Variance
MD	Market Driven
NIE	New Institutional Economics
OLS	Ordinary least squares
PCA	Principal Component Analysis
RM	Relationship Marketing

SAS	Statistical Analysis System
SME	Small and Medium Enterprise
SPSS	Statistical Package for Social Sciences
STATA	Data Analysis and Statistical Software
SUSENAS	Survei Sosial Ekonomi Nasional (the National Socioeconomic Survey of Indonesia)
USAID	U.S. Agency for International Development

Chapter 1 Introduction

In many developing countries, supply chain structures of agrifood markets have changed profoundly and rapidly. The changes can be seen from the patterns of supply chain organization including the rise of coordinated processors and retailers, specialized supply chains towards high value supply chains, and a direct/short relationship between retailers/processors and farmers. These changes have resulted in a need for the implementation of contractual arrangements. The establishment of implicit contracts implies the need for monitoring systems and technical assistance regarding private standards and quality. As a consequence, embodied technology and infrastructure such as irrigation equipments, high quality of seed, greenhouses, refrigerators, and transportation are adjusted to achieve efficiency of procurement. In turn, this causes policies, programs, and strategies from the government, non-governments, farmers, consumers, retailers, and private sectors to deal with the fast-approaching changes. These changes reveal a structural transformation of agricultural sectors (Reardon and Timmer 2008; Barrett 2011).

Numerous recent studies examine various economic dimensions, distributional consequences, supply chain consolidation, and environmental outcomes resulting from the rapid agrifood transformation. The structural transformation which affects small farmers deeply also results in changes in farmers' behaviors regarding social-economical, environmental, and relationship governance issues, as well as affecting the roles of women. In order to participate in and/or maintain access to modern supply chains, farmers

need to adjust their decisions in relation to financial issues (economy), household characteristics, and social capital. These structural changes in turn contribute to changes in the rural societies and economy. Thus, studies which examine how the modern supply chain transformation excludes or includes small producers and how social factors, particularly effective relationship quality in the relationship marketing, influence farmers to participate and are needed.

This thesis examines how the relationship quality influences farmers' decision to engage with potato buyers. The research is important because it highlights smallholders' livelihood involving modern supply chains and their ability to compete in the modern supply chains. Furthermore, the study highlights how a good relationship quality can contribute to farmers' decisions to engage in modern supply chains. The results of the thesis are relevant to food industries and policy makers, since they could potentially affect food policy decisions and agricultural development strategies.

1.1 Background

The Indonesian food market has been under a profound and extremely rapid transformation in the past three decades. Like other developing countries, there were two basic changes which triggered the transformation of the agrifood industry in Indonesia. Firstly, government investment encouraged a shift from a traditional small-scale informal agrifood industry to a modern formal sector and large-scale forms. These forms include the development of urban markets, infant industries supported by the government, and private retail chains. There was policy support, import substitution, for the food processing sector in the 1970s and 1980s. Secondly, the foreign direct investment (FDI)

in the food industry was liberalized in 1998 induced competitive domestic investment. This spurred diffusion of modern supply chains such as large-scale processors, supermarkets, fast food chains, and specialized wholesalers.

The agrifood transformation involves the establishment of modern retail structures, the rise of private standards and quality, and increasing vertical coordination across the food chains (Schipmann 2010; Minten and Reardon 2008). The establishment of the modern food retail sector is indicated by changes from farm areas to regional and national wholesale and retail markets, the different use of production and marketing technologies (water pump, cashier system, mobile phone), limitation of intermediate levels, a movement towards planned, well-regulated market transactions (contractual arrangements with suppliers), and increased quality control or grading (Meijer et al. 2008; Dirven and Faiguenbaum 2008; Reardon and Timmer 2007; Schipmann 2010; Neven and Reardon 2004). The modern supermarkets and large-scale food processors provide increasing opportunities for high-value food products, but create increasing difficulties, such as access to timely and quality inputs, and high search costs for potential farmers who must meet the production standards and related food safety requirements (Stringer, Sang, and Croppenstedt 2009) when managing their businesses. As a consequence, they adjust their practices, for example, by using contractual arrangements with farmers. Availability of contractual arrangements in relationships indicates that farmers involve in modern supply chains.

The use of contracts in the agrifood system benefits not only agro-industries (processors and modern retailers), but also smallholders. Through contractual arrangements, agro-industries can reduce the uncertainty in production and transaction

costs of marketing, and obtain guaranteed and quality supplies (Glover 1992; Simmons, Winters, and Patrick 2005; Swinnen 2004). For smallholders, the arrangements offer increased farm productivity by improving the quality of managerial inputs, speeding the transfer of technical information to growers, facilitating growers' access to credit, permitting the adoption of newer and more efficient technologies, and facilitating empowerment of women (Paul, Nehring, and Banker 2004; Eaton and Shepherd 2001; Key and Runsten 1999). Under a contract, a farm transfers control over certain aspects of production and/or marketing in return for greater surety over access to markets or inputs and lower risk. There are also potential welfare gains such as improving income for farmers who have access to the agro-industries markets (Minot 1986).

However, smallholders in rural areas of developing countries face markets which are often poorly serviced and unequal power relationship with agro-industries (Patrick 2004). Smallholders are unable to take advantage of modern market opportunities. Farmers often have trouble accessing credit, obtaining information on market opportunities or new technologies, purchasing certain inputs and accessing product markets (Patrick 2004; Hastuti 2004; Minten, Randrianarison, and Swinnen 2009). In some cases, contracted farmers face limited exit options and reduced bargaining power which may oblige them to accept less favorable or exploitative contract terms (Key and Runsten 1999).

The Indonesian potato industry faces many of these challenges related to supply chain marketing. Saptana et al. (2006) reveal that the supply chain in the Indonesian horticulture industry is not efficient as the market formed long marketing supply chains and an oligopsony market. Hastuti (2004) suggests that marketing costs were relatively

high, while the community's access to formal financing institutions is quite low. Natawidjaja et al. (2007) find that the Indonesian potato industry which is still dominated by traditional marketing supply chains, growers' total profit is 150% lower than growers in the modern supply chains.

Like other horticulture products, the potato supply chain faces difficulties in linking smallholders into the modern supply chains. Some difficulties within the relationship can be due to differences between perceptions of buyers and the sellers in terms of establishing, utilizing and changing points of view in the relationships (Leminen 2001). There are different pathways farmers enter various marketing channels, conventional and modern supply chains. The relationship elements have become important since establishing and managing relationships effectively at every link in the supply chains are the prerequisite of business success (Hsiao, Purchase, and Rahman 2002). Contract farming can offer an institutional solution to the problems caused by market failure in credit, insurance, and information systems. By being involved in contracts, growers can minimize firms' risk and uncertainty regarding land and labour costs in agricultural production, and reduce transaction costs (Simmons, Winters, and Patrick 2005). Effective and efficient contracts require a sustainable relationship between buyer and seller. However, it is still questionable whether farmers want to be involved in the opportunities provided by modern supply chains which offer contractual arrangements.

Studies investigate farmers' participation in modern supply chains which offer contractual arrangements through benefits and risks (Glover 1987; Simmons, Winters, and Patrick 2005; Singh 2002), farm, household, and contextual characteristics (Blandon,

Henson, and Cranfield 2009; Masakure and Henson 2005; Miyata, Minot, and Hu 2009; Hernández, Reardon, and Berdegue 2007). They implicitly assume that all farmers are able to supply to the modern supply chains and do not consider farmers' attitudes to join the contracts (Schipmann and Qaim 2011). Investigation of farmers' motivation and perception involving modern supply chains is lacking.

Studies on relationship marketing have become important for investigating what factors influence growers' decisions in choosing a marketing network and exploring the relationship performance of growers. The success of inter-firm relationships and whether a relationship is perceived to be productive can be seen from the relationship performance (LaBahn and Harich 1997; Kumar, Stern, and Achrol 1992). The relationship performance can be indicated by financial performance and non-financial performance (O'Toole and Donaldson 2000; O'Toole and Donaldson 2002). Financial performance refers to short-term results in the relationships and focuses on the goals of the buyer and seller in their relationships (Beugelsdijk et al. 2006). These goals include profit, sales and cost. The non-financial relationship performance consists of the behavioral dimensions such as satisfaction, commitment, communication and flexibility in the relationships (O'Toole and Donaldson 2000; O'Toole and Donaldson 2002). Farmers' motives for participating in modern supply chains can also be investigated through their relationship performance.

There is a lack of studies which specifically address the Indonesian potato industry and focus on the implications of agrifood transformation for smallholder farmers. One study focuses on the market restructuring of the potato industry (Natawidjaja et al. 2007), another on potato marketing patterns (Hastuti 2004), and one on the institutional

issues in the potato industry (Saptana et al. 2006). Research on how the potato farmers make decisions in channel choice and their relationship performance is merely descriptive. The research presented in this thesis aims to fill this research gap by conducting an empirical study focusing on potato producing smallholder farmers in Indonesia.

Moreover, in agriculture value chain marketing the number of women participating in sales and buyers-sellers relationships appears to increase with the rise of women in the job market (Siguaw and Honeycutt 1995). The topic of gender in agribusiness has emerged parallel to the liberalization and transformation of agrifood chains. Women are participating in market linkages both as buyers and as sellers of goods and services at different points in the chain. For example, in parts of Central Java, Indonesia, it has been known for more than a decade that women are involved at all stages of the supply chain from transplanting to selling the harvest (Van de Fliert 1999). Even though there has been extensive research about gender differences in buyer-seller relationships especially focused on salespersons in non-agriculture industries, no study to date has empirically investigated women's roles in agriculture in terms of the buyer-seller relationship. This gap is addressed in this thesis.

1.2 Research aims

This thesis focuses on farmers' participation in the modern supply chains, particularly food processing which applies a contract system and other forms of supply chains. The study is interested in how smallholders involve in the modern supply chain and how

social factors particularly relationship quality and women roles in the relationship marketing influence farmers to participate in the chain.

The specific research objectives of this study are to investigate:

- (1) the factors influencing farmers' participation in the modern supply chains and the impacts of contract farming with the modern supply chain on the potato farmers' income;
- (2) the motivations for the potato farmers to engage in contracting;
- (3) the determinants of trust as a construct of relationship quality within the groups of potato farmers; and
- (4) the differences of relationship quality factors between males and females.

The understanding of producers' preference is crucial since it is a motivating force for the continuation of the potato industry in the future. This will then have a motivating effect on agrifood industry growth. The outcomes of the study may also facilitate government policy formulation and future direction planning.

In the development of knowledge, this thesis provides some inputs for marketing studies and gender development. Better buyer-seller relationships could potentially be developed with greater understanding on relationship condition between farmers and their buyers. Moreover, greater understanding of gender on relational abilities and perceptions also contributes to the emerging stream of relationship marketing literature that places emphasis on the personal interactions between individuals in the marketing network. This knowledge can be used to build up a more sophisticated conception of gender role stereotypes in agricultural sales.

1.3 Structure of the thesis

Chapter 1 – Introduction

Topics covered in this chapter contain the background of the research and research aims. The chapter highlights the research questions which describe problems and literature gaps of this study, and then they lead to the research objectives.

Chapter 2 - Literature Review

This chapter provides understanding compulsory for the study, clarify other research which have previously been conducted, and justify the use models and methods addressing the research objectives. The main theoretical considerations that support this research are also presented and discussed in this chapter. Specifically, Chapter 2 explores the following topics: (1) transformation of agrifood systems in various supply chains; (2) the impact of the agrifood transformation on smallholder farmers; (3) farmers adoption facing the agrifood industry transformation; (4) supply chain differentiation and contractual arrangements; (5) the importance of farmers' relationships between exchange partners in the agricultural industry; (6) gender issues in buyer-seller relationships; and (7) the Indonesian potato industry.

Chapter 3 - Methodology

The Methodology chapter highlights the structure of questionnaires and sampling methods for obtaining the respondents. Furthermore, justification of the chosen research methods in order to get the best answers for the research objectives and questions is highlighted in this chapter. Chapter 3 discusses more details of the methods used in this study. The last part of this chapter provides a description of data included in this study,

which consists of three groups of potato farmers. Particularly, this chapter describes the development questionnaires, sampling methods, analyzing data, and data summary.

Chapter 4 – Determinants and effects of farmer participation in the contract

The fourth chapter aims to answer the first aim of this thesis: to investigate the factors influencing farmers' participation in the modern supply chains, and to investigate the impacts of contract farming with the modern supply chain on the potato farmers' income. Using a treatment effect model, this chapter explores how the potato farmers' income is affected by the new emergence of modern supply chains. Specifically, this chapter examines to what degree socio-demographics, contextual characteristics, farm capacity, and incentives aspects affect farmers' participation in the modern supply chain (processor) and whether involvement in the modern supply chain raises the income of participating farmers.

Chapter 5 – Motivations for the potato farmers to engage in the contract

Chapter 5 elaborates on farmers' motivation for engaging in the agrifood business. It explores the nature of the motives and restructuring of the supply chains over an extended period of time. It is important to understand the motivations for growers to participate in modern supply chains and their perceptions of the likely impacts of participation on their agricultural operations, since this will provide information on the modes that brings about the long-term sustainability of contract arrangements. The motivation factors are identified based on farmers' experiences. Then, the factors using cluster analysis are clustered to examine whether any motivation differences among the respondents.

Chapter 6 – Determinants of trust in the Indonesian potato industry

The third aim of this thesis is answered in Chapter 6. This chapter investigates how potato growers can build relationships with their buyers. Specifically the chapter elaborates on the determinants of trust within the three groups of potato farmers in Indonesia: the Farmer Field School (FFS), Indofood, and general farmer population (GFP). It is expected that better relationships can increase farmers' confidence and improve their relationships with the buyers. A high level of trust creates a positive condition decreasing transaction costs. Some socio-demographic variables are also added to the model of trust.

Chapter 7 – Male and female differences in buyer-seller relationship in the Indonesian potato farmers

Chapter 7 which answers the last objective of this thesis identifies factors that influence the development of male and female buyer-seller relationships, particularly in the potato production industry. This chapter starts with an analysis of women's roles in agricultural activities particularly production and marketing activities. Gender differences in the relational marketing particularly trust, satisfaction, and commitment, are also examined in this chapter. Then, the hypotheses are built and examined with MANOVA to identify whether there are any factor differences between males and females in the three groups of potato farmers.

Chapter 8 – Discussion and summary

In this chapter, the conclusion and managerial implications of the study are given. The assessment of the objectives and hypotheses which are built to accommodate the purposes of the study, as well as policy implications are presented and discussed. The main contributions of the research are addressed whether the contributions accommodate the

research questions. The last chapter also includes suggestions for further research and the limitations of study.

Chapter 2 Literature review

In this chapter, the empirical and theoretical literature is presented and discussed. This literature review covers the following issues: the transformation of agrifood systems in various supply chains, the impact of the agrifood transformation on smallholder farmers, farmer adoption decisions affecting the agrifood industry transformation, supply chain differentiation and contractual arrangements, the importance of farmers' relationships with exchange partners in the agricultural industry, women's roles in the supply chain marketing, and the Indonesian potato industry. The literature review develops an understanding to contextualize the study, clarify other studies which have previously been done, and justify the use of models and methods addressing the research objectives.

2.1 Transformation of agrifood systems in various supply chains

A wide variety of literature on agrifood transformation in developing countries highlights the process of transformation and farmers' participation in the transformed markets. The process can be different among the countries depending on the kinds of supply chains. This section provides literature about the process of food transformation in various supply chains in some developing countries. The information shows how food processing supply chains is essential to be highlighted in the process of the agrifood transformation.

Like other developing countries, the process of agrifood industry restructuring in Indonesia is categorized into two stages (Reardon et al. 2009). Firstly, pre-liberalization which took place from the 1960s to the mid 1980s is characterized by government

investment in the agrifood sector. It includes shifting from a traditional small-scale informal industry to a formal and large-scale sector, government investment in government-owned processing firms, urban wholesale markets, and state-run retail chains. Secondly, liberalization is induced by trade liberalization and public infrastructure and investment for transportation, storage, processing, and shipping. The time period for the second process is from the early 1980s until the present. These processes are likely to have implications for small farmers since they are the main supplier of agricultural products.

The studies of the modern supply chain and the farmers' participation can be divided according to the four kinds of modern supply chains: export, supermarket, large food processing, and mixed market. The markets are included in modern supply chains since as modern food industries they require quality, consistency, volume, and transaction specifications (Reardon et al. 2009). The markets are categorized based on various chains and most of the products are categorized as high value agribusiness products. CGIAR Science Council (2004) defines high value agribusiness products (HVAP) as products that are typically perishable, specific high-value, and are sold through specialized markets. They can include livestock, dairy products, fish, fruit and vegetables (Weinberger and Lumpkin 2005).

Bellemare (2012), and Schipmann and Qaim (2011) explored the first three categories of market under the description 'mixed market'. In their research, the respondents were surveyed regarding different types of retail chains; however, the analysis focused on differences between contract and non-contract farmers.

Numerous studies of the agrifood transformation focus on export supply chains in developing countries. For example, Deb and Suri (2011) focus on a study of the emergence of contract farming between pineapple farmers and exporters in Ghana. How Tropical African smallholders adjust to the emergence of organic export operations for Arabica coffee is investigated by Gibbon and Jones (2009). Warning and Key (2002) highlight Senegal farmers' participation in a program which provides confectionery peanuts for international markets. Parallel to Warning and Key's study, Maertens and Swinnen (2009) also investigate farmers' contribution in the export chains in Senegal, but they highlight horticulture products such as French beans, cherry tomatoes, and mangoes. Besides these products, fresh vegetable commodities have also recently been analyzed by Masakure and Henson (2005) and Minten, Randrianarison, and Swinnen (2007). They investigate farmers' involvement in the international markets in Zimbabwe and Madagascar.

The trends for empirical studies are now to focus on the transformations resulting from supermarket chains which have spread quickly, modernized their produce procurement systems, and differentiated themselves from traditional retailers and wholesalers (Reardon et al. 2003). For example, (Neven and Reardon 2004) investigate supermarket sales of food products in Kenya which have grown annually from 18% in the 1990s to 20% in the 2000s. Other authors, Reardon and Berdegue (2002) analyze the supermarket share in Guatemala which was 35% of national food retail in 2003, up from 15% in 1994. In the Philippines, modern retail sales which grew 26% from 1999-2008, and increased significantly about 35% in 2010 are investigated by Romo, Digal, and Reardon (2009). Natawidjaja et al. (2007) investigate market restructuring of vegetables

in supermarkets in Indonesia. Rao and Qaim (2010) and Neven et al. (2009) investigate farmers' participation in the Kenya's supermarkets requiring HVAP such as maize, bananas, other cash crops, spinach, kale, and tomatoes. Tomato farmers' participation in Guatemala is analyzed by Hernández, Reardon, and Berdegúe (2007). Using series data, Berdegúe et al. (2005) focus their study on supermarkets, which require fresh fruit and vegetables in Central America. Miyata, Minot, and Hu (2009) study farmers' impacts and participation in China.

The emergence of modern supply chains results in a continued demand for high quality and processed food (Reardon et al. 2009; Minten and Reardon 2008; Reardon and Berdegúe 2002). The processed food which enters the modern supply chains must have a high added value, and standards and food safety. The farmers' participation in food processing industries is analyzed by Key and Runsten (1999), Wilkinson (2004), Simmons, Winters, and Patrick (2005), Dev and Rao (2005), Birthal, Joshi, and Gulati (2005), Nagaraj et al. (2008), and Escobal and Cavero (2011). The products supplied by farmers are inputs or materials which are processed by the firms, for example poultry, maize seed, rice seed, oil palm, gherkin, baby corn, chili, milk, broiler, vegetables, and potato.

Although many studies have investigated the agrifood transformation and its effect on food processing supply chains, more empirical studies on the transformation of the processing supply chains are needed. In increasingly open economies, the role of the processed food sector in export and domestic markets is seen to be crucial. The process of transformation becomes more complex when the domestic industries are being radically transformed into transnational firms. The development of processed-food industries in

developing countries is influenced by varying degrees of changes, internal deregulation and external liberalization of markets, and legislative reform favorable to foreign investments (Wilkinson 2004). The large food processing firms involved in FDI tend to produce highly processed products and convenience foods which are required by urban consumers and export markets. This has implications for the differentiation of characteristics regarding the way processors trade off between coordination costs when they make procurement decisions (Stringer, Sang, and Croppenstedt 2009). The food processing industries tend to externalize many activities such as design, market studies, transport, distribution, and procuring inputs to direct third parties such as SMEs (Small and Medium Enterprises), and representative persons or groups. The firms also adopt more stringent quality criteria to accomplish international-level standards and private standards. As a consequence, in Indonesia which is dominated by small farms, farmers must form groups to achieve economy of scale and sometimes must change their behavior to achieve the requirements of the food processors. This thesis provides empirical data and more specific insights about the process of food transformation in the food processor supply chain and its implications for smallholders.

2.2 The impact of the agrifood transformation on smallholder farmers

Transformation of the agrifood system has important implications for smallholders and farm workers as a main part of the supply chains. This section highlights how the farmers are affected by the emergence of modern supply chains. The explanation is crucial to address the first research objective of this study, to investigate the impacts of contract farming with the modern supply chain on the potato farmers' income, by providing a deep

background literature. The literature is started by an explanation of factors driving the transformation of the agrifood system.

Demand and supply factors drive the transformation in the agrifood system. The demand side drivers include: (1) urbanization which transforms traditional diet habits from staple foods to meat or vegetables to processed convenience foods and drinks, and increases the entry of women into the workforce, changing their shopping and preparing food preferences; (2) lower relative prices from supermarkets and processing firms due to the symbiotic evolution of technologies and procurements systems; (3) the rise of real per capita income; and (4) the reduction of transaction costs to access modern supply chains due to technological progress e.g. refrigerators and cars (Pingali 2006; Jin 2007; Reardon and Timmer 2007; Maxwell and Slater 2003; Reardon et al. 2003). The supply side has three drivers: (1) the dramatic rise of modern supply chains due to the liberalization of foreign direct investment; (2) price reduction because of the low cost of investment, economies of scale, scope, and specialization; and (3) the revolution of retail procurement logistics technology and inventory management (Staatz et al. 1993; Pingali and Khwaja 2004; Reardon and Timmer 2007; Natawidjaja et al. 2007; Reardon et al. 2003).

One of the impacts of the agrifood transformation is a continuous and rapid change in procurement systems which increases coordination, reduces transaction costs, and improves efficiency. The procurement changes include the reduction in the number of middle men, the institutional innovation of contracts between the modern supply chains and the suppliers, and the rise of private quality and safety standards implemented by supermarket chains and large-scale processors (Reardon et al. 2005). To increase efficiency, modern supply chains eliminate per store procurement by establishing

distribution centers or specialized/dedicated wholesalers. The modern supply chains establish their own system of preferred suppliers and tend to switch from buying in spot markets to contractual arrangements with farmers as input suppliers who ensure the required products (Berdegué et al. 2005; Neven et al. 2009; Rao and Qaim 2010). This shift is implicated in the implementation of contractual arrangements reducing transaction costs with the suppliers. This helps modern supply chains to have better on-time delivery management of the right quantity and quality of a product. The rise in requirements for product variety, product quality, and product standards for attracting and maintaining modern markets' consumers make up an important aspect of the imposition of product requirements in the procurement systems. The specification standards, harmonization of the products, and delivering attributes improve efficiency and reduce transaction costs (Reardon, Codron, and Harris 2001; Berdegué et al. 2005; Henson and Reardon 2005).

A strand of literature which is most highlighted as a context for the agrifood transformation in developing countries is the effects of agrifood transformation on small farmers. Procurement changes have implications for the small farmers which include both advantages and disadvantages.

The advantages are benefits from various markets, a diversification of product portfolio, and financial and non-financial benefits of the contract. Modern supply chains such as supermarkets, large food processors, and export markets can provide more varied new markets for farmers compared to traditional markets. Smallholders have alternative marketing channels to conventional channels (Wollnia and Zeller 2007). Furthermore, the modern supply chains which attract consumers by offering a wide variety of products and maintain product quality by determining product standards, require particular products.

Farmers can gain new markets from the varied demands of high value products. Many empirical studies reveal that the modern supply chains, supermarkets and large food processors, offer higher financial benefits and can generate positive effects on the farm income of smallholders (Hernández, Reardon, and Berdegúé 2007; Neven et al. 2009; Simmons, Winters, and Patrick 2005; Swinnen 2004). In a coordinated relationship between the modern supply chain and farmer, a farmer obtains certain aspects of marketing. Improvement of farm productivity by improving the quality of managerial inputs, transfer of technical information, access to credit, and permitting the adoption of newer and more efficient technologies can be obtained by the farmers from the modern supply chains (Paul, Nehring, and Banker 2004).

Farmers also experience negative impacts of procurement systems. The additional requirements from modern supply chains are sometimes considered barriers. Meeting the quality requirements often requires improved technology such as own irrigation, greenhouse production, special treatment for organic food, specific seed/varieties, and changed farming behavior from traditional to modern farms. Because of a lack of capital and economics of scale, smallholders in developing countries frequently have difficulties meeting the requirements in quality and quantity (Neven et al. 2009; Henson, Masakure, and Boselie 2005). Furthermore, contracts as a consequence of procurement changes have been noted as emerging hazards because of their negative social effects on the ‘cash economy’ (Simmons, Winters, and Patrick 2005). The cash economy means that a cash culture is formed since traditional values and habits in agriculture are being replaced by transactions.

Empirical studies are needed regarding the impacts of procurement system changes on small farmers, particularly whether smallholders will be able to adapt to globalization. Agrifood transformation implies the need for various forms of contractual arrangements and vertical integration along the modern supply chains where farmers can engage directly to the modern supply chains such as large food processors. The issue is relevant to policy makers, since it affects food policy decisions and agricultural development strategies. Hence, this thesis addresses these gaps in particular focusing on the case of processing supply chains.

To measure the positive or negative impacts from the procurement system changes on small farmers, many scholars use income as an indicator to approximate the impacts on the farmers' welfare. They utilize various income measurements for different purposes. For example, Simmons, Winters, and Patrick (2005) use gross margins and comparisons of total returns to agricultural production for contractors and non-contractors to overcome the difficulties in evaluating the welfare effects and measuring the benefits of new crop such as seed corn, seed rice, or broilers. Neven et al. (2009) and Hernández, Reardon, and Berdegue (2007) are other scholars using gross margins. They investigate the impacts of the supermarket emergence on the horticultural farmers in Guatemala and Kenya. To reflect the approximate impact on net agricultural income, Warning and Key (2002) apply gross agricultural income as the dependent variable. Miyata, Minot, and Hu (2009), Rao and Qaim (2010), and Bellemare (2010) utilize per capita income to analyze impact of contract farming on income in China, Kenya, and Madagascar. These authors are concerned with the potential of contract farming for welfare increasing and per capita income is seen as a better measurement of welfare.

To accommodate the impact of agrifood transformation on the producers' welfare, this thesis contributes to developing a better overall picture regarding those issues. Per capita income is used as an indicator variable to proxy farmers' welfare and to examine impacts of farmer participation in modern supply chains, particularly contracts which is further elaborated in Chapter 4.

2.3 Farmer adoption decisions facing the agrifood industry transformation

Farmers' involvement in the agrifood industry transformation shows that the farmers have tried to adopt a new condition of modern supply chains. How they adjust the modern supply chains and what factors contribute them to engage in the modern supply chains are addressed in this section. These explanations are important as a background literature and related theories in order to address the first objective of this study, to investigate the factors influencing farmers' participation in the modern supply chains.

Smallholder market participation has been essential to economic growth and poverty reduction. This view originates from Adam Smith and David Ricardo's principles that a household can participate in agricultural production both for home consumption and for trade (Barrett 2008). The welfare benefits come from the welfare effects of trade holding comparative advantage, the opportunities that appear from large-scale production in the presence of fixed or sunk costs of production (Romer 1994), and dynamic technological changes that are due to regular trade-based interactions (Romer 1993). This leads to a more rapid total factor productivity growth in the economy (Edwards 1998).

In many developing countries, industrialization and trade liberalization push smallholders to enter global markets and face transformation of the restructured agrifood

industry systems. The agrifood transformation which requires improved agricultural technology results in the need for integrated market chains. In the macro framework, chains which consist of integrated farmers, traders, and consumers are needed for rapid economic growth (Timmer, Falcon, and Pearson 1983). As a consequence, farmers in particular should adjust their decisionmaking processes in order to participate in the modern supply chains.

Numerous studies have been conducted to investigate how farmers participate in the modern supply chains and how farmers adjust to the changes of a structured agrifood industry. The studies have used technology to theoretically explore farmers' participation in the modern supply chains. Market-channel adoption is appropriately a 'post-harvest technology' decision (Goetz 1992; Hernández, Reardon, and Berdegué 2007). Agrifood transformation has accelerated farmers' participation in the modern supply chains. It is likely that farmers are pushed to make decisions on adoption of technology as a result of procurement and output marketing (Reardon et al. 2009).

The decisions to adopt technology include incentives in the modern supply chains and capacity of the farm to undertake the technologies (Feder, Just, and Zilberman 1985). This is called a Heuratic model by Reardon et al. (2009). The model explains how retailers as modern supply chains and suppliers which are represented by farmers make decisions in the diffusion process of procurement system innovations in the agrifood chain system. The decision is presented as a binary choice which enters the modern procurement system versus staying with the traditional procurement system.

Farmers who make the decision to enter the modern supply chains are concerned with changes in investments. The investments include physical capital, institutional, and

organizational or social capital. Some adjustments and consequences have to be done by farmers who must get through the structural transformation.

Investment in physical capital is acquired in input markets. For modern retailers and large food processors it includes a distribution center, electronic data transfer systems with suppliers, truck fleet, etc. On the other hand, investment in physical capital for farmers is the capacity of the farm to undertake the technologies which form physical investments such as (a) assets of the farm such as land, non-land assets, and irrigation; and (b) collective capital, for example vehicles, warehouses, access to public infrastructure. These factors can influence farmers' decision to participate in the modern supply chains. Many studies are concerned with these factors which influence farmers' participation in modern supply chains and result various impacts (Rao and Qaim 2010; Simmons, Winters, and Patrick 2005; Miyata, Minot, and Hu 2009).

A consequence of structural transformation in agriculture is the rise of contractual arrangements which have implications for institutional capital in modern supply chains. For farmers, investment in institutional capital needs the establishment of implicit contracts which requires institutional arrangements, monitoring systems, technical assistance and credit provision mechanisms, product collection, infrastructure, structure and costs of supply arrangements, certification systems, and relationships with certification institutions (Sartorius and Kirsten 2007; Pingali 2006; Hueth et al. 1999; Pingali, Khwaja, and Meijer 2005; Stringer, Sang, and Croppenstedt 2009). In contract arrangements, farmers engaging in modern supply chains have to integrate subsequent stages such as grading, processing, packaging, exporting, etc. They should fulfill standards which are required at every the stage. Integration in the form of on-site

packaging and processing may serve to reduce transaction costs which are transport and handling costs, because information on product quality and demand condition flows more easily, supply can be more accurately scheduled, and inputs and management applied without negatively impacting on loan repayments (Minot 1986).

All changes of the structure transformation lead to changed costs of production, marketing and investment. Meeting modern markets' requirements often requires improved technologies for farmers that imply added costs (Schipmann 2010). The costs include the opportunity costs of participating in the modern supply chains (Barrett et al. 2012). Feder, Just, and Zilberman (1985) and Reardon et al. (2009) suggest that the costs are incentives in the modern supply chain relative to those of the traditional channel. The incentives consist of: (a) the relative net price of the commodity and controlling for product quality; (b) the relative cost and risk of the farm and post-harvested handling technologies to meet the commodity quality and transactional requirements of the modern supply chain. In order to achieve the product quantity which is required by modern supply chains, farmers have to add investments and fixed costs such as land rent and purchasing for land to expand their farm sizes. However, involvement in the modern supply chain results in a reduction of marketing and transaction costs from improved financial, transport, and telecommunication.

Investment in organizational or social capital can be associated with establishing and maintaining relationships and associations. This can be a relationship with a specialized/dedicated wholesaler or a direct relationship with a farmer. Social capital at the individual level is generally seen as an aggregate of two dimensions, personal involvement in social activities and trust in people in general (Huang, van den Brink, and

Groot 2009). Social participation covers all types of active affiliation with groups outside the family and voluntary activities except political objectives. Involvement in a farmers' group and women roles in agriculture are included as determinants of social capital for farmers.

Even though research on this issue in the agricultural field is rare, some recent studies have highlighted the importance of relationship establishment between modern supply chains and farmers. For example, a study by Warning and Key (2002) shows that a social collateral factor, honesty, is a determinant factor involved in an international market in Senegal. Honesty, in the relationship quality between exchange partners, is a dimension of trust. Trust can be categorized as a valuable economic asset (Dyer and Chu 2003) since it is believed to lower transaction costs that allow for greater flexibility to respond to changing market conditions and to lead to superior information sharing that develops coordination and joint efforts to reduce inefficiencies.

Based on the explanation above, this thesis uses variables which represent socio-demographics, contextual characteristics, farm capacity, and incentives aspects to deeply analyze factors contributing farmers involved in modern supply chains to address objective 1, to investigate the factors influencing farmers' participation in the modern supply chains. Some variables such as farmers' age, education, experience in farming, land, and ownership capital are more elaborated and expected as determinant factors farmers' participation. Furthermore, trust as social capital in farmers' making decision to adopt the emerging modern supply chains is highlighted specially to determine whether the social capital factors influence farmers to make the decision to become involved in modern supply chains.

2.4 Supply chain differentiation and contractual arrangements

An implication of the emergence of modern supply chains is an increasingly need for the implementation of contractual arrangements between the farmers and their buyers. This section highlights how the contractual arrangements are developed and what factors motivated small farmers to participate in the modern supply chains. These information are essential to know whether difficulties to involving modern supply chains are due to perception differences in terms of establishing, utilizing and changing points of view in the buyer-seller relationships.

The emergence of modern supply chains has been followed by specialization and product diversification. There has been a shift from commodity markets toward product markets for specific segments of consumers and uses. Modern supply chains which aim to attract consumers by offering a wide variety and exotic of products might apply two aspects: product variety and product quality. Large scale processors who differentiate a commodity into various products may buy the undifferentiated commodity from farmers. On the other hand, farmers have new opportunities and may face problems to deliver the high value products and safety standards demanded by the modern supply chains.

As agricultural products under the procurement changes become more specialized, there is an increasing need for coordination along the supply chains. Furthermore, a combination of a demand for products of high quality and safety standards and the problems which farms face in supplying the products has led to the need of contractual arrangements in supply chains. In modern supply chains, buying through spot-market transactions (traditional) is increasingly switched to contractual agreements. Traders, retailers, agribusiness and food processing companies increasingly contract with farms

and rural households and provide inputs and services in return for guaranteed and quality supplies.

A conceptual framework which explains the rise of the contractual arrangement in the supply chains is market imperfections. In the Neo-classical economic theory, a perfect competitive market is an ideal condition to be achieved in an economy. Perfect competition is characterized by free and complete information, homogenous goods, the absence of externalities, and no control over prices by buyers and sellers.

The coordination in market chains usually shifts transactions from traditional spot markets to more complex contractual or hierarchical arrangements (Sykuta and James 2004; Ménard and Valceschini 2005). From a theoretical perspective, these circumstances can be explained by New Institutional Economics (NIE). The concept is concerned with induced technological changes, organizational, and institutional changes. The induced technological changes are shown by technical innovation as a source of changes in production that can improve quality and offer sufficient guarantees (Ménard and Valceschini 2005). The organizational changes refer to the governance of transactions along the food chain to maintain or increase diversity during better controlling quality. North (1990), Williamson (1975), Williamson (1996), and Goetz (1992) suggest organization as the structure of relationships among producers and institutions as the mechanisms of governance. The need for guaranteed and quality supplies must be backed by institutional devices for example certification that can be private, public, or mixed (Ménard and Valceschini 2005).

The main point of the organizational and institutional changes in the NIE is the costs of alternative arrangements for transactions. Farmers as farm producers in the

change conditions will choose to organize transactions based on the nature of institutions and the cost of the transactions will affect the respective options (Coase 1937; Williamson 1991). These approaches consider transaction costs and organization form, or in other words determine suitable institutional frameworks to minimize transaction costs.

Transaction costs can be defined as: (a) the costs which consist of running an economic system; (b) friction in the economic system; (c) information imperfections; (d) moving from ignorance of omniscience; (e) reducing uncertainty; and (f) carrying out exchange (Coase 1960; Williamson 1975; Kähkönen and Leathers 1999). Since market prices do not fully reflect the true costs and returns to participation, transaction costs in developing countries arise (Delgado 1999). Transaction costs in agricultural production result from asymmetries in assets and production in the exchange patterns. Smallholders often lack the production and marketing information necessary such as new crops and varieties, and lack of the financial reserves necessary such as external credit.

Transaction costs can be categorized into six forms (Jaffee and Morton 1995): (1) search costs such as costs associated with identifying potential buyers and sellers; (2) screening costs, defined as costs associated with gathering information about the reliability of a buyer/seller and the quality of goods being transacted; (3) bargaining costs which are the costs of gathering information on prices in other transactions, and on factors that may influence the willingness to buy by the other party to the transaction, on implications of contract terms; (4) monitoring costs such as costs associated with monitoring contract performance; (5) enforcement costs which are incurred in ensuring contract provisions are met, including the costs of default provisions; and (6) transfer costs, for example, transport, storage, processing, retailing, wholesaling and losses.

One institutional form which deals with the farmers' constraints in the process of food transformation is contract farming. Contract farming can be explained as an institutional response to imperfections in markets, for example credit, insurance, information, factors of production, and raw materials (Karaan 2002). For farmers, contracts includes farm management assistance, extension services, quality controls, farm input assistance programs, trade credit and even bank loan guarantees. They can generate important improvements in the credit situation of the farms, and indirectly as they improve contracting farms' access to loans from banks or external financial institutions, for example, through loan guarantees, enhanced farm profitability and improved future cash flows (Swinnen and Maertens 2007). Contract farming does not only involve farmers, but also engages large-scale buyers such as exporters and food processors who need to ensure steady supplies of raw materials with determined quality standards.

The role of contract farming in developing countries is still controversial. There is an emerging literature analyzing the benefits of contract agriculture (Glover 1987; Mangala and Chengappa 2008; Simmons, Winters, and Patrick 2005; Singh 2002) and the success of contract farming to link smallholders to the modern supply chains (Henson, Masakure, and Boselie 2005; Huang et al. 2007; Maertens and Swinnen 2009). Numerous critics of contract farming have also arisen. They argue that the large agribusiness firms use contracts to take advantage of cheap labor and transfer production risk to farmers, and smallholders will be marginalized since the firms tend to choose work with medium and large scale farmers (Singh 2002; Miyata, Minot and Hu 2009).

Moreover, certain aspects are yet to be understood and addressed in the literature, e.g. the details of concrete contractual arrangements and the nature of motivations for

producers to engage in contracting in the context of the restructuring of supply chains and agriculture policies. Available studies explain farmers' participation in modern supply chains through farm, household, and socio-demographic characteristics without explicitly accounting for subjective attitudes. For example, differences in the design of contracts can crucially affect farmers' participation. Furthermore, it is important to understand the motivations for producers to participate. The motivations reflect growers' perceptions of the likely effects on their agricultural operation with a view to development of modes of contracts. The motivations will then bring about the long-term sustainability in the contract arrangements. By studying the case of potato marketing in Indonesia, this thesis aims to contribute to address the gaps.

The motivations to participate in contracts vary among farmers. As contracts offer economic benefits, farmers engaging in contract arrangements usually consider economic reasons such as the increase income, additional source of income, and better price or premium price to accept the contract provisions (Miyata, Minot, and Hu 2009; Dev and Rao 2005; Key and Runsten 1999). Avoiding market uncertainty is the main reason for producers to engage in contracts, because they can reduce risks of production and marketing (Binswanger 1981; Hazell 1982; Wang, Zhang, and Wu 2011). Contract firms usually provide input credit and marketing guarantee for getting required commodities. Other motivations of contract are to obtain direct benefits from contracts such as access to credit or inputs and technical support (Simmons, Winters, and Patrick 2005; Nagaraj et al. 2008) and to gain indirect/latent benefits such as easy transportation, recognized benefits from other growers, and gained satisfaction by being involved in modern supply chains (Nagaraj et al. 2008; Masakure and Henson 2005). These motivations are estimated and

analyzed as contract motivations for potato farmers involving in the contract with Indofood. This issue is elaborated in Chapter 5 in order to address objective 2 of this thesis, to investigating the motivations for the potato farmers to engage in contracting.

2.5 The importance of farmers' relationships between exchange partners in the agricultural industry

In this section, a literature of the importance of farmers' relationships in marketing is provided. This section also explains theoretical approaches that relate to the development of buyer and seller relationships. The last part of this section provides factors determining buyer-seller relationships and contribution of this study to the development of relationship marketing. All of these information are important to reveal whether potato growers can efficiently build relationships with their buyers.

A growing agrifood literature suggests that efforts to build and maintain buyer-seller relationships can provide benefits to both the producers and buyers. Developing and maintaining cooperative relationships between buyers and sellers enables them to be more efficient and cost effective (Kalwani and Narayandas 1995). Becoming closer and better understanding and satisfying customers needs, farmers as buyers/suppliers, can achieve greater customers (buyers) loyalty and higher repeat sales (Han, Wilson, and Dant 1993). Both parties are better able to plan forecast production schedules (Lohtia and Krapfel 1994) and to coordinate deliveries (Easton and Araujo 1994).

Relationship marketing (RM) is always viewed as an effective strategy in promoting interaction between the buyer and the seller. The purpose of RM is to build and maintain lasting relationships between exchange partners that provide mutual benefits (Rapp and Collins 1991). Relationship quality is considered as an appropriate indicator of

a successful relationship marketing (Hennig-Thurau and Hansen 2000). In the agricultural context, farm producers define the relationship quality as the producers' perception on how their relationships fulfill the expectations, predictions, goals and desires of the customer (Gyau and Spiller 2009).

Some scholars specifically define relationship quality as a higher-order concept, composed of three different elements, which are satisfaction, trust and commitment (Smith 1998; Lages, Lages, and Lages 2005). Satisfaction as a basic element (Gerlach, Köhler, and Spiller 2005) of relationship quality reflects experience with a business partner as a necessary but not sufficient condition for an ongoing relationship (van Weele 2010). Satisfaction captures an emotional state that occurs in response to an evaluation of all interaction experience with the partner (Crosby, Evans, and Cowles 1990; Leuthesser 1997). Fiegenbaum (1991) defines quality as the customer's actual experience with the product that consistently meets their specifications. Research by Matanda and Schroder (2004) analyzes communication quality and quantity as variables in relationship management. Moreover, Fornel et al. (1996) consider that satisfaction should not only be measured by the quality and quantity of the products, but also by the level of product quality relative to the price paid as perceived value received by customers. Satisfaction in the supplier relationship quality is the result of a comparison between a buyers' performance and the suppliers' expectations.

Besides, in many ways, scholars have constructed satisfaction through different settings and influences. Some scholars identify the significance of satisfaction to measure relationship quality (Boniface, Gyau, and Stringer 2012), while other studies investigate the influence of satisfaction on trust (Ganesan 1994; Gyau and Spiller 2007; Puspitawati

et al. 2011). As most of relational marketing studies investigate the influence of satisfaction on trust, satisfaction in this study is identified as a multidimensional of trust.

In a contractual arrangement of relationships, trust is shown to reduce opportunistic behaviour (Morgan and Hunt 1994), to lower transaction costs (Sartorius and Kirsten 2007), and to improve business performance (Sako 1997). Establishing and maintaining trusted buyer relationships is crucial for producers. Trust in a relationship can change contract characteristics, since it eliminates the need for bureaucratic involvement in contract enforcement and reduces transactions costs (Gow, Streeterc, and Swimenn 2000).

Commitment in some research is used to identify long-term relationships (Batt 2003; Boniface et al. 2010). When there are a desire for stable relationships, willingness to make short term sacrifices for the sake of maintaining the relationship, and a belief in relationship stability, the relationship quality between buyers and sellers develops into commitment. Because commitment is more appropriate to measure long-term relationships, the relational variable in this study is not highlighted. This study focuses on how smallholders involve and make relationships with buyers in modern supply chains. The operationalisation of relational variables and the contribution in this study are presented in Table 2.1.

There are several theoretical approaches that relate to the development of buyer and seller relationships. Firstly, transaction costs theory developed to back up economic efficiency along supply chains. Being integrated with other firms, a lack of trust and self interest may occur as moral hazards in the relationships. As transaction costs consist of two key behavioral assumptions: bounded rationality and opportunism (Williamson

1991), the moral hazards can be minimized by analyzing transaction costs in the supply chains. The concept of transaction costs is explained in sub Chapter 2.5 above. In order to minimize transaction costs and obtain economic efficiency, firms should practice the strategy of vertical integration and make contractual arrangements (Williamson 1985).

Table 2.1 Operationalisation of relational variables and the contribution in the study

Variable	Description	Contribution in the study
Trust	<ul style="list-style-type: none"> • A belief that a business partner will perform actions that result in positive outcomes for the firm and not take unexpected actions that may result of negative outcomes (Anderson and Narus 1990) • An expectation that acquire incomplete buyer information such as partners' words (Batt 2003) • A willingness of an exchange partner to make themselves vulnerable to the actions of another party (Mayer, Davis, and Schoorman 1995) • A willingness to rely on an exchange partner in whom one has confidence (Moorman, Zaltman, and Deshpande 1992, p.315) 	<ul style="list-style-type: none"> • Many scholars have influenced other theories which contribute to and motivate research on the buyer and seller relationship. In line with the related literature, this thesis focuses on trust to investigate largely the role of social capital factor in agrifood transformation • Development of empirical models of relationship marketing (RM) in agriculture and developing countries, particularly the Indonesian potato industry
Dimensions of trust:		
<ul style="list-style-type: none"> • Contractual trust 	<ul style="list-style-type: none"> • Shared moral norms of honesty and promise keeping (Sako 1997) 	<p>In this study, trust is identified through partners' honesty and goodwill to investigate largely the role of social capital factors in agrifood transformation, especially the potato industry. The honesty and goodwill trust represents the three dimensions of trust</p>
<ul style="list-style-type: none"> • Competent/honesty trust 	<ul style="list-style-type: none"> • A shared understanding of professional conduct and technical and managerial standards (Sako 1997) • Expectation of the ability and expertise of the trustee to fulfill his/her promise, agreement and/or obligation (Mayer, Davis, and Schoorman 1995) • A belief that a partner stands by his/her word, fulfills promised role obligations and a sincere referring honesty (Geyskens and Steenkamp 1995) 	
<ul style="list-style-type: none"> • Goodwill trust 	<ul style="list-style-type: none"> • Consensus on the principles of fairness (Sako 1997) • Expectations of other's moral obligations and responsibility in social relationships to demonstrate a special concern (dependability, responsibility and integrity) for other interests above their own (Barber 1983; Ring and Van de Ven 1992; Rempel, Holmes, and Zanna 1985) 	

Table 2.1 Operationalisation of relational variables and the contribution in the study
(continued)

Variable	Description	Contribution in the study
Antecedents of trust:		
• Communication	The formal as well as informal sharing of meaningful, timely and frequent information between firms (Anderson and Narus, 1990)	The selection of antecedent variables of trust is based on empirical literature in agriculture and is confirmed in the potato pre survey
• Price transparency	Clear, comprehensive, current, and effortless overview about offered buyers' prices (Matzler, Renzl, and Faullant 2007)	
• Relative price satisfaction	Farmers not only consider the price paid to them, but also compare the price to some reference price levels (Schulze, Spiller, and Wocken 2006)	
• Price quality ratio	An emotional state that occurs in response to an evaluation of all interaction experience with a partner (Crosby, Evans, and Cowles 1990; Leuthesser 1997)	
• Joint problem solving	A departure from the anchor point of discreteness that underlies spot-market transactions towards a relational, bilateral exchange (Yilmaz and Hunt 2001)	
• Reputation	Partners' ability to attract the best and brightest in competitive markets and showing a high and credible reputation (Kwon and Suh 2004; Merrill-Sands, Holvino, and Cumming 2000)	
• Dependency	Partners feeling under rewarded, angry and resentful and may result in suspicion and mistrust in the relationship between the buyers and sellers (Ganesan 1994; Gruen 1995)	
• Flexibility	A result of the bounded rationality of manager's decision making, the limited availability of information and the non-constant state of the environment (MacNeil 1980)	
Satisfaction	An emotional state that occurs in response to an evaluation of all interaction experience with the partner (Crosby, Evans, and Cowles 1990; Leuthesser 1997)	Satisfaction in this study is identified as a multidimensional of trust. The variable relates to satisfaction on the price.
Commitment	A desire for stable relationships, willingness to make short term sacrifices for the sake of maintaining the relationship, and a belief in relationship stability (Batt 2003; Boniface et al. 2010)	The variable is more appropriate for measures of long-term relationships.

Secondly, the principal-agent theory explains interdependence between parties. The theory has two assumptions; (1) that goal conflicts exist between the principals and agents, and (2) that agents have more information than their principals (Waterman and Meier 1998; Grossman and Hart 1986). Transaction costs and information asymmetry are central to principal-agency theory, because information is asymmetrical. The theory initially searches for the best option for both partners to be interdependent, and for minimizing transaction costs (Hobbs and Young 2001). However, interdependence between firms and farmers may cause other problems such as power asymmetry.

Thirdly, resource dependence theory which views inter-firm governance as an ideal strategy to respond to the conditions of uncertainty and dependence (Pfeffer and Salancik 1978) is applied. In this theory, firms seek to reduce uncertainty and manage dependence by means of establishing formal or semiformal links with other firms (Heide 1994). This may create power asymmetry when the exchange partner is much more powerful than the other. Thus, some scholars indicate that related norms such as trust may reduce unbalanced power (Heide and John 1992).

In many cases, scholars have influenced other theories which contribute to and motivate research on the buyer and seller relationship. In line with the literature above, this thesis focuses on trust to investigate largely the role of social capital factor in agrifood transformation.

Trust can be a significant component of social capital which together with institutional environment drives economic development (Fukuyama 1995; North 1990; Ostrom 2000; Dasgupta 2000). Trust is related to institutions and affects the costs of transacting if one's confidence in an enforcement agency falters, one is also less likely to

trust people and their agreements will not be established (Dasgupta 2000). A buyer's trust reduces the perception of risk and reduces transactions costs in an exchange relationship (Ganesan 1994; Doney and Cannon 1997). Hence, trust can be categorized as a catalyst that helps to make an economy function more efficiently. Anderson and Narus (1990) defined trust as the belief that a business partner will perform actions that result in positive outcomes for the firm and not take unexpected actions that may result of negative outcomes. Johnson and Grayson (1998) add competence, reliability and dependability to trust. In short, although the marketing scholars and practitioners cannot agree on a single model of trust, it can be defined as "...a willingness to rely on an exchange partner in whom one has confidence (Moorman, Zaltman, and Deshpande 1992, p.315)."

Scholars divide trust into various dimensions. For example, Sako (1997) distinguish between three types of trust as contractual trust, competent trust and goodwill trust. Contractual trust stresses shared moral norms of honesty and promise keeping. Competence trust requires a shared understanding of professional conduct and technical and managerial standards. Goodwill trust can exist only when there is consensus on the principles of fairness. Other scholars, such as Nooteboom et al. (1997) and Das and Teng (2001) classify trust into competent and goodwill trust. They use Mayer, Davis, and Schoorman (1995) to explain competence referring to the expectation of the ability and expertise of the trustee to fulfill his/her promise, agreement and/or obligation. Geyskens and Steenkamp (1995) view trust as encompassing two essential elements; honesty and benevolence. They define honesty trust as a belief that a partner stands by his/her word, fulfills promised role obligations and is sincere. Goodwill trust means the expectations of other's moral obligations and responsibility in social relationships to demonstrate a

special concern (dependability, responsibility and integrity) for other interests above their own (Barber 1983; Ring and Van de Ven 1992; Rempel, Holmes, and Zanna 1985).

Batt (2003) explains trust between growers and markets agents as an expectation of high returns when there is some uncertainty associated with the decision outcomes and when the outcome is considered important. Moreover, Batt (2003) also conceptualizes trust as an expectation that acquire incomplete buyer information such as partners' words. This results in a willingness of an exchange partner to make themselves vulnerable to the actions of another party (Mayer, Davis, and Schoorman 1995). Trust can be identified through partners' honesty and goodwill. Hence, in this thesis trust is conceptualized as honesty and goodwill. The multidimensional of trust is expected to be influenced by price satisfaction, dependence exploitation, reputation, flexibility, joint problem solving, communication, and exchange some partner's socio-demographic attributes. In the three farmer groups, the level of trust is also expected to be different among the farmers groups. Farmers who are closer to their partners tend to have a better understanding and be able to satisfy customer needs, and facilitate the informal resolution of conflict (Batt and Rexha 1999; Hakansson and Sharma 1996).

There are many factors which influence the building and maintenance of trust in the agrifood industry. One of the most important determinants of trust is communication. Anderson and Narus (1990) define communication as the formal as well as informal sharing of meaningful, timely and frequent information between firms. This definition stresses the efficacy of information exchange rather than the quantity or amount, and the construct inherently taps past communications. In agribusiness studies, many scholars such as Batt and Rexha (1999); Matanda and Schroder (2004); and Schulze, Spiller, and

Wocken (2006) investigate the relationship between communication and relationship quality as well as trust and observed that communication impacts positively on relationship quality.

Most of definitions of satisfaction are in the context of price. Price satisfaction is an important antecedent of trust that has been used frequently in many agribusiness literatures (Schulze, Spiller, and Wocken 2006). Price satisfaction as a construct has a number of dimensions such as price transparency, relative price satisfaction and price quality ratio (Matzler et al. 2006; Schulze, Spiller, and Wocken 2006).

Price transparency is an essential factor which influences trust. Price transparency shows clear, comprehensive, current, and effortless overview about offered buyers' prices (Matzler, Renzl, and Faullant 2007). Beukema and Zaag (1990) find that to reduce the uncertainty in the output market, farmers are more likely to establish long-term relationships with seed suppliers. Price transparency can be achieved through communication quality and information sharing (Naude and Buttle 2000; Lages, Lages, and Lages 2005).

Relative price satisfaction dimension assumes that farmers not only consider the price that is paid to them but also compare the price to some reference price levels which could be what they could obtain from alternative buyers (Schulze, Spiller, and Wocken 2006). Tanaya, McGregor, and Batt (2004) suggest that one of the factors which relates to financial issues affecting relationship of farmers and village intermediary is trading partner offers of best price. When comparing the own price received with the price paid by other dairies/slaughterhouses, Jaervelin (2001) finds that relative price satisfaction was the construct comprising short and long-term satisfaction. Farmers tend to seek other

buyers' prices before they sell their products. When they are satisfied with one best price offered by buyers, they will rely on a trusted buyer rather than seek another buyer.

Another determinant of trust is price quality ratio. Satisfaction including satisfaction in price quality ratio captures an emotional state that occurs in response to an evaluation of all interaction experience with a partner (Crosby, Evans, and Cowles 1990; Leuthesser 1997). Perceived level of product quality which is relative to the price paid is the perceived value received by customers (Fornel et al. 1996). Quality refers to the customer's actual experience with the product that consistently meets their specifications (Fiegenbaum 1991). Hence, as price quality ratio influences satisfaction in terms of relative price, the factor determines the level of trust in relationships.

Some authors suggest joint problem solving as determinant of trust (Zand 1972; Boss 1978; Gyau and Spiller 2007). The construct of joint problem solving is discussed in terms of collaboration. Yilmaz and Hunt (2001) identify collaboration as a departure from the anchor point of discreteness that underlies spot-market transactions towards a relational, bilateral exchange. In a buyer-seller relationship, a salesperson with personal cooperativeness determines the predisposition toward working in close collaboration with others. In agribusiness, cooperation between farmers and buyers is an essential factor influencing relationship quality. Gerlach, Köhler, and Spiller (2005) and Wilson (1995) show that suppliers consider processors orientations toward farmer' interests to maintain their relationships. This can only be accomplished through joint action. Moreover, Tanaya, McGregor, and Batt (2004) suggest that cooperation is an important factor explaining a buyer-seller relationship in dryland farming supply chains.

Other variables determining trust include partner reputation, dependency and flexibility in the relationship. Partners' reputation is one of three additional constructs assumed to have influence in assessing the level of trust among partners (Morgan and Hunt 1994). According to Schulze, Spiller, and Wocken (2006), farmers consider the performance of processors such as perceived management competence in judging the quality of their relationships. Trust in reputation relates to farmers' beliefs and expectations of buyers. The reputation of the buyers reflects their ability to attract the best and brightest in competitive markets (Merrill-Sands, Holvino, and Cumming 2000). Kwon and Suh (2004) argue that a partner's reputation in the market has a strong positive impact on the trust-building process, whereas a partner's perceived conflict creates a strong negative impact on trust.

Heide and John (1992) suggest relationship flexibility, which is a dimension of relationship management practices that influences relationship outcomes, is the willingness to move beyond the terms and conditions specified in contractual agreements as circumstances require. The requirement for flexibility in contracts arises as a result of the bounded rationality of manager's decision making, the limited availability of information and the non-constant state of the environment (MacNeil 1980). Flexibility is also considered as an important factor influencing relationship performances in agri-food supply chains (Aramyan et al. 2007; Gyau and Spiller 2008). The requirement of flexibility in agribusiness contracts arises as a result of bounded rationality of partners' decision making. Limited availability of information and non-constant condition of market result from fluctuation in price, supply and demand.

The final antecedent as a determinant of trust is dependence. Firms engage in transactions because they require resources from other firms (Pfeffer and Salancik 1978). Dependence enhances when the outcomes of relationships are higher than then the outcomes available from alternative relationships and when fewer alternative sources of exchange are available to the firm. Dependence usually engenders power which when used indiscriminately, will result in partners feeling under rewarded, angry and resentful and may result in suspicion and mistrust in the relationship between the buyers and sellers (Ganesan 1994; Gruen 1995). According to Dapiran and Hogarth-Scott (2003), the power of one party over others is derived from the latter's dependence on the former.

In addition to the antecedents discussed above, some socio-demographic variables can be as determinant factors of trust such as farm size, farming experience, and actual prize. La Porta et al (1997) provide evidence that trust is positively related to the size of firms. Fiegenbaum (1991) defined quality as the customer's actual experience with the product that consistently meets their specifications. Some studies report significant effects of experience to cooperative behaviors which lead to relationship manners (e.g Kidwell and Bennett 1993; Pullins, Fine, and Warren 1996; Spicer 1985), actual price in neo-classical market models is considered to be the key coordination mechanism of exchange relationships in perfect competition (Arndt 1983; Hobbs 1996). A commodity price should be important for the quality of business relationships which may be engendered by trust if the producers behave in a neo classical economic fashion (Gyau, Spiller, and Wocken 2011).

All constructs of trust explained above are examined in Chapter 6. The deep analysis is provided to address objective 3 of this thesis, the determinants of trust as a construct of relationship quality within the groups of potato farmers.

2.6 Gender issues in buyer-seller relationships

2.6.1 Women's roles in the agricultural supply chain marketing

This section provides the importance of women's roles in agricultural activities. Besides, this section shows how extensive research about gender differences in buyer-seller relationships especially focused on salespersons in non-agriculture industries are, but limited studies investigate women's roles in agriculture in terms of the buyer-seller relationships. The last part of this section reveals the possibility of women participation in agricultural market chains. These information are crucial to show the importance of women's roles in the agricultural supply chain marketing to be highlighted.

Gender roles are “the behaviours, tasks, and responsibilities that are considered appropriate for women and men because of socio-cultural norms and beliefs (USAID 2009, p.16).” In many Asian societies, rural women play key roles in agricultural activities including: production (planting, fertilizing, harvesting, and marketing), accessing to resources and effective technologies, and making decisions to adopt improved technologies. In crop cultivation, the distribution of tasks between women and men seem to depend mainly on the type of crop and on local cultural habits. For instance, rice cultivation in several areas of Central Java involves women in transplanting, weeding, routine observation of the crop, supplying food for hired laborers, harvesting and threshing, drying and selling the harvest. Men are in turn responsible for preparing

the soil, preparing and caring for the seedbed, supervising transplanting, managing water and fertilizers, making routine observations of the crop, controlling pests, harvesting and selling the harvest or supervising these activities (Van de Fliert 1993). In vegetable cultivation in North Sumatra, however, women are involved in all crop cultivation tasks, including preparing the soil and spraying pesticides. It is obvious that women have a very important role in decision making in all cases, since women usually manage the household's money. Men and women adopt agricultural technologies at different rates (Poats 1991). Women farmers tend to adopt improved technologies at a slower rate than male farmers (Doss and Morris 2001).

The importance of women's roles in agriculture has been widely acknowledged (e.g. Boserup 1984; Sajogyo 1985; IRRI 1985; Shiva 1989; Siwi, Machmud, and Mardiharini 1990), but understanding how to make better use of their contributions receives much less attention in most agricultural development programs. In most cases this lack of attention means that males have automatically become the target group for community programs by governments.

In Indonesia, the lack of attention is usually a result of a general assumption that the heads of families are men, who are also expected to represent their households in formal village activities. Surveys indicate that 17% of Indonesian agricultural households are headed by women (FAO 1990). The responsibility for farm management decisions is especially great for women farmers. Particularly for these women, involvement in agricultural development programs would be extremely useful. However, they often belong to the lower socio economic layers of the community (Van de Fliert 1993).

Women are not only involved in production activity, but they also fulfill numerous and significant roles in different aspects of processing, disposal, distribution and consumption within an economy (USAID 2009). The gendered patterns of behavior condition men's and women's jobs and tasks derived from income-generating activities in the supply chain, and the efficiency and competitiveness of value chains. Although most studies have investigated the value chain approaches as a strategy for enhancing economic growth and reducing poverty, few have considered how gender issues affect value chain development.

Saito, Mekonnen and Spurling (1994) reveal that one of the determinants of technology adoption in farm is gender as a human capital variable. Their study shows that the probability of women adopting new technologies and using fertilizer and agrochemicals, is higher than men. Educated women are more likely than educated men to increase the use of farming inputs and technologies. This shows that a women's role in decision making to adopt new technologies of farm production is increasingly important. Women's roles in agricultural marketing should be examined since empirical studies regarding gender differences in the agricultural supply chain are lacking.

From the marketing perspective, many studies highlight the differences between male and female buyer-seller relationships related to a number of different areas, such as management (Schein 2001; Paton and McCalman 2008) and performance (Dwyer, Richard, and Shepherd 1998; Swan et al. 1984; Cook and Corey 1991). The conventional perception argues that important differences exist between male and female in buyer-seller relationship concerning their attitudes and behavior (Fugate, Decker, and Brewer

1988; Gable and Reed 1987; Busch and Bush 1978). The differences should be considered when households make managerial decision.

Women are actively involved in agricultural value chains as unpaid household workers, wagedworkers, entrepreneurs, and leaders (USAID 2009). The gender aspects of agricultural value chains are especially complex because market-oriented agriculture, among smallholders still relies on farming households and family labor. Because of the prominent role of women as farmers and producers, value chain practitioners often overlook opportunities to enhance women's participation in other market transactions such as owners of input supply shops, traders and sales agents.

Yet evidence from different regions shows that women are participating in market linkages both as buyers and as sellers of goods and services at different points in the agricultural chain. For example, in Cambodia, many input supply shops providing swine livestock feeds are women. In many parts of West Africa, women conduct most marketplace-based agriculture trade (USAID-Guinea and Chemonics International Inc. 2007). Even in a highly mobility-constrained environment such as Pakistan, women are sales agents (USAID 2009). In parts of Central Java, Indonesia, women are involved at all levels from transplanting to selling the harvest (Van de Fliert 1999). Some of the gender based challenges face women as employees and entrepreneurs at other levels of the chain (USAID 2009).

The number of women participating in sales and buyers-sellers has increased since the increase of women in the job market (Siguaw and Honeycutt 1995). Some studies have examined the effect of gender on the buyer-seller relationships (Ndubusi 2006; Swan, Futrell, and Todd 1978; Siguaw and Honeycutt 1995; Cunningham III et al. 2008).

They reveal that identifying women's and men's specialization in buyer-seller relationships can create a better economy, such as greater number of trades (Cunningham III et al. 2008), effective selling (Cunningham III et al. 2008; Siguaw and Honeycutt 1995), and reduce transaction costs (Ndubisi 2006).

The literature above suggests that women are essential in agricultural activities and should receive attention in agricultural rural development, programs and policies. Furthermore, as women's roles in farm management have increased, investigation of women's participation in buyer-seller relationships is needed. Even though there are numerous studies about gender differences in buyer-seller relationships as salesperson in various industries, no study has empirically investigated the role of women in agriculture in terms of buyer-seller relationships. This study commences by exploring women's role in agricultural supply chains, what is known about male and female buyer-seller relationships, and male-female seller differences in the agricultural field, by exploring the case of the potato industry in Indonesia.

2.6.2 Gender differences in the buyer-seller relationships

Male and female differences in the supply chain marketing are deeply elaborated in this section. The topic is crucial since the increasingly gender roles in agribusiness are parallel to the liberalization and transformation of agrifood chains. Investigating the gender differences in relationship marketing provides valuable information on how the emergence of modern supply chains influences differently on male and female farmers and how the opportunities of the modern supply chains can be utilized by rural women.

The literature focusing on gender differences in the agricultural addresses various factors. For example Pearson (1979) analyzes sex differences in American farm work including attitudes and satisfaction levels. Leckie (1993) finds that farming profile and the socioeconomic characteristics such as farm size, sales, and commodity type are factors differing between male and female farmers in Canada. Zeuli and King (1998) investigate gender differences in farm management in U.S. farms which result from education level, type of farm operated, total acreage farmed, land tenure position, farm income, net farm profit, family income, off-farm income, and debt level as factor differences. Another study by Haugen and Brandth (1994) finds that even though there is indication that women farmers in Norway have taken up new roles in farming, they have not challenged the masculine way of farming. Compared to men farmers, the women farmers still had differences in terms of responsibility for domestic work and income from farming. The studies reveal that there are differences regarding behavior and perception between male and female farmers.

Empirical studies concerning gender differences on farms are commonly based on the theory of the household in farm productivity (Udry 1996; Udry et al. 1995; Saito, Mekonnen, and Spurling 1994). It is assumed that households behave as a single unit and the allocation of resources is Pareto efficient. The assumption of Pareto efficiency in the context of household decision making remains attractive because household members are engaged in a long-term, relatively stable relationship with good information about each other's actions. In this approach, individual characteristics including male and female differences and input level are expected to determine agricultural productivity. Although the theory can be used to explore technical and productive efficiency between males and

females, the measurement of sex differences in agricultural productivity is still debatable. When differences in yields are attributed to different characteristics of farmers such as human or physical capital, input levels, the gender of farmers is often an insignificant determinant of agricultural productivity (Quisumbing 1996). The process of the allocation human and physical capital to men and women is less often explored. In fact, gender differences arise from the socially constructed relationship between men and women (Oakley 1972) which impacts on the distribution of resources and responsibilities between them. The differences can be shaped through ideological, religious, ethnic, economic, and cultural determinants (Moser 1989, p.1800).

Understanding the process of decision making in agricultural households by male and female is more important to support gender differences analysis in the agricultural field. Quisumbing (1996) suggests taking an anthropological approach to improve the weaknesses of the research in terms of sex differences in agricultural productivity. Hence, this thesis provides an empirical study which shows the decision-making process of relationship marketing between male and female in agriculture using economics and an anthropological approach.

Although a lack of studies concerning gender differences is found in the agricultural field, many research findings in fields have different variables to explain relationship marketing (buyer-seller relationships). The analysis of male and female differences in many marketing studies utilizes two approaches: purchasing and salespeople.

In the purchasing literature, most of the empirical studies explore buyers' performance in various fields and methodologies. For example, studies by Swan et al.

(1984) and Cook and Corey (1991) use Multivariate Analysis of Variance (MANOVA) analysis to capture attributes determining buyer acceptance of the industrial salesperson. Using the experimental decision frame treatment, Stoddard and Fern (1999) focus on risk-taking propensity by marketing course students. Research by Swift and Gruben (2000) highlights supplier selection criteria such as support and dependability using Multivariate Analysis of Covariance (MANCOVA) and Analysis of Covariance (ANCOVA). Another study by Michaels, Kumar, and Samu (1995) uses cluster analysis to determine activity-specific role stress in purchasing between the male and female employees. Furthermore, Russ and McNeilly (1988) and Dion, Easterling, and Javalgi (1997) investigate business sectors to explore the relationship between sex stereotyping and buyers' general attitudes toward women, but these studies utilize different analytical tools: MANOVA and regression analysis. To answer the thesis objective 4, particularly to investigate the differences of relationship quality factors between males and females, a multivariate analysis of variance (MANOVA) is used to assess developed hypothesis. MANOVA is a useful test for comparing multivariate means of the two groups, males and females.

The salesperson perspective has been a main point of research in the relationship marketing and gender difference literature (Busch and Bush 1978; Swan, Futrell, and Todd 1978). Many gender issues in the buyer-seller relationships draw on salespeople differences in various sales scenarios based on the points of interests. For example, Schul and Wren (1992) examine potential gender differences in a large national company which are categorized into four variables: (1) job and organizational attitudes (i.e. satisfaction, organizational commitment); (2) reward preferences; (3) role stress; (4) job performance; and (5) turnover intentions. They find that sex differences in intrinsic reward preferences,

role conflict, supervisory-based performance evaluations, and turnover intentions. Moncrief et al. (2000) construct seven important factors concerning gender differences in an international service organization. They are: (1) role stress; (2) burnout and job stress; (3) organizational commitment; (4) met expectations; (5) intention to leave; (6) compensation and performance; and (7) family relationships. The significant differences in their study are role conflict, met expectations, and intention to leave. Furthermore, Dion, Easterling, and Javalgi (1997) who mix a purchasing and salespeople approach focus on sales performance factors such as education, sales experiences, job tenure, product expertise, buyer trust, adaptive selling ability, role ambiguity, buyer-seller similarity, and salesperson presentation skills. Their study results find some differences in salespeople's perceptions regarding education, years of experience, and professionalism and adaptive selling performance. The last three studies use different factors to identify sex differences based on structural industry and points of interest.

Focusing on agricultural producers, this thesis highlights buyer-seller relationship from salesperson perspective since the main respondents come from farmers who sell their products to various market chains. Some justification to determine gender difference variables is made considering farmers' behavior in decision making and literature from sex difference issues. Three elements of relationship quality: trust, commitment, and satisfaction, are highlighted intensively in terms of gender perspectives in Chapter 7.

Following the topic which will be explored in Chapter 7, trustworthiness is one variable of the gender differences. Constructs of trust are expected to reflect the aspects of salesperson (Plank, Reid, and Pullins 1999; Pullins, Reid, and Plank 2004). There seems

to be agreement on the importance of trust in relationship development (Crosby, Evans, and Cowles 1990). Fugate, Decker, and Brewer (1988) find that trust differences have been seen between salesmen and saleswomen. Following the analysis of determinants of trust which is elaborated in Chapter 6, contracts of trust which include the most germane factors in the agricultural field for the gender issues are communication, dependency, flexibility, joint problem solving, price quality ratio, price transparency, relative price, and reputation (Puspitawati et al. 2011).

Other relationship quality factors particularly commitment and satisfaction are also used in this thesis to analyze women sales performance by the potato farmers in marketing decision making. Moorman, Deshpandé, and Zaltman (1993) define commitment as an enduring desire to maintain a valued relationship. Morgan and Hunt (1994) propose that a firm will commit to an exchange partner when the relationship is considered important as to warrant maximum efforts to maintain it.

Satisfaction refers to a positive state resulted from the appraisal of all aspects of a firm's working relation with another firm (Anderson and Narus 1990). It can be measured by comparison of supplier's performance with buyers' expectation levels. According to Frazier (1983), farmers' satisfaction with past outcomes will indicate equity in the exchange which reduce levels of conflict in the relationship. The equity refers to fairness or rightness of something which will lead to the positive outcome in comparison to others (Halstead 1999).

Satisfaction for salespeople in the relationships can be conceptualized as various constructs of dimensions. In relation to gender differences analysis, the satisfaction dimensions include satisfaction on the relationships, orientation, price fairness,

uncertainty, performance, and organizational culture. A seller such as a farmer perceives satisfaction on the relationship with a buyer when his evaluation on his partner is matched to their expectation (Oliver 1980). Moreover, when a salesperson has a selling behavior which accomplish buyers' requirement, he practices a selling behavior, buyer-orientation, and focuses on maintaining long-term buyer satisfaction (Saxe and Weitz 1982).

Price fairness can lead a positive outcome and raise satisfaction when sellers' perception on the accepted price is reasonable, acceptable, and justifiable (Matzler, Renzl, and Faullant 2007). To reduce the uncertainty in the output markets, farmers are more likely to establish long-term relationships with seed suppliers (Beukema and Zaag 1990). Price transparency is needed by farmers to decrease uncertainty in price and marketing. It can be achieved through communication quality and information sharing (Naude and Buttle 2000; Lages, Lages, and Lages 2005).

Performance causes satisfaction when the differential performance results variation of satisfaction (Porter and Lawler 1968). Another important relationship management practice is organizational culture. It influences the attitude and commitment of buyers and sellers because shared assumptions, values, beliefs and norms can become deeply internalized by members of an organization (Jarrat and O'Neil 2002).

The elements of organizational culture become important in relation to thinking and social action. All those constructs of satisfaction will be used as gender differences factors which are more explored in Chapter 7. Satisfaction in this study is constructed from dimensions, which include satisfaction of the relationship, orientation, price fairness, uncertainty, performance, and organizational culture.

2.7 The Indonesian potato industry

This section highlights the performance of the Indonesian potato industry. The description includes the roles of potato industry in the Indonesian economy, a strand of potato literature, and potato marketing channels in Indonesia. These information are important to give basic information how this study can contribute to the Indonesian potato research and the emerging stream of relationship marketing literature.

In Indonesia, the potato has become an alternative food because of its economic and non economic benefits. With its high rate of growth, high yield, climate resistance and low water consumption, the potato is easy to cultivate and offers profit opportunities. Bottema et al. (1989) report that potato farmers at highland and medium altitude obtain positive gross margins and profit. FAO (2008) suggests that potatoes can provide food security commodity and help eradicates farmers from poverty.

Even though total potato production area in Indonesia dropped from 73,068 hectares in 2000 to 59,748 hectares in 2006 (Ministry of Agriculture of Indonesia 2008) and yield performance has remained flat since 2000, Indonesia is still the largest potato-producing nation in Southeast Asia with an annual potato production of 1.1 million tons (FAO 2009). This shows that Indonesia has a significant potential to develop potato cultivation because of compatible land and abundant human resources. Potatoes need high altitude to grow well.

The prospects for potato production in the world market are relatively good because it supports global food security. The national potato consumption in Indonesia has shown an upward trend in the past few years. The potato is also one of the effective

foodstuffs to lower per capita rice consumption which has reached an average of 135.5 kg per year (Ministry of Agriculture of Indonesia 2008).

Moreover, potato contributes a significant value to foreign exchange earnings. The volume and value of exported potatoes rose from 18.98 tons (2.31 million US\$) in 2000 to 85.99 tons (5.95 million US\$) in 2006 (Ministry of Agriculture of Indonesia 2008). However, the volume and value of imported potatoes also increased from 2.56 tons (0.62 million US\$) to 4.39 tons (2.41 million US\$) at the same period. This situation triggered some disadvantageous suppression on farm gate prices.

There is limited research analyzing Indonesian potato, most of which covers topics concerned with production issues such as the economic behavior of potato farmers under price and production risk (Fariyanti et al. 2007), and institutional issues for example farmer accessibility to sources of credit (Supadi and Syukur 2004). Fariyanti et al. (2007) conclude that the household economic behaviors of potato farmers in Indonesia are easily influenced by the rise of product price and product risk. This shows that output price is an essential variable influencing farmers on farms. On the other hand, Supadi and Syukur (2004) conclude that horticulture farmers in Indonesia have more access to informal than formal institutions to obtain credit, such as input/output traders.

Some studies have focused on potato farmer welfare, such as research by Supriyati (2004) and Fuglie et al. (2006). Supriyati (2004) investigated factors that influence farmer's welfare and potato price in Central Java, East Java and South Sulawesi. The results show that potato farming is capital intensive, since it involves high costs, such as for seeds, pesticides, and fertilizer, which are imported. Farmer's welfare is influenced by the level of technology adoption, cost of production (seeds and pesticides), productivity,

and potato price. On the other hand, Fuglie et al. (2006) highlight farm demand for quality potato seed in Indonesia. They conclude that potato farmers in Indonesia could benefit from increased use of quality seed, whether supplied through imports or locally produced. If a farmer faces a high discount rate, the net benefit of quality seed is reduced since the value of future improvements in crop yield is more heavily discounted.

Marketing topics of potato industry are rarely discussed. Some studies have analyzed the relationships of potato farmers and processors. For instance, Saptana et al. (2006) investigate institutional relationships in the horticultural supply chain. Their study found that the supply chain in Indonesian horticulture commodities was not efficient as the market formed long marketing channels and an oligopsony market. The study also reports that some potato farmers in Indonesia engage with big companies such as PT Indofood Fritolay Makmur (IFM). Another study by Hastuti (2004) examines the institution of potato marketing and farmer partnerships. Hastuti (2004) suggests that the marketing cost is relatively high, while the community's access to formal financing institutions is quite low. Most traders make partnerships with farmers to maintain supply continuity, and in the mean time farmers can get capital for input production and marketing security.

Potato marketing in Bandung where the majority of potato producers are located in Indonesia can differ depending on the potato varieties. In general, there are two potato varieties, each with their distinct marketing channels: Granola and Atlantic. The Granola marketing channel is between farmers and traders selling to the main traditional markets for household consumption. Atlantic is sold via a marketing partnership between farmers' groups producing and the Indofood Company. Farmers who plant Atlantic varieties are

supplying potato chips. The partnerships are applied without any formal agreements between the company and the farmers.

The increased demand for processed potato by large processing companies is supported by the growth demand for snack food. The growth of snack food industry has partly been driven by the increasing number of retail convenience stores (Indofood 2009). The increase of snack food demand has caused the increase of fresh potatoes as input of potato processing. For Indonesian potato farmers, this can be seen as a new marketing channel rather than traditional channels.

Another study of potato marketing in Indonesia was conducted by Natawidjaja et al. (2007). They divide potato marketing channels in West Java into five groups; (1) farmer – traditional wholesaler – wholesale market – retail market; (2) farmer – local collector – traditional wholesaler – wholesale market – retail market; (3) farmer – farmer group – industry specialized supplier (vendor) – food industry; (4) farmer – traditional wholesaler – supermarket specialized supplier – supermarket; and (5) farmer – farmer group – supermarket. The study shows that there has been a transformation of market channels in potato as a result of the increase in the modern supply chains, such as supermarkets and food industries. However, the sales of the potatoes in the last 10 years are still dominated by the traditional market (almost 99%) which is represented by marketing channels 1 and 2.

In their research, Natawidjaja et al. (2007) also find that the Indonesian potato industry in traditional marketing channels is less efficient as shown by the growers' farm profitability (ratio revenue/cost) be only 1.4 - 1.5 compared to the modern supply chain with ratio 2.0. Their total profit is 150% lower than growers in the modern supply chains.

In a similar fashion, Saptana et al. (2006) reveal that the supply chain in the Indonesian horticulture industry dominated by traditional channels is not efficient as the market forms long marketing channels and an oligopsony market. Hastuti (2004) suggest that marketing cost is relatively high, while the community's access to formal financing institutions is quite low. Most traders form partnerships with farmers to maintain supply continuity, and in the mean time farmers receive capital for input productions and marketing securities.

Potato marketing in Indonesia is dominated by general trading and contract farming schemes (Saptana et al. 2010). General trading refers to an informal and flexible relationship between sellers and buyers and the commodity price is defined in an agreement (Saptana et al. 2010; Saptana et al. 2006). The traders' positions in determining prices are usually higher than the farmers as the farmers have tight relationships in terms of loans for buying seed, fertilizer, pesticide, and household goods. On the other hand, contract farming is "...an agreement between farmers and processing and/or marketing firms for the production and supply of agricultural products under forward agreements, frequently at predetermined prices (Eaton and Shepherd 2001, p.2)".

Even though studies by Saptana et al. (2006) and Hastuti (2004) provide worthwhile information about current potato marketing in Indonesia, they do not investigate factors influencing farmers' decision to choose among various markets, domestic and international markets. The studies also do not investigate how farmer's decisions in marketing influence the value chain performance of potato. Thus, in order to fill this gap, this thesis analyses about how farmers' relationships influence the potato supply chain in Indonesia and factors influencing farmers to choose the potato markets.

Chapter 3 Methodology

Chapter 2 established potato marketing, farmers' participation in various marketing channels, relational marketing, and women's roles in agricultural marketing as the best starting points for understanding the importance of relational marketing in varied aspects in the Indonesian potato industry. This chapter provides a description of the sample, sampling, data collection and data analysis methods. This chapter aims to justify the research methods chosen to the best answers the research objectives and questions.

3.1 Questionnaire development

A structured questionnaire was designed to form the basis of the fieldwork and to obtain the variables in the context of farmers' participation, motivations, relationship quality and women's roles to be examined by potato farmers. The questionnaire is divided into four parts: social and economic, best-worst, relationship quality, and gender parts. For this study, only questions related to variables the social economic, relationship quality and gender are used. The best-worst questionnaire is not utilized because it is used by another counterpart of this research.

The social economic section of the questionnaire consists of 10 elements. They are the following: the characteristics of members of the household, housing and investment, agricultural land, potato production, potato sales, contract relationships and income, price and product incentives, price and payment system, farmers' reasons for not contracting Indofood, and contract production. The last is only used for the contract farming growers. Most of data in the social economic section consists of continuous data. The relationship

quality section is developed according to a five-point likert scale which indicated respondents' level of agreement (1 = strongly disagree to 5 = strongly agree). Some relational variables were built in order to know the relational marketing of the Indonesian potato industry. The gender section consists of questions related to the best-worst and relationship quality. The questionnaire aims to identify females' perception of relational marketing if the female farmers are potato sellers. The final questionnaire is presented in Appendix A.

The process of developing the structured questionnaire involved three steps: building a draft questionnaire, pre testing the questionnaire, and refining the questionnaire. In the first step, a draft questionnaire was developed based on variables needed to answer research questions. The draft was developed based on the literature and discussions of the research team comprising the author, the Australian Centre for International Agricultural Research (ACIAR), the University of Adelaide, Indonesian Vegetables Research Institute (IVEGRI/Balitsa), the International Potato Center (CIP), and a representative from Indonesian Centre for Agriculture Socio-Economic and Policy Studies (ICASEPS). Then the questionnaire draft was field-tested with 10 respondents who represented the sample areas. The aim was to identify problems when the questionnaires were used in the field and to respond to feedback from the respondents. The final step was to refine the draft questionnaire. This was done by the whole team including the interviewers. The refined questionnaires were applied in a survey which was conducted from the 23rd of February to the 22nd of March 2009. There were 7 interviewers who completed two training exercises. The training aimed to make sure that all the interviewers had the same perceptions of the questions in the questionnaires. Then, they

were able to deliver the questions uniformly in the same way, obtain full details from the respondents and complete all the filling in the questionnaires.

3.2 Sampling methods

This study utilizes stratified random sampling to obtain a representative sample. Random sampling is the best sampling method to represent a population in a survey for generalizing the study results and reducing the risk of bias. Random sampling is a sampling technique where a group of subjects (a sample) for study from a larger group (a population) is selected. Each individual in the sample is chosen entirely by chance and each member of the population has a known chance of being included in the sample (Easton and McColl 2010). The random sampling is applied for the three groups of population determined in this research (stratified random sampling).

As the research project used in this thesis initially was set up to compare three groups of potato farmer population: general farmer population (GFP), Farmer Field School (FFS), and Indofood groups, the sampling method precisely is stratified random sampling. The method may expect the measurement of interest to vary among the different of the sub populations. Stratified random sampling techniques are utilized when the population is expected heterogeneous and is representative of the population. The process of stratified techniques for the three groups is described below.

In most developing countries, identifying a population of farmers is very difficult as population records are poor. Information about the number of potato farmers and the list of farmers' names in a village, or at a district and sub-district level is insufficient. Indonesian statistics do not record the number of potato farmers per area, but it usually

documents the area under production. Hence, the product and harvest data are used to stratify the sample in this study.

West Java province is chosen to represent potato farmers in Indonesia because it is the largest potato area, as indicated in Table 3.1 and 3.2. The potato production of West Java was 35.65% of the Indonesian potato production in 2005, and achieved 32.55% in 2007. Central Java and North Sulawesi had the second and third largest production of Indonesian potatoes.

Table 3.1 The top five potato producers in Indonesia

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Source: Statistics Indonesia (2006 and 2008).

Table 3.2 The top five potato harvested area in Indonesia

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Source: Statistics Indonesia (2006 and 2008).

In terms of the harvested area, West Java and Central Java still dominate potato production with 16,535 and 15,491 hectares in 2007 (see Table 3.2). Other provinces with potato production are North Sulawesi, East Java, and North Sumatera.

After determining the province, the next step was stratification of the sample based on areas at a district, sub-district and village level. The population in this study is from two districts in West Java: Bandung and Garut. These two districts account for over 90% of West Java's potato production (Natawidjaja et al. 2007). Only farmers who grow potatoes in the 2008/09 rainy season or dry season were included in the population since they have farm records completely a year before the survey.

The two groups from the three groups of potato farmers, Farmer Field School (FFS) and Indofood, were chosen as they are parts of the potato project of this study. The project called potato-brassica involves a collaboration of the Australian Centre for International Agricultural Research (ACIAR), the University of Adelaide, the Indonesian Centre for Agriculture Socio-Economic and Policy Studies (ICASEPS), and the International Potato Center (CIP).

The FFS sample refers to all the potato farmers who are involved in the FFS potato-brassica project 2009. The FFS project provides opportunities for learning-by-doing, based on principles of non-formal education. The project is conducted in two districts in West Java, Bandung and Garut. The project introducing new potato varieties, new potato farming techniques and adapting environmentally friendly methods is conducted in the two districts. The sample of 50 FFS producers is selected randomly from lists of more than 200 farmers provided by extension officers working for two government departments and the Australian and Indonesian governments.

The Indofood farmers are farmers who sell their products under forward contracts to Indofood. Indofood forms partnerships with farmers in the major potato producing areas which are concentrated in several sub-districts in West Java (Bandung and Garut)

and Central Java (Dieng). The Indofood sample including 60 farmers is drawn randomly from a list provided by Indofood of more than 400 producers.

The last group is the general farmer population (GFP) farmers who are not involved in the FFS project or the Indofood partnership. These farmers sell their products directly to the market and other middle men. Different from the FFS and Indofood samples, the general farmer sample is chosen by random stratification based on area. This is because of the lack of a name list of the thousands of potato farmers in West Java. The potato farmer population in West Java is around 31,240 farmers containing more than 24,000 farmers in Bandung and 7,100 farmers in Garut (Natawidjaja et al. 2007). Because of a limited research budget, 197 respondents were selected to represent the general farmer population.

The sample of the general farmer population (GFP) resulted from randomly selecting an average of 12 potato producers from each of the 16 villages. The 16 villages includes Cibodas, Sunten Jaya, Cisondari, Margamekar, Margaluyu, Sukaluyu, Cikembang, Cibereum, Sukajaya, Mekarjaya, Sukawargi, Karamat Wangi, Sukahati, Mekarmukti, Simpang, and Girijaya. Bandung and Garut were chosen as the representative districts because the two samples were the biggest producers in West Java and the FFS and Indofood samples were available.

The 16 villages in the general farmer population (GFP) sampling were selected in three steps. Firstly, sub-districts (*kecamatan*) were stratified into two categories, major and minor potato production areas based on published production and area data in 2006, and key informant interviews. The list of sub-districts which produced potatoes in the two districts and become the data base for sampling is given in Table 3.3.

Table 3.3 Area and production of potatoes used in the research sampling by district in Bandung and Garut district in 2006

Bandung district			Garut district		
Sub-district	Area (ha)	Production (Quintal)	Sub-district	Area (ha)	Production (Ton)
Pangalengan	8,066	1,797,519	Cikajang	1,362	32,587
Kertasari	540	270,915	Pasirwangi	975	22,640
Cimendan	225	63,118	Cisurupan	591	14,127
Pasirjambu	209	44,137	Cigedug	342	8,224
Rancabali	89	19,560	Boyongbong	326	7,656
Ciwidey	88	16,030	Samarang	324	7,559
Paseh	72	12,271	Sukaresmi	307	7,154
Lembang	58	32,848	Leles	177	4,093
Pacet	56	11,523	Wanaraja	150	3,349
Cimaung	33	389	Cilawu	137	3,104
Sindangkerta	30	10,181	Pamulihan	127	2,867
Cisarua	26	6,016	Sucinaraja	121	2,096
Ibun	25	6,652	Pangatikan	90	2,910
Cikancung	22	5,878	Banjarwangi	54	1,221
Parongpong	12	2,400	Talegong	32	712
Gununghalu	8	799	Karangtengah	16	363
Cilengkrang	8	15,074	Karangpawitan	7	156
Total	9,568	2,315,310	Total	5,139	120,842

Source: Agricultural Service for Food Crops of Bandung District (2006); Statistics Garut (2008).

Secondly, two sub-districts were randomly selected from the major and minor potato production zones, resulting in a total of eight sub-districts. Each district (Bandung and Garut) has 4 sub-districts.

Thirdly, to identify villages which produced potatoes in the year before the survey, site visits and key informant interviews were used. Two villages were chosen for each *kecamatan*. The first village was the largest producer, and the second village was drawn randomly. Then the research team visited the land registry in each of the randomly sampled villages to obtain names and contact information on potato producers from the land tax office files.

Table 3.4 Number of respondents in each farmer group and survey area (persons)

District/Village	GFP	FFS	Indofood
<i>Bandung district</i>			
Lembang			
- Cibodas	12	0	0
- Sunten Jaya	12	0	0
Pasir Jambu			
- Cisondari	12	0	0
Pangalengan			
- Margamekar	12	10	4
- Margaluyu	12	5	0
- Warnasari	0	0	6
- Pulosari	0	0	20
- Sukaluyu	12	0	0
Kertasari			
- Cikembang	12	7	0
- Cibereum	12	7	0
<i>Garut district</i>			
Sukaesmi			
- Sukajaya	12	0	0
- Mekarjaya	12	0	0
Cisurupan			
- Sukawargi	12	0	0
- Karamat Wangi	12	0	0
- Cisurupan	0	4	0
- Cisero	0	2	0
Cilawu			
- Sukahati	12	0	0
- Mekarmukti	12	0	0
Cikajang			
- Simpang	12	0	0
- Girijaya	12	0	0
- Cibodas	0	3	0
- Padasuka	0	3	0
Cigedug			
- Cigedug	0	0	23
- Sukahurip	0	0	3
- Barusuda	0	0	2
- Sindangsari	0	0	2
Pasir Wangi			
- Padaawas	0	6	0
- Sari Mukti	0	3	0
<i>Back up respondents</i>	5	0	0
Total	197	50	60

Finally, 192 farmers in total from 16 villages were obtained from the survey. The survey had five respondents as extra back up samples. The total respondent in the survey was 197. The number of respondents in each group and area is presented in Table 3.4.

3.3 Data summary

3.3.1 The samples' characteristics

This chapter describes characteristics of the respondents. Table 3.5 shows some characteristics, such as demography, assets, lands, potato production, income, and potato price, and the results of a difference test using the Tukey test on the variables. The statistic test shows a mean value difference when there are different superscripts in the mean values among the three groups.

In terms of demography, the average age of all the respondents is 45 years. Using the Tukey test, the results indicate that there is a mean difference only between the FFS and the general farmer group. Based on Table 3.5, the household heads of the general farmer group has 47 years average age. This shows that general potato farmers in West Java are dominated by old farmers. Meanwhile, the FFS and Indofood groups are relatively young farmers who are around 41 and 44 years old. The average age of the spouses also shows similar results that the FFS group has a mean difference compared to the general group. The spouses' average ages are 41 and 38 for the general farmers, FFS and Indofood groups, respectively. From the total sample in each group which is 197 general farmer samples, 50 FFS samples, and 60 Indofood samples, male dominates the main respondents. The household heads as the main decision makers in potato production and marketing are dominated, about 98.0%, by males for the general farmer and FFS

groups (see Appendix B). Indeed, all the main respondents of the Indofood group are male.

Table 3.5 Descriptive statistics of the respondents

Variable	General Farmer Population (N=197)		FFS (N=50)		Indofood (N=60)		Total (N=307)	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Err.
<i>Demographics</i>								
Age of household head (years)	47.04 ^{bc}	11.85	41.00 ^a	10.39	44.33 ^{ab}	9.53	45.28	0.65
Education of household head (years)	6.48 ^a	2.82	9.38 ^c	3.24	8.37 ^{bc}	3.44	7.32	0.18
Age of spouse (years)	41.05 ^{bc}	11.82	36.50 ^a	9.59	37.90 ^{ab}	9.49	39.52	0.64
Education of spouse (years)	6.83 ^a	2.87	8.90 ^c	3.16	8.20 ^{bc}	3.07	7.43	0.17
Living together (years)	23.86 ^{bc}	12.06	18.37 ^a	9.90	20.82 ^{ab}	10.55	22.19	0.66
Household size (persons)	4.31	1.69	4.72	1.65	4.72	1.89	4.46	0.10
<i>Assets</i>								
Area of house (m ²)	326.49	343.00	307.34	587.40	288.75	266.52	312.94	21.59
Value of house (million Rupiah)	82.40	72.80	93.10	182.00	127.00	131.00	92.2	6.33
Value of agricultural assets (million Rupiah)	258.00	716.00	181.00	604.00	250.00	437.00	240.00	36.90
Total owned land (hectare)	1.12	2.38	0.71	1.85	1.15	1.38	1.04	0.12
Total farm land (hectare)	1.64	1.98	1.92	3.1	2.05	1.57	1.76	0.12
Total potato land (hectare)	0.93	1.56	1.22	2.52	1.24	0.95	1.03	0.09
Total farm land (hectare)	1.81	2.59	2.02	3.35	2.15	1.65	1.91	0.15
Total area using irrigation in rainy season (hectare)	0.01	0.07	0.01	0.05	0.00	0.00	0.01	0.00
Total area using irrigation in dry season (hectare)	0.47	1.25	0.64	1.36	0.59	0.75	0.51	0.07
Total area not using irrigation in rainy season (hectare)	0.66	1.40	0.91	2.41	0.93	0.79	0.74	0.09
Total area not using irrigation in dry season (hectare)	0.00	0.03	0.03	0.21	0.02	0.11	0.01	0.01
First potato area (hectare)	0.19	0.20	0.21	0.25	0.31	0.35	0.23	0.02

Note:

^{abc} Means with same superscript are not statistically different. The mean difference is significant at the 0.05 level.

^{*)} The values are calculated by eliminating the negative income.

Education of the household heads and their spouses is relatively low, which is 7 years on average. Even though education for the general farmer group is the lowest, around 6 years on average, the farmers obtain the minimum basics of education at primary school. Based on Table 3.5, the average values of FFS' education of the household heads and spouses are statistically different from the general farmer group.

The group has mean differences with the FFS and Indofood. However, the Indofood group does not have any differences with the other groups. The data of reading and writing literacy shows that all of the FFS and Indofood respondents can read and write well. However, only 97.5% of the general farmer sample can read and write at a literate level.

Another variable which shows different mean values among the groups is living together. The mean value of the general farmer group only differs from the FFS. The FFS also only differs from the general farmer group. Nevertheless, the Indofood group does not have differences in mean values to the other groups. The average mean values of living together by the general farmers, FFS, and Indofood are 24, 18, and 21 years.

Most of the respondents in each group are married (Appendix B). Only about two percent the respondents are single. The average household size of the respondents is moderate, which is four persons in each household. In parallel to the National Socioeconomic Survey of Indonesia (SUSENAS = Survei Sosial Ekonomi Nasional) data, the average value of household size in 2010 was about 4 persons (Statistic Indonesia 2010). The household size of the FFS and Indofood groups is bigger, five persons. Even though the average of household size by each group is four or five persons, there are some households which have big families. The number of the family members can be 10 persons. As the number of the household members among the three groups is not significantly different, the test results show that it does not statistically differ among the groups.

Farmers' assets include their houses and agricultural assets, such as tractor, pump set, agricultural equipment, motorcycle, supporting business equipment, land, mist

blower, car, and storehouse. In Table 3.5, the statistic tests show that there are no different mean values of asset variables among the three groups. The average of the total house area is 312 meter square and its value is 92 million rupiah. Although the poorest potato farmers own a minimum of a 23 meter square house, there are some rich farmers who own 4200 meter square houses. This reveals that the composition of capital owned by the potato farmers varies. Moreover, the average values of the house vary from 400,000 rupiah to 1.10 billion rupiah. The respondents' houses include facilities such as own water drinking source, toilet, and electricity light. More than 65% of the general farmer and 44% of the FFS respondent use outdoor covered wells (see Appendix B). On the other hand, about 63% of the Indofood farmers use private taps. Even though there are a few farmers using toilets without septic tanks and shared/public toilets, more than 80% of the respondents have their own septic tank toilets. Almost all of the three sample groups have mains electricity. Only 1.7% of the Indofood farmers still utilize oil lamps.

Other assets owned by most of the respondents are television, radio, CD player, water pump, mobile phone, and motorbike. More than 50% the farmers in the FFS and Indofood groups has water pumps to support their activities in the fields (Appendix B). More than 42% of the general farmer group owns the pumps. Other devices which the respondents use on their potato fields are mist blowers, storehouses, and other agricultural equipment. Most of them also own motorbikes which are used to reach their hilly fields. Interestingly, more than 80% of the FFS and Indofood farmers and more than 67% of the Indofood farmer have mobile phones. About 26% of the general farmers and FFS, and more than 47% of the Indofood farmers contact their buyers by phone. Moreover, 18% of

the FFS, and about 4 and 5% of the general farmers and Indofood farmers utilize the internet on their mobiles.

Farm land is a valuable asset owned by the potato farmers. The respondents' land is used not only to plant potatoes but also other crops such as broccoli, tomato, chili, etc. However, the main source income and the top commodity produced in the three years before the survey year is potato (see Appendix B). As shown in Table 3.5, the overall average for farm land owned by the respondents is 1.04 hectares. The average total land holdings for the general farmers (GFP), FFS and Indofood samples are 1.12, 0.71, and 1.15 hectares, respectively. Although there are some farmers who had large farm lands, up to 25 hectares, there are some farmers who do not have any land. They rent, borrow, pawn or lease land. Forty four percent of the FFS sample, almost 64% of the general farmer, and 72% of the Indofood own and farm the land. The other farmers 19% of the general farmers, 36% of the FFS, and 52% of the Indofood use rented land. The other tenure system which can be applied to the farmers is utilized land. Utilized land means that the land is owned by local/central government, but farmers are allowed to utilize the land for a particular time. Then they have to plant the land with the forest trees.

The average mean of the total land which the farmers provided for potatoes is 1.03 hectares. The average total potato land for the GFP and FFS groups are 0.93 and 1.22 hectares respectively. The largest mean of the potato land (1.24 hectares) belongs to the Indofood group. This shows that the general potato farmers have less land on average than other West Java producers. It is likely that the traditional potato farmers are dominated by small scale farmers. Although the modern supply chain farmers, Indofood farmers, have more land on average than other West Java producers, they are still

relatively small producers. From suppliers' perspective, they are small. Buyers, whether traders or Indofood, need lots of the small farmers to fill orders. Indofood in particular is forced to work with many producers that are relatively small.

Potato land is mostly planted in rainy seasons. This can be seen from the average values of the areas with no irrigation in rainy season is 0.66 hectares for the general farmer, 0.91 hectares for the FFS, and 0.93 hectares for the Indofood group. All the respondents are asked about the size of potato land for their first experience as potato farmers. They plant 0.23 hectares on average.

At the survey locations, there are four kinds of potato grade: AL, ABC, Kecil and BS. The grades are based on the sizes and qualities of potatoes from high to low. For example, the AL grade is the highest quality and the biggest size. The BS grade is the lowest quality and size. The ABC grade is a general quality and size of potatoes which are sold in West Java. Hence, the largest production of potato was ABC potatoes.

As seen in Table 3.6, the average total production of the ABC grade is 18.39 ton per year. The biggest production of ABC grade is achieved by the Indofood group reaching 25.67 ton. The general farmer group produces almost 15.99 ton of potatoes per year. The smallest production is in the AL grade, in total 0.3 ton a year. The general group contributes the largest production of AL potatoes. Some of the respondents also produce potatoes for seed. The total production of potatoes for seed is 3.54 ton a year on average.

Table 3.6 Potato production of the respondents

Variable	General Farmer Population (N=197)		FFS (N=50)		Indofood (N=60)		Total (N=307)	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Err.
<i>Potato production</i>								
Total potato production (ton)	22.04	43.55	26.97	57.32	29.21	25.14	23.91	2.45
AL production (ton)	0.48	2.11	0.1	0.24	0.05	0.21	0.33	0.1
ABC production (ton)	15.99	30.88	20.63	43.79	25.67	23.06	18.39	1.83
Kecil production (ton)	1.33	7.30	0.73	1.83	1.24	1.56	1.19	0.33
BS production (ton)	0.40	0.89	0.7	2.32	0.55	0.83	0.47	0.07
Seed production (ton)	3.72	9.94	5.45	15.68	1.61	1.66	3.54	0.58
Total sold potatoes (ton)	3.55	9.34	23.02	58.87	26.58	23.61	19.95	2.13
Kept seed (ton)	17.58	33.59	2.84	3.91	2.11	1.86	3.11	0.43
Sold seed (ton)	0.42 ^b	2.95	2.72 ^c	10.85	0.00 ^{ab}	0.00	0.71	0.29
Other use of potato (ton)	0.07 ^b	0.61	0.67 ^c	0.79	0.06 ^{ab}	0.32	0.16	0.04
Consumed potato (ton)	0.48	1.92	0.62	2.14	0.54	0.79	0.51	0.1
Proportion between sold and produced potato (%)	0.74 ^b	0.14	0.67 ^a	0.22	0.89 ^c	0.07	0.76	0.01
Percentage of expanded/reduced potato area (%)	47.93	85.80	77.26	185.38	70.63	81.3	31.53	4.78
<i>Income</i>								
Total household income (million Rupiah)	63.70	138.00	65.40	123.00	63.00	62.00	63.80	6.99
Net crop income (million Rupiah)	51.70	103.00	46.10	83.30	55.70	63.40	51.70	5.26
Net income from potato (million Rupiah)	23.60	53.40	26.60	65.10	29.40	44.20	24.90	3.05
Net crop income excluding potato (million Rupiah)	28.00	61.80	19.50	23.60	26.3	30.50	26.80	2.97
Non-farm income (million Rupiah)	12.00	58.50	19.40	48.80	7.32	13.80	12.10	2.89
Proportion between potato income and total household income ^{*)} (percent)	0.34	0.46	0.29	0.29	0.41	0.27	0.34	0.02
Proportion between net crop income excluding potato and total household income ^{*)} (%)	0.49	0.47	0.45	0.32	0.72	2.36	0.55	0.06
Proportion between non-farm income and total household income ^{*)} (%)	0.17	0.27	0.27	0.39	0.18	0.33	0.18	0.02
<i>Transportation</i>								
Total transportation cost (million Rupiah)	2.48	10.50	4.90	25.30	1.57	1.78	2.65	0.75
Distance from farm to house (km)	1.91	2.02	2.00	2.65	2.26	3.13	1.98	0.14
<i>Potato price</i>								
Average selling price in 2008 (Rp/kg)	3162.50 ^{ab}	729.09	3169.00 ^a	605.66	3462.50 ^{ac}	166.63	3252.12	38.74
Average selling price in 2009 (Rp/kg)	3016.93 ^a	499.10	3033.00 ^a	492.14	3893.33 ^b	169.11	3223.13	34.81

Note:

^{abc} Means with same superscript are not statistically different. The mean difference is significant at the 0.05 level.

^{*)} The values are calculated by eliminating the negative income.

Generally, potato farmers sell potatoes as consumption and seed potatoes. The total potatoes which are sold as consumed potatoes are almost 19.95 ton per year on average (see Table 3.6). The Indofood group contributes the largest number of sold potatoes, on average 26.58 ton a year. To cover the high production cost of potatoes demanded by Indofood, the Indofood farmers should produce in economies of scale. The main consumer of the Indofood group is a big food processor, Indofood Fritolay Ltd, which requested a special potato variety called Atlantic. The seed of this variety was expensive and contributed the biggest portion of the production cost. On the other hand, the highest sale of seed potatoes is reached by the FFS group since the FFS farmers involved in the farmer field school program adopt the first filial generation (F1) seeds. This situation causes most of the FFS farmers to sell their harvested potatoes as seed.

The results of the statistics tests in Table 3.6 show that the mean values of some potato production variables such as total sold seed, total other uses of potato, and proportion between sold and produced potato are significantly different among the three groups. The mean of the total sold seed by the FFS group differs from the general farmers and the Indofood group. The Indofood group only has different mean values than the FFS group, and the general farmer group only differs from the FFS regarding the mean value of total sold seed. A variable, total other use of potatoes, which refers to other purposes of potatoes such as for gifts or charities to the farmers' neighbors, reveals the same results as the total sold seed. A different result is revealed by the variable of proportion between sold and produced potatoes. The result shows that each group has a different mean compared to the other groups.

Farmer characteristics can be seen from income, sources of income and proportion of farm – non-farm income. Table 3.6 indicates that there are no mean values of income variables which differ statistically among the three groups. In total, the household income of the respondents per year was 63.80 million rupiah on average. The FFS farmers receive the highest total household income, about 65.40 million rupiah on average. This is because only a few farmers had a negative income. On average, the general farmer and Indofood's income are 63.70 and 63.00 million rupiah. Most of the income of these respondents came from farming. Compared to non-farm income, the mean value of the net crop income is 51.70 million rupiah. The Indofood group contributes the highest farm income, about 55.70 million rupiah, and the lowest non-farm income which is 7.32 million rupiah. The mean values of the general farmer's farm and non-farm income are 51.70 and 12.00 million rupiah a year. This shows that the main source of income for the Indofood and general potato groups is farming, particularly vegetables. Even though the FFS group has the lowest farm income (on average 46.10 million rupiah), but it contributes the highest non-farm income (average 19.40 million rupiah). This is reasonable since based on the interviews the FFS program does not specify that the members must should only be farmers. Any youth with no job can join the program.

As the Indofood group obtains a higher price for potatoes, its income which come from sold potato is higher than the general farmer and FFS groups. This increased the proportion of their potato income to 41% on average of their total income. The mean potato income of the general farmer, FFS and Indofood is 23.60, 26.60, and 29.40 million rupiah a year respectively. In proportion calculation, income from other crops dominated the source of the farmers' income. The proportion income between net crop income

(excluding potato income) and total income is 52% for the general farmer group, 45% for the FFS group, and 72% for Indofood group. On the other hand, the proportion of potato income is only 34, 29, and 41% for each group respectively. Although the proportion of potato income is lower than the other crops' income, the majority of the respondents (49% for the general farmer group, 52% for the FFS farmers, and 82% for the Indofood farmers) stated that potato is still their main crop. The top three commodities which contributed to the farmers' main crops were potato, cabbage, and tomato (see Appendix B). The reasons why the farmers still produced potato; although the potato income was lower than the other crops were: (1) it was suitable to the farmers' lands; (2) planting potato is a generation activity; (3) seed was still available; and (4) the potato is the most popular commodity at the market.

Another variable which can describe the respondents' characteristics is transportation condition. In the survey, transportation cost and distance are represented as the transportation condition. The transportation cost is calculated from the farmers' expenses to move the potatoes from the field to the point of sale. Distance is an average length from the farmers' fields to their houses. Based on Table 3.6, the Indofood group has the lowest transportation cost which is 1.57 million rupiah a year. However, the general farmer and FFS spend 2.48 and 4.90 million rupiah on average. The reason for the low transportation cost for the Indofood group is because there was an Indofood representative in each district, Bandung and Garut, who collected the Atlantic potatoes and coordinated the farmers to distribute seed. The intermediary usually provided trucks which moved potatoes from the farmers' fields to his store house and to the Indofood factory. The person sometimes gave loans to the Indofood farmers.

The potato price can be used as a variable which describes farmers' characteristics. Table 3.6 contains information regarding the selling potato price in the survey year and the year before. It shows that the Indofood farmers have the highest price for their potatoes, average 3,893.33 rupiah per kilogram in 2009. Then the general farmer and FFS follow with prices of 3,016.93 and 3,033.00 rupiah per kilogram. In the previous year, the potato prices are lower. The Tukey test results indicate that there are some differences among the mean values of the three groups for potato prices in 2008 and 2009. For example, the average selling price in 2008 for the general farmers is different from the mean selling price for the Indofood group. However, the FFS and Indofood group do not differ statistically in price means in 2008 from the other groups. The selling price in 2009 has a different result, where the FFS group differs from the Indofood group in mean values, and the Indofood has a different mean from the general farmer and the FFS. Like the variable selling price in 2008, the general farmer group only has a different mean selling price in 2009 from the Indofood group.

3.3.2 The marketing channels of the respondents

Similar to the studies by Saptana et al. (2010) and Natawidjaja et al. (2007), the potato marketing channels in this study consist of general trading as represented by the traditional channel and contract farming representing the modern supply chain. Although this study focuses on the three groups of potato farmers, 9 types of potato buyers were found in the survey data. They are buyer type I (the buyer comes to the farms for buying and collecting the potatoes), buyer type II (the farmer delivers potatoes to the buyer), buyers who are at the edge of the road (farmers sell to outside of the fields), a cooperation

or farmer group, traders of traditional markets at the center of sub districts, traders of markets at the center of the districts, supermarkets, Indofood (a potato processor), and other (middle men who give loans and not sold, collected to the group for the next season).

Table 3.7 Potato marketing in the survey locations

Variable	GFP	FFS	Indofood
	(N=197) (%)	(N=50) (%)	(N=60) (%)
Always sell potatoes to one buyer	50.76	50.00	90.00
Types of the potato buyers			
Buyer type I (the buyer comes to the farms for buying and collecting the potatoes)	62.00	42.64	5.00
Buyer type II (the farmer delivers potatoes to the buyer)	6.00	15.74	1.67
Buyers who are at the edge of the road (farmers sell to outside of the fields)	32.00	25.89	10.00
A cooperation or farmer group	0.00	0.51	0.00
Traders of traditional markets at the center of sub districts	2.00	0.00	0.00
Traders of markets at the center of the districts	0.00	4.57	1.67
Supermarkets	2.54	0.00	0.00
Indofood (a potato processor)	8.00	0.00	100.00
Other (specify)	20.00 ^{a)}	12.18 ^{b)}	0.00

^{a)} Middle men who give loans.

^{b)} Not sold, collected to the group for the next season.

In the survey locations more than 50% of the respondents sold their potatoes to one buyer. Table 3.7 shows that 62% of the general farmer population (GFP) sold potatoes to the traders who came to the farms to buy and collect potatoes. More than 40% of the FFS farmers also sold to buyer type I. As the Indofood farmers got Atlantic seed from Indofood, they must sell their potatoes to the processor. Although they could sell the potatoes to other buyers, the prices that they received were lower than Indofood's price. The lower prices could not cover the production costs. This was because the Atlantic seed which was provided and lent by Indofood to the farmers was very expensive.

The types of the potato buyers as shown in Table 3.7 can be differentiated into buyers using modern and those using traditional supply chains. The modern group includes buyers who supply to the modern supply chains such as food processors, exporters, and supermarkets. In the modern supply chains, the potato becomes a product which added value such as processing, labeled healthy, and high quality. Otherwise, the traditional channels supply potatoes for consumption. The types of potato buyers which include the traditional channels are buyer type I (the buyer comes to the farms to buy and collect the potatoes), buyer type II (the farmer delivers potatoes to the buyer), buyers who sell at the edge of the road (farmers sell near their fields), a cooperation or farmer group, traditional market traders at the center of sub districts, and markets traders at the center of the districts.

3.4 Data analysis

The survey data was tabulated in the Statistical Analysis System (SAS) program by the Indonesian Centre for Agriculture, Socio-Economic and Policy Studies (ICASEPS) officers in Bogor. All of the statistical analyses in this thesis are processed using the Statistical Package for Social Sciences (SPSS) 18.0 and Data Analysis and Statistical Software (STATA) 10 for windows.

After the survey data had been entered, a frequency output, mean, and standard deviation for all variables was undertaken to check whether the data was missing or whether there were outliers. The data is complete since any missing or unclear data has been confirmed with the enumerators and respondents.

In order to achieve the research objectives in Chapter 1, some hypotheses which are explained in the chapters Chapter 4 - 7 are developed. Hence, there are different analytical approaches in the each discussion chapter. Farmers' participation in the modern supply chains which is examined in Chapter 4, applies t-test, Probit, and Heckman two-stage methods. On the basis of frequency outputs, socio-demographics, and contract responses to many of the questions are analyzed using cross tabulations. In Chapter 5, Wilcoxon sign-rank test, t-test, Principal Component Analysis (PCA), and two stage cluster analysis are applied to identify the motivations for the potato farmers to engage in contracting. The determinants of trust in the Indonesian potato industry in Chapter 6 utilize PCA, MANOVA, and linear regression model. In the last discussion chapter, male and female differences in the buyer-seller relationship are analyzed using PCA and MANOVA model. Furthermore, the data summary which is provided in this sub chapter above uses the Tukey test to compare categorical responses among the three groups of farmers.

The data analysis is evaluated after examining the results. Before conducting the analysis, tests have be done to check the validity of the variables (Appendix C). The analytical methods are used in this thesis are explained below.

3.4.1 The t-test

The t-test is used to assess the means of two groups are statistically different from each other. There are various t-tests (DeCoster and Claypool 2004). Firstly, when the mean value of a target variable is expected to differ from a hypothesized value, it is named a one-sample t-test. Secondly, an independent-samples t-test (or a between-subjects t-test)

is a statistical test to determine whether the mean value on a given target variable for one group differs from the mean value on the target variable for a different group. The two groups should have entirely different members for validity the test. Thirdly, the most common use of the t-test to compare participants' responses, a paired samples t-test (or a within-subjects t-test) is utilized to determine whether a single group of participants differs on two measured variables. This test is also similar to determining whether there is a significant difference between the means of the two variables. The t-test is mathematically equivalent to one way Analysis of Variance (ANOVA). They would yield identical results. Both tests assume that the data from the different groups come from populations where the observations have a normal distribution and the standard deviation is similar for each group.

The t-test is useful to identify whether there are any differences of two such sample groups on a certain dependent variable. The test is a widely used statistical test, simple, straightforward, and adaptable to a broad range of situations. For example, when we need to compare mean differences between two independent samples, modern and traditional farmer groups, on some dependent variables such as socio-demographics, farm capacity, income, and incentive, the t-test provides a validity statistic test. Hence, this test is applied in Chapter 4 and Chapter 5 which examine the different means between two groups of samples.

3.4.2 Tukey test

Post-hoc tests in statistics assist researchers to know how the means differ from each other. There are several post-hoc tests available, but the Tukey test provides a post-hoc

test suitable for multiple comparisons such as the three groups of potato farmers. The Tukey method called Tukey's Honestly Significant Difference (HSD test) is optimized in situations in which the researchers need to test all possible pairwise comparisons (comparing sets of two) among the means. The Tukey's HSD test can assess whether any particular sample mean significantly differs from any particular one. Like t-test, The Tukey's HSD test has assumptions that the observations of data population have a normal distribution and their standard deviations are similar for each group of observation.

The t-test provides mean differences between two sample groups, but it cannot be used to compare several samples. If the t-test and ANOVA lead to a conclusion that there is evidence that the group means differ; they cannot answer which of the means are different. The Tukey's HSD test offers the t-test and ANOVA's weaknesses.

In order to compare the difference means on the three groups of potato farmers, the numerical and categorical data which dominate in this study and are presented in sub Chapter 3.3 are tested by the Tukey's HSD test. Different categorical responses are expected coming from the independent groups of samples: the general farmer population (GFP), FFS, and Indofood group.

3.4.3 Wilcoxon sign-rank test

Wilcoxon sign-rank test is a non-parametric statistical hypothesis test which is used to compare two related samples, matched samples, or repeated measurements on a single sample. The test assesses whether the population mean ranks differ. It is used as an alternative to the t-test if the population cannot be assumed to be normally distributed or the samples are large (Wilcoxon 1945).

As the Wilcoxon sign-rank test can be used to measure ordered categorical data and is possible to rank the observations, the test is appropriate to examine factors motivating farmers to participate in a contract. The data of the farmers' perception on the contract consists of a categorical scale which represents the importance of the identified factors. The important category is expressed from not at all important, somewhat important, important, very important, and extremely important.

3.4.4 Multivariate analysis of variance (MANOVA)

MANOVA is an extension of ANOVA (univariate analysis of variance) which accommodates more than one dependent variable (Ndubisi and Jantan 2003). Multivariate differences across groups are assessed using the Wilks' Lambda criterion (known as the U statistics). The test examines whether groups are somehow different without being concerned with and whether they differ on at least one linear combination of dependent variable. The procedure allows the determination of the variability in a set of continuous response variables from a set of categorical predictor variables. It is possible to include continuous predictor variables either as covariates or as true independent variables in the design.

The main purpose of MANOVA is to show that an independent variable has an overall effect on a collection of continuous dependent variables. With a large number of dependent variables, a MANOVA can see whether there is any effect of the independent variables, taking into account the number of different dependent variables. Compared to ANOVA, the MANOVA has several advantages; (1) by measuring several dependent variables in an experiment, a better chance of discovering is resulted; (2) it can protect

against errors that might occur if multiple ANOVA's are conducted independently; and (3) it can show differences which are not found by ANOVA test.

In order to fulfill objective 3 and 4 of this thesis, to investigate the determinants of trust as a construct of relationship quality within the groups of potato farmers, and to examine the differences of relationship quality factors between male and female producers, multivariate analysis of variance (MANOVA) and post-hoc tests are done. Some hypotheses are built to expect that there is a significant difference in the level of trust, its antecedents and the socio-demographic factors among the groups, and in male and female perceptions on the relational marketing variables.

3.4.5 Principal Components Analysis

Principal Components Analysis (PCA) is a useful statistical technique which has been applied in many fields such as face recognition (Asadi, Rao, and Saikrishna 2010), image compression (Townshend, Goff, and Tucker 1985; Eklundh and Singh 1993; Benedetti, Rossini, and Taddei 1994), and finding patterns in data of high dimension. As it is a mathematical procedure, in the economics and business, the mathematical concepts of PCA such as standard deviation, covariance, eigenvectors, and eigenvalues are used in numerous empirical studies and theories (Hotelling 1933; Rachlin 2006; Jollands, Lermitt, and Patterson 2004; Hall, Lazarova, and Urga 2002).

Basically, PCA is a method to transform into new variables and tries to re-express the data as a sum of uncorrelated components. PCA offers uncorrelated components that are generally not independent components; however, the independent component analysis is needed (Stone 2004). PCA seeks linear combinations of the original features, although

in the feature space, the combinations would become curves or surfaces. The method is purely a descriptive technique, but it causes no prediction of what future data will look like.

The benefits of PCA are: (1) providing a simpler representation of the data, reduction in memory, and faster classification; (2) reducing a complex data set to a lower dimension to reveal the hidden (latent) and simplified structures; and (3) quantifying the importance of each dimension for describing the variability of a data set (Shlens 2009).

To categorize potato farmers' motivations in contract (Chapter 5) and determinant factors of trust among farmer groups (Chapter 6), PCA is suitable. It is because the variables consist of latent factors and they are needed to reduce into lower dimensions which represent new features.

3.4.6 Factor analysis

Factor analysis is related to Principal Components Analysis (PCA). However, they are different in function. PCA is mainly utilized to describe statistical technique, while factor analysis is used to test hypotheses producing error terms. Factor analysis applies regression modeling techniques.

Factor analysis is used to describe variability among observed and correlated variables. The variables have a potentially minor number of unobserved variables which are named factors. Factor analysis seeks joint variations in response to unobserved latent variables. It removes redundancy from a set of correlated variables.

Applications of factor analysis include, firstly, identification of underlying factors can be done by clustering variables into homogeneous sets, creating new variables i.e.

factors, and allowing to gain insight to categories. Secondly, screening of variables includes identification of groups which allows the selection of one variable to represent many, and the screening is very useful in regression model in terms of recalling collinearity (Manly 2005; Rencher 2002).

Assumptions applied in factor analysis (Manly 2005; Rencher 2002) include: (1) only interval and ordinal data (e.g. scores assigned to Likert scales) can be used; (2) the variables should be linearly related to each other, scatterplots of pairs can be used to measure whether the variables are linear to others; and (3) the variables must also be moderately correlated to each other, otherwise the number of factors will be the same as the number of original variables, which means that carrying out a factor analysis would be pointless.

Algebraically, the model of factor analysis is written as follows. If p variables X_1, X_2, \dots, X_p are measured on a sample of n subjects, then variable i can be written as a linear combination of m factors F_1, F_2, \dots, F_m where, $m < p$. Thus,

$$X_i = a_{i1}F_1 + a_{i2}F_2 + \dots + a_{im}F_m + e_i$$

where the a_i s are the factor loadings (or scores) for variable i and e_i is the part of variable X_i that cannot be 'explained' by the factors.

Factor analysis has three main steps: firstly, calculating initial factor loadings can be done in a number of different ways. The most common method is principal component method. This method utilizes the method used to carry out a principal components analysis. However, the factors will be obtained will not actually be the principal components. The loadings for the k th factor will be proportional to the coefficients of the

k^{th} principal component). The resulting factors at the first stage will be uncorrelated. The factors are called factor loadings.

Secondly, once the initial factor loadings have been calculated, the factors are rotated. This step is named factor rotation which aims to find factors being easier to interpret. If there are groups (clusters) of variables i.e. subgroups of variables that are strongly inter related, the rotation is used to make variables within a subgroup score as highly (positively or negatively) as possible on one particular factor, whereas, at the same time, the rotation ensures that the loadings for the variables on the remaining factors are as low as possible. In short, the object of the rotation is to try to ensure that all variables have high loadings only on one factor. There are two types of rotation method, orthogonal and oblique rotation. The orthogonal rotation remains uncorrelated, but oblique rotation is correlated. In SPSS, the most common orthogonal method is called varimax rotation which is most used and recommended because it attempts to make the loadings either large or small to facilitate interpretation and is reasonable and available in virtually all factor analysis software programs (Field 2000). In the varimax rotation, the orthogonal rotation results in a rotated component/factor matrix that presents the 'post-rotation' loadings of the original variables on the extracted factors, and a transformation matrix that gives information about the angle of rotation.

Thirdly, calculation of factor scores is the next process of factor analysis. A decision needs to be made regarding how many factors include when calculating the final factor scores (the values of the m factors, F_1, F_2, \dots, F_m , for each observation). This step is usually done using one of the following methods:

- a) choose m such that the factors account for a particular percentage (e.g. 75%) of the total variability in the original variables;
- b) choose m to be equal to the number of eigenvalues over 1 (if using the correlation matrix). A different criteria must be used for the covariance matrix;
- c) use the scree plot of the eigenvalues. This will indicate whether there is an obvious cut-off between large and small eigenvalues.

The second method, choosing eigenvalues over 1, is the most common one. The final factor scores are usually calculated using a regression-based approach.

Some of tests below are usually done to the factor analysis to analyze the measurement scale for all the relational variables. A reliability test using Cronbach's Alpha was used to analyze the measurement scale used for all the relational variables. Cronbach's alpha reliability coefficient normally ranges between 0 and 1. The internal consistency of the items in the scale is greater if the Cronbach's alpha coefficient closes to 1. However, there is no lower limit to the coefficient. The increasing value of alpha is partially depended to the number of items in the scale. Although a high value for Cronbach's alpha shows good internal consistency of the items, it does not mean that the scale is unidimensional. George and Mallery (2003, p. 231) give some rules of thumb: “ ≥ 0.9 – excellent, ≥ 0.8 – good, ≥ 0.7 – acceptable, ≥ 0.6 – questionable, ≥ 0.5 – poor, and < 0.5 – unacceptable”.

To test for the appropriateness of the PCA for the scales, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO-MSA) is conducted for all the variables. All measurements are accepted as the KMO-MSA is in the accepted region of greater than 0.5 (Nunnally 1978).

In order to measure the relational variables such as trust, flexibility, price transparency, relative price satisfaction, price quality, communication, dependence, reputation, flexibility and joint problem solving, a five-point likert scale ranging from 1=strongly disagree to 5=strongly agree are used. The dimensionality of the relational variables is utilized using principal component analysis (PCA) with varimax rotation. All items with Eigen values above one are extracted. In addition, the items with factor loading above 0.5 are extracted and all those with cross loadings above 0.5 are deleted.

3.4.7 Cluster analysis

Cluster analysis is used is to identify the actual groups of individuals or objects that are similar to each other but different from individuals in other groups. In factor analysis, variables are clustered based on how much variance these variables share, how much variance these variables share, and how many unique cluster variables share the same variables, while the cluster analysis focuses on grouping cases of people based on the similarity of responses to several variables. In short, instead factor analysis stresses forming groups of variables based on several people's responses to those variables, while cluster analysis concerns grouping people based on their responses to several variables.

Cluster analysis is fit to be used in marketing disciplines since it provides empirically based methods and means for explicitly classifying objects (Punj and Stewart 1983). In marketing cluster analysis covers following issues: (1) segmentation of people, markets, organizations which share common characteristics of attitudes, purchase propensities, and media habits, etc.; (2) buyer-seller behaviors; and (3) potential new product opportunities through brands/ products segmentation. Hence, the method is

appropriate to identify segmentation of farmers who have similar motivation to sell their products in modern supply chains. This issue is elaborated further in Chapter 5 in the case of potato farmers.

There are two ways that clusters commonly can be formed Hierarchical clustering and *k*-means clustering. Hierarchical clustering is one of the most straightforward methods. The hierarchical can be agglomerative or divisive. Agglomerative hierarchical clustering starts with every case being a cluster itself, and proceeds at successive steps where similar clusters are merged. The algorithm ends with every case in one jolly, but useless cluster. On the other hand, divisive clustering begins with one single cluster containing all records and ends up with separating the cluster into smaller ones. Both steps are a worthwhile solution (Everitt and Dunn 2001).

To form clusters using a hierarchical cluster analysis, some criterions must be selected such as a criterion for determining similarity or distance between cases, a criterion for determining which clusters are merged at successive steps, and the number of clusters that are needed to represent the data. As the main aim of cluster analysis is to form similar groups of figure-skating judges, the criterion to be used for measuring similarity or distance is decided by the users themselves.

Distance is defined as a measure of how far apart two objects are, while similarity measures how similar two objects are. There are some different definitions of distance and similarity provided by SPSS, for example Euclidean distance, squared Euclidean distance, Chebychev, block, Minkowski, or customized which are used for interval data, Chi-square measure or phi-square measure for continuous data, and Euclidean distance,

squared Euclidean distance, size difference, pattern difference, variance, shape, or Lance and Williams for binary data.

In order to find the number of clusters, hierarchical procedure utilizing Ward's hierarchical clustering method can be applied. The Ward method does group objects according to the distance between objects (with whatever linkage), but according to the amount of information that would be lost as a result of grouping two objects. Information can be measured as the sum of the squared deviations from the cluster centric.

Clustering process in the Hierarchical clustering then can be summarized in a dendrogram. The dendrogram inspection is utilized to determine whether the sample is clustered, how many clusters there are, and which items are in each cluster.

To identify which the best number of clusters resulted from the dendrogram, Calinski and Harabasz's rule is commonly practiced. Calinski and Harabasz pseudo F value are useful to identify the most distinct of solution (Milligan and Cooper 1985; Calinski and Harabasz 1974). The method calculates an informal indicator of the best number of clusters and implements a Genetic Algorithm (GA) that finds an approximation of the k optimal value, with significantly lower computation time.

Another way to form cluster is a k -means clustering. It is a clustering method that does not require computation of all possible distances. The clustering needs to know the numbers of clusters will be added. An algorithm to produce exactly K clusters in the k -means clustering are following steps: (1) start with K randomly chosen points to define the centres of the K clusters, where k is the number of clusters is needed; (2) assign each item to the closest point; (3) calculate the mean (centroid) of each cluster; (4) use the K means to define the centres of K new clusters and reassign each item to the cluster with

the closest centre; and (5) repeat the previous two steps until there is no change in the nature of the clusters between steps (Everitt and Dunn 2001). *K*-means clustering is very sensitive to outliers, since they will usually be selected as initial cluster centers. This will result in outliers forming clusters with small numbers of cases.

SPSS has three different procedures that can be used to cluster data: hierarchical cluster analysis, *k*-means cluster, and two-step cluster. Two stage cluster analysis procedure is chosen in this thesis. Two stage cluster analysis needs two ways of clustering, Hierarchical clustering and *k*-means clustering. The procedure is more powerful rather than Hierarchical clustering or *k*-means clustering individually since it requires only one pass of data with a large data, and it can produce solutions based on mixtures of continuous and categorical variables and for varying numbers of clusters. Hierarchical clustering requires a matrix of distances between all pairs of cases, and *k*-means requires shuffling cases in and out of clusters and knowing the number of clusters in advance.

3.4.8 Linear regression

Linear regression is an approach to model the relationship between a random variable called a dependent variable and one or more explanatory variables (Hill, Griffiths, and Lim 2008). Linear regression analysis can be applied to quantify the strength of the relationship between the dependent and independent variables. The goal of linear regression is to find the best line which predicts the linear relationship of the variables. Linear regression does this by finding the line that minimizes the sum of the squares of the vertical distances of the points from the line. Linear regression is not a linear test of

data, but it finds the slope and intercept that make a straight line best fit to the data. In STATA and SPSS, a runs test determines whether the data differ significantly from the straight line. A run is series of consecutive points that are above or below the regression line. The P values from the runs test provide the probability of observing as few runs (or fewer) than observed. A low P value concludes that the data do not really follow the straight line.

Given a data set $\{y_i, x_{i1}, \dots, x_{ip}\}_{i=1}^n$ of n statistical units, a linear regression model assumes that the relationship between the dependent variable y_i and the p -vector of regressors x_i is linear. The relationship is modeled through an error or a disturbance term, ε_i , as an unobserved random variable that adds noise to the linear relationship between the dependent variable and regressors. Then the model form is

$$y_i = \beta_1 x_{i1} + \dots + \beta_p x_{ip} + \varepsilon_i = x_i' \beta + \varepsilon_i, \quad i=1, \dots, n, \quad (3.1)$$

where $'$ denotes the transpose, so that $x_i \beta$ is the inner product between vectors x_i and β . These n equations are stacked together to become a standard form:

$$y_i = x_i \beta + \varepsilon_i. \quad (3.2)$$

where y_i is a dependent variable, x_i are explanatory variables, β is a regression coefficient, and ε_i are error terms.

Regression analysis in this thesis is used in Chapter 6 to check the significance and the direction of the hypothesized relationships. Some exploratory variables containing relational and demographic variables as dependent variables are analyzed whether there is a relationship with a dependent variable such as trust.

3.4.9 Ordinary least squares (OLS) model

A common estimation technique for linear regression is ordinary least squares (OLS). The OLS estimator is consistent when the regressors are exogenous and there is no multicollinearity. It is also optimal in the class of linear unbiased estimators when the errors are homoscedastic and serially uncorrelated. As the errors in OLS are normally distributed, OLS is the maximum likelihood estimator.

The assumptions of the OLS regression model which becomes OLS' characteristics include that: (1) the dependent variable is generated according to the model specified in an equation; (2) the explanatory variables are fixed (rather than random); (3) the errors are uncorrelated random variables with; (4) zero means; and (5) constant variance or homoskedasticity (Berry 1993; White 1980). The measurement of the errors can bias OLS regression estimates.

In this thesis, the ordinary least squares (OLS) model is used to estimate household income in a year as a function of household and farm characteristics and a dummy variable representing participation in modern supply chain (contract) as it can explain the correlation between farmers' participating in contract and income as farmers' welfare measurement. The OLS model for the potato farmer income is

$$y_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 I + \dots + \beta_k x_k + e_j \quad (3.3)$$

where y_i is net income, X is farm characteristics which are expected to be effecting household income; I is a dummy variable for farmers' participation in the modern supply chain; $\beta_1, \beta_2, \dots, \beta_k$ are sets of parameters to be estimated; and e are error terms.

3.4.10 Probit model

A model which measures the farmers' probability of participation in the modern supply chain taking into consideration is the Probit model. Probit analysis is a type of regression used to analyze binomial response variables. In dichotomous probit, it is assumed that an unobservable score, z , is a linear function of observable variables and of an unobservable disturbance term that has the standard normal distribution. The probit model is

$$G(z) = \Phi(z) \equiv \int_{-\infty}^z \phi(v) dv \quad (3.4)$$

where $\phi(v)$ represents the standard normal probability distribution $(2\pi)^{-1/2} \exp(-z^2/2)$. This model is useful to measure the farmer's probability of participation in the contract taking into consideration the farmer's characteristics:

$$P(y_i = 1 / X) = P(y_i / x_1, x_2, \dots, x_k), \quad (3.5)$$

where i is the farmer ($i=1, \dots, 302$); y is the market channel to which the producer sells, where $y=0$ for the farmers who sell to the traditional channel, and $y=1$ for the farmers who sell to the modern supply chain such as a food processor (Indofood); P is the probability that a market channel will be chosen by a farmer i ; X is a vector of characteristics of the farmers such as age of the farmer, education of the farmer, farm size, income, women participation in marketing, and trust.

3.4.11 Heckman two-stage methods

To avoid biased estimates and control for the conditional probability of a farm being in a given group such as modern supply chain group, the Heckman two-stage method called the switching regression model (Heckman 1978; Heckman 1979) is adapted in Chapter 4.

The first stage of the Heckman two-stage method involves estimation of the Inverse Mills Ratio (IMR) from the market channel model (probit model). In the probit model, it provides estimates of α which are used to estimate the IMRs [λ_s and λ_t]. IMR is

$$\lambda \equiv \frac{\phi(x\delta_1)}{\Phi(x\delta_1)}.$$

The second stage of the Heckman two-stage method includes self-selection and accounts for systematic differences across groups of household (Maddala 1983) in the regression model (income regression). The self-selection refers to unmeasured factors which jointly determine farmers' participation in the modern supply chain and household income. To control the conditional probability of a farmer being in a particular (endogenous) channel, the Inverse Mills Ratio (IMR) which is in the first stage is included as a regressor in the regression model of income. The IMRs are treated as 'missing variables' in estimating regime equation. Basically in the Heckman procedure, there are variables in the second stage belong to a bigger pool of variables which are used for estimation in the first stage (Hernández, Reardon, and Bedegué 2007). The variables are named as switched variables that are not reported as results in the first stage as they are used as controls.

Chapter 4 Determinants and effects of farmers' participation in contract

4.1 Introduction

As described in Chapter 1 and 2, the transformation of the agrifood industry has had and continues to have important implications for smallholders and farm workers. The main debates which have arisen focus on two issues: to what extent does the transformation include or exclude farmers, and to what extent does inclusion raise farmer's income and modernize farm technologies (Reardon et al. 2009). In many developing countries, the role of modern supply chains involving contractual agreements between farmers and agribusiness firms or their agents is becoming increasingly important. Hence, the question of how smallholder farmers can be linked successfully to these emerging markets has a high policy relevance. The two issues are analyzed in this chapter.

Natawidjaja et al. (2007) propose that supermarket and large food processors represent modern markets in the potato supply chain in Indonesia. As demand for export and processing potatoes has appeared to be strong since the food transformation (Adiyoga et al. 1999), farmers have better markets for their fresh potatoes and have closer relationships with the food processors. The food processors on their side need a close relationship with the farmers and require an integrated production-processing-marketing system to secure production as is needed in the modern supply chain.

Indofood has become a large-scale potato processor of potato chips and fries since they set up a joint venture with Fritolay (a United States company) in 1991. They require

fresh potatoes for raw production materials. To meet the continuity of potato supply, Indofood establishes contracts with potato farmers.

4.2 Description of the sample

The total initial sample collected in the survey of this thesis is 197 from the general farmer population (GFP), 60 Indofood farmers and 50 FFS farmers (see Chapter 3). To address the question of farmer's participation in the modern supply chains and its impact on the growers, in this chapter, the sample is divided into contract and non-contract farmers. Contract farmers sell their potatoes under forward contracts to the modern supply chains particularly Indofood. The 60 Indofood farmers sample includes as the contract farmers. The non-contract farmers represent potato farmers involved in traditional channels such as the 197 GFP farmers. The third group sample involving the FFS project farmers is excluded in this chapter because it does not represent the two groups, contract and non-contract farmers. Furthermore, five respondents from the GFP group were removed because they sell their potatoes to supermarkets and do not represent traditional channels. The total sample representing traditional channel sample in this chapter is 192 respondents.

Since there are negative and zero income values which are expected to contribute outlier data for data analysis in this Chapter, 9 samples were rejected. Five respondents were removed from the traditional channel sample, at the same time four respondents were rejected from the contract farmer sample of 60. Hence, the total sample which is used in the data analysis and model in this chapter is 243 samples, including 187 from the

general farmer population respondent which is called the non-contract group and 56 from the Indofood sample which is named the contract farmers group.

Table 4.1 reveals the comparison characteristics of the samples, the contract and non-contract farmers. The characteristics highlight the socio-demographics, contextual characteristics, farm capacity, income, and incentives.

Table 4.1 Comparison of characteristics for contract and non-contract farmers

Variable	Non-contract farmers	Contract farmers	t-test of difference	
	(N=187)	(N=56)	t-Stat	P>t
<i>Socio-demographics</i>				
Age of household head (average year)	47.14	44.80	1.348	0.179
Education of household head (average year)	6.49	8.57	-4.548	0.000**
Household size (average persons)	4.32	4.64	-1.215	0.226
<i>Contextual characteristics</i>				
Experience in farming (average years)	21.65	18.61	1.565	0.119
Farm group (persons)	12 (6.42%)	19 (33.93%)	-5.749	0.000**
Farming with one variety (persons)	182 (97.33%)	47 (83.93%)	3.874	0.000**
Proportion of potato income (average %)	35.00	44.00	-2.060	0.041*
Farmers with proportion of potato income > 50% previous year (persons)	52 (27.81%)	24 (42.86%)	-2.142	0.033*
<i>Farm capacity</i>				
Land cultivated for potato (hectare)	0.94	1.28	-1.527	0.128
Land irrigated (hectare)	1.20	1.06	0.418	0.676
Ownership of water pump (persons)	86 (45.99%)	49 (87.50%)	-5.834	0.000**
Ownership of motorbike (persons)	127 (67.91%)	48 (85.71%)	-2.629	0.009**
Ownership of land for agriculture (persons)	149 (79.68%)	54 (96.43%)	-3.008	0.003**
Ownership of car (persons)	40 (21.39%)	16 (28.57%)	-1.118	0.265
Farms with phones (persons)	126 (67.38%)	48 (85.71%)	-2.698	0.008**
<i>Income</i>				
Total net household income (rupiah)	65.45	66.06	-0.032	0.975
Net household per capita income (million rupiah)	13.57	15.55	-0.491	0.624
Net potato income (rupiah)	24.32	32.04	-0.975	0.330
<i>Incentives</i>				
Honesty (average likert scale 1=strongly disagree to 5=strongly agree)	3.09	3.52	-6.632	0.000**

*Significant at the 5% level; ** Significant at the 1% level.

The socio-demographic characteristics of the contract and non-contract groups are shown in Table 4.1. The average household participating in the contract has 5 members, the average age of the contract household heads is 45 years, and the average amount of schooling of the heads of households is almost 9 years. As the contract farmers are on average younger, their experience cultivating potatoes is less than the non-contract, 18.6 years on average. The only statistically significant variable is education of household head which shows a difference at the 1% level of statistical significance between the contract and non-contract farmers.

From the Table 4.1, the non-contract differs from the contract growers at the 1% level of statistical significance for some contextual characteristics such as farm group and farm with one variety. More than 97.0% of the non-contract group farms only one variety, Granola, and more than 30% of the contract farmers join in farm groups.

Another contextual characteristics variable, the contract farmers' average proportion of potato income, is higher than the non-contract. Most of them, around 42.9%, have a > 50% proportion of potato income in the year before the survey. The two income variables are significant at the level of 5%.

The total net household income, net potato income, and net household per capita income for the contract farmers are greater than that of the non-contract farmers. However, the differences are not statistically significant.

There are some farm capacity variable differences between the contract and non-contract growers that are significant at the 1% level. More contract farmers have a water pump, motorbike, land for agriculture, and phones as assets compared with the non-contract, and they are more active in farm groups.

Table 4.1 also shows that regarding incentive variables, the contract farmers are different from the non-contract farmers for the level of honesty. The level of statistical significance for the variable is 1%.

4.3 Model specification

To model farmer participation in modern supply chains, this study views participation as a binary choice. The choice is the option between adopting the new channels as a result of procurement and not adopting the channels. Adoption of the emerging channels by smallholders can be analogized as an adoption of a new product with new conditions. It is therefore hypothesized that the more a farmer is able to meet the new conditions, the more likely the adoption decision will be positive.

Investigating factors influencing farmers' participation in the modern supply chains means identification of possible adoption constraints. The adoption constraints differ depending on the particular innovation of a farmer who attempts to address the new conditions. As explained in Chapter 2, the decisions to adopt the new channels can be influenced by the capacity of the farm to undertake the technologies and incentives in the modern supply chains (Feder, Just, and Zilberman 1985; Reardon et al. 2009). Schipmann (2010) suggests three categories of possible adoption constraints: personal constraints, farm and household constraints, and contextual constraints.

In this thesis, the variables which are expected to influence the farmers' choice are divided into four categories: socio-demographics, contextual characteristics, farm capacity, and incentives. The description of variables used and hypotheses built in this study. The hypotheses which represent a correlation between farmers' participation and

influential variables, and the relationship between farmers' income and the influential factors are presented below.

The socio-demographics include the age of the household head, the education of the household head, and the household size. The socio-demographic factors can be constraints preventing involvement in the modern supply chain such as old age, lower education level and less experience in potato farming, but they can also support the farmers' participation. As better educated farmers are more likely to enter modern supply chains and better educated farmers tend to become more innovative, and therefore are more likely to adopt modern supply chains, the correlation between education and farmers' participation is significant and positive. On other hand, the relationship between age and farmers' participation can be represented as a U-shape which indicates middle-aged farmers are more likely to participate in the modern supply chains. Hence, age is hypothesized as having a positive impact to farmers' participation if farmers' age is > 50 years.

In contrast to the socio-demographics, contextual characteristics variables such as experience in farming, income structure (proportion of potato income), involving in farm groups and farm with one potato variety are expected to support farmers' participation. Farmers who join in farm groups can access continually information and contract offers from contract firms. On the other hand, the contractors are likely to make relationships with the farmers who are active in farm groups and have more experience in potato farming. Making a relationship with the farmers can reduce transaction costs and the farmers are more reliable as trading partners for the firms (Rao and Qaim 2010). Farmers with much income from selling contracted commodities will be more confident to make

relationships with modern supply chains. Thus, farmers with contextual characteristics, more proportion of potato income, more experience and involvement in farm groups are expected to have a positive relation with farmers' participation in modern supply chains.

As modern supply chains offer a wide variety of products which usually needs specific treatments and quality requirements, farmers who cannot adapt to the modern markets' offers will face difficulties becoming involved in contracts (Rao and Qaim 2010). Hence, farming with only one variety is hypothesized to negatively impact on the potato farmers' involvement in modern supply chains.

The farm capacity includes land cultivated for potato, land irrigated, ownership of water pumps, ownership of motorbikes, ownership of land for agriculture, ownership of cars, and farms with phones. Farm capacity is especially relevant when the new adoption requires additional capital and equipment, and increased skills and knowledge. In this thesis, irrigated land, ownership of water pump, ownership of motorbike, ownership of land for agriculture, ownership of car, and farms with phone represent farm capacity. As participation is expressed as a function of ownership of land, physical, and other capital, and can be seen as a capital investment, farm capacity is expected to have positive and significant influence on farmers' participation in contract. The reason for this is capital investment is necessary for participation in modern supply chains.

Incentives refer to the relative cost and risk of the farm and post-harvested handling technologies which are needed to meet the commodity quality and transactional requirements of the modern supply chain (Feder, Just, and Zilberman 1985; Reardon et al. 2009). Involvement in the modern supply chain creates relative costs in terms of reduction of marketing and transaction costs from improved financial, transport, and

telecommunication. Moreover, relationship establishment between modern supply chains and farmers is believed to lower transaction costs that allow for greater flexibility to respond to changing market conditions (Dyer and Chu 2003) and can be seen as an investment of social capital (Warning and Key 2002).

As noted in Chapter 2, when making the decision to become involved in the modern supply chains, farmers will consider the opportunity costs of a contract. One of the opportunity costs of contract is reducing transaction costs. According to the transaction cost theory by Jaffee and Morton (1995), honesty as a relationship factor of trust between exchange partners, represents search costs, screening costs, bargaining costs, monitoring costs, and enforcement costs. When considering the transaction costs to become involved in modern supply chains, farmers can determine suitable institutional frameworks to minimize the costs of seeking, contacting, negotiating, and maintaining buyers. Farmers who form an integrated relationship with a buyer and put their trust in the buyer will reduce the transaction costs and achieve efficiency gains along the supply chain. Moreover, as the procurement systems employed in the modern supply chains are characterized by contractual relationships between buyers and sellers, the level of trust between both parties becomes an essential factor influencing participation. Hence, in this research, trust is hypothesized as an expected factor which determines positively the potato farmers' involvement in the modern supply chain, i.e. Indofood.

In this study, trust which is as a social collateral variable and represents a determinant factor of relational marketing is defined as honesty. The honesty variable is chosen because the contract with Indofood involves a wide variety of unmonitored tasks that the firm must trust the contracting farmer to undertake correctly. On the other hand,

farmers do not have same position bargaining in the contract since they do not written contracts which should be legally binding for both parties. Hence the relationship between potato farmers and Indofood is based on honesty on both parties.

Honesty trust can reduce the perception of risk and transaction in an exchange relationship (Ganesan 1994; Doney and Cannon 1997). In this chapter, the definition of honesty trust for potato farmers in Indonesia refers to a dimension of trust suggested by Puspitawati et al. (2011). Honesty is defined as a farmer's belief that buyers will fulfill their promises. The further explanation regarding relational marketing is explored in Chapter 6.

The analysis focuses on the household characteristics associated with participation in a modern supply chain, Indofood as a large food processor, and the impact of contract participation on per capita income. The analysis of contract participation on farmers' per capita income shows how farmers' welfare which is different structurally among households adjusts to the change in procurement systems.

Farmers' expansion to modern supply chains can therefore have substantial effects on farm household income (Hernández, Reardon, and Berdegúé 2007; Neven et al. 2009; Rao and Qaim 2010; Miyata, Minot, and Hu 2009). This is because contracting allows farmers to cope with uncertainty about income by access to insurance, information, or credit. Stable prices and contractual arrangements offered by modern supply chains improve income flows for farmers. Moreover, diversity of production because of contract can generate added income. Hence, the relationship between farmers' participation and income is significantly positive.

In this thesis, a treatment effect model is used to understand how factors affecting income interact with the decision to participate in modern supply chains. It allows for structural differences in income functions of farmers across market channels. A probit model estimates participation in the modern supply chain. However, the results indicate that the model was not able to correctly predict factors affecting farmers' participation and there was selection bias when the model was compared to the treatment effect model.

The treatment effect model called the Heckman selection-correction model corrects for self-selection in groups of households, contract and non-contract farmers. There are two equations in the model; the selection equation and the outcome equation estimates. In the income effect model, the treatment effects model calculates the inverse Mills ratio and includes the ratio as a regressor. This term corrects for possible selection bias and yields unbiased and consistent estimates in the income model.

In many studies of farmers' participation, there are possibilities of sample selection bias as resulting from an overestimation of the contract effect (Greene 1993). Even though Indofood farmers' income is higher than that of the general farmers as described on Table 4.1, the gaps cannot necessarily be attributed to the impact of the contract by the Indofood farmers. It is necessary to consider that individuals who participate in the contract might have earned higher incomes even if they did not participate. That is, there may be unobservable factors such as industriousness, skill, intelligence, entrepreneurial and management ability. The unobservable factors increase the likelihood of participating in the contract and income. The increase of the likelihood estimation in the farmers' participation model causes the impact of contract to the modern

supply chain will be overestimated by simply income regression on the participation variables and a selection bias is found in the model.

In the treatment effects model, the sample selection bias can be avoided by calculating the Inverse Mills Ratio (IMR). The IMR is calculated from the selection equation and adjusts the outcome equation for the selection bias. To control the sample selection bias, a standard treatment effects model becomes:

$$Y_i = \beta X_i + \delta I_i + u_i \quad (4.1)$$

$$I_i^* = \alpha Z_i + e_i \quad (4.2)$$

$$I_i = 1 \quad \text{if } I_i^* > 0 \quad \text{otherwise } I_i = 0$$

where Y_i is the value of output (per capita income in log value), X_i is independent variables which affect the output, I_i is a dummy for modern supply chain participation, Indofood, and Z_i is the variables which determine participation. Equation (4.1) cannot simply be estimated because the decision to participate may be influenced by unobservable variables which may also have an effect on output. This causes the error terms in equation (4.1) and (4.2) being correlated and leading to bias estimation of δ , the impact of contracting on per capita income. The selection bias can be corrected by assuming a joint normal error distribution and using a two-step procedure.

Our identifying variable is honesty. Based on the field observations, the village leader plays an important role in selecting farmers for participation in the contract farming scheme. Therefore, proximity to the village leader is a good predictor of participation. The honesty variable in the model does not have an independent effect on income, making it a useful identifying variable.

4.4 Empirical results for contract participation

If reducing transaction cost is the motivation for engaging in a partnership, as noted in Chapter 2, an agribusiness firm can be expected to include farmers in a manner that minimizes the costs. Contracting firms are hypothesized to prefer larger farmers because they reflect economies of scale.

Participation in a contract can be expressed as a function of ownership of land, physical, human, community, and other capital (Simmons, Winters, and Patrick 2005). The ownership of the various capitals reflects the four categories of the variables which are expected the participation: socio-demographics, contextual characteristics, farm capacity, and incentives. In this thesis, the land of the potato farm includes the ownership of the agriculture land and the irrigated land. Human capital is represented by the age of the head household, the formal education having the head of household, and farmer's experience farm potato. Community is approximated using membership of the head household in agricultural groups. Other capital can be shown by the ownership of a water pump, motorbike, car, and phone.

Honesty as a relationship variable influences farmers' participation in modern supply chains. Determining the social performance like honesty trust can be used to determine the success of inter-firm relationships between the growers and buyers and to analyze transaction costs.

The results of the treatment effects regression are presented in Table 4.2. The selection equation which predicts participation in a contract with Indofood shows that variables which are statistically significant and have positive signs of the coefficients are education of household head, ownership of water pump, ownership of motorbike, and

honesty. Farmers who have more education, physical and human capital are preferred by large food processors since they are expected to ensure the continuity of the raw material, potatoes. The educated farmers tend to be more innovative and more likely to adopt modern supply chains such as Indofood. For every additional year education of household head, respondents are 9.2% more likely to participate in the contract.

Table 4.2 Treatment effect model for selection equation

Variable	Coefficient	Std. Err.	P> z
Dependent variable: contract participation with Indofood (<i>dummy</i>)			
<i>Socio-demographics</i>			
Age of household head (year)	0.001	0.016	0.937
Education of household head (year)	0.092	0.036	0.010 **
Household size (persons)	0.096	0.063	0.128
<i>Contextual characteristics</i>			
Experience in farming (years)	-0.012	0.014	0.374
Farm group (<i>dummy</i>)	0.311	0.295	0.292
Farming with one variety (one variety <i>dummy</i>)	-1.110	0.481	0.021 **
Farm with proportion of income > 50% a year before (<i>dummy</i>)	0.039	0.226	0.863
Proportion of potato income (%)	0.079	0.420	0.851
<i>Farm capacity</i>			
Irrigated land (hectare)	0.000	0.000	0.313
Ownership of water pump (<i>dummy</i>)	0.916	0.264	0.001 ***
Ownership of motorbike (<i>dummy</i>)	0.484	0.272	0.075 *
Ownership of land for agriculture (<i>dummy</i>)	0.763	0.488	0.118
Ownership of car (<i>dummy</i>)	-0.078	0.257	0.762
Farms with phone (<i>dummy</i>)	0.265	0.269	0.324
<i>Incentives</i>			
Honesty	0.478	0.121	0.000 ***
Constant	-2.642	0.906	0.004 ***
Athrho	-1.013	0.307	0.001 ***
LR test of independent equations			
Chi-squared (1)		5.910	
Probability > chi-square		0.015	
Number of observations		243	

*Significant at the 10% level; **Significant at the 5% level; *** Significant at the 1% level.

Head households who have water pumps and motorbikes are 91.6% and 48.4% more likely to participate in contract farming than the households who do not have. Potato farmers in West Java who have water pumps can cultivate potatoes in the dry and the wet season and therefore supply continually to the company. A motorbike is essential for potato farmers for transporting potatoes which are planted on hilly areas and directly contacting the Indofood's representatives who distribute Atlantic seed.

The honesty variable has a positively significant association with contracting to Indofood. It seems that a high value of honesty shows a meeting of the contracted household's willingness and the contractual arrangements which are given by Indofood. This result is supported by a study by Warning and Key (2002). As a variable honesty is not expected to be correlated with income, the variable is an identifying variable in the selection model.

One variable relates to potato variety. Farmers who participate in the modern supply chain appear to prefer to plant more than one variety, combination of Atlantic and Granola, Atlantic and Tanggo, and Atlantic and Atlantic-Balitsa. This variable has a negative coefficient at the level of significance of 10%. Farmers who farm potatoes with combination varieties are more than 100% less likely to have chosen to participate in the contract. From the survey, it is clear that Indofood made contracts with farmers to provide Atlantic seed and to buy Atlantic potatoes. The contracts reduced the risk of production and marketing for farmers who grew the Atlantic potatoes which needed extra treatment compared to the other varieties; however, this did not preclude the cultivation of the other varieties.

4.5 Income effect of participation in the modern supply chain

The impact of the Indofood contract on income is highlighted in this chapter in relation to explanations for farmers' adoption of modern supply chains. Increased income is a positive indicator when the farmers engage in contracts with modern markets. Per capita household income is applied as a measure for the following reasons: (1) to be able to capture indirect effects and potential resource reallocations within households; and (2) to assess the potential of contract farming to promote poverty alleviation. In the survey, income data were collected on agricultural income and non-agricultural income value from each household over a 12-months period. In the income equation of the treatment effect model as shown in Table 4.3, total annual household income per household member is the dependent variable (in million rupiah). The value of per capita income is expressed in logarithms to minimize the deviations of individual observations from the total income. The contract variable which represents modern supply chain adoption is a treatment variable while controlling for other factors that might influence the outcome.

The results for estimation of outcome equation are presented in Table 4.3. At the bottom of the table, the parameter ρ is the correlation between the error terms in the selection equation and outcome equation. The ρ shows significant statistically at the level 1% significance. This means that a selection bias exists at the OLS model. Therefore, the treatment effect model is preferred in this study.

The outcome equation results reveal that the variable of contract with Indofood has a positive impact on household income. It is assumed all other things equal, cultivating potato under Indofood's contract increases annual per capita income. The

results indicate that a 1-percent increase in the likelihood of participating in contract entails a 118% increase in a household's total income.

Table 4.3 Treatment effect model for outcome equation

Variable	Coefficient	Std. Err.	P> z
<i>Outcome equation</i>			
Dependent variable: per capita household income			
Age of household head (year)	-0.024	0.008	0.003***
Education of household head (year)	0.002	0.024	0.946
Household size (persons)	-0.220	0.037	0.000***
Irrigated land (hectare)	0.000	0.000	0.000***
Farm group (<i>dummy</i>)	-0.072	0.217	0.740
Ownership of water pump (<i>dummy</i>)	0.002	0.155	0.988
Ownership of motorbike (<i>dummy</i>)	0.471	0.148	0.001***
Ownership of land for agriculture (<i>dummy</i>)	0.124	0.189	0.512
Ownership of car (<i>dummy</i>)	0.845	0.165	0.000***
Farms with phone (<i>dummy</i>)	-0.007	0.151	0.965
Farm with proportion of income > 50% a year before (<i>dummy</i>)	0.121	0.146	0.406
Proportion of potato income (%)	0.816	0.254	0.001***
Variety (one variety <i>dummy</i>)	0.536	0.290	0.065*
Experience in potato farming (years)	0.025	0.007	0.001***
Contract with Indofood (<i>dummy</i>)	1.180	0.307	0.000***
Constant	15.231	0.507	0.000***
Athrho (ρ)	-1.013	0.307	0.001***
LR test of independent equations			
Chi-squared (1)		5.910	
Probability > chi-square		0.015	
Number of observations		243	

*Significant at the 10% level; **Significant at the 5% level; *** Significant at the 1% level.

The finding of this research is supported by the survey data regarding their perceived income which showed that more than 80% of them perceived an increase in income (0-50%) since the contract has began. These findings show that the farmers' innovations for involving in the modern supply chain can improve the situation of potato farmers. This finding is parallel with results from earlier studies on adoption of modern

supply chains. Rao and Qaim (2010) and Miyata, Minot, and Hu (2009) showed that involving in modern supply chains, under contracts with supermarkets, can increase farmers' per capita income in Kenya and China. Simmons, Winters, and Patrick (2005) found positive impacts of contract participation on gross margins of seed corn and broiler farmers in Indonesia respectively.

As Table 4.3 shows, not only does participation in a contract with Indofood directly increase income, it also appears that other socio-demographic factors, contextual characteristics, and farm capacity have a significant impact on per capita income. Irrigated land, ownership of motorbike, ownership of car, proportion of potato income, variety, and farm experience have significantly positive impacts on the per capita household income. On the other hand, age and household size influence negatively on the per capita income. Interestingly, the results from Table 4.2 and Table 4.3 reveal that potato farmers who own a motorbike(s) and farm with more than one potato variety are more likely to participate in contract which increases their income.

4.6 Summary and discussion

Increasing demand for processed potatoes by the food processors has resulted in potential new markets for farmers. Indofood as a large food processor which needs potatoes as raw materials for potato chips has formed long term relationships with farmers. The firm provides Atlantic potato seed and a guaranteed market to the contracted farmers.

In this chapter, the adoption and impacts of contract farmers becoming involved in the modern potato supply chain is analyzed. The results of this study answer the research questions posed in the introduction.

Firstly, it explores how the potato farmers make decisions in channel choice particularly the choice to contract with Indofood as a modern supply chain. The treatment effect model for the selection equation in this study suggests that socio-demographics, contextual characteristics, farm capacity, and incentives factors influence farmers' involvement in the contract. A socio-demographics variable, the education of household heads, was found to be a factor influencing farmers' engagement in contract farming. Farmers with better formal education were found to be more likely to participate in the modern supply chain. This result suggests that contract farmers tend to be better endowed than non-contract farmers. This result is in line with other studies such as those by Miyata, Minot, and Hu (2009), and Simmons, Winters, and Patrick (2005). Farmers with better education tend to be more innovative and adaptive to accept new requirements from the modern markets. Moreover, the modern markets which determine quality, quantity and safety specification for high value products are more likely to form relationships with educated farmers. An understanding of forward agreements which are often written in a contract agreement is needed in a relationship between farmers and contract firms and sometimes becomes a great problem for the farmers. Although in the relationship between potato farmers and Indofood is not written in a contract agreement, the farmers are required to be more adaptive to plant the Atlantic potatoes received from Indofood. The Atlantic variety needs accurate fertilization and irrigation. Hence, farmers with better education are expected by the firms to have a better understanding of the agreement.

Farm capacity factors, ownership of a water pump which is used for irrigation and motorbike which is for transportation, also increase the chances of participation in contracts by farmers. The ownership of a water pump and motorbike are included as part

of farm capacity. Procurement system innovations in the agrifood chains have become diffused among the various players (e.g. farmers, retailers, agrifood firms, consumers). Farmers have increasingly made the decision to adopt technology. This procurement system innovation is affected by their capacity to make use of technology (Reardon et al. 2009). For farmers, involvement in contracts requires investment in physical capital such as water pumps and motorbikes to improve their capacity. In a similar fashion, Feder, Just, and Zilberman (1985) and Hernández, Reardon, and Berdegué (2007) find a positive impact of physical capital, particularly irrigation. The availability of irrigation in various seasons is a big constraint for potato farmers who farm in the hilly areas. A water pump is crucial for farmers to provide water to their fields in the dry season. Moreover, firms/wholesalers prefer farmers who have improved their irrigation because of the following reasons: (1) better quality and consistency of the product; (2) the ability to multiple-crop throughout the year (Hernández, Reardon, and Berdegué 2007). A motorbike is important for potato farmers to move their yields from hilly farms to their houses or the nearest roads and motorbikes are their main transportation from their houses to their fields. Although Indofood's middle man provide pick up cars to move potatoes from farmers' houses to Indofood's warehouses, farmers still needs vehicles which can overcome the difficulties of footpaths in hilly areas. Hernández, Reardon, and Berdegué (2007) apply the transportation variable (meaning equipment used for transportation) in their model of determinants of tomato grower adoption. However, the variable is not significant to influence farmers' participation in the supermarket channel. In contrast to their finding, the results in this thesis show transportation, especially motorbikes, influences farmers' decision to become involved in contracts with modern supply chains.

For contextual characteristic variables, farming with one variety of potato shows a negative correlation to farmers' participation. This result suggests that farmers who plant other varieties alongside Atlantic are more likely to participate in a contract. Because there is no written agreement, they expect Indofood can unilaterally end the relationship at any time. The farmers still grow Granola or other varieties to prepare for production risks if Atlantic yields fail. This finding supports the study by Neven et al. (2009) which found that the number of different horticultural products grown by supermarket farmers in Kenya is higher than that of the traditional farmers of tomato and kale.

Furthermore, farmers with high levels of honesty trust are more likely to have enhanced participation in the modern supply chain. Trust is the social capital used in maintaining a long term relationship between contracted farmers and Indofood, and furthermore it decreases transaction costs. Research by Warning and Key (2002) shows similar results. They suggest that a high value of honesty is likely correlated with a household's willingness to meet its contractual obligations. Because there is no written contracts between the firm and potato farmers, the social collateral variable such as trust emerge as important to establish a long term relationship. A legal contract contains clauses relating to the rights and obligations of both parties, and the consequences if the agreement fails. Legal contract agreements can be used by large firms to act opportunistically (Singh 2002). Indofood does not provide a legal agreement since previous agreements were misused by contract farmers to obtain bank mortgages.

Secondly, the agrifood transformation as reflected by farmers' participation in modern supply chains increases farmers' income. This is shown by the results of the treatment effect model for the output equation. Therefore this is a successful model of

contract farming because it improves farmers' welfare. This study also shows that participation in contract farming with Indofood yields significant per capita income gains. This result underlines the fact that adopting modern supply chains can be an important way for potato farmers in Indonesia to improve their situation. These research results are crucial in designing policies aimed at enhancing farmers' access to modern markets such as food processors, and thereby leading to further improvements in household income.

An implication of these results is that there should be public policy support to establish and maintain a contract farming system, especially when smallholders are involved. The supports could take the form of a clear legal framework for contracts, help for companies to identify potential contract farmers, allowing extension workers to provide technical assistance under the companies' guidance for less experience farmers, and mediating conflicts between farmers and the companies (Miyata, Minot, and Hu 2009). However, the supports provided should be matched with the real problems reported by contract farmers. Identification of their problems and motives for engaging in contracts can be used to guide the development of appropriate policies. This issue is raised in the next chapter.

This study contributes to the identification of the causal impact of contracts on farmers' welfare. Because participation in contracts is not randomly distributed across households, and it might be that households select to participate in the contracts on the basis of factors which are unobservable, a treatment effect model which requires a suitable instrumental variable to identify the causal impact of the contract on welfare is appropriate to analyze farmers' participation in the potato industry. By controlling the unobserved heterogeneity which comes from heterogeneous preferences among

respondents, the instrumental variable is utilized to partially exogenize participation in contracts by alleviating statistical endogeneity problems caused by omitted variables. It was identified that there is selection bias in the model of potato farmers' participation. Using IMR, the selection bias in the outcome equation is adjusted.

Chapter 5 Motivations for the potato farmers to engage in contract

5.1 Introduction

There has been a long debate in the literature focusing on the potential benefits for rural development and poverty alleviation and the effects of contract production shifting small-scale producers into modern supply chains. A case of contract farming scheme for the potato industry in Indonesia has been highlighted in the Chapter 4. The results show the positive impacts of an agribusiness development model on the farmers' farewell. The model suggests that the large agribusiness (Indofood) is competent in its contract relations with the farmers. The results imply that this relationship potentially affects cash income which impacts further on poverty alleviation in the rural areas.

However, research is still needed to address smallholders' motivations and the problems experienced by contract farmers. Among the important issues include the efficacy of input and output markets, transaction costs, access to land and water, credit, agricultural services, and other hidden motives for the formation of contracts. In the potato case in Indonesia, producers still face marketing inefficiencies (Saptana et al. 2006; Hastuti 2004), problems related to the availability of high quality potato seed (Puspitawati et al. 2011) and issues related to access to credit (Hastuti 2004; Puspitawati et al. 2011).

Chapter 4 describes the *ex post* perspective of potato farmers on the impacts and factors influencing a contract. This chapter provides the *ex ante* motivations for the potato

farmers to engage in contracting. Small scale farmers are rarely asked about their motivations to contract before they join in a contract partnership. Therefore, this investigation of farmers' motivation to form contracts aims to compare between farmers' potential to become involved in modern supply chains (with Indofood as a food processor) and their agricultural operation which includes farm problems and constraints. Moreover, there is a need to explore on an on-going basis the nature of the motives in the context of agrifood chain transformation and policy reforms particularly the case of agricultural commodities linked to high-value markets in the food industries in developing countries. It is also important to explore how motivations vary across individual producers and the resulting policy implications.

5.2 Description of the sample and analysis

This chapter focuses on contracted farmers who are the main respondents. Sixty contract respondents were chosen randomly from a list provided by two of Indofood's representatives (middle men) of more than about 400 producers. The chosen respondents had engaged in a contract with Indofood for at least a year before the survey and grew potatoes in the 2008 wet and dry seasons. This is because the collected data was collected at intervals during that financial year.

The main questionnaire which is used in the survey covers a wide range of information on the characteristics of contract producers, the reasons for contract production, the problems encountered, contract conditions, etc. Information regarding the reasons for contract production particularly part I.3 is mainly applied in this chapter. The information is only asked to the farmers who have experiences contracts with Indofood.

The part I.3 of the questionnaire is quite different than other parts. Before the questions were asked to the farmers, there were a few explanations by the enumerators that the questions are related to the farmers' experiences before deciding to engage with Indofood. The explanation confirms that the information collected includes *ex ante* motivation data. The relative importance of the motivating factors is identified with a five-point Likert scale from one (not at all important) to five (extremely important) of statements.

In order to fulfill the objective 2 of this thesis, two kinds of methods are applied in this chapter. Firstly, the scale values were analyzed using factor analysis to identify any underlying constructs. Using principal component analysis (PCA) with varimax rotation, the statements were measured to become some component constructs. In the PCA, the components fulfill the measurement such as Eigen values, factor loadings, Cronbach's Alpha, and the Keiser-Olkin Measure of Sampling Adequacy (KMO-MSA).

Next, the scale values were analyzed using a two stage cluster analysis. The analysis was applied to identify clusters of contract farmers who had similar views on the contract motivations. Cluster analysis was used to establish groups internally as homogenous as possible and externally (in comparison to each other) preferably heterogenous. To find the number of clusters, hierarchical procedure utilizing Ward's hierarchical clustering method was applied. The dendogram and Calinski and Harabasz pseudo F value were used to identify the most distinct of solution (Milligan and Cooper 1985; Calinski and Harabasz 1974).

Finally, a k-means non-hierarchical analysis was employed to identify some main observation (producer) segments in each cluster. The resulting clusters were compared using t-test to identify whether there are differences among the clusters.

5.3 Factors motivating contract production

From the analysis of the interview results, sixteen statements were identified as motivating farmers to contract with Indofood for the production of fresh potatoes (see Table 5.1). A major issue for many interviewed potato farmers was gaining a reliable supply of inputs particularly potato seed. Availability of potato seed in their area was still a big problem for the farmers for the continuity of production. The partnership which was offered by Indofood through providing ‘special’ seed and output marketing was seen as a worthwhile opportunity to improve their production and welfare. Another issues affecting potato production was uncertainty with the market and prices.

The sixteen statements in Table 5.1 show some statements referring to market uncertainty are statistically significant. These include, for example the payment is more reliable, and having a guarantee for marketing the crop, and no need to organize transportation to market. Although reliable supply of inputs is not significant, the motivation factor also explains another variable which shows the market uncertainty in potato marketing. The statements related to market uncertainty reveal that marketing for high value agribusiness products (HVAP) is still a major issue since the producers face weakness of output markets because the products are perishable and need to be sold quickly. In turn, market uncertainty can result in a high transaction cost. Accessing transport can be seen as a market uncertainty factor. In a similar fashion to the results in other studies such as those by Binswanger (1981), Hazell (1982), and Wang, Zhang, and Wu (2011), agricultural producers tend to avoid market uncertainty through contract farming schemes since the risks of production and marketing can be transferred to contract partners.

Growing under contract is also seen as a good way to obtain direct benefits such as the increase yield, to acquire knowledge/technical assistance and knowledge for use on new crops (Atlantic variety), and access high quality seed. These reflect the major problem of potato producers which is the availability, quality, and knowledge of how to use seed appropriately.

Table 5.1 Mean important scores in descending order for factors motivating contracting to Indofood

Item	Average
The payment is more reliable	4.083 ^a
Saw benefits from other farmers	4.033 ^a
Having a guarantee of market for crop	4.017 ^a
Ability to make new relationships with other farmers	4.000 ^a
Transportation is organized /no need to organize transportation to market	3.967 ^a
Access high quality seed	3.933 ^a
Ability to receive a higher price	3.850 ^a
Access to credit for purchasing seed	3.800 ^a
Acquire knowledge for use on new crops	3.650 ^a
Ability to increase yields	3.517 ^a
Acquire knowledge/technical assistance from the contractor	3.367 ^a
Access to credit for purchasing fertilizer and pesticide	3.167
Guaranteed minimum price	3.033
Reliable supply of inputs	2.900
Helps me to get involved in other projects	2.817 ^b
Acquire knowledge for use on traditional crops	2.233 ^b

a Mean scores indicated significant higher mean than 3 (average score) at the 10% level on the basis of a Wilcoxon sign-rank test.

b Mean scores indicated significant lower mean than 3 (average score) at the 5% level on the basis of a Wilcoxon sign-rank test.

Studies by Miyata, Minot, and Hu (2009), Dev and Rao (2005), and Key and Runsten (1999) prove that contracted farmers' income improves after the farmers engaged in contract farming. In the case of Indonesian potatoes, the interviewed producers recognized economic motivations which made them willing to involve in the contract.

The economic motivations are related to price and credit such as the ability to receive a higher price, guaranteed minimum price, access to credit for purchasing seed, and access to credit for purchasing fertilizer and pesticides. These reflect the actual conditions and institutional structures especially finance, which are faced by many potato producers. The potato producers usually lack access to the finance institutions. For the potato farmers, engaging in a contract with Indofood is a golden opportunity to obtain access to seed credit. Sometimes the middlemen who are Indofood representatives and connect the farmers and the firm provide credit of inputs such as pesticide and fertilizer to individuals.

Not only direct benefits, but intangible benefits also were highlighted by the farmers as motivations engaging in the contract. The ability to make new relationships with other farmers, the possibility of benefits from other farmers, the acquisition of knowledge for use on traditional crops, and the possibility of receiving help to become involved in other projects were described as intangible benefits motivating farmers to contract with agribusiness firms. These show that the farmers not only considered economic and direct benefits but also the intangible impacts of contract farming in their areas.

In order to categorize the motivation statements according to a smaller set of crosscutting themes which relate to any underlying latent constructs, the data were subject to principal component analysis (PCA). Using principal component analysis (PCA) with varimax rotation, the statements were measured to become four component constructs: market uncertainty, direct benefit, economic, and intangible benefit. Most of the constructs were operationalized following the study by Masakure and Henson (2005) which divides the motivations of contract for Hortico Agrisystems into four constructs:

market uncertainty, indirect benefits, income, and intangible/latent benefits. A modification is done to adopt the Masakure and Henson's constructs into the context of contract farming in the potato commodity. All of component constructs for contract farmers with Indofood are explained in Table 5.2.

Factor loadings of all factors must be above 0.5 and KMO-MSA should be greater than or equal to 0.5 to test the appropriateness of the factors. The Cronbach Alpha which is a reliability test should be above 0.6. The principal component analysis and the measurement values of the component constructs are shown in the Table 5.2 below.

Table 5.2 Principal component analysis of contract farmers' motivations

Component constructs	Factors and items	Factor loading
Market uncertainty	<i>(Cronbach's alpha=0.582, KMO-MSA=0.590, Explained variance=44.516)</i>	
	Having a guaranteed market/buyer for crop	0.808
	Payment is more reliable	0.808
Direct benefit	<i>(Cronbach's alpha=0.614, KMO-MSA= 0.595, Explained variance= 57.047)</i>	
	Reliable supply of inputs	0.509
	Ability to increase yields	0.613
Economic Intangible benefit	<i>(Cronbach's alpha= 0.805, KMO-MSA= 0.500, Explained variance= 83.653)</i>	
	Acquire knowledge/technical assistance from contractor	0.812
	To acquire knowledge for use on new crops	0.823
Economic Intangible benefit	Ability to receive a higher price	1.000
	Ability to make new relationships with other farmers	0.915
	Saw benefits from other farmers	0.915

The dendrogram and Calinski and Harabasz pseudo F value were used to identify the most distinct of solution (Milligan and Cooper 1985; Calinski and Harabasz 1974). Using the dendrogram and Calinski and Harabasz pseudo F value (see Appendix D), the component constructs were divided into two groups of solution or clusters.

Finally, a k-means non-hierarchical analysis was employed to identify the two main observation (producer) segments in each cluster. The resulting clusters were compared using two group mean comparison test (t-test) to identify whether there were differences between the clusters. The producer's characteristics were also compared between the two clusters.

The description of the two clusters is explained as follow:

Cluster 1: There were twenty respondents in this cluster which constitutes of 33.3% of the total sample. The producers in this cluster were mainly established farmers who had less motivation to engage in the contract farming system. They had more income and assets, but were less motivated to involve in contracts. They could easily exit from the contract. This cluster is named the market-driven group (MD).

Cluster 2: This cluster comprised the majority of respondents, about 66.7%. The cluster was dominated by contract farmers who had a high level of motivation to form contracts. The potato farmers in this cluster had less assets and income. However, they intended to form a long term relationship with the firm and wanted to gain as much as possible from the contract. They are labeled as the predominantly contract oriented group (CO).

There are thus two distinct clusters of respondents categorized according to their motivations to contract for potato, the groups have significant differences in some motivation factors such as reliability of payment, reliability of input supply, ability to increase yields, acquisition of knowledge/technical assistance and knowledge for use on new crops (Atlantic variety). As shown in Table 5.3, the contract oriented (CO) group has a higher level of motivations to form the contract agreement. The CO farmers can be as contract motivators since they intend to gain as much as direct benefits and reduce

uncertainty through contract partnerships. As they have less assets and income relatively, they reduce production and marketing risks in terms of availability of input (seed) and payment by engaging in a contract with modern supply chains.

Table 5.3 Cluster means by contract producers for factors scores derived from K-means clustering

Component constructs	Factors and items	Cluster 1(MD)	Cluster 2 (CO)	T statistic
		(N =20) (33.33%)	(N =40) (66.67%)	
		Mean		
Market uncertainty				
	Having a guaranteed market/ buyer for crop	4.000	4.025	-0.160
	Payment is more reliable	3.950	4.150	-1.754*
	Reliable supply of inputs	2.400	3.150	-2.609**
Direct benefit				
	Ability to increase yields	3.100	3.725	-2.627**
	Acquire knowledge/technical assistance from contractor	2.200	3.950	-11.769**
	To acquire knowledge for use on new crops (Atlantic potato variety)	2.800	4.075	-7.564**
Economic				
	Ability to receive a higher price	3.850	3.850	0.000
Intangible benefit				
	Ability to make new relationships with other farmers	4.000	4.000	0.000
	Saw benefits from other farmers	3.950	4.075	-1.115

*significant at the 10% level; **significant at the 1% level.

When the respondents were asked some questions regarding the background to their formation of a contract, the two groups responded with a variety of answers. As described in Table 5.4, the market-derived (MD) group was dominated by farmers who had engaged in a contract for a longer period and had become involved in a contract because of recommendations by other contract farmers and because they had offered themselves to the Indofood's representatives (middle men). This cluster seems to be more

dominated by independent farmers. Compared to the contract oriented (CO) group, the second cluster is formed from farmers who were recommended by other contract farmers.

Table 5.4 Cluster of contracted partnership background and contracted reasons

Factors and items	Cluster 1 (MD)	Cluster 2 (CO)
	(N =20) (33.33%)	(N =40) (66.67%)
	Frequency (%)	
<i>How long is your contract period? (month)</i>	42.75	39.93
<i>How do you become a contract potato grower?</i>		
Recommendation from other farmers who have been contracted	8 (40.00)	22 (55.00)
Sending an application to Indofood	8 (40.00)	9 (22.50)
Offered by Indofood (or its representatives)	4 (20.00)	8 (20.00)
Local official/extnension workers	0 (0.00)	1 (2.50)
<i>Why are you offered a contract by Indofood?</i>		
I have experience in growing potato	15 (75.00)	20 (50.00)
I have more land and can produce more	1 (5.00)	7 (17.50)
I can meet high quality standards	3 (15.00)	4 (10.00)
<i>Why do you choose Indofood as a contract partner?</i>		
It is the only one company which I know and I am able to access.	11 (55.00)	12 (30.00)
Hear good opinions from other contract farmers	3 (15.00)	6 (15.00)
The company gives me a better contract term	0 (0.00)	12 (30.00)
The company is big and have a good reputation	1 (5.00)	5 (12.50)
Influenced by a friend	4 (20.00)	2 (5.00)
The company offers me a flexible condition	1 (5.00)	3 (7.50)
<i>What are the main advantages for you to agree the contract?</i>		
Access to appropriate potato seed	12 (60.00)	27 (67.50)
Getting information on how to produce potato	1 (5.00)	0 (0.00)
Good (high) price for product	0 (0.00)	1 (2.50)
Fixed price for crop, less risk, and assured market	7 (35.00)	12 (30.00)

Farmers in the both clusters perceive that farming experience is the main reason they are chosen as a contract partner. When the farmers were asked regarding why they chose Indofood as a contract partner, most of them responded that the firm was the only one company they knew and were able to access. Access to appropriate potato seed is also a reason for the farmers in the two clusters involving in a contract partnership.

5.4 Socio demographic characteristics of producer segments

To gain a clear picture of the characteristics of each cluster, the socio demographic characteristics of the members of each group are explored. The outcome of the cluster analysis between the market-driven and contract oriented groups differs according to the contract motivation dimensions: market uncertainty, direct benefit, economic, and intangible benefit. They are not different regarding the proportion of land used for contract, proportion of income from potatoes, per capita income, age of respondents, education, farming experience, and farming with only one variety (see Table 5.5).

As shown Table 5.5, the market-driven group (MD) represents producers with larger farming land (2.6 hectares) and land for potatoes (1.8 hectares) compared to the contract oriented (CO) group. Most of their land is irrigated (0.8 hectares) and most of them use rented land for the potato farming. Moreover, they have better assets such as cars and water pumps than the CO group. This group is dominated by young and educated farmers who has an average age of 43 years and has been education for almost 9 years on average. It seems that the MD group is consisted of well established farmers. However, the group invests less in social capital. The MD farmers are less involved in farmer groups and perceive lower honesty (trust) which promote less relationship quality to the firm. Because of they have more assets, this group can easily change their relationship marketing to other buyers when they expect less beneficial partnerships.

Interestingly, the use of rented land and utilized land (utilizing government's land) is significantly different between MD and CO groups. More than 60% and 13% of CO farmers use rented and utilized land to grow their contracted crops. This means that they accept risks in providing land since they expect that the contract benefits will be greater.

Table 5.5 Cluster by characteristics of respondents

Factors and items	Cluster 1 (MD)	Cluster 2 (CO)	T statistic
	(N =20) (33.33%)	(N =40) (66.67%)	
	Mean		
<i>Land and asset</i>			
Total farming land (hectare)	2.561	1.792	1.826 *
Total land for potato (hectare)	1.528	1.095	1.697 *
Proportion of land used for contract (%)	85.116	85.863	-0.126
Irrigated land (hectare)	0.805	0.487	1.569 *
Number of farmers using rent land (persons)	17 (85.0%)	25 (62.5%)	1.812 *
Number of farmers using utilized land (persons)	1 (5.0%)	8 (13.3%)	-1.539 *
Values of owned cars (million rupiah)	28.100	9.125	2.210 **
Values of owned water pumps (million rupiah)	2.348	1.430	1.630 *
<i>Income</i>			
Proportion of income from potato (%)	45.723	58.800	-1.433
Income per capita (million rupiah)	18.600	14.700	0.8121
<i>Social capital</i>			
Age (years)	42.750	45.125	-0.909
Education (years)	8.800	8.150	0.686
Farmer group (persons)	3 (15.0%)	16 (40.0%)	-1.995 **
Farming experience (years)	18.400	18.650	-0.077
Relationship quality - Honesty (average)	0.038	0.563	-2.702 ***
Farming with only one variety (Atlantic) (persons)	16 (80.0%)	35 (87.5%)	0.758

*Significant at the 10% level; **Significant at the 5% level; *** Significant at the 1% level.

On the other hand, the contract oriented group contained by farmers with a high level of motivation to form long term partnerships. They were also more adaptable, and relied on getting benefits from the contract. These can be seen from their perception of the relationship quality factor (honesty), involvement in farmer groups, perception of the market uncertainty and belief that they would receive direct benefits from the contract.

5.5 Summary and discussion

This chapter highlights farmers' motivations for engaging in contracts with a large agribusiness firm, Indofood. This study has addressed the question of whether farmers

really want to be engaged in contracts. Numerous studies suggest that farmers are able to supply modern supply chains (Glover 1987; Simmons, Winters, and Patrick 2005; Singh 2002, Miyata, Minot, and Hu 2009; Hernández, Reardon, and Berdegúé 2007), but the studies do not consider farmers' attitudes affecting their decisions to participate.

This study finds four components affecting farmers' to participate in contracts with Indofood. Their motivations are categorized as market uncertainty, direct benefits, economic benefits, and intangible benefits.

Market uncertainty is still the main problem faced by farmers supplying high-value food products. Marketing uncertainty perceptions of contract farmers in the Indonesian potato industry is affected by the reliability of payment, having a guarantee for marketing the crop, and the need or otherwise to organize transportation to market. One particular attraction of contracting with Indofood is that the payments to the farmers are assured consistently. The reputation of Indofood as a multinational company makes farmers perceive that the firm's payment is still reliable, although there is sometimes a delay of payment for the Atlantic yields. Moreover, as the farmers can get Atlantic seed on credit from Indofood, they recognize that Indofood's payment mechanism can be relied on, thus covering uncertainty in marketing. This finding is supported by a study by Beukema and Zaag (1990) that shows that farmers are more likely to establish long-term relationships with seed suppliers, in order to reduce the uncertainty in the output market. Yield of non-traditional products is more uncertain than traditional crops and such crops are often more perishable (Marsh and Runsten 1995). Thus having a guarantee for potato marketing through a contract with Indofood is the most important motivation to establish the relationship. Another motive for farmers involving in contracts is the free

transportation provided by the firm to move the potatoes from their houses to the firm's warehouse. This facility is attractive for the farmers to reduce the post harvest risks. Potatoes which are a perishable commodity must be moved quickly after harvesting and be kept in dry places to avoid extra water which may damage potato tubers.

Farmers are interested to engage in contracts since they see direct benefits from the participation. The direct benefits that can be obtained by contract farmers are increasing yield, acquiring knowledge/technical assistance and knowledge the use of new crops (Atlantic variety), and accessing high quality seed. These motivations reveal the opportunities and constraints faced by the potato farmers. Some authors, Miyata, Minot, and Hu (2009), Dev and Rao (2005), and Key and Runsten (1999), argue that contract farming represents a great opportunity to boost agricultural development through capital investment, transferring technology, and access to markets. The increasing yield results in a rise in income which is caused mainly from the higher prices of products. As reported in section 3.3.1, the potato price is significantly different between the Indofood and general farmer population (GFP) groups. The Indofood farmers can have the potato price of more than 3893 rupiah per kilogram, meanwhile the GFP only get less than 3017 rupiah on average. Although the average total potato production for Indofood farmers is higher than the GFP group, the average production is statistically not significant. Involvement in a contract with Indofood helps the contract farmers not only to obtain increasing yields, but also to acquire knowledge/technical assistance and knowledge of the use of the Atlantic variety from the firm's middlemen. Moreover, the farmers can access high quality seed which is imported directly from the seed company and includes the first filial generation (F1) of Atlantic seed.

In this study, the economic motive is associated with contract farmers' perceptions of price, income, and profit. The results of PCA analysis suggest the economic motivation for involvement in a contract relates to having the ability to receive a higher price. Again, the results obviously show that potato prices cause potato farmers to join in the modern supply chain. Their need for higher price is reasonable since producing high value agribusiness products (HVAP) such as potatoes make households more vulnerable to food shortages and price fluctuations. Prices of the non-traditional crops are more volatile due to thinly traded markets, yield is more uncertain than with traditional crops and such crops are often more perishable (Marsh and Runsten 1995). In contracts, price transparency is needed by farmers to decrease uncertainty.

Another motive for farmers' participation is the intangible benefits that contract farmers may experience. Intangible benefits are latent advantages of the contract that the farmers did not expect at the beginning of the contract. The intangible benefits formed in this study include the ability to form new relationships with other farmers, perceiving the benefits received by other farmers, and acquiring knowledge for use on traditional crops (Granola). These intangible benefits are different to the variable found in the research by Masakure and Henson (2005) who suggest that seeing benefits to other farmers and getting satisfaction from growing export crops are intangible benefits of contracting to Indofood.

The results of this study show that there are two main producer groups within the sample. Firstly, the market-derived (MD) group consists of established farmers who have a low motivation to engage long term partnerships in a contract. Secondly, the contract oriented (CO) group is dominated by farmers who have a high motivation to become

involved in contract farming. Although the CO farmers have less physical assets, they have the potential to increase the efficacy of input and output markets using their social capital such as relationship quality and their involvement in farmer groups. Through contract production, farmers with limited capital can link successfully to modern supply chains. This result relates to some studies by Simmons, Winters, and Patrick (2005), Henson, Masakure, and Boselie (2005), Huang et al. (2007), and Maertens and Swinnen (2009) that find contract farming can be seen as a golden bridge to link small scale farmers who have the resources required to produce high value commodities with large firms which require the continuity in the supply of high quality commodities.

The most important motivation for contract farming for potato farmers is to decrease market uncertainty, particularly to obtain a reliable supply of inputs and more reliable payments from the contracted firm. Contracting for food processors provides a less uncertain option to avoid production and marketing problems. The analysis in this chapter displays the complexity of contract motivations and thus acts to enhance our understanding of the manner in which production contracts are positioned within small scale farmers' livelihood strategies. For example, the potato farmers particularly the contract oriented (CO) group are willing to rent potato land as long as their expectations for contract benefits are greater.

Another motivation which encourages potato farmers to become involved in contracts is direct benefits such as the ability to increase yields, acquire knowledge/technical assistance from contractor, and to acquire knowledge for use on the new crop, Atlantic potatoes. This suggests that a production contract can be seen as having a potential direct effect on better yields, in turn, the farmers expect higher income.

This also shows the high level of farmers' adjustment to the transformation of the agrifood system which requires high quality agricultural commodities. Obtaining knowledge/technical assistance from contractors and acquiring knowledge for use on the new crop are benefits and consequences for farmers who engage in contractual agreements. Technical assistance is important for the effective adoption of new channels by potato farmers.

In this chapter, producer segmentation which is based on contract motivations is used to address the ex-ante motivations for small scale farmers to engage in contracting. On-going research on the nature of their motives is needed in the context of the restructuring of supply chains and policy reforms. In the case of global supply chains involving large scale agribusiness firms, small growers frequently find difficulties to link to high value markets and the market driven by highly concentrated retailers/firms. An understanding of the motivations of producers to farm contracts can be used to explore the likely impacts on their agricultural operation. In turn, this addresses the long-term sustainability of contract arrangements.

Chapter 6 Determinants of trust in the Indonesian potato industry: A comparison among groups of potato farmers¹

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Chapter 7 Male and female differences in buyer-seller relationships in the Indonesian potato farmers

7.1 Introduction

Women's roles in agriculture have been changing rapidly because of the economic and social forces transforming the agricultural sector (Raney et al. 2011). As described in Chapter 2, in the agrifood transformation, small farmers have been faced with new labor market opportunities which are characterized by specialization in high value agricultural product (HVAP) supply chains, differentiated products, and processed food products. The opportunities for women include job stability, wages, better working conditions, and opportunities for career development. In many developing countries of Africa, Asia, and Latin America, women's roles have increased and now dominate the labor market in the production and processing HVAP (Dolan and Sorby 2003). The rise of female labour participation should increase families' income and the women's capacity, because economic, social gender relations, and household organization of employment are embedded in the ability to gain new labor market opportunities. However, the emergence of modern supply chains not only provides different opportunities, but also different challenges and impacts on relationships between women and men. The differences derive from the different roles and responsibilities of women and the limitations that they face.

Like in other developing countries, rural women in Indonesia are not only responsible for the household and caring for children and elderly household members, but also for agricultural production (Raney et al. 2011). Women contribute to agricultural

and food production in varying degrees. Their position is influenced by religious, social, and political systems and by their economic status (Azahari 2008). Their contribution also cannot be separated from men's roles. Most food in Indonesia is produced with labor contributed by men and women in a collaborative process.

In the process of agrifood transformation, rural women in Indonesia have participated in a range of activities from producing agricultural crops to engaging in trade and marketing. In South Sulawesi, 70-100% of the upland women farmers are mainly responsible for marketing of livestock and poultry production (Saenong and Ginting 1995). The village traders conducting crops (palawija) marketing are dominated by women in East Java. Most of the traders (93%) in the survey in East Java live in the village where they operate. In the case of potato industry, it is unclear what roles women play in agricultural activities in the emergence of modern supply chains for HVAP.

Women are becoming such a large and important segment of the sales force (Schul and Wren 1992) particularly in the buyer-seller relationships. Research has suggested that "men and women might do relationships differently, have different relationship capabilities, or perceive the nature and importance of relationships differently" (Beetles and Crane 2005, p. 232). However, an important key question is whether gender differences create different attitudinal and behavioral relationships between male and female farmers. Are there differences in the relationships between constructs based on gender?

This chapter commences by exploring what is known about male and female buyer-seller relationships and male-female seller differences. Specifically, this chapter has two main objectives; (1) to describe women's roles in the Indonesian potato industry;

and (2) to investigate the differences of relationship quality factors between males and females. The gender differences are based on several constructs of relationship marketing. It is expected that males and females of the Indonesian potato farmers have different points of view regarding marketing preferences and buyer-seller relationships.

7.2 The role of Indonesian women in the agricultural activities

The agricultural sector still dominates the labor force in Indonesia. The average share of agricultural labor from 2004 to 2011 was 41.2 percent (Statistics Indonesia 2011). Although the agricultural sector contributes the highest labor force, its level of wages is the lowest (Ministry of Manpower and Transmigration 2005). The Indonesian agricultural sector is dominated by small family farmers who manage <1 hectare area or farm workers. A small family farmer in rural areas consists at least of a household head and his wife, and around 2.6 children (Statistics Indonesia 2011).

Women in Indonesia comprise 51.1% of the total population in 2008 and about 58.0% of them were engaged in agriculture (Directorate of Population and Labor 2009). They play roles as domestic managers and agricultural producers some of whom are in self employment ventures and others in wage labor. Although the labor participation of women in the agricultural sector appears to be increasing, about 40.7%, nearly 40.0% of them come from poor families (Yusuf 2007).

Women's participation in rural labor markets is over represented in unpaid, seasonal, part-time work, and they are often paid less than men. Saenong and Ginting (1995) report that women family laborers who are unpaid workers comprise over 57.3% compared to only 20.1% for men. Because women face a work burden, they are generally

less able to participate in agricultural economic opportunities. The most responsibilities of rural women are domestic work and child-rearing activities (Raney et al. 2011; Eugenia 2010). The responsibilities are usually unpaid, limit women's capacity to engage in income-earning activities, and require women to stay near their homes.

Basically rural women in Indonesia have the same rights as men with respect to marriage, divorce, heritage, and property rights. Rural woman in Java have a considerable degree of economic independence and initiative, and exercise social power (Azahari 2008). Although they have an equal status in family's decision making, they do not project an image of independence. They are often described as the silent head of the home or as having informal power. The rural economy can potentially be developed through the empowering of women since they can be important family income earners.

7.3 Description of the sample

All the respondents who are used in this chapter are categorized into Farmer Field School (FFS), Indofood, and the general farmer population (GFP) farmers to distinguish whether there are any differences among the groups of the potato farmers. The total sample which was drawn in the survey is household samples. To cover the objectives of this chapter, to investigate the role of women in the potato production and marketing including the differences of relationship quality factors between males and females, the sample uses male and female samples based on the household bases in the 3 groups of samples. Thus, the total sample contains 302 heads of households and their partners/spouses. Specifically, the total sample of 614 includes 100 FFS, 394 GFP, and 120 Indofood respondents. They were asked regarding marketing preferences.

Table 7.1 shows the individual characteristics of the male and female samples for the general farmer population (GFP), Indofood, and Farmer Field School (FFS) farmers. The characteristics are explored in terms of the age, education, and length of life of the head of the household. The average age of females for the general farmer (GFP) group is older (41 years) than the FFS and Indofood groups (36 and 38 years). The average age of males in each group is older than the males' spouses.

Women's education in the GFP group is better than the men's. The mean of formal education for women is nearly 7 years, while the men have an education of about 6 years on average. For the group of FFS and Indofood, males have a higher level of education than females. This is reasonable since male respondents who are more educated are preferred by the FFS program managers and the Indofood representatives.

As the male and female respondents work as couples, the length of time that they live together in the same households can influence their decision making. On average, the couples in the GFP group live longer in the same households (24 years) than the Indofood and GFP groups (21 and 18 years).

Table 7.1 Individual characteristics of male and female potato farmers

Item	Gender	GFP					FFS					Indofood				
		Obs.	Mean	Std. Dev	Min	Max	Obs.	Mean	Std. Dev	Min	Max	Obs.	Mean	Std. Dev	Min	Max
Age (year)	female	197	41.15	11.70	15.0	70.0	50	36.32	9.49	19.0	65.0	60	37.80	9.64	20.0	63.0
	male	197	46.82	12.12	21.0	77.0	50	39.74	8.87	22.0	60.0	60	44.33	9.53	24.0	64.0
	total	394	43.98	12.23	15.0	77.0	100	38.03	9.30	19.0	65.0	120	41.07	10.09	20.0	64.0
Education (year)	female	197	6.84	2.90	1.0	17.0	50	8.96	3.08	1.0	17.0	60	8.25	3.06	1.0	16.0
	male	197	6.47	2.95	0.3	16.0	50	9.38	3.24	2.0	18.0	60	8.37	3.44	2.0	17.0
	total	394	6.65	2.93	0.3	17.0	100	9.17	3.15	1.0	18.0	120	8.31	3.25	1.0	17.0
Long life with head of household (year)	total	394	23.80	12.04	0.3	56.0	100	18.19	9.47	1.0	47.0	120	20.56	10.44	0.3	49.0

7.4 Model specification

To investigate the difference between male and female's perceptions regarding relationship marketing, this study uses relational variables. The variables which are correlated with gender perspectives and farmers' behavior in decision making are similar to those used in the previous chapter (Chapter 6) with some additions.

This research combines ideas from previous studies (Schul and Wren 1992; Moncrief et al. 2000; Dion, Easterling, and Javalgi 1997; Busch and Bush 1978; Swan, Futrell, and Todd 1978) in delineating variables important in buyer-seller relationships, in terms of buyers' perspectives. A construct of buyer-seller relationships is developed to measure male-female differences in the relationships. The three pillars of the buyer-seller relationships: satisfaction, trust and commitment are identified as being different in male and female farmers. Satisfaction and trust are identified as having some relational variables. The relational variables for satisfaction are price quality ratio, price transparency, relative price, price fairness, uncertainty and price satisfaction. Trust has five relational variables: communication, dependency, flexibility, joint problem solving, and reputation. The constructs of gender differences and principal component analysis for each variable are listed in Table 7.2.

The hypothesis presented in this chapter is that there are differences in perceptions between males and females in terms of making decisions in the buyer-seller relationship. The following section highlights the variables and the derivation of the hypothesis for each variable.

7.4.1 Trust

Moorman, Deshpandé, and Zaltman (1993) define trust as a willingness to rely on an exchange partner in whom one has confidence. Following the definition of trust in Chapter 6, trust in this thesis is conceptualized as honesty and goodwill. Honesty refers to farmers' perceptions of their partners' words, fulfilling their promised obligations and sincerity. Goodwill is defined as farmers' perceptions of their buyers based on the buyers' responsibility, dependability, and integrity.

As explained in Chapter 2, trust has 8 relational variables: flexibility, price transparency, relative price, price quality ratio, communication, dependency, reputation, and joint problem solving. To accommodate the 4th objective of this study which is to investigate the differences in relationship quality factors between males and females, the terms of the trust constructs follow trust dimensions elaborated in Chapter 6. The summary of relational behavior variables of trust for male and female differences is described in Table 7.2 below.

Table 7.2 Aspects of relational behavior of trust for male and female differences

Norm/behaviour	Descriptions	Composite statements
Flexibility	Willingness to move beyond the terms and conditions specified in contractual agreements as circumstances require (Heide and John 1992)	<ul style="list-style-type: none"> • My buyer is flexible in their contract and arrangement to fit with the current scenario • My buyer can adjust the contract condition to fit with my present requirement • When I have problem, my buyer will make sure the problem does not jeopardize our business relationship
Price transparency	Clear, comprehensive, current, and effortless overview about offered buyers' prices (Matzler, Renzl, and Faullant 2007)	<ul style="list-style-type: none"> • Price changes are communicated to me properly and timely • The price information provided by the buyers is complete, correct and frank • I know what I pay and what I get

Table 7.2 Aspects of relational behavior of trust for male and female differences
(continued)

Norm/behavior	Descriptions	Composite statements
Relative price satisfaction	Comparison of price levels to a reference price (Schulze, Spiller, and Wocken 2006)	<ul style="list-style-type: none"> • Terms and condition of my buyer/processor are better than those of other buyers/processors
Price quality ratio	An emotional state that occurs in response to an evaluation of all interaction experience with a partner regarding quality refers to the customer's actual experience with the product that consistently meets their specifications (Crosby, Evans, and Cowles 1990; Leuthesser 1997; Fiegenbaum 1991)	<ul style="list-style-type: none"> • I am satisfied with the potato price and grading system • I get a good price-quality ratio
Communication	The formal as well as informal sharing of meaningful, timely and frequent information between firms (Anderson and Narus 1990)	<ul style="list-style-type: none"> • The buyers provide me with information in time • the buyers provide me with all the relevant market information • We share a common information frequently with the buyer • Information sharing on important issues has become a critical element to maintain this partnership
Dependence	Partners feeling under rewarded, angry and resentful and may result in suspicion and mistrust (Ganesan 1994; Gruen 1995)	<ul style="list-style-type: none"> • The buyers have all the power in my potato production • I have no other alternative buyer • My buyers control all the production information
Reputation	Partners' ability to attract the best and brightest in competitive markets and showing a high and credible reputation (Kwon and Suh 2004; Merrill-Sands, Holvino, and Cumming 2000).	<ul style="list-style-type: none"> • The buyers have a high reputation
Joint problem solving	Collaboration regarding buyer-seller relationship defined as a departure from the anchor point of discreteness that underlies spot-market transactions towards a relational, bilateral exchange (Yilmaz and Hunt 2001)	<ul style="list-style-type: none"> • When I have problem with my buyers, I meet them to get problem solving together

Using the trust relational behaviors above and following Fugate, Decker, and Brewer (1988), Jeanquart-Barone and Sekaran (1994), and Buchan, Croson and Solnick (2008) who find the differences in trustworthy behavior between males and females in exchanges, hypotheses for gender differences in the potato industry are developed. The hypotheses are:

H1: Male and female potato farmers have differences in their perceptions of:

- (a) flexibility,
- (b) price transparency,
- (c) relative price,
- (d) price quality ratio,
- (e) communication,
- (f) dependency,
- (g) reputation, and
- (h) joint problem solving.

7.4.2 Satisfaction

The definition of satisfaction in this thesis follows Smith, Kendal, and Hulin (1969) and Anderson and Narus (1990) who delineate satisfaction as a positive response resulting from the assessment of all components of a partner's working relation with other partners. The partners in this thesis refer to the potato farmers' buyers. Considering relationship marketing and gender difference studies, the satisfaction components in the agricultural

marketing context can include satisfaction of the relationship, orientation, price fairness, uncertainty, performance, and organizational culture.

In terms of sales, numerous studies which have focused on the attitudes of women find that females who are salespeople have significant differences regarding satisfaction (Busch and Bush 1978; Fugate, Decker, and Brewer 1988; Gable and Reed 1987; Kennedy and Lawton 1992; Swan, Futrell, and Todd 1978). Satisfaction of the relationship is defined according to the definition of satisfaction by van Weele (2010), Crosby, Evans, and Cowles (1990), and Leuthesser (1997), and the definition is customized to be appropriate to agricultural contexts. Satisfaction of the relationship is the result of a comparison between a farmers' expectation and a buyers' performance in terms of relationships. An example of satisfaction is when the farmer is pleased with his/her relationship with the buyer.

Orientation refers to a selling behavior that focuses on maintaining long-term buyer satisfaction (Saxe and Weitz 1982). Market orientation for potato farmers can be different, but they usually consider quality and price. Farmers who are orientated to fulfill buyers' requirement such as quality and grading specification, practice a selling behavior, buyer-orientation. McMurrian and Rhey (2001) find that females are perceived to be less knowledgeable about selling products than males. Female salespersons tend to have less understanding of buyer-orientation. This suggests that there is a gender difference in terms of orientation.

Price can be a measurement of satisfaction for farmers as decision makers in buyer-seller relationships. When sellers perceive that the accepted price is reasonable, acceptable, and justifiable, they can measure the price fairness of their partners (Matzler,

Renzl, and Faullant 2007). In turn, this produces a positive outcome and raises satisfaction. In some gender difference literature, as male producers are more overconfident to estimate prices and more frequently trade to reduce price risk (Cunningham III et al. 2008), they are considered as being able to measure price fairness better than female producers.

Uncertainty refers to the difficulty experienced by decision makers (buyer/sellers) in predicting the outcomes. The outcomes can be expected through benefits-costs and risk (Duncan 1972; Kohli 1989; Tripathi, Singh, and Singh 2005). Market price and contract terms in the future also can be considerations of uncertainty in agricultural marketing (Musshoff and Hirschauer 2008). In gender difference studies from the selling perspective, uncertainty which is related to role ambiguity occurs when the sales woman perceives uncertainty of the measures or variables being used to evaluate partners' performance (Siguaw and Honeycutt 1995). Siguaw and Honeycutt (1995) also find that female salespeople in industry reduce unclear or contradictory expectations more than male salespeople because they are more communicative, empathic, and sensitive to others. Thus, a different perception between male and female sales on uncertainty occurs.

Several researchers in marketing and management have found the relationship between performance and satisfaction. An advanced theoretical proposition by Porter and Lawler (1968) states that performance causes satisfaction. Differential performance determines rewards which results in variation in satisfaction level. The self-confidence of an individual is believed as a determinant of performance level (Stanton and Buskirk 1974). As women might have less confidence (Lenney 1977; Swan, Futrell, and Todd 1978) and less positive perception (Stanton and Buskirk 1974); it is expected that there is

a significant difference in performance between male and female salespeople (Schul and Wren 1992).

Organizational culture is an important factor influencing relationship skills and can be different between male and female salespeople. The elements of organizational culture such as assumptions, values, beliefs and norms can deeply affect thinking and social action of decision makers (Jarratt and O'Neil 2002). In the case of gender differences, men and women acquire different skills and beliefs which influence their behavior (Buchan, Croson, and Solnick 2008). For example, women tend to be more social (Anderson and Blanchard 1982), less aggressive in general (Eagly and Steffen 1986), and have more empathy (Ickes et al. 1986). Hence, it is expected that there are gender differences in terms of organizational culture.

Consistent with the research on satisfaction dimensions above, the following hypotheses are offered:

H2: Male and female potato farmers differ in their perceptions of:

- (a) satisfaction of the relationship,
- (b) orientation,
- (c) price fairness,
- (d) uncertainty,
- (e) performance, and
- (f) organizational culture.

7.4.3 Commitment

Commitment defined by Moorman, Deshpandé, and Zaltman (1993) is an enduring desire to maintain a valued relationship. Morgan and Hunt (1994) and Wilson (1995) propose that a partner will commit to an exchange of buyer-seller relationship when the relationship is considered important and he warrants maximum efforts to maintain it into the future. To some extent, a commitment is an act of faith by which the respective parties handle uncertainty and complexity. Other scholars identify commitment as the essence of stability and sacrifice (Anderson and Weitz 1989) which implies the adoption of a long-term orientation to the relationship and a willingness to make short-term sacrifice regarding longer-term benefits (Dwyer, Schurr, and Oh 1987).

Many studies highlight gender differences in organizational commitment in various industries (Schul and Wren 1992; Russ and McNeilly 1995; Siguaw and Honeycutt 1995; Smith 1998). Only the study by Russ and McNeilly (1995) suggests that organizational commitment differs because of the attitudes and behavior of males and females. The other studies suggest that organizational commitment seems to have less of a social dimension for women because women historically have had more reasons for leaving the job or responsibility than men have. For example, women can leave the job because of having a family and following a spouse's career move (Russ and McNeilly 1995). Thus, the hypothesis regarding gender difference in commitment is:

H3 : Male and female farmers have no differences in their perceptions on commitment.

7.5 Operationalisation of the variables, measure evaluation, and analysis

To examine the gender differences in marketing relationships, this study uses measurement constructs of composite measurement. Composite measures (O'Toole and Donaldson, 2000) are applied to make all the constructs operational. The composite measures were created by combining two or more separate dimensions of the various constructs. A single statement or fewer statements are used to represent these dimensions. All items containing the variables were measured on a five-point likert scale ranging from 1=strongly disagree to 5=strongly agree. The marketing relationships are measured with one or more statements respectively. Every factor of the gender differences is measured with a number of statements and they can be seen in Table 7.3.

Table 7.3 Principal component analysis of relationship marketing factors for male and female differences

No	Factors and items	Factor loading		
		GFP	FFS	Indofood
<i>Trust</i>				
Flexibility	<i>Cronbach's alpha</i>	0.613	0.674	0.501
	<i>KMO-MSA</i>	0.500	0.662	0.500
	<i>Explained variance</i>	72.124	60.999	67.315
	When I have problem, my buyer will make sure the problem does not jeopardize our business relationship	na	0.803	Na
	My buyer is flexible in their contract and arrangement to fit with the current scenario	0.849	0.783	0.820
	My buyer can adjust the contract condition to fit with my present requirement	0.849	0.757	0.820
Price transparency	<i>Cronbach's alpha</i>	0.773	0.678	0.513
	<i>KMO-MSA</i>	0.593	0.608	0.589
	<i>Explained variance</i>	62.219	60.872	50.693
	Price changes are communicated to me properly and timely	0.839	0.843	0.679
	The price information provided by the buyers is complete, correct and frank	0.873	0.838	0.778
	I know what I pay and what I get	0.633	0.643	0.675
Relative price	Regarding price, terms and condition of my buyer/ processor are better than those of other buyers/ processors	1.000	1.000	1.000
Price quality ratio	<i>Cronbach's alpha</i>	0.681	0.870	0.654
	<i>KMO-MSA</i>	0.500	0.500	0.500
	<i>Explained variance</i>	75.925	88.501	74.494
	I am satisfied with the potato price and grading system	0.871	0.941	0.863
	I get a good price-quality ratio	0.871	0.941	0.863
Communication	<i>Cronbach's alpha</i>	0.857	0.867	0.845
	<i>KMO-MSA</i>	0.809	0.801	0.802
	<i>Explained variance</i>	70.039	71.496	68.439
	We frequently share a common information with the buyer	0.813	0.852	0.800
	The buyers provide me with information in a timely manner	0.881	0.866	0.868
	The buyers provide me with all relevant market information	0.861	0.873	0.879
	Information sharing on important issues has become a critical element to maintain this partnership	0.790	0.788	0.756
Dependency	<i>Cronbach's alpha</i>	0.540	0.524	0.445
	<i>KMO-MSA</i>	0.584	0.500	0.543
	<i>Explained variance</i>	52.291	52.586	47.664
	The buyers have all the power in my potato production	0.798	0.862	0.790
	I have no other alternative buyer:	0.733	0.862	0.514
	My buyers control all the production information	0.628	na	0.737
Reputation	The buyers have a high reputation	1.000	1.000	1.000
Joint problem solving	When I have problem with my buyers, I meet with them and solve problems together	1.000	1.000	1.000
<i>Satisfaction</i>				
Satisfaction of the relationship	<i>Cronbach's alpha</i>	0.630	0.735	0.579
	<i>KMO-MSA</i>	0.500	0.500	0.500
	<i>Explained variance</i>	73.438	79.323	73.249
	I am very pleased with my relationship with the buyer(s)	0.857	0.891	0.856
	Generally, I am very satisfied with my relationship with the buyer	0.857	0.891	0.856

na shows the factor with other factor(s) cannot form one or more composite latent variable(s).

Table 7.3 Principal component analysis of relationship marketing factors for male and female differences (continued)

No	Factors and items	Factor loading		
		GFP	FFS	Indofood
Orientation	<i>Cronbach's alpha</i>	0.592	0.638	0.608
	<i>KMO-MSA</i>	0.634	0.612	0.651
	<i>Explained variance</i>	46.668	68.984	47.290
	I am satisfied with the potato price and grading system	0.785	0.895	0.779
	I get a good price-quality ratio	0.831	0.903	0.801
	The potato price depend on my potato quality	0.54	0.673	0.554
	The potato price equivalent with the production cost	0.517	<i>na</i>	0.580
Price fairness	The buyer/processor offer me fair and reasonable potato price	1.000	1.000	1.000
Uncertainty	I know my buyers' ways of doing things	1.000	1.000	1.000
Performance ^a	<i>Cronbach's alpha</i>	0.223	0.142	0.387
	<i>KMO-MSA</i>	0.500	0.500	0.500
	<i>Explained variance</i>	57.099	53.940	64.385
	I do not believe other buyers/processors will have the same or even better offers	0.756	0.734	0.802
	I am convinced that my buyer/processor is the best choice	0.756	0.734	0.802
Organizational culture	<i>Cronbach's alpha</i>	0.606	0.701	0.639
	<i>KMO-MSA</i>	0.668	0.517	0.572
	<i>Explained variance</i>	46.218	53.065	49.192
	My buyer and I have similar cultures of work	0.675	0.729	0.618
	I know my buyer's ways of doing things	0.689	0.752	0.763
	My buyer(s) understands my ways of doing my business	0.771	0.710	0.781
	My buyer(s) respects to my belief and traditions	0.568	0.723	0.628
Commitment	<i>Cronbach's alpha</i>	0.825	0.584	0.783
	<i>KMO-MSA</i>	0.692	0.610	0.710
	<i>Explained variance</i>	74.451	55.038	72.580
	Even if we could, we would not drop the buyer because we like being associated with him/her	0.849	0.796	0.833
	We want to remain a member of the buyers' network because we genuinely enjoy our relationship with them	0.903	0.766	0.872
	Our positive feelings towards the buyers are a major reason why we continue to work with them	0.835	0.657	0.850

^a The item is unacceptable.

na shows the factor with other factor(s) cannot form one or more composite latent variable(s).

The dimensionality of the gender difference factors were checked using principal component analysis (PCA) with varimax rotation. All items with Eigen values above one were extracted. The items with factor loading less than 0.500 were deleted (see Table 7.3). To test for the appropriateness of the PCA for the scales, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO-MSA) was conducted for all the variables. All

measurements are accepted as the KMO-MSA when they are in the accepted region of greater than 0.500 (Nunnally 1978).

The Cronbach's alpha coefficients for the research scales are applied to purify the measurement scale for the relationship quality construct. The Cronbach's alpha values which are above 0.501 indicate that the internal consistency of the non single items in the scale is acceptable. Only performance factor has the coefficient of <0.5 which means an unacceptable item.

A multivariate analysis of variance (MANOVA) is used to assess hypothesis of *H1 – H3*. The MANOVA examines gender differences in trust (communication, dependency, flexibility, joint problem solving, and reputation; *H1*), satisfaction (price quality ratio, price transparency, relative price, price fairness, uncertainty and price satisfaction; *H2*), and commitment (*H3*). In terms of increasing measurement precision, the inclusion of a relevant set of personal variables as covariates in the design can press potential extraneous influences from the dependent variable (Hair et al. 2010). The relevant personal variables can be age and education (Busch and Bush 1978). Hence, the analysis of this chapter adds age and education as the dependent variables of the gender function.

7.6 Women's roles in the Indonesian potato industry

Rural women roles in the potato industry can be identified from their activities on the farms. Table 7.4 reveals women's activities in the potato household units from the data survey of this thesis. Most of women (90.4%) had a dominant activity, preparing meals for their family.

On the three groups, most of the female farmers (more than 50.0%) were involved in the agricultural activities on the potato farms such as planting, harvesting, controlling, and sorting and grading. In particular, more than 86.3% of women from the general potato farmer population (GFP) and Indofood groups harvested. Only 84.0% of females from Farmers Field School (FFS) group were involved in the harvesting activity on the farms. Weeding was done by the majority of women from the GFP and FFS. This shows that most women in the Indonesian potato industry engage in domestic work and farming activities particularly planting, harvesting, controlling, sorting and grading potatoes.

Table 7.4 Women's activities of Indonesian potato households

Activity	GFP		Indofood		FFS		Total	
	Number (N=197)	%	Number (N=60)	%	Number (N=50)	%	Number (N=307)	%
Preparing for land	99	50.30	19	31.67	17	34.00	136	44.30
Buying farm equipments	76	38.60	17	28.33	15	30.00	110	35.80
Planting	161	81.70	40	66.67	33	66.00	238	77.50
Spraying	44	22.30	15	25.00	12	24.00	72	23.50
Weeding	138	70.10	25	41.67	27	54.00	194	63.20
Harvesting	170	86.30	54	90.00	42	84.00	270	88.00
Controlling	139	70.60	42	70.00	31	62.00	216	70.40
Sorting and grading	151	76.70	45	75.00	36	72.00	236	76.90
Preparing meals	178	90.40	58	96.67	48	96.00	288	93.80
Negotiating price	54	27.40	7	11.67	18	36.00	80	26.10

Source: Survey data.

Interestingly, the female farmers made a relatively high contribution in terms of price negotiation, totally 26.1% of the respondents transacted with buyers. The GFP group constituted 27.4% of the females involving in price decision making. The highest contribution of women's involvement in price negotiation was the FFS group, 36.0% of total FFS sample; while the Indofood group had the lowest contribution, around 11.7%.

The highest percentage of women involved in price negotiation was in the FFS group since the average spouse education of the group was the highest (see Table 3.5 in Chapter 3). The percentage of women contributing to price negotiation in this study was still larger than the study by Hill and Vigneri (2011). Their study found that women's role in transaction of coffee was only 7% in the HVAP chain in Uganda. The women's involvement in price negotiating in this study can be seen as representing women's participation in HVAP supply chains.

7.7 Gender differences of marketing relationships in the Indonesian potato industry

Using multivariate analysis of variance (MANOVA), the study examined differences among the three farmer groups in terms of gender difference factors. Table 7.5 shows the results of the MANOVA analysis. The table gives four numbers of the p-values (significance) for different multivariate tests, Pillai Trace, Wilks' Lambda, Hotelling's Trace and Roy's Largest Root. These results indicate significant differences overall in the dependent variable set as a function of gender since the test statistics are significant ($p < 0.05$).

Table 7.5 Results of MANOVA for gender differences

	Value	F	Hypo-thesis df	Error degrees of freedom	Prob.> F	Noncent. Parameter	Observed Power ^b
Pillai's Trace	0.045	2.004	14.000	589.000	0.016 ^b	28.054	0.953
Wilks' Lambda	0.955	2.004	14.000	589.000	0.016 ^b	28.054	0.953
Hotelling's Trace	0.048	2.004	14.000	589.000	0.016 ^b	28.054	0.953
Roy's Largest Root	0.048	2.004	14.000	589.000	0.016 ^b	28.054	0.953

^a Exact statistic.

^b Computed using $\alpha = 0.05$.

A univariate test for the gender groups on each of the relational behavior gender differences is shown in Table 7.6. The results indicate some significant differences (p-value < 0.100) exist between male and female farmers.

To investigate the differences of relationship quality factors between males and females of potato farmers, hypothesis tests, *H1 – H3*, are examined on the basis of a univariate MANOVAs (Table 7.6). The univariate MANOVAs indicate significant gender differences on some variables which are elaborated below.

The results generally show that female respondents in the general farmer population (GFP) group have more gender differences in the three of relational behavior, trust, satisfaction, and commitment, rather than FFS and Indofood. This is reasonable because the proportion of women roles in price negotiating in the GFP group is greater compared to the two other groups, 17.5% of the total sample or 27.4% of the GFP sample.

7.7.1 Gender differences in trust

Consistent with *H1*, gender differences are found in salespeople's preferences for dependent variables of trust particularly communication, reputation, and joint problem solving. Communication was found to be different between male and female potato farmers in the general farmer population (GFP) and the Indofood group. From the mean values, it is shown that the Indofood female farmers had less communication compared to the males (see Table 7.6). This is because the contracted farmer group was dominated by males. Several authors have found that although most of farm work under contracts is done by females as part of family labors, men control the contracts as contracting parties (Porter and Phillips-Horward 1997; Singh 2003; Eaton and Shepherd 2001; Dolan

2001). In the general farmer population (GFP) group, the females also had a difference in communication which was lower than their counterparts (female=-0.126, male=0.126).

Differences between male and female salespeople are expected in terms of another relational variable of trust, reputation in the potato industry. The results shown in Table 7.6 reveal that, in this case, reputation had a gender difference only for the FFS group. Rural females in the FFS group perceived reputation as less important than males (female=3.500, male=3.840). This can easily be overlooked since most of the female respondents of the FFS were not involved in the project of the Farmer Field School. Hence, the females could not measure the performance and reputation of their partners' buyers.

In the GFP group, the female partners of the potato farmers had a different perception regarding joint problem solving. Joint problem solving refers to a collaboration to solve conflicts or a departure point from separateness in the bilateral exchange (Yilmaz and Hunt 2001). From the result of the mean values, it is revealed that female farmers in the GFP group rated joint problem solving lower than their male partners. It seems that female farmers were not confident to propose a collaboration since the buyers were dominated by males.

Table 7.6 Multivariate analysis of variance (MANOVA) for gender difference relational variables

Dependent Variable	GFP (N=197)				FFS (N=50)				Indofood (N=60)			
	F	Sig.	Mean		F	Sig.	Mean		F	Sig.	Mean	
			Male	Female			Male	Female			Male	Female
<i>Trust</i>												
Flexibility	0.338	0.561	0.030	-0.030	0.066	0.798	0.026	-0.026	0.319	0.573	0.052	-0.052
Price transparency	0.929	0.336	0.049	-0.049	0.160	0.690	0.040	-0.040	1.027	0.313	0.092	-0.092
Relative price	1.499	0.222	3.646	3.547	0.000	1.000	3.540	3.540	1.021	0.314	3.833	3.950
Price quality ratio	0.588	0.444	-0.039	0.039	0.223	0.638	0.047	-0.047	0.229	0.633	0.044	-0.044
Communication	6.191	0.013 **	0.126	-0.126	1.985	0.162	0.140	-0.140	2.726	0.101 *	0.150	-0.150
Dependency	0.333	0.565	-0.029	0.029	0.000	0.991	-0.001	0.001	0.248	0.620	0.046	-0.046
Reputation	0.021	0.884	3.745	3.734	4.480	0.037 **	3.840	3.500	0.230	0.633	3.967	3.917
Joint problem solving	3.963	0.047 **	3.474	3.292	0.013	0.910	3.600	3.620	0.840	0.361	3.850	3.733
<i>Satisfaction</i>												
Satisfaction of the relationship	0.081	0.776	0.015	-0.015	0.353	0.554	-0.060	0.060	0.018	0.893	0.012	-0.012
Orientation	0.134	0.715	-0.019	0.019	0.114	0.737	0.034	-0.034	0.001	0.971	0.003	-0.003
Price fairness	0.862	0.354	3.417	3.333	3.035	0.085 *	3.620	3.320	0.221	0.639	3.617	3.550
Uncertainty	13.107	0.000 ***	3.266	2.911	5.020	0.027 **	3.280	2.860	0.194	0.660	3.067	2.983
Performance	4.905	0.027 **	0.112	-0.112	1.591	0.210	0.126	-0.126	0.032	0.859	-0.016	0.016
Organizational culture	7.602	0.006 ***	0.140	-0.140	1.715	0.193	0.130	-0.130	0.405	0.526	0.058	-0.058
<i>Commitment</i>	0.032	0.858	-0.009	0.009	0.010	0.919	0.010	-0.010	0.001	0.973	-0.003	0.003

*Significant at the 10% level; **Significant at the 5% level; *** Significant at the 1% level.

^aComputed using alpha = 0.05.

7.7.2 Gender differences in satisfaction

As indicated in Table 7.6, the results clearly support hypothesis *H2*, that the female salespersons in the GFP and FFS group have different perceptions of satisfaction regarding price fairness, uncertainty, performance, and organizational culture. As Cronbach's alpha for performance is unacceptable, the variable cannot explain the gender difference.

Price fairness was found to differ between males and females only in the Farmer Field School (FFS) group. This is reasonable because the participants of the FFS project were dominated by males who were chosen by extension officers working for two government departments and the Australian and Indonesian governments. This fact is in line with some research (Azahari 2008; Eaton and Shepherd 2001; FAO 2011) that find that women in developing countries are not considered in many agricultural development programs and as such are excluded from access to land, credit and extension. The female farmers of the FFS group also perceived less price fairness from their buyers than the males (female=3.320, male=3.620). In relational marketing, price acting as a signal for farmers in marketing decision reflects a 'premium' for meeting more exacting buyer requirements relating to quality standards and more prominent reliability and logistics parameters (Blandon, Henson, and Cranfield 2009).

In the gender difference field, the degree of uncertainty in parties' understanding can be described based on the term structural ambiguity (Bowles, Babcock, and McGinn 2005; Siguaw and Honeycutt 1995). Structural ambiguity can occur when the farmers are uncertain about their partners' conditions and partners' expectations with respect to the

relationships. The results in Table 7.6 provide a gender difference for uncertainty in the GFP and FFS groups where *H2* is supported. In both groups, apparently, female farmers did not have enough confidence to rate themselves as least equal to males in terms of the factor. This result is consistent with those of a previous study by Siguaw and Honeycutt (1995) who investigated gender differences in selling behaviors in industry.

H2 which hypothesizes gender difference in satisfaction is also partially supported, particularly on the performance variable for the GFP group. The means of performance indicate that women farmers of the GFP group perceived the performance of the buyers as lower than the men (women=-0.112, men=0.112). It is likely that women accepted and recognized the buyers' performance in the relationships less. This behavior can be caused by the large number of buyers who easily came and went from the farmers' fields. More than 50.0% of the GFP farmers (see Table 3.7 in Chapter 3) had more than one buyer when the harvest time came. This condition makes difficulties the female farmers to assess the buyers' performances.

Values, beliefs and norms which are applied in societies influence male-female behaviors and form a culture which considers farmers in relationship making decisions. Based on the results shown in Table 7.6, organizational culture is a variable of gender differences for the GFP group. The female GFP group rates valued relationship in organizational culture lower than the male. This can be caused by women's characteristics in rural areas which are less aggressive and less confident to measure buyers' cultures.

7.7.3 Gender differences in commitment

No gender differences were found for commitment. The result supports hypothesis *H3*. This cannot explain gender differences affect developing and maintaining sales relationships in agriculture. This result supports Mathieu and Zajac's (1990) finding that there is no consistent correlation between gender and the level of organizational commitment. However, the means indicate that females measure of their commitment to buyers higher than males.

7.8 Summary and discussion

In this chapter, the research questions regarding women's roles in agricultural activities in the emergence of modern supply chains, and the existence of gender differences created from different attitudinal and behavioral relationships between male and female farmers are explored. Utilizing principal component analysis (PCA) with varimax rotation and a multivariate analysis of variance (MANOVA), the models of gender differences in relational marketing are examined for three groups of potato farmers: Indofood, FFS, and GFP.

Women's roles in agriculture activities related to marketing of high value agricultural products (HVAP) are highlighted in this study. Rural females in the Indonesian potato industry contribute significantly to all stages of production activities, from planting to harvesting. Their roles in the agricultural marketing are also significant, but this role is usually overlooked in rural and agricultural development. The results of this study reveal that women's roles in the potato marketing referring to negotiating price is significant (around 26.1%). The women's involvement in price negotiation can

represent women's roles in the relationship marketing in the Indonesian potato industry because although the women are not involved directly in the marketing decision making, they have a significant influence on the male households heads. Although women in the potato industry in Indonesia still dominate production activities, their roles in the potato marketing for the HVAP have increased. This implies that women have the potential to be involved in agricultural value chains in terms of buyer-seller relationships.

Women's involvement in marketing such as price negotiating is related to a women's' role as a sales agent and an entrepreneur. In the agrifood transformation, marketing systems shift from spot market interactions to more dependent and predictable relationships governed by contractual arrangements in modern markets. Women farmers as farm workers should be able to access the opportunities of the modern markets. However, discriminatory and paternalistic cultural attitudes in Java or Sunda² societies may prevent female farmers from entering value chains altogether or allow them very limited roles. The rural women are still seen as dependants who cannot decide crucial things in the households and must obey their husbands. This cultural attitude in turn makes women less confident to express their opinions.

This thesis chapter also develops an empirical model of gender differences for Indonesian potato farmers. The model is used to describe the independent variables which influence gender differences in relationship marketing. The relational variables which show differences are communication, reputation, joint problem solving, price fairness, uncertainty, performance and organizational culture.

² An ethnic group in West Java.

The results of MANOVA suggest differences in communication of relational marketing between male and female farmers in the general farmer population (GFP) and Indofood groups. The females rated their communication with buyers lower than males. This result differs from the studies by Siguaw and Honeycutt (1995), and Kohli and Jaworski (1990), and O'Leary (1974) who suggested that women's communication in industries was higher since women are more communicative and try to reduce unclear or contradictory expectations. Women farmers in rural areas are less communicative because they tend to be less confident to contact other persons and spend more of their time on domestic work. Female farmers might have lower level of knowledge of trader networks, and access to market information since they face many gender-specific constraints such as physical harassment by market, time burdens doing non domestic activities, and marital conflict (Sinha, Raju, and Morrison 2007; Hill and Vigneri 2011). This leads to rural women having fewer opportunities to communicate and build relationships with buyers.

The gender difference model for reputation shows reputation has a gender difference only for the FFS group and the women perceived lower value for the variable than men. This result is supported by a study by Jones and Linardi (2012) who follow Bénabou and Tirole's (2006) model of prosocial behaviour. Jones and Linardi (2012) find females tend to avoid being perceived as reputation-seeking.

In the GFP group, the female farmers exhibited different perceptions regarding joint problem solving compared to the males. The results also reveal that female farmers in the GFP group rate joint problem solving or collaboration lower than their male partners. Women tend to resist more strongly in a negotiation for themselves depending on the perceivers' goals in relationships (Rudman 1998; Rudman and Glick 1999); hence,

they revealed less motivation to collaborate with others. This result contrasts with other studies in non-agricultural field such as the one by Nelson (1978) who suggests that women are more cooperative while men tend to compete, and the study by Janoff-Bulman and Wade (1996) who find that women are likely to advocate for others.

The female farmers of the FFS group perceived less price fairness in their buyers than the males. In relational marketing, price acting as a signal for farmers in marketing decision reflects a 'premium' for meeting more exacting buyer requirements relating to quality standards and more prominent reliability and logistics parameters (Blandon, Henson, and Cranfield 2009). Price fairness is defined as a comparison perception between the socially accepted price and another comparative buyer being reasonable, acceptable, and justifiable (Matzler, Renzl, and Faullant 2007). Xia, Monroe and Cox (2004) suggest reliability of price and acceptability or justification to assess price fairness. Although studies investigating gender differences in price fairness in agricultural field are rare, a study by Cunningham III et al. (2008) can explain differences in behavior by gender regarding output price in the Oklahoma wheat industry. Their research suggests that there are no direct differences in the net price received by gender, but small differences in how men and women market their products rather than frequency of transactions are found.

Women in industries tend to provide a superior value to their partners including price fairness, as their passive socialization makes them less willing to express discontent. On the other hand, in most rural areas in Indonesia married women in agriculture maintain a subordinate position which is influenced by the dominant ideology in societies (Heyzer 1986). Although wives in rural Java have an equal status in the household in

terms of the decision making process and managing the household's finances (Azahari 2008), they tend to be less dominated in crucial decisions such as large-scale marketing/trading. The rural women are not involved in large-scale trading since managing the large-scale trading needs more flexibility, mobility, and free time from domestic responsibility of the women Azahari (2008).

The results of this study find that gender differences occur regarding the uncertainty variable for the GFP and FFS groups showing the females of the groups perceive uncertainty lower than the males. In line with a study by Cunningham III et al. (2008), females who are less confident than males have low perceptions of uncertainty especially to expect forecast price and partner's performance. The low perception of uncertainty for female farmers can be related to greater uncertainty earning from the farm for females since most of females on farms do a great deal of unpaid work (Schultz 1999). The greater uncertainty of the income results in less confidence among women to assess uncertainty related relational marketing in their buyers.

There are differences in the performance evaluation of men and women in the GFP group. Performance is evaluated by two items: a belief that buyers/processors will have the same or even better offers, and the buyer/processor is the best choice. The men show greater means than the women. Research by Siguaw and Honeycutt (1995) and Schul and Wren (1992) also examines gender differences on expectations about job performance in non-agricultural industries. However, their empirical studies do not find gender-related differences. The different results can be caused different points of views in the measurement. Siguaw and Honeycutt (1995) and Schul and Wren (1992) rate the

performance of women as saleswomen. On the other hand, in this thesis, the women assess their partners' performance in the relationships.

Gender differences were also found in terms of organizational culture where the female GFP group rated their relationship perceptions on culture lower than the male. The females assessed the buyers' cultural attitudes such as culture of works, belief, and traditions. The low perception of organizational culture for the female farmers was due to cultural, social and religious norms which prevented women in rural areas becoming involved in modern markets. This finding is supported by other studies (Haggblade, Hazell, and Brown 1988; Lanjouw and Feder 2001; Lanjouw and Lanjouw 2001; Woldehana 2005; Quisumbing and Clafferty 2006) which reveal women in Africa concentrate on subsistence food crop production, domestic activities, and low-return off-farm economic activities such as food processing, pottery, weaving, etc. In the case of potato farmers in West Java, social and religious norms, for instance paternalism and dependency of women on men as household heads, still influence farmers' behaviors in the societies.

Although the females tend to rate the relational factors lower than their partners in the households, limited access to resources and assets cause the females to perceive the negotiation outcomes less favorably. In many developing countries including Indonesia, rural women are not given equivalent access to land, credit, and extension services (Azahari 2008). This results in females' exclusion from agricultural development. Religious, social, political systems, and economic status which place women under males' power, frequently cause them to have less confidence and communication; although they are more educated than the males.

From the results of this study, it is likely that rural women farmers appear to have low participation in marketing. However, they have a significant influence on their partners in the households in terms of marketing decisions. This can be seen from their roles in almost all agricultural activities particularly in planting, harvesting, controlling, sorting and grading potatoes. They have a great potential to influence males as the decision makers in households. By having better education, rural women should have equal opportunities in management training, motivation, and socialization activities.

Chapter 8 Discussion and summary

8.1 Introduction

The agricultural sector in Indonesia has been challenged by rapid and profound structural changes of which are characterized by the significant modern supply chain growth and globally focused agrifood markets. This provides opportunities for participants in the potato supply chains to increase economy and efficiency. The increasing economy and efficiency can be achieved by both buyers and sellers from improving income/profit and decreasing transaction costs of marketing. The buyers in the modern supply chains such as large retailers and agribusiness firms (food processors) may obtain guarantee of quality and volume, consistency, and transaction specification (Reardon et al. 2009). Besides, farmers as agricultural product sellers can obtain improving financials and access to financial credits, and reducing transport and handling costs (Minot 1986; Paul, Nehring, and Banker 2004).

A recent strand of literature and interests of the emerging food policy agenda in the agrifood transformation era is the implications of agrifood transformation on farmers. Farmers are seen as a poor participant in the agrifood supply chains since they have limited access to capital, knowledge, and information to enter the modern supply chains (Reardon et al. 2009; Timmer 2009; Weatherspoon and Reardon 2003). Moreover, farmers are likely to find difficulty in fully participating in the emerging markets (Eaton and Shepherd 2001). The emerging markets may create increasing difficulties for farmers to fulfill their required standards and quality.

To date, emerging literature focuses on *ex post* motives by farmers for participating modern supply chains particularly agribusiness firms (Key and Runsten 1999; Wilkinson 2004; Simmons, Winters, and Patrick 2005; Dev and Rao 2005; Birthal, Joshi, and Gulati 2005; Nagaraj et al. 2008; Escobal and Caverro 2011), the income impacts of farmers' participation (Hernández, Reardon, and Berdegúe 2007; Neven et al. 2009; Simmons, Winters, and Patrick 2005; Swinnen 2004), relationship quality in the buyer-seller relationships in the modern supply chains (Batt 2003; Gyau and Spiller 2008; Boniface et al. 2010), and women's roles in the high value product marketing (USAID-Guinea and Chemonics International Inc. 2007; USAID 2009).

This study contributes to the body of literature which focuses on potato industry in Indonesia and addresses five essential gaps. The gaps cover some following issues in the Indonesian potato industry. Firstly, most current studies use farmers' capacity and demography variables in investigating *ex post* motives for farmers' participation in modern supply chains (Key and Runsten 1999; Simmons, Winters, and Patrick 2005; Dev and Rao 2005; Birthal, Joshi, and Gulati 2005; Nagaraj et al. 2008; Escobal and Caverro 2011). Most of them are less paid attention on social capitals variables (farmer group, education and relationship quality) which contribute to farmers' participation. Investment in social capitals which is associated with establishing and maintaining relationships and associations have become important in the agricultural marketing of the modern supply chains (Warning and Key 2002; Batt 2003; Gyau and Spiller 2008; Boniface et al. 2010).

Secondly, few studies utilize per capita income to analyze impact of farmers' participation in the modern supply chains. Various ways are used to measure farmers' participation impacts (Neven et al. 2009; Hernández, Reardon, and Berdegúe 2007;

Warning and Key 2002; Simmons, Winters, and Patrick 2005). However, the better measurement for promoting poverty alleviation is per capita income (Miyata, Minot, and Hu 2009, Rao and Qaim 2010; Bellemare 2010).

Thirdly, numerous studies examine *ex post* perspective by potato farmers to engage with modern supply chains (Key and Runsten 1999; Simmons, Winters, and Patrick 2005; Dev and Rao 2005; Birthal, Joshi, and Gulati 2005; Nagaraj et al. 2008; Escobal and Cavero 2011). However, *ex ante* motives are seldom to be highlighted (Masakure and Henson 2005). Research on the nature of the motives of farmers' participating in modern markets is needed in the context of the restructuring of supply chains and policy reforms.

Fourthly, topics of relationship quality in the relational marketing with buyers in the emerging markets are fewer to be paid attention. Research on Indonesia's potato industry has focused almost exclusively on production and institutional issues (Fariyanti et al. 2007; Supadi and Syukur 2004; Supriyati 2004; Fuglie et al. 2006). Marketing topics of potato industry regarding the relationships between farmers and their buyers are rarely discussed. The relationship elements in marketing have become important since establishing and managing relationships effectively are required for business success (Hsiao, Purchase, and Rahman 2002).

Finally, research which draws women's roles in the agrifood transformation and the gender differences of relational marketing is infrequently highlighted. The number of women participating in sales and buyers-sellers relationships appears to increase in the marketing of high value agricultural products (HVAP) value chains (Siguaw and Honeycutt 1995). Moreover, gender differences in buyer-seller relationships create better

conditions for example increasing number of trades, effective selling, and shrinking transaction costs (Cunningham III et al. 2008; Siguaw and Honeycut 1995). Hence, it is important to examine women's roles in participating and maintaining market access in the modern supply chains.

In order to address the gaps above, this thesis investigates how producers make decisions about where they sell their potatoes. Particularly, this thesis analyses four issues: (1) the determinants, and effects of farmer participation in the modern potato supply chains; (2) the motivations for potato farmers to enter the modern supply chain; (3) the determinants of buyer-seller relationships particularly trust; and (4) women's roles in the potato production and marketing including gender differences in buyer-seller relationships between the male and female household heads.

This last chapter discusses and summaries the findings of this study in order to examine the gaps. The managerial and policy implications are provided in the next sections of this chapter. The contribution to the body literature and directions for future research including the study limitations are also addressed.

8.2 Farmers' participation in the modern supply chains and the impacts of the participation

The agrifood transformation effects some adjustments for farmers such as the use of contractual arrangements, increasing assets of farm, and collective capital. To decide whether they participate to the modern supply chains, they should consider the opportunities (advantages) and constraints (disadvantages) of the participation. The opportunities include higher farm income, price and marketing certainty, increasing farm productivity, access for credit, input and assistances, and technology improvement

(Hernández, Reardon, and Berdegúe 2007; Neven et al. 2009; Simmons, Winters, and Patrick 2005; Swinnen 2004; Paul, Nehring, and Banker 2004). On the other hand, the constraints of farmers' participation in the modern supply chains are the difficulties for meeting determined quality and quantity, extra expenses for capital investment and fix costs, and negative social effects such as cash economy, lack of trust, and self-interest (Neven et al. 2009; Henson, Masakure, and Boselie 2005; Simmons, Winters, and Patrick 2005; Williamson 1985; Stringer, Sang, and Croppenstedt 2009). Farmers decide to stay in the modern supply chains and continue to maintain their relationships with the buyers when the benefits from the participation are greater than the disadvantages.

Investigation of factors influencing farmers' participation is useful to know whether farmers obtain the contract opportunities or constraints and to identify *ex post* farmers' motives engaging in the contracts. Following previous literature, this study suggests variables influencing farmers' participation. The variables are following: socio-demographics, contextual characteristics, farm capacity, and incentives.

The results of treatment effect model for selection equation address the factors influencing farmers' participation and coverage the research question regarding how the potato farmers make decisions in participating in the contract with a large food processor, Indofood. The results reveal that a socio-demographics variable, education, has influenced farmers' decisions to enter the modern supply chains. Some studies support this finding (Miyata, Minot, and Hu 2009; Simmons, Winters, and Patrick 2005). The finding implicates that farmers with lower levels of education tend to be less involved in the contracts. Farmers with better education are more likely to adopt a new technology by involving in modern supply chains since they are more innovative. The contract firms

also tend to be more likely to make relationships with more educated, innovated, adjusted and cooperated farmers to fulfill quality standards and obtain a high quantity of commodities. It seems that education becomes a constraint for farmers to enter modern markets.

Thus, this study suggests the important of education in supporting farmers to engage contracts with modern supply chains. Farmers with better education can adjust easily the new market situations through increasing managerial and technical skills (Rao, Brümmer, and Qoim 2011; Blandon, Henson and Cranfield 2009). The potato farmers who contract with Indofood need to adjust their skills in order to fulfill the firm's requirement such as the size of the Atlantic potato and the quality (freshness). Furthermore, the farmers must understand the unwritten agreement which is provided by the Indofood representatives (middle men).

As engaging in contracts is seen as an adoption of post-harvest technology, the changes of farm capacity can influence participation in modern supply chains. Capital investment is necessary for participation in modern markets (Rao and Qaim 2010). The results of this thesis also show that farm capacity which includes the ownership of a water pump and motorbike influences the potato farmers engaging in the modern supply chains. This result underscores the importance of agricultural equipment for irrigations and transport infrastructure in meeting modern markets' requirement in a timely and regular fashion and enhancing farmers' capacity.

In response to seasonal fluctuation in the potato production and marketing, most of the contract farmers diversify their potato varieties, Atlantic and Granola. This finding is found from the contextual characteristics variable, variety, which influences farmers'

participation. Although the farmers have a price guarantee to sell their Atlantic potatoes from the contract firm and access for seed credit, they still face uncertainty in marketing. The firm which provides high quality seed can unilaterally reject the supply of potatoes from contract farmers if the potato quality does not meet their requirement. Furthermore, the high quality of seed needs different treatment in production compared to Granola and has a greater risk of harvest failure. The contract farmers plant two kinds of potatoes to anticipate the risks of production and marketing. Consistent with the studies of Binswanger (1981), Hazell (1982), and Wang, Zhang, and Wu (2011), the main reason for producers to engage in contracts is avoiding market uncertainty to reduce risks of production and marketing. As a result, private contracts are needed to become an alternative solution for the farmers' constraint, market uncertainty. The private contracts usually provide guarantee in marketing (Glover 1992; Simmons, Winters, and Patrick 2005; Swinnen 2004).

Sometimes farmers do not expect the 'costs' of contractual arrangements which arise from the market coordination in the modern chains. Unequal power relationship with large firms/retailers (Patrick 2004; Key and Runsten 1999) and a lack of understanding and information on the agreements in contracts (Eaton and Shepherd 2001) are the costs that farmers must consider in contracts. Hobbs and Young (2001) suggests the costs as transaction costs in the principal-agency relationships. In a contract relationship, the contractor usually has more power while the contracted party is dependent on the contractor (Singh 2002).

Critics of contracts underline the inequality of the relationship and the stronger position of large agribusiness firms/retailers with respect to growers (Patrick 2004; Key

and Runsten 1999). Contracts are viewed as ways for the large firms/retailers to obtain benefits from farmers (Eaton and Shepherd 2001). In other side, farmers sometimes face difficulties to understand the terms and specifications of the legal and informal agreement. Hence, there should be public policy which supports farmers' ability to ensure and to honour agreements. Factors contributing contracts should be modes for policy makers to support farmers who face difficulties in meeting farmers' abilities and firms' requirements.

The model of treatment effect model for selection equation in this study reveals that trust as relational marketing influence farmers to become involved in the modern supply chains. For contract farmers, trust is an incentive being the relative cost of an adoption of post-harvest technology and an investment of social capital. As explained in the hypothesis, it is expected that trust as a relationship quality dimension can lower transaction costs and reduces inefficiencies. Indeed, as Dyer and Chu (2003) mention, trust is a valuable economic asset which makes farmers confident to enter modern supply chains.

Since there is no legal written contract in the potato contract farming, the social collateral factors such as trust emerges important to establish long term relationships in the contract. The high value of the honesty trust by the potato farmers shown in the selection equation results demonstrates the high household's willingness to meet the contractual obligations required by Indofood. Using related norms such as trust, the costs can be reduced since trust among the parties in contracts creates a more balanced arrangement (Heide and John 1992). Trust can be used to measure benefits of the relationships for the farmers in order to establish the contractual arrangements.

Numerous studies regarding the impacts of farmers' participation in modern markets on farmers' welfare are investigated and most of them prove that the farmers obtain higher income (Hernández, Reardon, and Berdegue 2007; Neven et al. 2009; Simmons, Winters, and Patrick 2005; Swinnen 2004). This study enriches the empirical studies regarding the positive impacts of the farmers' participation on the farmers' income. From the model of treatment effect model for output equation, it is shown that potato farmers who involve in a large food processor, Indofood, indicate to gain increasing income per capita. This result addresses a research question regarding implications of farmers' participation. Participation in modern supply chains offers an opportunity for commercialization of farm activities leading to extensive gains in household income (Rao and Qaim 2010). The contract farmers earn more income which comes from higher yields, price and specialized input (variety) provided by the firm. The findings are also in line with results from earlier studies on adoption of high-value products (Miyata, Minot, and Hu 2009; Dev and Rao 2005; Key and Runsten 1999) which show an increase in incomes for the contract farmers compared to non-contract farmers. One implication of this result is that there should be public policy which supports the establishment and maintenance of contract farming where it involves small-scale farmers.

8.3 Farmers' motivations engaging in contracts

Analysis of farmers' participation which shows *ex post* motives for the farmers to engage in contracts is not sufficient to identify whether the nature of contract relationships is build. The emerging literatures stress on the analysis of factors contributing contracts, but

it is lack to highlight the potentially exploitative nature of contract relations. This study provides farmers' motivations to engage in contracting which reflect farmers' perceptions of the likely decision behaviors and impacts on their farms. The motivations address a manner that brings the long term sustainability of contracts.

Using principal component analysis (PCA), the data consisting of farmers' statements regarding farmers' experiences and reasons to join the contract are measured to become component constructs of contract motivation. The analysis provides an on-going basis the nature of the motives. From the PCA analysis, factors motivating potato farmers to form a contract with Indofood include market uncertainty, direct benefits, intangible benefits, and economic motives. The motivations are likely to present farmers' constraints and opportunities faced by contract farmers. Market uncertainty as the main motivation for forming a contract is a major problem for Indonesian potato farmers, in particular, matters of payment reliably, marketing guarantee, and organized transportation (free transportation). This is reasonable since high value agricultural products (HVAP) mainly fruits and vegetables are highly perishable and carry higher timing and coordination costs, higher transportation costs, and higher search costs (Hill and Vigneri 2011). The high price provided for HVAP reflect the high transaction costs of the products. Hence, the market uncertainty factors are related to the transaction costs. Hobbs (1996) suggests vertical coordination such as contract farming can reduce transaction costs. Understanding the motivation factors can be used to evaluate which transaction cost should be reduced in order to enhance the efficiency vertical coordination within supply chains. The transaction cost attributes suggested by Hobbs (1996) include continuity of supply, transportation costs, basis of payment, and traceability of the

commodities. In a similar fashion to Hobbs' study, the transaction costs which should be reduced in the context of potato farmers in Indonesia are continuity of supply, transportation costs, and basis of payment.

Other motivations of contracts for the potato farmers, direct benefits, intangible benefits, and economic motives are more related to the perceived opportunities of the contract. The direct benefits demonstrate increased yield of potato, acquiring knowledge/technical assistance and knowledge for the use of new crops (Atlantic variety), and accessing high quality seed. The contract is seen to offer intangible benefits when the farmers see benefits from other contract farmers and obtain knowledge for the use in Granola potato production. Additionally, a contract is perceived by the potato farmers as an income source which ensures a higher price (economic motives). Involvement in the emerge markets provides new opportunities for farmers such as new job opportunities, diversification of new crops, markets for the raw material and/or the processed product, increasing income, the availability of alternative earning, price equal to the expected price, and access to relevant technical information (Dolan and Sorby 2003; Miyata, Minot, and Hu 2009; Barrett et al. 2012; Eaton and Shepherd 2001). These opportunities can motivate and enhance the attractiveness of contracts for farmers. Masakure and Henson (2005) add intangible and/or latent benefits such seeing benefits to other farmers and getting satisfaction from growing export crops. In order to agree contracts, farmers agree to the contracts when their gains from their choice must exceed a certain utility threshold. Barrett et al. (2012) suggest that farmers' utility threshold is best thought of as the opportunity cost from contracts when it sometimes does not make economic sense to contract with firms. Hence, not only tangible benefits, but intangible

benefits from contracts can motivate farmers to engage in contracts. The motivation factors can be used to provide information on the modes that bring about the long-term sustainability of contract arrangements.

To identify whether there is differences in motivation among the contract farmers, the motivation factors are classified using cluster analysis. The analysis suggests two main groups of contract producers: the market-derived (MD) and the contract oriented (CO). The MD group consists of 20 contract farmers is dominated by farmers with the following characteristics: more income, assets and land (wealthy farmers), low motivation to engage in contracts, less attention paid to farming groups, and less relationship quality. The CO group made up of 40 respondents is composed by farmers with lower incomes, assets and land, high motivation to form contracts, involved in farming groups, and paying more attention to maintaining relationship quality. These results show that the MD group is likely to easily exit from the contract; while the CO group is more loyal and takes more risks. The second group has a high desire to form long term relationships with buyers, is more adaptable, and is more reliable in order to obtain benefits, and expects risks from the contracts. These groups reveal a variation of constraints which are faced due to their economic condition and their ability to exploit the benefits of the contract. Practically, the incentives of contracts for farmers reflect the weakness of input and output markets in the potato industry such as availability of high quality seed. Contracting with Indofood can be seen as a solution to market uncertainty, lack access of input, output marketing and credit, and poor extension services. This conclusion is supported by other studies (Boselie, Henson, and Weatherspoon 2003; Masakure and Henson 2005; Poulton et al. 2004) which suggest private investment through contracts is necessary as an

alternative solution in order to cover the lack of public policies and prevailing market institutions in many developing countries.

The important implications for these findings are provided. The motivations to participate in the contracts vary among producers and reflect local economic, social, and institutional conditions. Through these findings, contract farming can be as a bridge to facilitate farmers' problems and incentives without having to adjust for the motives of individual farmers. The incentives of farmers are important for the sustainability of contract farming schemes.

8.4 The buyer-seller relationship in Indonesia's potato industry

This thesis focuses on the important and roles of the close and sustainable relationships between buyers and sellers in the case of Indonesian high value supply chain, potato industry, as being essential to the future success of the industry. This issue responds to the research question regarding farmers' problems to link with modern markets and marketing efficiency in the potato marketing. The problems faced by the potato farmers are believed to arise from the differences of farmers' perceptions of their relationship quality with buyers. Relationship quality is believed to be an indicator of a successful relationship marketing which creates efficiency and cost effectiveness (Hennig-Thurau and Hansen 2000; Kalwani and Narayandas 1995). Thus, some hypotheses are developed to examine the determinants of relationship quality particularly trust within the groups of potato farmers in Indonesia, the general farmer population (GFP), farmer field school (FFS), and Indofood groups.

The principal component analysis (PCA) is used to identify the dimensions of trust and determinant factors of trust. Then, the determinant factors of trust are measured using MANOVA to know whether there are factor differences among the groups, and a linear regression model to analyze factors contributing to trust. Some demographic variables such as farm size, farm experience, and actual price are added into the model.

The results suggest a model of trust for the Indonesian potato industry. Trust is identified as honesty regarding the truthfulness of their partners' words, their fulfillment of their promised obligations and sincerity, and goodwill is defined as responsibility, dependability, and integrity of the relationship. Furthermore, among the three groups of potato farmers, there are some significant differences in the MANOVA results in the following variables: price transparency, price satisfaction, and flexibility, reputation communication, joint problem solving, and dependence.

From the linear regression of trust models, each group has different determinant factors of trust with various signs of coefficients. For example, determinants of trust for the GFP group are price transparency, joint problem solving, flexibility, communication, and dependence, and actual price, and the FFS farmers feel price transparency, relative price satisfaction, flexibility, firm size and actual price are determinant factors of trust. Indofood farmers perceive that their trust depends on reputation, flexibility, and dependence. These results show that there are different behaviors among the three groups. Cunningham (1982) supports this finding that interaction between buyers and sellers should vary in intensity, style, and scope from one relationship to another and over time. The interaction occurs between groups of functional specialist or individuals with different roles and changing purposes. Hence, identification of farmers' behaviours in the

relationships is essential since the buyers can capture sellers' (potato producers) needs and perceptions in developing and maintaining long term relationships.

The outcomes of the regression model also show the variables which have positive correlation with trust are price transparency, relative price satisfaction, reputation, communication, joint problem solving, flexibility, dependence, firm size, and actual price. All of the variables follow the hypotheses expecting the correlation between the independent variables and trust, except dependence variable. The positive correlation trust and its determinants indicate that developing a good understanding of price transparency, relative price satisfaction, reputation, communication, joint problem solving, and flexibility should make potato producers able to improve their relationship quality with buyers. Better understanding and satisfying customers' needs, farmers as buyers can achieve greater customers (buyers) loyalty and higher sales (Han, Wilson, and Dant 1993). Moreover, better relationships can result in an increase in farmers' confidence and improve their relationships with the buyers. On the other hand, buyers who have better relationship quality tend to maintain their relationships with particular farmers who can fulfill their requirements. Both parties, buyers and sellers, are better able to plan for and forecast production schedules (Lohtia and Krapfel 1994), as well as coordinating deliveries (Easton and Araujo 1994). In turn, both parties will obtain effective and efficient marketing.

The dependence variable shows a contrast resulting from the hypothesis where dependence which usually engenders power, indiscriminately, leaves partners feeling under-rewarded, angry and resentful creates mistrust in the relationship between the buyers and sellers (Ganesan 1994; Gruen 1995). In the case of potato producers in

Indonesia, the farmers still need to depend on resources such as seed, fertilizer, pesticide and other related financial assistance. Seed particularly is the major production constraint in the potato industry (Batt and Rexha 1999). The availability of high quality seed and credit for seed is vital where the seed cost dominates production cost of potato. The farmers' limitations can be fulfilled by buyers who need to maintain a channel relationship in order to obtain potatoes sustainably. These mutual relationships in agribusiness are legalized in a concept of contract farming. In this concept, a party who seems to control resources can be accepted by other parties as long as they perceive mutual benefits of the contracts and no exploitation in terms of relationship-specific investments to achieve collective goals from the relationships.

In this study, it is also found that the determinant factors of trust influence the relationships negatively. The factors include flexibility, joint problem solving, and firm size. The negative correlation occurs in the relation between honesty trust and the determinant factors. Farmers pay little attention to buyers' promises and words (honesty trust). However, the farmers evaluate buyers' trustworthiness by looking at the buyers' moral obligations and responsibility (goodwill trust). Limited information in the relationships and marketing, and uncertainty of the business environment are the reasons why the farmers cannot trust the buyers' performance in flexibility and joint problem solving only based on the buyers' promises and words.

It is likely that potato farmers in Indonesia need to establish long term relationships with buyers through making relationship specific investments such as seed, fertilizer, pesticide and other related financial assistance. Furthermore, establishing long term relationship generates efficiency and effective marketing through decreasing

transaction costs and becoming closer to buyers. Relational marketing offers a stronger and longer-term relation which is harder for competitors to match and makes it difficult for them to enter the market. In turn, buyers will become less sensitive to price competition and the suppliers (farmers) will obtain benefits from the higher prices (Batt and Rexha 1999).

8.5 Male and female differences in the potato marketing relationship

Agri-food transformation has not only caused changes in the economic dimension, distributional consequences, supply chain consolidation, and environmental outcomes in rural areas, but also has created new job opportunities. Emerging markets contribute to the upgrading of agricultural production skills, and create substantial opportunities for waged employment and self-employment. The women workforce in Indonesia which has increased significantly from 36.6 million in 2006 to 42.8 million in 2008 has contributed to employment in agriculture, trade and industry sectors (Statistic Indonesia 2010). Hence, emerging markets provides important opportunities for women as smallholders and wage employees in rural areas in terms of job stability, waged employment status, increased wages, and better working conditions.

The roles of rural women in the agricultural activities, particularly production and marketing, and differences between women and men in relational marketing are also highlighted in this study. The study addresses the research questions regarding women's roles in the emergence of modern supply chains, and the possibility of gender differences arising from the different attitudes and behaviors of male and female farmers. The samples were drawn from household respondents and their partners in the three groups of

potato farmers (Indofood, FFS, and GFP) to analyze their perceptions of relational marketing variables. In addition, principal component analysis (PCA) with varimax rotation is used to identify constructs of relationship factors and a multivariate analysis of variance (MANOVA) is utilized to model gender differences in the relationship marketing.

The results commence that women play a crucial role in both the production and marketing of potatoes. In production activities, the majority of the female farmers are involved in planting, weeding, controlling, harvesting, sorting and grading potatoes. In marketing activities, the women's role in the high value agricultural products (HVAP) supply chains is significant. More than 26% of the potato female farmers are involved in negotiating price. However, the main responsibility for women is domestic work such as preparing meals for their families. The main responsibility is related to the paternalistic social norms in West Java that follow where women are dependant on related males. This finding is line with Lawler and Atmananda's (2000) study which reports that women in Thailand have a primary responsibility of domestic work as required by country social norms, regardless of whether they are full-time employees. It is likely that women's ability to make decisions and to create significant outcomes for themselves and their families depends on social norms and household rules. The women roles are likely to change over time as a result of social and political changes which emerge from changed opportunities (government policies creating new conditions of economy, education and environment) and/or social upheaval (natural disasters, war, and post conflict).

It was originally hypothesized that gender differences would be found between males and females regarding trustworthiness in relational exchanges in the potato industry

(Fugate, Decker, and Brewer 1988; Jeanquart-Barone and Sekaran 1994; and Buchan, Croson and Solnick 2008). The results of this research partially support this hypothesis. Using MANOVA analysis, the antecedents of trust which reveal differences between male and female farmers are communication, reputation, and joint problem solving. For each group of potato farmers, the determinant of trust for the gender differences model varies. For example communication and joint problem solving are found to be different between male and female perceptions of the GFP group; while in the FFS and Indofood groups, the gender differences regarding the determinant of trust include reputation and communication.

Communication between male and female farmers is perceived different as a determinant of trust and the females rate their perceptions of trust lower than their male counterparts. This result is correlated to the rural women's characteristics and roles where rural women are less confident and almost never know their buyers. These reasons correspond to gender differences in joint problem solving and reputation. It seems that rural women have less motivation to collaborate, to communicate, and to seek reputation to particularly with male buyers. The characters are influenced by gender relations. Gender relations are the habitual means by which men and women interrelate with each other in social institutions. They include means such as in friendships, sexual relationships, workplaces, and different sectors of the economy (USAID 2009). Gender relations are formed and reinforced by cultural, political, and economic institutions including the household, legal and governance structures, markets, and religion. Consistent with a study by Azahari (2008), the gender relations of potato farmers are

more influenced by religious, social, political system, and economic status related the size of farm than other factors.

The hypotheses that the antecedents of satisfaction differ between male and female farmers are partly confirmed. Price fairness, uncertainty, performance and organizational culture are found different in the various groups. Each group of farmers has the different determinant factors of satisfaction i.e. males and females in the GFP group differ perceptions in uncertainty, performance, and organizational culture, and gender in the FFS group has a distinction in price fairness and uncertainty.

On average, the female farmers rank the determinants of satisfaction lower compared to their males partners. The results in terms of gender differences on price fairness indicate that females' valuation on fairness and reasonability of potato price is less because of limited information on buyers' performance. This is confirmed by the results on performance where the females rate the performance of their buyers and uncertainty lower than males. Uncertainty refers to the situation where all parties in a transaction face incomplete levels of information (Hobbs 1996). It is likely that access to information regarding buyers' performance and output prices is an essential factor satisfying the potato farmers. However, rural women are limited in their access to trade and marketing information and thus have limited gains in the emerging markets. In the case of potato farmers, limited access to trade and marketing information is influenced by social norms and household rules. In line with this finding, a study by Morrison, Raju, and Sinha (2007) suggests female farmers have less access to information networks, while, information exchange within social networks is an important determinant of the adoption decision.

From the results of this study, it is found that male and female farmers have different perceptions of organizational culture and the females rate their perceptions of the culture in their relationship with buyers lower. These findings confirm the hypothesis regarding the effect of gender differences on satisfaction. Cultural, social, and religious norms in the survey areas influence the females' perceptions of their organizational culture and interactions with buyers.

Becoming involved in the HVAP supply chains can be seen as having opportunities and constraints for rural women. The opportunities can be obtained when they can gain not only job stability, waged employment status, increase wages, and better working conditions, but also improved welfare, and access to credit and marketing structures for the HVAP.

The emerging markets may however create constraints preventing rural women from becoming involved in the development of a dynamic economy, governance structures, markets and rural development. Studies by Barrientos, Mc Clennegan, and Orton (2000), Barrientos, Dolan and Tallontire (2001), Barrientos, Dolan and Tallontire (2003), Barrientos and Kritzing (2004), and World Bank (2007) support this finding. The studies suggest that modern supply chains do not always contribute to gender equality. In the HVAP supply chains, contract farming, a forward agreement between farmers processing or marketing firms to supply agricultural products, is increasingly important to modern value chains but women in some regions cannot engage in contract farming because social norms preclude them from signing contracts (World Bank 2009). In Guatemala, for instance, women hold only 3% of snow pea production contracts, but supply more than one-third of total field labor and almost all processing labor (World

Bank 2007). In the case of the Indonesian potato industry, there is no exclusivity of contract membership based on gender from the contract firm, Indofood, but women's direct involvement in the contract is very little. From the list of contracted names from Indofood representatives (middlemen), there is no female who is a member of the contract. Most of the female farmers are directly involved through their spouse or family member. Their main roles in the contract can be seen from their activities in planting, harvesting, controlling, and sorting and grading. The lower participation of female potato farmers in the contract is mainly caused by their limited access to trade and marketing information which is influenced by cultural, social, and religious norms in the households and areas. It is likely that discriminatory culture may prevent female farmers from entering value chains of HVAP or allows them very limited roles. Discrimination based on gender occurs in the labour markets in many countries such as caste-based inequality in India (Esteve-Volart 2004), inheritance system culture in Latin America (Deere and Leon 2001), imposition of purdah in Bangladesh (Kabeer 1994; Rahman 2000), and Hindu structure in Bali-Indonesia (Branson and Miller 1988). Morrison, Raju, and Sinha (2007) also show that female farmers face many gender-specific constraints for accessing agricultural markets because of the following reasons: (1) physical harassment by market or health officials; (2) time burdens to seek the best price; and (3) marital conflict.

8.6 Managerial and policy implications

The results of this study have important implications for participants related to the potato farmers, particularly government agencies, non-governments, and retailers/wholesalers/privates sectors. The government represents the decision makers for public policy; while

the non-governments, and retailers/wholesalers/privates sectors are farmers' partners in their production and marketing organisation. Farmers can establish networks among themselves as well as with government agencies, non-governments, and retailers/wholesalers/privates sectors agencies in order to facilitate their integration in the new agrifood systems.

The positive income effects of farmers' participating show that additional benefits can be realized through engaging in modern supply chains. The question as to how small-scale farmers can access the markets must not be overlooked from a development perspective. In the particular case of the potato industry analyzed here, concrete recommendations for policy makers include addressing education and infrastructure weaknesses particularly irrigation and transportation problems. Government should increase budget for agricultural infrastructure. Moreover, the high honesty trust by the contract farmers reflecting the farmers' relationship quality implies that relationship marketing is increasingly important.

One of implication of the results regarding income impacts is that there should be public which supports the establishment and maintenance of contract farming schemes. Private contracts are recommended as an alternative solution in order to cover the lack of public policies and prevailing market institutions in many developing countries. However, the low bargaining power of farmers is frequently used by large scale firms to take advantages of farmers. Policy makers need to play a role in supporting legal frameworks. They can play the role of mediator between farmers and the agribusiness firms in the following ways: helping firms to identify potential contract farmers, mediating conflicts between farmers and the buyers, and allowing extension workers to assist farmers who

need technical assistances in terms of firms' requirements. Active involvement by policy makers in the agrifood transformation in developing countries will lead to faster changing market conditions in the future. Policy support is needed to make small scale farmers better prepared for the dynamic adaptations needed in order to maintain and increase their competitiveness.

Important implications of the design and operation of contract farming schemes in developing countries should consider farmers' motivation for becoming involved in contracts. The motivations differ among producers and reflect local economic, social, demographic and institutional conditions. The identification of incentives for farmers' participation is essential for the sustainability of contract farming schemes.

The findings can be used by firms in related businesses, such as wholesales supermarkets, and processors which demand potato from farmers. Regarding the transformation phenomenon in Indonesian food supply chains, the modern supply chains, such as supermarkets and potato processors, need information in terms of farmers' perceptions about trust to the buyers. It will accelerate efficiency in supply chain marketing of potato industry if they are able to understand their association to farmers and build a better coordination in their relationships by considering the factors that enhance the building and development of trust. This will enable them to take the right actions to influence farmers when necessary. Moreover, this study also can be used as a public policy to Indonesian government, especially agriculture department, which should increase its role to support Indonesian potato farmers who are still under confident engaging in the modern supply chains.

The agrifood transformation has impacted on opportunities for rural women. New job opportunities have been created, there is more job stability, waged employment, increased wages, and better working conditions. However, cultural, social, and religious norms in the households and areas may prevent female farmers from entering HVAP value chains or they may be offered very limited roles. Improving women's access to capital asset and encouraging women to be involved in the development of dynamic economy, governance structures, markets and rural development can be a means for governments to strengthen women's roles in the emerging markets. Some practical managerial strategies recommended are interventions to develop female farmers groups or marketing groups which allow women to access marketing channels. In short, making better education for rural women in management training, motivation, and socialization activities are the keys to empower rural women.

8.7 Knowledge contribution to the body literature

The results of this study contributes to the literature on high-value markets in developing countries particularly in the issues of farmers' participation and its impacts on farmers' income, relationship quality and women's roles in the agrifood transformation. Particularly, this study provides an understanding of farmers' participation behaviors in the high value agricultural products (HVAP) chains where relationship quality between farmers and their buyers are stressed. Likewise, the findings enable us to draw some conclusions about the implications of the transformation of agro-food systems on the livelihood of horticultural farmers in Indonesia. Currently, large agribusiness firms' contribution to the improvement of farmers' livelihood is still questionable. In the case of

potato industry, this study contributes the empirical findings on private investments contributions in agricultural development.

Because a sample of participants in contracts is generally not a random population sample, selection bias can occur. Selection bias can be caused by unobserved differences between contract and non-contract farmers. This study has therefore applied a model which eliminates the bias. In order to address the problem of selection bias, a Heckman two-stage (treatment effects) model is utilized. The model uses the participation model (selection equation) to calculate the Inverse Mills (IM) ratio and includes the ratio to be a regressor in the income (outcome equation) model. The ratio corrects for possible selection bias, yields unbiased data and produces consistent estimations for the income model.

This study provides *ex post* factors motivating farmers involving in the modern supply chains and these are completed by analysis of the farmers' *ex ante* motivations. The *ex ante* motivation analysis is needed to explore on an on-going basis the nature of contract motives in the context restructuring supply chains and policy reforms in the agrifood transformation era.

This thesis also contributes to the field of knowledge regarding relationship marketing in particular inter-firm relationships and buyer-seller relationships. The study focuses on the potato producer relationship in the Indonesian potato industry. The supplier side of the relationship (potato grower) has not been previously explored and the study aims to accomplish this. The area of supplier/producer relationship has also not been examined to a high degree in the literature and this study addresses this body of work.

A model of gender roles on the relationship marketing in emerging markets is extended in this research. Assessing the patterns and underlying determinants of female engagement in the high value agricultural products (HVAP) markets is increasingly needed to identify the most appropriate interventions in women development. Furthermore, the research is relevant to the understanding of efficiency and empowerment arguments for promoting gender equality and value chain development for poverty reduction.

8.8 Directions for future research

In spite of the significance of this research, it is worthwhile to recognize some limitations. Firstly, this research does not have detailed asset data for previous years to determine whether changes in assets (capital investment) are a cause or an effect of the contract. This suggests that the analysis of farmers' participation does not allow the determination of whether this is a cause or an effect of the contracts. Other studies are recommended to address this limitation. Secondly, the data is a cross sectional data which captures the farmers' perception at a given point in time. However, buyer-seller relationship is a dynamic phenomenon that changes over time. As consequence, another research is recommended to take into consideration the time varying dimensions of inter-firm relationships. Thirdly, the relationship performance is measured only from farmers' perspective. To identify whether gap perceptions exist between farmers and buyers, future research is suggested to measure the relationship performance dimensions from buyers' perspectives. Finally, this thesis only captures women's potential perception compared to

men. Further studies are recommended to highlight the actual perceptions of rural women as decision makers where women household heads are the main women samples.

References

- Adiyoga, W., R. Suherman, A. Asgar, and Irfansyah. 1999. *The Potato System in West Java, Indonesia: Production, Marketing, Processing, and Consumer Preferences for Potato Products*. Lembang, Indonesia: Research Institute for Vegetables.
- Agricultural Service for Food Crops of Bandung District. 2006. *Bandung in figures 2006*. Bandung, Indonesia: Agricultural Service for Food Crops of Bandung Regency.
- Andaleeb, S.S. 1996. "An Experimental Investigation of Satisfaction and Commitment in Marketing Channels: The Role of Trust and Dependence." *Journal of Retailing* 72: 77-93.
- Anderson, E., and B. Weitz. 1989. "Determinants of Continuity in Conventional Industrial Channel Dyads." *Marketing Science* 8(4): 310-323.
- Anderson, J.C., and J.A. Narus. 1990. "A model of Distributor Firm and Manufacturer Firm Working Partnerships." *Journal of Marketing* 54(1): 42-58.
- Anderson, L.R., and P.N. Blanchard. 1982. "Sex Differences in Task and Social-Emotional Behavior." *Basic and Applied Social Psychology* 3(2): 109-139.
- Aramyan, L.H., A.G.F.M.O Lansink, J.G.A.F. van der Vorst, and O. van Kooten. 2007. "Performance Measurement in Agri-Food Supply Chains: A Case Study." *Supply Chain Management: An International Journal* 14(4): 304-315.
- Arndt, J. 1983. "The Political Economy Paradigm: Foundation for Theory Building in Marketing." *Journal of Marketing* 47(4): 44-54.
- Asadi, S., C.D.V.S. Rao, and V. Saikrishna. 2010. "A Comparative Study of Face Recognition with Principal Component Analysis and Cross-Correlation Technique." *International Journal of Computer Applications* 10(8): 0975 – 8887.
- Azahari, D.S. 2008. "Indonesian Rural Women: The Role in Agricultural Development." *Analisis Kebijakan Pertanian* 6(1):1-10.
- Bahlmann, J., B. Schulze, and A. Spiller. 2007. "Trust as a Supply Chain Management Tool for Slaughterhouses: Empirical Evidence from North-Western Germany." Paper presented at the 17th Annual World Forum and Symposium Agribusiness Food Culture: Tradition, Innovation and Trust – A Positive Force for Modern Agribusiness, IAMA Conference, Parma, Italy.
- Barber, B. 1983. *The Logic and Limit of Trust*. New Brunswick, NJ: Rutgers University Press.
- Barrett, C.B. 2008. "Smallholder Market Participation: Concepts and Evidence from Eastern and Southern Africa." *Food Policy* 33: 299-317.

- Barrett, C.B. 2011. "The Economics of Agricultural Development: An Overview." In C.B. Barrett, ed. *Agricultural Development: Critical Concepts in Development Studies*. London: Routledge.
- Barrett, C.B., M.E. Bachke, M.F. Bellemare, H.C. Michelson, S. Narayanan, and T.F. Walker. 2012. "Smallholder Participation in Contract Farming: Comparative Evidence from Five Countries." *World Development* 40(4): 715-730.
- Barrientos S., McGlenaghan, S., and L. Orton. 2000. "Ethical Trade and South-Africa's Deciduous Fruit Exports: Addressing Gender Sensitivity." *The European Journal of Development Research* 12(1): 140-158.
- Barrientos, S., and A. Kritzinger. 2004. "Squaring the Circle: Global Production and The Informalization of Work in South-African Fruit Exports." *Journal of International Development* 16: 81-92.
- Barrientos, S., C. Dolan, and A. Tallontire. 2001. *Gender and Ethical Trade: A Mapping of the Issues in African Horticulture*. Brighton, UK: Institute of Development Studies, University of Sussex.
- Barrientos, S., Dolan, C., and A. Tallontire. 2003. "A Gendered Value Chain Approach to Codes of Conduct in African Horticulture." *World Development* 31(9): 1511-1526.
- Batt, P.J., and N. Rexha. 1999. "Building Trust in Agribusiness Supply Chains: A Conceptual Model of Buyer-Seller Relationships in the Seed Potato Industry in Asia." *Journal of International Food and Agribusiness Marketing* 11(1): 1-17.
- Batt, P.J.. 2003. "Building Long-Term Buyer-Seller Relationships in Food Chains." Proceeding International Farm Management Congress 2003, 10-15 August. Curtin University of Technology, Perth, Western Australia.
- Beetles, A., and A. Crane 2005. "Mapping out the Field of Gender and Buyer-Seller Relationships: Developing a New Perspective." *Journal of Marketing Management* 21: 231-250.
- Bellemare, M.F. 2010. "As You Sow, So Shall You Reap: The Welfare Impacts of Contract Farming." Munich Personal RePEc Archive (MPRA), online <http://mpra.ub.uni-muenchen.de/23638>.
- Bellemare, M.F. 2012. "As You Sow, So Shall You Reap: The Welfare Impacts of Contract Farming." *World Development* 40(7):1418-1434.
- Bénabou R., and J. Tirole's. 2006. "Incentives and Prosocial Behavior." Discussion Paper Series, The Institute for the Study of Labor (IZA) No. 1695, Bonn.
- Benedetti, R., P. Rossini, and R. Taddei. 1994. "Vegetation Classification in the Middle Mediterranean Area by Satellite Data." *International Journal of Remote Sensing* 15(3): 583-596.

- Berdegué, J., F. Balsevich, L. Flores, and T. Reardon. 2005. "Central American Supermarkets Private Standards of Quality and Safety in Procurement of Fresh Fruits and Vegetables." *Food Policy* 30: 254-269.
- Berry, W.D. 1993. *Understanding Regression Assumptions*. Newbury Park, CA: Sage.
- Beugelsdijk S., C.I. Koen, and N.G. Noorderhaven. 2006. "Organizational Culture and Relationship Skills." *Organizational Studies* 27(6): 833-854.
- Beukema, H.P., and D.E. van der Zaag. 1990. *Introduction to potato production*. Wageningen, Pudock: Backhuys Publisher.
- Binswanger, H.P. 1981. "Attitudes Toward Risk: Theoretical Implications of An Experiment in Rural India." *The Economic Journal* 91(December): 867-890.
- Birthal, P.S., P.K. Joshi, and A. Gulati. 2005. "Vertical coordination in high-value food commodities: Implications for smallholders." Discussion Paper No. 85, International Food Policy Research Institute (IFPRI), Washington, DC.
- Blandon, J., S. Henson, and J. Cranfield. 2009. "Small-Scale Farmer Participation in New Agri-Food Supply Chains: Case of the Supermarket Supply Chain for Fruit and Vegetables in Honduras." *Journal of International Development* 21:971-984.
- Boniface, B., A. Gyau, R. Stringer, and W. J. Umberger 2010. "Building Long Term Relationship in the Malaysian Fresh Milk Supply Chain." *Australasian Agribusiness Review* 8(5): 66-84.
- Boniface, B., A. Gyau, and R. Stinger. 2012. "Linking Price Satisfaction and Business Performance in Malaysia's Dairy Industry." *Asia Pacific Journal of Marketing and Logistic* 24(2): 288-304.
- Boselie, D., Henson, S., and Weatherspoon, D. 2003. "Supermarket Procurement Practices in Developing Countries: The Role of the Public and Private Sectors." *American Journal of Agricultural Economics* 85(5): 1155-1161.
- Boserup, E. 1984. *Women's Roles in the Economy Development (Peranan Wanita dalam Perkembangan Ekonomi)*. Jakarta-Indonesia: Yayasan Obor.
- Boss, R.W. 1978. "Trust and Managerial Problem Solving Revisited." *Group and Organization Studies* 3(3): 331-342.
- Bottema, J.W.T., H. Siregar, S.M. Pasaribu., G. Gijsbers, and R.S. Basuki. 1989. *Potato in Indonesia: Prospects for Medium Altitude Production*. Regional Co-ordination Centre for Research and Development of Coarse Grains, Pulses, Roots and Tuber Crops in the Humid Tropics of Asia and the Pacific (CGPRT). Bogor: The CGPRT Centre.
- Bowles, H.R., L. Babcock, and K. McGinn. 2005. "Constraints and Triggers: Situational Mechanics of Gender in Negotiation." Working Paper KSG, No. RWP05-051.
- Branson, J., and D. Miller. 1988. "The Changing Fortunes of Balinese Market Women." In G. Chandler, N. Sullivan, and J. Branson, eds. *Development and*

- Displacement: Women in Southeast Asia*. Victoria: Centre of Southeast Asian Studies.
- Buchan, N.R., R.T.A. Croson, and S. Solnick. 2008. "Trust and Gender: An Examination on Behavior and Beliefs in the Investment Game." *Journal of Economic Behavior and Organization* 68: 466-476.
- Busch, P., and R.F. Bush. 1978. "Women Contrasted to Men in the Industrial Salesforce: Job Satisfaction, Values, Role Clarity, Performance, and Propensity to Leave." *Journal of Marketing Research* 14(August): 438-448.
- Calinski, R.B., and J. Harabasz. 1974. "A Dendrite Method for Cluster Analysis." *Communications in Statistics* 3:1-27.
- CGIAR Science Council. 2004. *Report on CGIAR Priorities and Strategies for the Period 2005-2010*. Washington, DC: Science Council Secretariat Food and Agriculture Organization of the United Nations (CGIAR).
- Coase, R.H. 1937. "The Nature of the Firm." *Economica* 4: 386-405.
- Coase, R.H. 1960. "The Problem of Social Cost." *Journal of Law and Economics* 3(October): 1-44.
- Cook, R.W., and R.J. Corey. 1991. "A Confirmatory Investigation of Industrial Buyer Image of the Saleswoman." *Journal of the Academy of Marketing Science* 19(3): 199-207.
- Crosby, L.A., K.R. Evans, and D. Cowles. 1990. "Relationship Quality in Services Selling: An Interpersonal Influence Perspective." *Journal of Marketing* 54(3): 68-81.
- Cunningham III, L.T., B.W. Brorsen, K.B. Anderson, and E. Tostão. 2008. "Gender Differences in Marketing Styles." *Agricultural Economics* 38: 1-7.
- Cunningham, M.T. 1982. "Barriers to Organizational Interaction." In H. Hakansson, ed. *International Marketing and Purchasing of Industrial Goods, an Interaction Approach*, pp. 358-368. IMP Project Group, Wiley. Cited from H. Hakansson, and D.D. Sharma. 1996. "Strategic alliances in a network perspective." In D. Lacobucci, ed. *Networks in Marketing*, pp. 108-124. Thousand Oaks, Calif.: Sage Publications.
- Dapiran, G.P., and S. Hogarth-Scott. 2003. "Are Co-operation and Trust Being Confused with Power? An Analysis of Food Retailing in Australia and the UK". *International Journal of Retail and Distribution Management* 31(5): 256-267.
- Das, T. K., and B.S. Teng. 2001, "Trust, Control and Risk in Strategic Alliances: An Integrated Framework." *Organization Studies* 22(2): 251-283.
- Dasgupta, P. 2000. "Economic Progress and the Idea of Social Capital." In P. Dasgupta, and I. Serageldin, eds. *Social Capital; A Multifaceted Perspective*, pp.172-214. Washington, DC: The World Bank.

- Deb, R., and T. Suri. 2011. *Relational Contract Farming: Theory and Its Emergence in Ghana*. Toronto: Department of Economics, University of Toronto.
- DeCoster, J., and H. Claypool. 2004. "Data Analysis in SPSS." Cited on 2 August 2011, <http://www.stat-help.com/notes.html>.
- Deere, C.D., and M. Leon. 2001. *Empowering Women: Land and Property Rights in Latin America*. Pittsburgh: University of Pittsburgh Press.
- Delgado, C. 1999." Sources of Growth in Smallholder Agriculture in Sub-Saharan Agriculture: The Role of Vertical Integration of Smallholders with Processors and Marketers of High Value-Added Items." *Agricultural Economics Research, Policy and Practice in Southern Africa (Agrekon)* 38(S1): 165-189.
- Dev, S.M., and N.C. Rao. 2005. "Food Processing and Contract Farming in Andhra Pradesh: A Small Farmer Perspective." *Economic and Political Weekly* 40(26): 2705-2713.
- Dion, P.A., D. Easterling, and R. Javalgi. 1997. "Women in the Business-to-business Salesforce: Some Differences in Performance Factors." *Industrial Marketing Management* 26: 447-457.
- Directorate of Population and Labor. 2011. *Survei Angkatan Kerja Nasional - SAKERNAS (National Survey of Labor Force)*. Jakarta: Direktorat Statistik Kependudukan dan Ketenagakerjaan (Directorate of Population and Labor), Statistics Indonesia.
- Dirven, M., and S.Faiguenbaum. 2008. The Role of Santiago Wholesale Markets in Supporting Small Farmers and Poor Consumers. In E.B. McCullough, P.L. Pingali, and K.G. Stamoulis, eds. *The Transformation of Agrifood Systems*. London: FAO and Earthscan.
- Dolan, C.S. 2001. "The 'Good Wife': Struggles over Resources in the Kenyan Horticultural Sector." *The Journal of Development Studies* 37(3): 39-70.
- Dolan, C.S., and K. Sorby. 2003. Gender and Employment in High-Value Agriculture Industries. Agriculture and Rural Development Working Paper 7. Washington DC: The World Bank.
- Doney, P.M., and J.P. Cannon. 1997. "An Examination of the Nature of Trust in Buyer-Seller Relationships." *The Journal of Marketing* 61(2): 35-51.
- Doss, C.S., and M.L. Morris. 2001. "How Does Gender Affect the Adoption of Agricultural Innovations? The Case of Improved Maize Technology in Ghana." *Agricultural Economics* 25: 27-39.
- Duncan, R.B. 1972. "Characteristics of Organizational Environments and Perceived Environmental Uncertainty." *Administrative Science Quarterly* 1(September): 313-327.
- Dwyer, F.R., P.H. Schurr, and S. Oh. 1987. "Developing Buyer-Seller Relationships." *Journal of Marketing* 51(2): 11-27.

- Dwyer, S., O. Richard, and C.D. Shepherd. 1998. "An Exploratory Study of Gender and Age Matching in the Salesperson-Prospective Customer Dyad: Testing Similarity-Performance Predictions." *Journal of Personal Selling and Sales Management* XVII(4): 55-69.
- Dyer, J.H., and W. Chu. 2003. "The Role of Trustworthiness in Reducing Transaction Costs and Improving Performance: Empirical Evidence from the United States, Japan, and Korea." *Organization Science* 14(1): 57-68.
- Eagly, A.H., and V.J. Steffen. 1986. "Gender and Aggressive Behavior: A Meta-Analytic Review of the Social Psychological Literature." *Psychological Bulletin* 100(3): 309-330.
- Easton, G., and L. Araujo. 1994. "Market Exchange, Social Structures and Time." *European Journal of Marketing* 28(3):72-84.
- Easton, V.J., and J.H. McColl. 2010. *Statistic Glossary*. Online resource www.stats.gla.ac.uk.
- Eaton, C., and A.W. Shepherd. 2001. "Contract Farming Partnerships for Growth." FAO Agricultural Services Bulletin No. 145, Food and Agriculture Organization of the United Nations, Rome.
- Edwards, S. 1998. "Openness, Productivity and Growth: What Do We Really Know?" *The Economic Journal* 108(March): 383-398.
- Eklundh, L., and A. Singh, 1993. "A Comparative Analysis of Standardized and Unstandardized Principal Components Analysis in Remote Sensing." *International Journal of Remote Sensing* 14(7): 1359-1370.
- Escobal, J.A., and D. Cavero. 2011. "Transaction Costs, Institutional Arrangements and Inequality Outcomes: Potato Marketing by Small Producers in Rural Peru." *World Development* 40(2): 329-341.
- Esteve-Volart, B. 2004. "Gender Discrimination and Growth: Theory and Evidence from India." DEDPS Working Paper No. 42. London: London School of Economics and Political Science.
- Eugenia, L. 2010. "Significance of Family Farming in the Asian Region - the Indonesian Agriculture Sector." IYFF, Asia Continental Meeting. New Delhi 23-25 March, 2010. International Year of Family Planning.
- Everitt, B., and G. Dunn. 2001. *Applied Multivariate Data Analysis*. New York: John Wiley and Sons, Inc.
- FAO. 1990. *Women in Agricultural Development: FAO's Plan of Action*. Rome: Food and Agricultural Organization (FAO).
- FAO. 2008. "Potato World." Food and Agriculture Organization of the United Nations (FAO) website <http://www.potato2008.org/en/world/index.html>.

- FAO. 2009. International Year of the Potato 2008: New Light on a Hidden Treasure, an End of Year Review. Rome: Food And Agriculture Organization of the United Nations (FAO).
- FAO. 2011. "The Role of Women in Agriculture." ESA Working Paper No. 11-02, March 2011. Agricultural Development Economics Division, The Food and Agriculture Organization of the United Nations, www.fao.org/economic/esa.
- Fariyanti, A., Kuntjoro, S. Hartoyo, and A. Daryanto. 2007. "The Economic Behaviour of Vegetables Farm Household on Price and Production Risk Condition in Pangalengan Sub District of Bandung Regency." *Jurnal Agro Ekonomi* 25(2): 178-206.
- Feder, G., R. Just, and D. Zilberman. 1985. "Adoption of Agricultural Innovations in Developing Countries: A Survey." *Economic Development Cultural Change* 33(2): 255-298.
- Fiegenbaum, A.V. 1991. *Total Quality Control*, 3rd ed. Singapore: McGraw-Hill.
- Field, A. 2000. *Discovering Statistics using SPSS for Windows*. New Delhi: Sage Publications.
- Fornell, C., M.D. Johnson, E.W. Anderson, J. Cha, and B.E. Bryant. 1996. "The American Customer Satisfaction Index: Nature, Purpose and Findings." *Journal of Marketing* 60(4): 7-18.
- Frazier, G.L. 1983. "Interorganisational Exchange Behaviour in Marketing Channels: A Broadened Perspective." *Journal of Marketing* 47(Fall): 68-78.
- Fugate, D.L., P.J. Decker, and J.J. Brewer. 1988. "Women in Professional Selling: A Human Resource Management Perspective." *The Journal of Personal Selling and Sales Management* 8(November): 33-41.
- Fuglie, K.O., A. Witono, A. Rini, M. Sukendra, and S. Rachman. 2006. "Farm Demand for Quality Potato Seed in Indonesia." *Agricultural Economics* 35(2006): 257-266.
- Fukuyama, F. 1995. *Trust, the Social Virtues and the Creation of Prosperity*. New York: The Free Press.
- Gable, M., and B. J. Reed. 1987. "The Current Status of Women in Professional Selling." *The Journal of Personal Selling and Sales Management* 7(May): 33-39.
- Ganesan, S. 1994. "Determinants of Long-Term Orientation in Buyer-Seller Relationships." *Journal of Marketing* 58(2): 1-19.
- George, D., and P. Mallery. 2003. *SPSS for Windows Step by Step: A Simple Guide and Reference 11.0 Update*, 4th ed. Boston: Allyn and Bacon.
- Gerlach, S., B. Köhler, and A. Spiller. 2005. "Farmers as Suppliers and Investors: Management of Supplier- and Investor-Relations in the Agribusiness." *Jahrbuch der Österreichischen Gesellschaft für Agrarökonomie* 14(S): 221-233.

- Geyskens, I., and J.B. Steenkamp. 1995. "An Investigation into the Joint Effects of Trust and Interdependence on Relationship Commitment." In M. Bergadaa, ed. *Marketing for Today and for the 21st Century*, pp. 351-371. France: Proceedings of the 24th EMAC, May 1995, European Marketing Academy.
- Geyskens, I., J.B. Steenkamp, and N. Kumar. 1999. "A Meta Analysis of Satisfaction in Marketing Channel Relationships." *Journal of Marketing Research* 36(2): 223-238.
- Gibbon, S.B., and S. Jones. 2009. "The Economics of Smallholder Organic Contract Farming in Tropical Africa." *World Development* 37(6): 1094-1104.
- Glover, D. 1992. "Introduction." In Glover, D., and L.T. Ghee, eds. *Contract Farming in Southeast Asia: Three Country Studies*. Kuala Lumpur: Institute Pengajian Tinggi/Institute for Advanced Studies.
- Glover, D., and K. Kusterer. 1990. *Small Farmers, Big Business: Contract Farming and Rural Development*. London: Macmillan.
- Glover, D.J. 1987. "Increasing the Benefits to Smallholders from Contract Farming: Problems for Farmers' Organizations and Policy Makers." *World Development* 15(4): 441-448.
- Goetz, S.J. 1992. "A Selectivity Model of Household Food Marketing Behavior in Sub-Saharan Africa." *American Journal of Agricultural Economics* 74(2): 444-452.
- Gow, H.R., D.H. Streeter, and J.E. Swimenn. 2000. "How Private Contract Enforcement Mechanisms Can Succeed Where Public Institutions Fail: The Case of Juhocukor a.s." *Agricultural Economics* 23: 253-265.
- Greene, W. 1993. *Econometric Analysis*, 2nd ed. New York: MacMillan.
- Grossman, S.J., and O.D. Hart. 1986. "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration." *Journal of Political Economy* 94(4): 691-719.
- Gruen, T. 1995. "The Outcome Set of Relationship Marketing in Consumer Markets." *International Business Review* 4: 447-469.
- Gyau, A., A. Spiller, and C. Wocken. 2011. "Price or Relational Variables? Supplier Relationship Management in the German Dairy Industry." *British Food Journal* 113(7): 838-852.
- Gyau, A., and A. Spiller. 2007. "Determinants of Trust in the International Fresh Produce Business between Ghana and Europe." *International Business Management* 1(4):104-111.
- Gyau, A., and A. Spiller. 2008. "The Impact of Supply Chain Governance Structures on the Inter-Firm Relationship Performance in Agribusiness." *Agricultural Economics – Czech* 54(4): 176-185.
- Gyau, A., and A. Spiller. 2009. "Comparison of Relationship Perception in the International Fresh Produce Business." *Journal of Enterprise Information Management* 22(4): 441-455.

- Haggblade S., P. Hazell, and J. Brown. 1988. "Farm-nonfarm Linkages in Rural Sub-Saharan Africa." Policy, Planning and Research Working Paper WPS6, the World Bank, Washington D.C.
- Hair, J.F., W.C. Black, B.J. Babin, and R.E. Anderson. 2010. *Multivariate Data Analysis*, 7th ed. Upper Saddle River, NJ: Prentice Hall.
- Hakansson, H., and D.D. Sharma. 1996. "Strategic Alliances in a Network Perspective." In D. Lacobucci, ed. *Networks in Marketing*. Thousand Oaks, Calif.: Sage Publications, pp. 108-124.
- Hall, S., S. Lazarova, and G. Urga. 2002. "A Principal Components Analysis of Common Stochastic Trends in Heterogeneous Panel Data: Some Monte Carlo Evidence." *Oxford Bulletin of Economics and Statistics* 61(SI): 749-767.
- Halstead, D. 1999. "The Use of Comparison Standards in Customer Satisfaction Research and Management: A Review and Proposed Typology." *Journal of Marketing Theory and Practice* 7(3): 13-26.
- Han, S., D.T. Wilson, and S.P. Dant. 1993. "Buyer-Supplier Relationship Today." *Industrial Marketing Management* 22(4): 331-338.
- Hastuti, E. L. 2004. "Marketing Institutional and Partnership of Vegetables in Indonesia. Case Study in Central Java and North Sumatera." Project report, Marketing Institutions No. 4, Indonesian Centre for Agriculture, Socio-Economic and Policy Studies (ICASEPS), Bogor, Indonesia.
- Haugen, M.S., and B. Brandth. 1994. "Gender Differences in Modern Agriculture: The Case of Female Farmers in Norway." *Gender and Society* 8(2): 206-229.
- Hazell, P.B.R. 1982. "Application of Risk Preference Estimates in Firm-Household and Agricultural Sector Models." *American Journal of Agricultural Economics* 64(2): 384-390.
- Heckman, J. 1978. "Dummy Endogenous Variables in a Simultaneous Equation System." *Econometrica* 46(4): 931-959.
- Heckman, J. 1979. "Sample Selection Bias as a Specification Error." *Econometrica* 47(1): 153-162.
- Heide, J.B. 1994. "Interorganizational Governance in Marketing Channels." *Journal of Marketing* 58(1): 71-85.
- Heide, J.B., and G. John. 1992. "Do Norms Matter in Marketing Channels?" *Journal of Marketing* 58(1): 71-85.
- Hennig-Thurau, T., and U. Hansen. 2000. "Relationship Marketing: Gaining Competitive Advantage through Customer Satisfaction and Customer Retention." Berlin: Springer.
- Henson, S., and T. Reardon. 2005. "Private Agri-Food Standards: Implications for Food Policy and the Agri-Food System." *Food Policy* 30(2005): 241-253.

- Henson, S., O. Masakure, and D. Boselie. 2005. "Private Food Safety and Quality Standards for Fresh Produce Exporters: The Case of Hortico Agrisystems, Zimbabwe." *Food Policy* 30: 371-384.
- Hernández, R., T. Reardon, and J. Berdegue. 2007. "Supermarkets, Wholesalers, and Tomato Growers in Guatemala." *Agricultural Economics* 36:281-290.
- Heyzer, N. 1986. *Working Women in South-East Asia: Development, Subordination, and Emancipation*. Philadelphia: Open University Press.
- Hill, R.C., W.E. Griffiths, and G.C. Lim. 2008. *Principles of Econometrics*, 3rd edition. NJ: John Wiley and Sons.
- Hill, R.V., and M. Vigneri. 2011. "Mainstreaming Gender Sensitivity in Cash Crop Market Supply Chains." ESA Working Paper No. 11-08 March 2011, Agricultural Development Economics Division, Food and Agriculture Organization of the United Nations. www.fao.org/economic/esa.
- Hobbs, J.E., and L.M. Young. 2001. *Vertical Linkages in Agri-Food Supply Chains in Canada and the United States*. Ottawa: The Branch, Research and Analysis Directorate, Strategic Policy Branch, Agriculture and Agri-Food Canada.
- Hobbs, J.E. 1996. "A Transaction Cost Approach to Supply Chain Management." *Supply Chain Management* 1(2): 15-27.
- Hotelling, H. 1933. "Analysis of a Complex of Statistical Variables into Principal Components." *Journal of Educational Psychology* 24(1): 417-441.
- Hsiao, M.J., S. Purchase, and S. Rahman. 2002. "The Impact Of Buyer-Supplier Relationship and Purchasing Process on The Supply Chain Performance: A Conceptual Framework." Paper presented at 18th Industrial Marketing and Purchasing Group (IMP)-conference, Perth.
- Huang, J., H.M. van den Brink, and W. Groot. 2009. "A Meta-Analysis of the Effect of Education on Social Capital." *Economics of Education Review* 28(2009): 454-464.
- Huang, J., X. Dong, Y. Wu, H. Zhi, X. Nui, Z. Huang, and S. Rozelle. 2007. "Regoverning Markets: The China Meso-Level Study." Beijing: Center for Chinese Agricultural Policy, Chinese Academy of Sciences.
- Hueth, B., E. Ligon, S. Wolf, and S. Wu. 1999. "Incentive Instruments in Fruit and Vegetable Contracts: Input Control, Monitoring, Measuring, and Price Risk." *Review of Agricultural Economics* 21(2): 374-389.
- Ickes, W., L. Stinson, V. Bissonnette, and S. Garcia. 1990. "Naturalistic Social Cognition: Emathic Accuracy in Mixed-Sex Dyads." *Journal of Personality and Social Psychology* 59(4):730-742.
- Indofood. 2009. "Annual Report 2009 Enhancing..." Jakarta: PT Indofood Sukses Makmur Tbk.

- IRRI. 1985. *Women in Rice Farming*. Proceedings of a Conference on Women in Rice Farming Systems, International Rice Research Institute. Hants, UK: Gower Publishing Company Ltd.
- Jaervelin, A.M. (2001). "Evaluation of relationship quality in business relationships." Unpublished Ph.D. dissertation, School of Business Administration, University of Tampere, Finland.
- Jaffee, S., and J. Morton. 1995. *Marketing Africa's High Value Foods: Comparative Experiences of an Emergent Private Sector*. Iowa: Kendall-Hunt Publishing.
- Janoff-Bulman, R., and M. B. Wade. 1996. "The Dilemma of Self-Advocacy for Women: Another Case of Blaming the Victim?" *Journal of Social and Clinical Psychology* 15: 143-152.
- Jarrat, D., and G. O'Neill. 2002. "The Effect of Organizational Culture on Business-to-Business Relationship Management Practice and Performance." *Australasian Marketing Journal* 10(3): 21-40.
- Jeanquart-Barone, S., and U. Sekaran. 1994. "Effects of Supervisors' Gender on American Women's Trust." *Journal of Social Psychology* 134: 253-255.
- Jin, H.J. 2007. "Changes in South Korean Consumers' Preferences for Meat." *Food Policy* 33(2008): 74-84.
- Johnson, D., and K. Grayson. 1998. "Sources and Dimension of Trust in Service Relationships." London Business School Working Paper, No. 98-503, August.
- Jollands, N., J. Lermitt, and M. Patterson. 2004. "Aggregate Eco-efficiency Indices for New Zealand – A Principal Components Analysis." *Journal of Environmental Management* 73: 293-305.
- Jones, D., and Linardi. 2012. "Gender Differences in Reputation Concerns: Prosocial Behavior in the Field and Lab." Paper presented at the ESA 2011 meeting, Pittsburgh Experimental Brownbag, Tuscon.
- Kabeer, N. 1994. *Reversed Realities: Gender Hierarchies in Development Thought*. London: Verso.
- Kähkönen, S., and H. Leathers. 1999. "Transaction Cost Analysis of Maize and Cotton Marketing in Zambia and Tanzania." Technical Paper No. 105, SDI Publication Series, USAID, Washington.
- Kalwani, M.U., and N. Narayandas. 1995. "Long-Term Manufacturer-Supplier Relationships: Do They Pay Off for Supplier Firms?" *The Journal of Marketing* 59(1): 1-16.
- Karaan, M. 2002. "Transaction Costs in Contract Farming Models for Mussel and Oyster Farming in South Africa: Organisational and Management Implications." *Aquaculture Economics and Management* 6(5/6): 397-409.
- Kennedy, E.J., and L. Lawton. 1992. "Men and Women in Industrial Sales: Satisfaction and Outcomes." *Industrial Marketing Management* 2(February): 5-14.

- Key, N. 2004. "Agricultural Contracting and Scale of Production." *Agricultural and Resource Economics Review* 33(2): 255-271.
- Key, N., and D. Runsten. 1999. "Contract Farming, Smallholders, and Rural Development in Latin America: The Organization of Agroprocessing Firms and the Scale of Outgrower Production." *World Development* 27(2): 381-401.
- Key, N., and W.D. McBride. 2008. "Do Production Contracts Raise Farm Productivity? An Instrumental Variables Approach." *Agricultural and Resource Economics Review* 37(2): 176-187.
- Kidwell, R.E. Jr., and N. Bennett. 1993. "Employee Propensity to Withhold Effort: A Conceptual Model to Intersect Three Avenues of Research?" *The Academy of Management Review* 18(3): 429-456.
- Kohli, A. 1989. "Determinants of Influence in Organizational Buying: A Contingency Approach." *Journal of Marketing* 53(July): 50-65.
- Kohli, A.K., and B.J. Jaworski. 1990. "Market Orientation: The Construct, Research Propositions, and Managerial Implications." *Journal of Marketing* 54(April): 1-18.
- Kumar N., Stern L.W., and R.S. Achrol. 1992. "Assessing Reseller Performance from the Perspective of the Supplier." *Journal of Marketing Research* 29(May): 238-253.
- Kwon, I.-W.G., and T. Suh. 2004. "Factors Affecting the Level of Trust and Commitment in Supply Chain Relationships." *The Journal of Supply Chain Management* 40(2): 4-14.
- La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R.W. Vishny. 1997. "Trust in Large Organizations." Paper and Proceeding of Interaction of Economic Institution and Theory: American Economic Association (AEA), 87(2), pp. 333-338, Chicago, Ill.
- LaBahn D.W., and K.R. Harich. 1997. "Sensitivity to National Business Culture: Effects on US- Mexico Channel Business Performance." *Journal of International Marketing* 5(4): 29-51.
- Lages, C., C.R. Lages, and L.F.Lages. 2005. "The RELQUAL Scale: A Measure of Relationship Quality in Export Market Ventures." *Journal of Business Research* 58: 1040-1048.
- Lanjouw J., and P. Lanjouw. 2001. "The Rural Nonfarm Sector: Issues and Evidence from Developing Countries." *Agricultural Economics* 26(1): 1-23.
- Lanjouw, P., and G. Feder. 2001. "Rural Non-farm Activities and Rural Development." From Experience towards Strategy. Rural Development Strategy Background paper No 4, the World Bank, Washington D.C.
- Lawler, J., and V. Atmiyanandana. 2000. "Gender and Agribusiness (GAP): Case Study of Cargill Sun Valley Thailand." The Women in Development (G/WID), Global

- U.S. Agency for International Development, downloaded at <http://www.ips.uiuc.edu/gap/>.
- Leckie, G.J. 1993. "Female Farmers in Canada, 1971-1986." *Professional Geographer* 45(2): 180-193.
- Leminen, S. 2001. "Gaps in Buyer-Seller Relationships." *Management Decision* 33(3): 180-189.
- Lenney, E. 1977. "Women's Self-Confidence in Achievement Settings." *Psychological Bulletin* 84(January): 1-13.
- Leuthesser, L. 1997. "Supplier Relational Behavior: An Empirical Assessment." *Industrial Marketing Management* 26(3): 245-254.
- Lohtia, R., and R.E. Krapfel. 1994. "The Impact of Transaction Specific Investments on Buyer-Seller Relationships." *Journal Business and Industrial Marketing* 9(1):6-16.
- MacNeil, I.R. 1980. *The New Social Contract: An Inquiry into Modern Contractual Relations*. New Haven CT: Yale University Press.
- Maddala, G. S. 1983. *Limited-Dependent and Qualitative Variables in Econometrics*. Cambridge: Cambridge University Press.
- Maertens, M., and J.F.M. Swinnen. 2009. "Are African high-value horticulture supply chains bearers of gender inequality? Gender Pathways Out of Poverty Rural Employment." Paper presented at the FAO-IFAD-ILO Workshop on Gaps, Trends and Current Research in Gender Dimensions of Agricultural and Rural Employment: Differentiated Pathways Out of Poverty, Rome, 31 March - 2 April 2009.
- Mangala, K.P., and P.G. Chengappa. 2008. "A Novel Agribusiness Model for Backward Linkages with Farmers: A Case of Food Retail Chain." *Agricultural Economics Research Review* 21: 363-370.
- Manly, B.F.J. 2005. *Multivariate Statistical Methods*, 3rd ed. London: Chapman and Hall.
- Marsh, R. R., and D. Runsten. 1995. "The Potential for Small Holder Fruit and Vegetable Production in Mexico: Barriers and Opportunities." Paper presented at the XIX International Congress of the Latin American Studies Association, Washington.
- Masakure, O., and S. Henson. 2005. "Why Do Small-Scale Producers Choose to Produce under Contract? Lessons from Nontraditional Vegetable Exports from Zimbabwe." *World Development* 33(10): 1721-1733.
- Masuku, M.B., and J.F. Kirsten. 2003. "The Role of Trust in the Performance of Supply Chains: A Dyad Analysis of Smallholder Farmers and Processing Firms in the Sugar Industry in Swaziland." Paper presented at the 41st Annual Conference of the Agricultural Economic Association of South Africa (AEASA), October 2-3, Pretoria, South Africa.

- Matanda, M.J., and B. Schroder. 2004. "Business-to-business Relationships by Categories of Suppliers in the Marketing Channel." In H.J. Bremmers, S.W.F. Omta, J.H. Trienekens, and E.F.M. Wubben, eds. *Dynamics in Chains and Networks*. Wageningen: Academic Publisher, pp. 532-537.
- Mathiew, J.E., and D.M. Zajac. 1990. "A Review and Meta-Analysis of the Antecedents, Correlates, and Consequences of Organizational Commitment." *Psychological Bulletin* 108(2): 171-194.
- Matzler, K., B. Renzl, and R. Faullant. 2007. "Dimensions of Price Satisfaction: A Replication and Extension." *International Journal of Bank Marketing* 25(6): 394-405.
- Maxwell, S., and R. Slater. 2003. "Food Policy Old and New." *Development Policy Review* 21(5-6): 531-553.
- Mayer, R.C., J.H. Davis, and F.D. Schoorman. 1995. "An Integrative Model of Organizational Trust." *Academy of Management Review* 20(3): 709-734.
- Meijer, M., I. Rodriguez, M. Lundy, and J. Hellin. 2008. "Supermarkets and Small Farmers: The Case of Fresh Vegetables in Honduras." In McCullough, E.B., Pingali, P.L. and Stamoulis, K.G., eds. *The Transformation of Agrifood Systems*. FAO and Earthscan, London.
- McMurrian, R., and W.H. Rhey. 2001. "Summary Brief Gender Related Effects on Buyers' Perceptions of Salespeople: Revisited." www.sbaer.uca.edu/research/sma/2001/83.pdf.
- Ménard, C., and E. Valceschini. 2005. "New Institutions for Governing the Agri-Food Industry." *European Review of Agricultural Economics* 32(3): 421-440.
- Merrill-Sands, D., E. Holvino, and J. Cumming. 2000. "Working with Diversity: A framework for Action." Working Paper of Gender and Diversity of the Consultative Group on International Agricultural Research (CGIAR).
- Michaels, R.E., A. Kumar, and S. Samu. 1995. "Activity-specific Role Stress in Purchasing." *International Journal of Purchasing and Materials Management* 31(1): 11-19.
- Milligan, G., and M. Cooper. 1985. "An Examination of Procedures for Determining the Number of Clusters in A Data Set." *Psychometrika* 50(2): 159-179.
- Ministry of Agriculture of Indonesia. 2008. "Statistic of Agriculture." Ministry of Agriculture, Republic of Indonesia, electronic publication, <http://www.deptan.go.id>
- Ministry of Manpower and Transmigration. 2005. "Rencana Ketenagakerjaan 2004-2009 (Masterplan of Employment 2004-2009)." Jakarta: Depnakertrans (Ministry of Manpower and Transmigration of Republic of Indonesia).

- Minot, N.W. 1986. "Contract Farming and Its Effect on Small Farmers in Less Developed Countries." Working Paper, MSU International Development Papers, Department of Agricultural Economics, Michigan State University, Michigan.
- Minten, B. and T. Reardon. 2008. "Food Prices, Quality, and Quality's Pricing in Supermarkets Versus Traditional Markets in Developing Countries." *Review of Agricultural Economics* 30(3): 480-490.
- Minten, B., L. Randrianarison, and J. Swinnen. 2007. "Spillovers from High-Value Agriculture for Exports on Land Use in Developing Countries: Evidence from Madagascar." *Agricultural Economics* 37: 265-275.
- Minten, B., L. Randrianarison, and J.F.M. Swinnen. 2009. "Global Retail Chains and Poor Farmers: Evidence from Madagascar." *World Development* 37: 1728-1741.
- Miyata, S., N. Minot, and D. Hu. 2009. "Impact of Contract Farming on Income: Linking Small Farmers, Packers, and Supermarkets in China." *World Development* 37(11): 1781-1790.
- Moncrief, W.C., E. Babakus, D.W. Cravens, and M.W. Johnston. 2000. "Examining Gender Differences in Field Sales Organizations." *Journal of Business Research* 49: 245-257.
- Moorman, C., G. Zaltman, and R. Deshpande. 1992. "Relationships between Providers and Users of Market Research: The Dynamics of Trust within and between Organizations." *Journal of Marketing Research* 29(3): 314-328.
- Moorman, C., R. Deshpandé, and G. Zaltman. 1993. "Factors Affecting Trust in Market Research Relationships." *Journal of Marketing* 57(1): 81-101.
- Morgan, R.M., and S.D. Hunt. 1994. "The Commitment-Trust Theory of Relationship Marketing." *Journal of Marketing* 58(July): 20-38.
- Morrison, A., D. Raju, and N. Sinha. 2007. "Gender Equality, Poverty and Economic Growth." The World Bank, Policy Research Working Paper 4349.
- Moser, C.O.N. 1989. "Gender Planning in the Third World: Meeting Practical and Strategic Gender Needs." *World Development* 17(11): 1799-1825.
- Mushoff, O., and N. Hirschauer. 2008. "Investment Planning under Uncertainty and Flexibility: The Case of a Purchasable Sales Contract." *The Australian Journal of Agricultural and Resource Economics* 52: 17-36.
- Nagaraj, N., M.G. Chandrakanth, P.G. Chengappa, H.S. Roopa, and P.M. Chandakavate. 2008. "Contract Farming and Its Implications for Input-Supply, Linkages between Markets and Farmers in Karnataka." *Agricultural Economics Research Review* 21:307-316.
- Natawidjaja, R.S., E. Rasmikayati, Kusnandar, D. Purwanto, T. Reardon, and H. Zhi. 2007. "Impact of Agrifood Market Restructuring in Indonesia: Case of Potato Farmers in West Java." Unnumbered Report of Center for Agricultural Policy and Agribusiness Studies Padjajaran University and Michigan State University.

- Naudé, P. and F. Buttle. 2000. "Assessing Relationship Quality." *Industrial Marketing Management* 29(4): 351-361.
- Ndubisi, N.L., and M. Jantan. 2003. "Malaysian Entrepreneurs and Strategic Use of Information Technology." *Malaysian Management Review* 38(1): 32-42.
- Ndubisi, N.O. 2006. "Effect of Gender on Customer Loyalty: A Relationship Marketing Approach." *Marketing Intelligence and Planning* 24(1): 48-61.
- Nelson, K. 1978. "Modesty Socialization in Sexual Identity: The Transition from Infant to Girl or Boy." PhD dissertation, University of California, Berkeley.
- Neven, D., and T. Reardon. 2004. "The Rise of Kenyan Supermarkets and the Evolution of Their Horticulture Product Procurement Systems." *Development Policy Review* 22(6): 669-699.
- Neven, D., M.M. Odera, T. Reardon, and H. Wang. 2009. "Kenyan Supermarkets, Emerging Middle-Class Horticultural Farmers, and Employment Impacts on the Rural Poor." *World Development* 37(11): 1802-1811.
- Nooteboom, B., H. Berger, and N.G. Noorderhaven. 1997. "Effects of Trust and Governance on Relational Risk." *The Academy of Management Journal* 40(2): 308-338.
- North, D.C. 1990. *Institutions, Institutional Changes and Economic Performance*. Cambridge: Cambridge University Press.
- Nunnally, J.C. 1978. *Psychometric Theory*, 2nd ed. New York, N.Y.: McGraw-Hill.
- O'Leary, V.E. 1974. "Some Attitudinal Barriers to Occupational Aspirations in Women." *Journal of Applied Psychology* 81(11): 809-826.
- O'Toole T., and B. Donaldson. 2002. "Relationship Performance Dimensions of Buyer-supplier exchanges." *European Journal of Purchasing Supply Management* 8(4): 197-207.
- O'Toole, T., and B. Donaldson. 2000. "Relationship Governance Structures and Performance." *Journal of Marketing Management* 16(4): 327-341.
- Oakley, A. 1972. *Sex, Gender, and Society*. London: Ashgate Publishing.
- Oliver, R. 1980. "A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions." *Journal of Marketing* 17(November): 460-469.
- Ooi, P.A.C. 1996. "Experiences in Educating Rice Farmers to Understand Biological Control." *Entomophaga* 41(3/4): 375-385.
- Osborn, C. 2000. "Grower Feedback and Developing Relationships." In C. Davies, C. Dundon, and R. Hamilton, eds. *Modern Viticulture - Meeting Market Specifications*, pp. 52-53. Proceedings of Australian Society of Viticulture and Oenology (ASVO) Seminar held in Mildura, Victoria, September 3, 1999. Adelaide, Australia: Australian Society of Viticulture and Oenology.

- Ostrom, E. 2000. "Social Capital: A Fad or a Fundamental Concept?" In P. Dasgupta, and I. Serageldin, eds. *Social capital: A Multifaceted Perspective*, pp. 172-214. Washington, DC: The World Bank.
- Paton, R.A., and J. McCalman. 2008. *Change Management: A Guide to Effective Implementation*, 3rd ed. London: SAGE Publications Ltd.
- Patrick, I. 2004. "Contract Farming in Indonesia: Smallholders and Agribusiness Working Together." ACIAR Technical Reports No. 54. Canberra: Australian Centre for International Agricultural Research.
- Paul, C. J. M., Nehring, R., and Banker, D., 2004. "Productivity, Economies, and Efficiency in U.S. Agriculture: A Look at Contracts." *American Journal Agricultural Economics* 86, 1308-1314.
- Pearson, J. 1979. "Note on Female Farmers." *Rural Sociology* 44(1): 189-200.
- Pfeffer, J., and G.R. Salancik. 1978. *The External Control of Organizations: A Resource-Dependence Perspective*. New York, NY: Harper and Row.
- Pingali, P. 2006. "Westernization of Asian Diets and the Transformation of Food Systems: Implications for Research and Policy." *Food Policy* 32: 281-298.
- Pingali, P., and Y. Khwaja. 2004. "Globalisation of Indian Diets and the Transformation of Food Supply Systems." ESA Working Paper No. 04-05, 17th Annual Conference, Indian Society of Agricultural Marketing, Hyderabad, 5-7 February 2004, the Food and Agriculture Organization of the United Nations.
- Pingali, P., Y. Khwaja, and M. Meijer. 2005. "Commercializing Small Farms: Reducing Transaction Costs." In Proceedings of a Research Workshop, the Future of Small Farms, Wye, UK.
- Plank, R.E., D.A. Reid, and E.B. Pullins. 1999. "Perceived Trust in Business-to-business Sales: A New Measure." *Journal of Personal Selling and Sales Management* 19(3): 61-71.
- Poats, S.V. 1991. "The Role of Gender in Agricultural Development." Issues in Agriculture No.3, Consultative Group on International Research (CGIR), Washington, D.C.
- Porter, G., and K. Phillips-Horward. 1997. "Contract Farming in South Africa: A Case Study from KwaZulu-Natal." *Geography* 82(1): 38-44.
- Porter, L.W., and E.E. Lawler. 1968. *Managerial Attitudes and Performance*. Homewood: R.D. Irwin. Inc.
- Poulton, C., P. Gibbon, B. Hanyani-Mlambo, J. Kydd, W. Maro, and M. N. Larsen. 2004. "Competition and Coordination in Liberalised African Cotton Market Systems." *World Development* 32(3): 519-536.
- Pullins, E.B., D.A. Reid, and R.E. Plank. 2004. "Gender Issues in Buyer-Seller Relationships: Does Gender Matter in Purchasing?" *The Journal of Supply Chain Management: A Global Review of Purchasing and Supply* 40(3): 40-48.

- Pullins, E.B., L.M. Fine, and W.L. Warren. 1996. "Identifying Peer Mentors in the Sales Force: An Explanatory Investigation of Willingness and Ability." *Journal of the Academy of Marketing Science* 24 (2): 125-136.
- Punj, G., and D.W. Stewart. 1983. "Cluster Analysis in Marketing Research: Review and Suggestions for Application." *Journal of Marketing Research* 20(2):134-148.
- Puspitawati, E., A. Gyau, R. Stringer, and W.J. Umberger. 2011. "Determinants of Trust in the Indonesian Potato Industry: A Comparison between Groups of Potato Farmers." *Journal of Agribusiness* 29(1): 117-140.
- Quisumbing, A., and B.Mc. Clafferty. 2006. *Using Gender Research in Development*. Washington DC: International Food Policy Research Institute.
- Quisumbing, A.R. 1996. "Male-Female Differences in Agricultural Productivity: Methodological Issues and Empirical Evidence." *World Development* 24(10): 1579-1595.
- Rachlin, J. 2006. "Principal Component Analysis and Extreme Value Theory in Financial Applications." Thesis of Degree of Bachelor of Arts, Princeton University.
- Rahman, S. 2000. "Women's Employment in Bangladesh Agriculture: Composition, Determinants and Scope." *Journal of Rural Studies* 16: 497-507.
- Raney, T., G. Anrequez, A. Croppenstedt, S. Gerosa, S. Lowder, I. Matuscke, J. Skoet, and C. Doss. 2011. "The Role of Women in Agriculture." ESA Working Paper No. 11-02, the State of Food and Agriculture (SOFA), the Food and Agriculture Organization (FAO).
- Rao, E.J.O., and M. Qaim. 2010. "Supermarkets, Farm Household Income, and Poverty: Insights from Kenya." *World Development* 39(5): 784-796.
- Rao, E.J.O., B. Brümmer, and M. Qaim. 2011. "Farmer Participation in Supermarket Channels, Production Technology, and Efficiency: The Case of Vegetables in Kenya." GlobalFood Discussion Papers RTG 1666, Transformation of Global Agri-Food Systems: Trends, Driving Forces, and Implications for Developing Countries, Georg-August-University of Göttingen, Germany.
- Rapp, S., and T. Collins. 1991. *The Great Marketing Turnaround: The Age of the Individual - and How to Profit from It*. Englewood Cliffs, NJ: Prentice-Hall.
- Reardon, T., and C.P. Timmer. 2007. "Transformation of Markets for Agricultural Output in Developing Countries Since 1950: How Has Thinking Changed?" In R. Evenson, and P. Pingali, eds. *Handbook of Agricultural Economics, Volume 3, Agricultural Development: Farmers, Farm Production and Farm Markets*. Oxford: Elsevier B.V.
- Reardon, T., and C.P. Timmer. 2008. "The Rise of Supermarkets in the Global Food System." In J. von Braun, and E. Díaz-Bonilla, eds. *Globalization of Food and Agriculture and the Poor*. New Delhi: Oxford University Press.

- Reardon, T., and J.A. Berdegué. 2002. "The Rapid Rise of Supermarkets in Latin America: Challenges and Opportunities for Development." *Development Policy Review* 20(4): 371-388.
- Reardon, T., C.B. Barrett, J.A. Berdegué, and J.F.M. Swinnen. 2009. "Agrifood Industry Transformation and Small Farmers in Developing Countries." *World Development* 37(11): 1717-1727.
- Reardon, T., C.P. Timmer, C.B. Barrett, and J. Berdegué. 2003. "The Rise of Supermarkets in Africa, Asia, and Latin America." *American Journal of Agricultural Economics* 85(5): 1140-1146.
- Reardon, T., J. Codron, and L.B.J.B.C. Harris. 2001. "Global Change in Agrifood Grades and Standards: Agribusiness Strategic Responses in Developing Countries." *International Food and Agribusiness Management Review* 2(3/4): 421-435.
- Reardon, T., J.A. Berdegué, C.P. Timmer, T. Cabot, D. Mainville, L. Flores, R. Hernandez, D. Neven, and F. Balsevich. 2005. "Links among Supermarkets, Wholesalers, and Small Farmers in Developing Countries: Conceptualization and Emerging Evidence." Proceedings of a Research Workshop the Future of Small Farms, Wye, UK.
- Rempel, J.K., J.G. Holmes, and M.P. Zanna. 1985. "Trust in Close Relationships." *Journal of Personality and Social Psychology* 49(1): 95-112.
- Rencher, A.C. 2002. *Methods of Multivariate Analysis*, 2nd ed. New York: John Wiley and Sons, Inc.
- Ring, P.S., and A.H. Van de Ven. 1992. "Structuring Cooperative Relationship between Organizations." *Strategic Management Journal* 13: 483-498.
- Romer, P. 1993. "Idea Gaps and Object Gaps in Economic Development." *Journal of Monetary Economics* 32(1993): 543-573.
- Romer, P. 1994. "New Goods, Old Theory, and the Welfare Costs of Trade Restrictions." *Journal of Development Economics* 43(1): 5-38.
- Romo, G.D., L. Digal, and T. Reardon. 2009. "The Transformation of Food Retail in the Philippines." *Asian Journal of Agriculture and Development* 6(2): 51-84.
- Rudman, L. A., and P. Glick. 1999. "Feminized Management and Backlash Toward Agentive Women: The Hidden Costs to Women of A Kinder, Gentler Image of Middle Managers." *Journal of Personality and Social Psychology* 77(5): 1004-1010.
- Rudman, L.A. 1998. "Self-promotion as a Risk Factor for Women: The Costs and Benefits of Counterstereotypical Impression Management." *Journal of Personality and Social Psychology* 74(3):629-645.
- Russ, F.A., and K. McNeilly. 1988. "Has Sex Stereotyping Disappeared? A Study of Perceptions of Women and Men in Sales." *Journal of Personal Selling and Sales Management* 8(November): 43-54.

- Russ, F.A., and K.M. McNeilly. 1995. "Links among Satisfaction, Commitment, and Turnover Intentions: The Moderating Effect of Experience, Gender, and Performance." *Journal of Business Research* 34:57-65.
- Saenong, S., and E. Ginting 1995. "The Role of Women in Upland Agriculture Development in Indonesia with a Focus on CGPRT Crop Based Farming System." In van Santen, C.E., J.W.T. Bottema, and D.R. Stoltz, eds. *Women in Upland Agriculture in Asia*. Proceedings of a workshop held in Chiang Mai, Thailand, January 31 – February 3, 1995, CGPRT Centre.
- Saito, K.A., H. Mekonnen, and D. Spurling. "Raising the Productivity of Women Farmers in Sub-Saharan Africa." World Bank Discussion Papers Africa Technical Department Series No. 230, the World Bank, Washington, D.C.
- Sajogyo, P. 1985. "Women and Food: Production, Processing and Marketing an Indonesian Case." Paper presented on Women's Role in Food Self-Sufficiency and Food Strategies, conducted by ORSTOM and CIE, Paris 14-19 January 1985.
- Sako, M. 1997. "Does Trust Improve Business Performance?" In C. Lane and R. Backmann, eds. *Trust Within and Between Organizations*, pp. 1-39. Oxford: Oxford University Press.
- Saptana, E.L. Hastuti, K.S. Indraningsih, Ashari, S. Friyatno, Sunarsih, and V. Darwis. 2006. "The Development of Institutional Model 'Competitive Horticulture Relationship'." Project Report, Indonesian Centre for Agriculture, Socio-Economic and Policy Studies (ICASEPS), Bogor.
- Saptana, Kurnia, S. Indraningsih, and E.L. Hastuti. 2010. "Institutional Analysis of Relationship Marketing Vegetable: A Case Of Relationship Marketing in Bali, North Sumatera and West Java." Project Report, Indonesian Centre for Agriculture, Socio-Economic and Policy Studies (ICASEPS), Bogor, website: <http://caser@indosat.net.id>.
- Sartorius, K., and J. Kirsten. 2007. "A Framework to Facilitate Institutional Arrangements for Smallholder Supply in Developing Countries: An Agribusiness Perspective." *Food Policy* 32: 640–655.
- Saxe, R., and B.A. Weitz. 1982. "The SOCO Scale: A Measure of the Customer Orientation of Salespeople." *Journal of Marketing Research* 19(August): 343-351.
- Schein, V.E. 2001. "A Global Look at Psychological Barriers to Women's Progress in Management." *Journal of Social Issues* 57(4): 675–688.
- Schipmann, C. 2010. "The Food System Transformation in Developing Countries: Opportunities and Challenges for Smallholder Farmers in Thailand. PhD dissertation, der Fakultät für Agrarwissenschaften, der Georg-August-Universität Göttingen.

- Schipmann, C., and M. Qaim. 2011. "Supply Chain Differentiation, Contract Agriculture, and Farmers' Marketing Preferences: The Case of Sweet Pepper in Thailand." Globalfood discussion paper, No. 3, Georg-August-University of Gottingen.
- Schul, P.L., and B.M. Wren. 1992. "The Emerging Role of Women in Industrial Selling: A Decade of Change." *The Journal of Marketing* 56(3): 38-54.
- Schultz, T.P. 1999. "Women's Role in the Agricultural Household: Bargaining and Human Capital." Center discussion paper No. 803. New Haven, Connecticut: Economic Growth Center Yale University.
- Schulze, B., Spiller, A., and C. Wocken. 2006. "Supplier Relationship Quality in the German Pork and Dairy Sector: Theoretical Considerations and Empirical Evidence." Paper presented at the 16th Annual World Forum and Symposium "Agribusiness, Food, Health, and Nutrition", IAMA, June 10-13, 2006 in Buenos Aires, Argentina.
- Shiva, V. 1989. *Staying Alive: Women, Ecology and Development*. London: Zed Books Ltd.
- Shlens, J. 2009. *A Tutorial on Principal Component Analysis*. New York City: Centre for Neural Science, New York University.
- Siguaw, J.A., and E.D Honeycutt Jr. 1995. "An Examination of Gender Differences in Selling Behaviors and Job Attitudes." *Industrial Marketing Management* 25:45-52.
- Simmons, P., P. Winters, and I. Patrick. 2005. "An Analysis of Contract Farming in East Java, Bali, and Lombok, Indonesia." *Agricultural Economics* 33:513-5125.
- Singh, S. 2002. "Contracting Out Solutions: Political Economy of Contract Farming in the Indian Punjab." *World Development* 30(9): 1621-1638.
- Sinha N., D. Raju, and A. Morrison. 2007. "Gender Equity, Poverty and Economic Growth." World Bank policy research working paper No. 4349, World Bank Latin America and Caribbean Region.
- Siwi, S.S., M. Machmud, and M. Mardiharini. 1990. "Indonesian Women in Rice Farming System." Proceedings of the First National Workshop on Women in Rice Farming System in Indonesia, April 6, 1989. Bogor, Indonesia: Agency for Agricultural Research and Development, Central Research Institute for Food Crops and International Rice Research Institute.
- Smith, J.B. 1998. "Buyer-Seller Relationships: Similarity, Relationship Management, and Quality." *Psychology and Marketing* 15(1): 3-21.
- Smith, P.C., L.M. Kendall, and C.L. Hulin. 1969. *The Measurement of Satisfaction in Work and Retirement: A Strategy for the Study of Attitudes*. Chicago: Rand McNally.
- Spicer, M. W. 1985. "A Public Choice Approach to Motivating People in Bureaucratic Organizations?" *Academy of Management Review* 10:518-526.

- Staatz, J.M., T.S. Jayne, D. Tschirley, J.D. Shaffer, J. Dioné, J. Oehmke, and M.T. Weber. 1993. "Restructuring Food Systems to Support A Transformation of Agriculture in Sub-Saharan Africa: Experience and Issues." Paper presented at the AAEEA Pre-Conference Workshop on Post-Green Revolution Agricultural Development Strategies in the Third World-What Next? Orlando, Florida, July 30-31 1993.
- Stanton, W.J., and R.H. Buskirk. 1974. *Management of the Sales Force*, 4th ed. Homewood: R.D. Irwin. Inc.
- Statistics Garut. 2008. *Garut in Figures 2008*. Garut, Indonesia: Garut Regency.
- Statistics Indonesia. 2006. *Statistical Yearbook of Indonesia 2006*. Jakarta: Statistics Indonesia.
- Statistics Indonesia. 2008. *Statistical Yearbook of Indonesia 2008*. Jakarta: Statistics Indonesia.
- Statistics Indonesia. 2010. *Trends of the Selected Socio-Economic Indicators of Indonesia 2010*. Jakarta: Statistics Indonesia.
- Statistics Indonesia. 2011. *Number of Workers per Sector from 2004 to 2011*. Jakarta: National Labor Survey, Statistics Indonesia.
- Stoddard, J.E., and E.F. Fern. 1999. "Risk-taking Propensity in Supplier Choice: Differences by Sex and Decision Frame in a Simulated Organizational Buying Context." *Psychology and Marketing* 16(7): 563-582.
- Stone, J.V. 2004. *Independent Component Analysis: A Tutorial Introduction*. Massachusetts: Massachusetts Institute of Technology.
- Stringer, R., N. Sang, and A. Croppenstedt. 2009. "Producers, Processors, and Procurement Decisions: The Case of Vegetable Supply Chains in China." *World Development* 37(11): 1773-1780.
- Supadi, and M. Syukur. 2004. "Farmers' Accessibility for Financial Credits: A Case of Paddy and Horticultural Products in West Java and West Nusa Tenggara (Aksesibilitas petani terhadap Sumber Permodalan: Kasus Petani Padi Sawah dan Hortikultura di Jawa Barat dan Nusa Tenggara Barat)." ICASERD Working Paper No.48. Pusat Penelitian dan Pengembangan Sosial Ekonomi Pertanian, Bogor.
- Supriyati. 2004. "The Analysis of Terms of Trade for Agricultural Commodities: An Indonesian Potato Case (Analisis Nilai Tukar Komoditas Pertanian: Kasus Komoditas Kentang)." ICASERD Working Paper No. 49. Bogor, Indonesia: Indonesian Centre for Agriculture, Socio-Economic and Policy Studies (ICASEPS).
- Swan, J.E., C.M. Futrell, and J.T. Todd. 1978. "Same Job- Different Views: Women and Men in Industrial Sales." *Journal of Marketing* 42(1): 92-98.

- Swan, J.E., D.R. Rink, G.E. Kiser, and W.S. Martin. 1984. "Industrial Buyer Image of the Saleswoman." *The Journal of Marketing* 48(1): 110-116.
- Swift, C.O., and K.H. Gruben. 2000. "Gender Differences in Weighting of Supplier Selection Criteria." *Journal of Managerial Issues* 12(4): 502-512.
- Swinnen, J. 2004. *The Dynamics of Vertical Coordination in ECA Agrifood Chains as an Engine of Private Sector Development: Implications for Policy and Bank Operations*. Washington, DC: The World Bank.
- Swinnen, J.F.M., and M. Maertens. 2007. "Global Supply Chains, Standards and the Poor: some Conclusions and Implications for Government Policy and International Organizations." In J.F.M. Swinen, ed. *Global Supply Chains, Standards and the Poor; How the Globalization of Food Systems and Standards Affects Rural Development and Poverty*. Trowbridge, UK: Cromwell Press.
- Sykuta, M., and H. S. James. 2004. "Organizational Economics Research in the US Agricultural Sector and the Contracting and Organizations Research Institute." *American Journal of Agricultural Economics* 86(3): 756-761.
- Tagarino, D.D., E.B. Cungihan, and J.B Paday-os. 1998. "Analysis of the Credit Market for Potato Production Production and Marketing in the Cordillera Administrative Region." HARRDEC, Benguet State University, La Trinidad.
- Tanaya, I.G.L.P., M. McGregor, and P. Batt. 2004. "Buyer-Seller Relationships in Dryland Farming Supply Chains in Lombok Indonesia." Australian Agricultural and Resource Economics Society (AARES) Conferences 2004, 48th AARES Confeneces 11-13 February 2004, Melbourne, Victoria.
- Timmer, C.P. 2009. "Do Supermarkets Change the Food Policy Agenda?" *World Development* 37(11): 1812-1819.
- Timmer, C. P., Falcon, W. P., and S. R. Pearson. 1983. *Food Policy Analysis*. Baltimore, MD: Johns Hopkins University Press for the World Bank.
- Townshend, J.R.G., T.E. Goff, and C.J. Tucker. 1985. "Multitemporal Dimensionality of Images of Normalized Difference Vegetation Index at Continental Scales." *IEEE Transactions on Geoscience and Remote Sensing* Ge 23(6): 888-895.
- Tripathi, R.S., R. Singh, and S. Singh. 2005. "Contract Farming in Potato Production: An Alternative for Managing Risk and Uncertainty." *Agricultural Economics Research Review* 18:47-60.
- Udry, C. 1996. "Gender, Agricultural Production, and the Theory of the Household." *Journal of Political Economy* 104(5): 1010-1046.
- Udry, C., J. Hoddinott, H. Alderman, and L. Haddad. 1995. "Gender Differentials in Farm Productivity: Implications for Household Efficiency and Agricultural Policy." *Food Policy* 20(5): 407-423.
- USAID. 2009. "Promoting Gender Equitable Opportunities in Agricultural Value Chains." A handbook of U.S. Agency for International Development (USAID)

- Office of Women in Development, Washington DC, http://www.usaid.gov/our_work/crosscutting_programs/wid/.
- USAID-Guinea and Chemonics International Inc. 2007. "Guinea Agricultural Market Linkages Activity: Chili Pepper Product Development Plan." The United States Agency for International Development (USAID) Guinea.
- Van de Fliert, E. 1993. "Integrated Pest Management: Farmer Field Schools Generate Sustainable Practices. A Case Study in Central Java Evaluating IPM Training." PhD dissertation. Wageningen Agricultural University.
- Van de Fliert, E., and J. Proost. 1999. "Women in IPM Training and Implementation in Indonesia." In E. Van de Fliert, and J. Proost, eds. *Women and IPM: Crop Protection Practices and Strategies*. Amsterdam: Royal Tropical Center.
- van Weele, A. 2010. *Purchasing and Supply Chain Management: Analysis, Planning and Practice*, 5th ed. Hampshire: Thomas Rennie.
- Wang, H.H., Y. Zhang, and L. Wu. 2011. "Is Contract Farming a Risk Management Instrument for Chinese Farmers? Evidence from a Survey of Vegetable Farmers in Shandong." *China Agricultural Economic Review* 3(4): 489-504.
- Warning, M., and N. Key. 2002. "The Social Performance and Distributional Consequences of Contract Farming: An Equilibrium Analysis of the Arachide de Bouche Program in Senegal." *World Development* 30(2): 255-263.
- Waterman, R.W., and K.J. Meier. 1998. "Principal-Agent Models: An Expansion?" *Journal of Public Administration Research and Theory* 8(2): 173-202.
- Weatherspoon, D., and T. Reardon. 2003. "The Rise of Supermarkets in Africa: Implications for Agrifood Systems and the Rural Poor." *Development Policy Review* 21(2003): 333-355.
- Weinberger, K., and T.A., Lumpkin. 2005. "High Value Agricultural Products in Asia and the Pacific for Smallholder Farmers: Trends, Opportunities and Research Priorities." Workshop How Can the Poor Benefit from the Growing Markets for High Value Agricultural Products. Cali, Colombia: The World Vegetable Centre (AVRDC).
- White, H. 1980. "A Heteroskedasticity-Consistent Covariance Matrix Estimator and Direct Test for Heteroskedasticity." *Econometrica* 48: 817-838.
- Wilcoxon, F. 1945. "Individual Comparisons by Ranking Methods." *Biometrics Bulletin* 1(6):80-83.
- Wilkinson, J. 2004. "The Food Processing Industry, Globalization and Developing Countries." *Electronic Journal of Agricultural and Development Economics* 1(2): 184-201.
- Williamson, O. E. 1985. *The Economic Institutions of Capitalism*. The Free Press, New York.

- Williamson, O.E. 1975. *Markets and Hierarchies. Analysis and Anti-Trust Implications: A Study in the Economics of Organisation*. Free Press, New York.
- Williamson, O.E. 1991. "Comparative Economic Organisations: The Analysis of Discrete Structural Alternatives." *Administrative Science Quarterly* 36: 269-296.
- Williamson, O.E. 1996. *The Mechanisms of Governance*. New York: Oxford University Press.
- Wilson, D.T. 1995. "An Integrated Model of Buyer-Seller Relationships." *Journal of Academy of Marketing Science* 23(4): 335-345.
- Woldehana, T. 2005. "Rural Farm/Nonfarm Linkages in Northern Ethiopia." In B. Davis, T. Reardon, K. Stamoulis, and P. Winters, eds. *Promoting Farm/Non-Farm Linkages for Rural Development* (FAO, Rome).
- Wollnia, M., Zeller, M., 2007. "Do Farmers Benefit from Participating in Specialty Markets and Cooperatives? The Case of Coffee Marketing in Costa Rica." *Agricultural Economics* 37: 243-248.
- World Bank. 2007. *World Development Report 2008 Agriculture for Development*. Washington, DC: The World Bank.
- World Bank. 2009. *Gender in Agriculture Sourcebook*. Washington, DC: The World Bank.
- Xia, L., K.B. Monroe, and J.L. Cox. 2004. "The Price Is Unfair! A Conceptual Framework of Price Fairness Perceptions." *Journal of Marketing* 68(October): 1-15.
- Yee, W.M.S., and R.M.W. Yeung. 2002. "Trust Building in Livestock Farmers: An Exploratory Study." *Nutrition and Food Science* 32(4): 137-144.
- Yilmaz, C. and S.D. Hunt. 2001. "Salesperson Cooperation: The Influence of Relational, Task, Organizational, and Personal Factors." *Journal of the Academy of Marketing Science* 29(4): 335-357.
- Yusuf, R.P. 2007. "Dynamic Characteristics of Women's Roles (Karakteristik Dinamis Peran Ganda Wanita)." *Ejournal Universitas Udayana* 2(July): 1-11. [Http://ejournal.unud.ac.id](http://ejournal.unud.ac.id).
- Zaheer, A., B. McEvily, and V. Perrone. 1998. "Does Trust Matter? Exploring the Effects of Inter-Organizational and Interpersonal Trust on Performance." *Organization Science* 9(2): 141-159.
- Zand, D.E. 1972. "Trust and Managerial Problem Solving." *Administrative Science Quarterly* 2: 229-239.
- Zeuli, K.A., and R.P. King. 1998. "Gender Differences in Farm Management." *Review of Agricultural Economics* 20(2): 513-529.

Appendices

Appendix A Survey questionnaires

AGRICULTURAL SOCIO ECONOMIC SURVEY - INDONESIA
 February and March 2009
 CIP - IVEGRI - UNIVERSITY OF ADELAIDE

Objective: The purpose of this survey is to improve our understanding of agricultural marketing patterns in Indonesia, particularly the relationship between farmers and traders and companies that buy potatoes from them.

Use of data: The data collected as part of this survey are for research purposes ONLY. Household-level data will not be shared with non-research organizations. . Only summary results will be included in published report.

Name of head family	CODE :	
Name of respondent	CODE :	
Location of house/Address	CODE :	
Village	CODE :	
Subdistrict	CODE :	
District/Town	CODE :	
Province	CODE :	
Phone/HP		_____

Household ID number		
Category	Enumerator	Household
1.FFS	1. Asma S	ID_1
2.Non FFS	2. Dewi A	ID_2
3.Indofood	3. Nana	
4.Combination 1 & 3	4. Pitri	
5.Combination 2 & 3	5. Titie	
	6. Wawan	
	7. Eka	

1 = Male
 2 = Female

Interview
 Field check
 Check kantor
 Data Entry
 a. Entering date
 b. Finishing date

Date			Name	Sign
Day	Month	Year		

PART A. CHARACTERISTICS OF MEMBERS OF THE HOUSEHOLD

No	Name	What is the relationship between [name] and the head of household?	Is [name] a male or female?	How old is [name]? [age at last birthday, use 0 for < 1 yr]	-----Ask these questions only for members 7 years or older-----			What is the marital status of [name]?	How many years does [name] live with the household?
					How many years of schooling has [name] completed?	Can this person read?	Can this person write?		
		1 Head 2 Spouse 3 Son/daughter 4 Son/daughter in law 5 Grandchild 6 Parent or parent in law 7 Other related 8 Other unrelated	1 Male 2 Female	Year	Year	0 No 1 Yes	0 No 1 Yes	1 Single 2 Married 3 Separated 4 Divorced 5 Widow/ widower	Year
A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

PART B. HOUSING AND INVESTMENT

B.1. Housing and Facilities

<p>What is the approximate area of your house in square meters? 2008/09</p> <div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px auto;"></div> <p style="text-align: right;">B1</p> <p>What is the approximate current value of your house (without land)</p> <div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px auto;"></div> <p style="text-align: right;">B2</p> <p>(the price you could get if you sold it today?)</p> <p>What is the main source of drinking water for your household?</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">1 Indoor tap</td> <td style="width: 50%;">5 Rainwater</td> <td rowspan="4" style="width: 50px; vertical-align: middle; text-align: right;">B3</td> </tr> <tr> <td>2 Outdoor private tap</td> <td>6 River, lake, or pond</td> </tr> <tr> <td>3 Outdoor shared tap</td> <td>7 water collected in a container</td> </tr> <tr> <td>4 Covered well</td> <td>8 Aqua/bottled water</td> </tr> </table> <p>What is the main type of toilet used by your household?</p> <div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px auto;"></div> <p style="text-align: right;">B4</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">1 Own toilet with septic tank</td> <td style="width: 50%;">5 river/ditch</td> </tr> <tr> <td>2 Own toilet without septic tank</td> <td>6 Yard/farm land</td> </tr> <tr> <td>3 Shared toilet with other hh</td> <td>7 fishpond</td> </tr> <tr> <td>4 Public toilet</td> <td></td> </tr> </table> <p>What is the main type of lighting used by your household?</p> <div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px auto;"></div> <p style="text-align: right;">B5</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">1 Electric lights</td> <td style="width: 50%;">4 Others</td> </tr> <tr> <td>2 Oil lamps</td> <td>5 None</td> </tr> <tr> <td>3 Candles</td> <td></td> </tr> </table>	1 Indoor tap	5 Rainwater	B3	2 Outdoor private tap	6 River, lake, or pond	3 Outdoor shared tap	7 water collected in a container	4 Covered well	8 Aqua/bottled water	1 Own toilet with septic tank	5 river/ditch	2 Own toilet without septic tank	6 Yard/farm land	3 Shared toilet with other hh	7 fishpond	4 Public toilet		1 Electric lights	4 Others	2 Oil lamps	5 None	3 Candles		<p>Does any member of your household own... (If yes, how many?)</p> <table style="width: 100%; border: none;"> <thead> <tr> <th style="width: 40%;"></th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> </tr> <tr> <th></th> <th>0 No</th> <th>1 Yes</th> <th></th> <th>Quantity</th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>a radio?</td> <td></td> <td></td> <td><input type="text"/></td> <td>B6</td> <td><input type="text"/></td> <td>B6 a</td> </tr> <tr> <td>television?</td> <td></td> <td></td> <td><input type="text"/></td> <td>B7</td> <td><input type="text"/></td> <td>B7 a</td> </tr> <tr> <td>a fan?</td> <td></td> <td></td> <td><input type="text"/></td> <td>B8</td> <td><input type="text"/></td> <td>B8 a</td> </tr> <tr> <td>A computer?</td> <td></td> <td></td> <td><input type="text"/></td> <td>B9</td> <td><input type="text"/></td> <td>B9 a</td> </tr> <tr> <td>a washing machine?</td> <td></td> <td></td> <td><input type="text"/></td> <td>B10</td> <td><input type="text"/></td> <td>B10 a</td> </tr> <tr> <td>a refrigerator?</td> <td></td> <td></td> <td><input type="text"/></td> <td>B11</td> <td><input type="text"/></td> <td>B11 a</td> </tr> <tr> <td>telephone?</td> <td></td> <td></td> <td><input type="text"/></td> <td>B12</td> <td><input type="text"/></td> <td>B12 a</td> </tr> <tr> <td>a mobile phone?</td> <td></td> <td></td> <td><input type="text"/></td> <td>B13</td> <td><input type="text"/></td> <td>B13 a</td> </tr> <tr> <td>internet access</td> <td></td> <td></td> <td><input type="text"/></td> <td>B14</td> <td><input type="text"/></td> <td>B14 a</td> </tr> <tr> <td>a bicycle?</td> <td></td> <td></td> <td><input type="text"/></td> <td>B15</td> <td><input type="text"/></td> <td>B15 a</td> </tr> <tr> <td>a motorbike?</td> <td></td> <td></td> <td><input type="text"/></td> <td>B16</td> <td><input type="text"/></td> <td>B16 a</td> </tr> <tr> <td>a car?</td> <td></td> <td></td> <td><input type="text"/></td> <td>B17</td> <td><input type="text"/></td> <td>B17 a</td> </tr> <tr> <td>a truck?</td> <td></td> <td></td> <td><input type="text"/></td> <td>B18</td> <td><input type="text"/></td> <td>B18 a</td> </tr> <tr> <td>a tracktor?</td> <td></td> <td></td> <td><input type="text"/></td> <td>B19</td> <td><input type="text"/></td> <td>B19 a</td> </tr> <tr> <td>a cart?</td> <td></td> <td></td> <td><input type="text"/></td> <td>B20</td> <td><input type="text"/></td> <td>B20 a</td> </tr> <tr> <td>a water pump?</td> <td></td> <td></td> <td><input type="text"/></td> <td>B21</td> <td><input type="text"/></td> <td>B21 a</td> </tr> <tr> <td>a CD player</td> <td></td> <td></td> <td><input type="text"/></td> <td>B22</td> <td><input type="text"/></td> <td>B22 a</td> </tr> <tr> <td>television channel</td> <td></td> <td></td> <td><input type="text"/></td> <td>B23</td> <td><input type="text"/></td> <td>B23 a</td> </tr> <tr> <td>Livestock</td> <td></td> <td></td> <td><input type="text"/></td> <td>B24</td> <td><input type="text"/></td> <td>B24 a</td> </tr> </tbody> </table> <p>What is your kitchen stove type?</p> <div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px auto;"></div> <p style="text-align: right;">B25</p> <div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px auto;"></div> <p style="text-align: right;">B25a</p> <p>Fill in with 1,2,3,4,5 and 6</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">1 electric</td> <td style="width: 50%;">4 kerosene</td> </tr> <tr> <td>2 LPG</td> <td>5 wood</td> </tr> <tr> <td>3 biogas</td> <td>4 other</td> </tr> </table>									0 No	1 Yes		Quantity			a radio?			<input type="text"/>	B6	<input type="text"/>	B6 a	television?			<input type="text"/>	B7	<input type="text"/>	B7 a	a fan?			<input type="text"/>	B8	<input type="text"/>	B8 a	A computer?			<input type="text"/>	B9	<input type="text"/>	B9 a	a washing machine?			<input type="text"/>	B10	<input type="text"/>	B10 a	a refrigerator?			<input type="text"/>	B11	<input type="text"/>	B11 a	telephone?			<input type="text"/>	B12	<input type="text"/>	B12 a	a mobile phone?			<input type="text"/>	B13	<input type="text"/>	B13 a	internet access			<input type="text"/>	B14	<input type="text"/>	B14 a	a bicycle?			<input type="text"/>	B15	<input type="text"/>	B15 a	a motorbike?			<input type="text"/>	B16	<input type="text"/>	B16 a	a car?			<input type="text"/>	B17	<input type="text"/>	B17 a	a truck?			<input type="text"/>	B18	<input type="text"/>	B18 a	a tracktor?			<input type="text"/>	B19	<input type="text"/>	B19 a	a cart?			<input type="text"/>	B20	<input type="text"/>	B20 a	a water pump?			<input type="text"/>	B21	<input type="text"/>	B21 a	a CD player			<input type="text"/>	B22	<input type="text"/>	B22 a	television channel			<input type="text"/>	B23	<input type="text"/>	B23 a	Livestock			<input type="text"/>	B24	<input type="text"/>	B24 a	1 electric	4 kerosene	2 LPG	5 wood	3 biogas	4 other
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PART B. HOUSING AND INVESTMENT

B 2. Investment and Asset

What investments have you made on assets in the last 5 years		How many?	Sources of income or credit for purchases (fill with code)
1 Tractor/Power Tiller (0 No, 1 Yes)	<input type="checkbox"/>	B26	<input type="checkbox"/> B26 a
2 Pump set	<input type="checkbox"/>	B27	<input type="checkbox"/> B27 a
3 Agricultural equipments	<input type="checkbox"/>	B28	<input type="checkbox"/> B28 a
4 Renovate house	<input type="checkbox"/>	B29	<input type="checkbox"/> B29 a
5 Motorbike	<input type="checkbox"/>	B30	<input type="checkbox"/> B30 a
6. Supporting Business Equipment	<input type="checkbox"/>	B31	<input type="checkbox"/> B31 a
7. Education for children	<input type="checkbox"/>	B32	<input type="checkbox"/> B32 a
8. Land	<input type="checkbox"/>	B33	<input type="checkbox"/> B33 a
9. Mist blower	<input type="checkbox"/>	B34	<input type="checkbox"/> B34 a
10. Car	<input type="checkbox"/>	B35	<input type="checkbox"/> B35 a
11. Storehouse	<input type="checkbox"/>	B36	<input type="checkbox"/> B36 a
12. Adornment and saving	<input type="checkbox"/>	B37	<input type="checkbox"/> B37 a
Did your potato earnings help pay for any of these acquisitions? 0 No 1 Yes			
1 Tractor/Power Tiller	<input type="checkbox"/>	B38	1 Potato crop income
2 Pump set	<input type="checkbox"/>	B39	2 Self-help group (credit program)
3 Agricultural equipments	<input type="checkbox"/>	B40	3 Self-help group (other than credit)
4 Renovate house	<input type="checkbox"/>	B41	4 Provided by trader (potoato or other crop)
5 Motorbike	<input type="checkbox"/>	B42	5 Insurance
6 Supporting Business Equipment	<input type="checkbox"/>	B43	6 Welfare program
7 Education for children	<input type="checkbox"/>	B44	7 Others (specify_____)
8 Mist blower	<input type="checkbox"/>	B45	8 Heritage
9 Storehouse	<input type="checkbox"/>	B46	9 Other agriculture income
10 Car	<input type="checkbox"/>	B47	10 Non-agriculture income

Note: Welfare programs are: Housing, Subsidies (Small business enterprise subsidies, incentive programs for women, nutrition, and food security programs).

PART C. AGRICULTURAL LAND

Total land your own (in square meters)

Total land farmed (2008/09) (in square meters)

What are the top five commodities that you cultivated in 3 years (code)

Total land for potato (2008/09) (in square meters)

C1				
C2				
C3	C3b	C3c	C3d	C3e
C4				

Enumerator: Draw a simple map of the plots **owned or farmed** by members of the household in 2008/09 on the opposite page.

Then number the plots and complete this form.

Plot number	Size (m2)	Land Tenure System	[If C7=1,2,3,10,12,13] How was this plot acquired?	What is the source of water for this plot?	What is the distance from this plot to your house?	Was these plots acquired in the last 3 years ? 0 = No , 1 = Yes		
						0 = No , 1 = Yes	When did you sell it? year	How much did you sell it for? Value in rupiah
C5	C6	C7	C8	C9	C10	C11	C12	C13
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
...								
14								

PART D. POTATO PRODUCTION

Enumerator: Fill in for each potato plot number from Part C.

Season of 2008/09	Plot size		Land Tenure System	Varieties	Irrigation	Rainfed	How many kilos of potatoes were harvested from this plot during this season Sep/Oct 2008 to Feb 2009?					
	No	Area in square meters					Total Quantity (Kg)	Grade AL (big) (Kg)	Grade ABC Beres (Kg)	Grade small size (Kg)	Others including BS (Kg)	Grade DN seeds (Kg)
D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13
Rainy Seas on Sep 2008 to January 2009	1											
	2											
	3											
	4											
	5											
	6											
	7											
Dry Seas on February 2008 to August 2008	1											
	2											
	3											
	4											
	5											
	6											
	7											

PART E. POTATO SALES

Enumerator: Repeat potato plot numbers, seasons, and quantities harvested from PART D, then complete the remaining questions.

Season of 2008/09	Potato area on plot [##] during the season of Sep/Oct 2008 to Feb 2008/09	How much potato crop was harvested during this season in 2008/09	How much of the harvest was sold?	How much was saved for seed?	How much of this harvest was sold as seed?	How much was kept for other uses such as for paying pawn & leasing?	How much was kept for consumption (including for gift to friends, neighbours, etc)?
		Kilogram	Kilogram	Kilogram	Kilogram	Kilogram	Kilogram
	$E3 = E4 + E5 + E6 + E7 + E8$						
E1	E2	E3	E4	E5	E6	E7	E8
Rainy Season Sep/Oct 2008 to Feb 2009	1						
	2						
	3						
	4						
	5						
	6						
	7						
Dry Season February 2008 to August 2008	1						
	2						
	3						
	4						
	5						
	6						
	7						

Verify that $E2 = D3$ and that $E3 = D7$. Also, verify that the total harvest (E3) equal to the sum of different uses ($E4 + E5 + E6 + E7 + E8$).

PART E. POTATO SALES (continued 1)

Season of 2008/09	Potato area on plot [##] during the season of Sep/Oct 2008 to Feb 2009 (M ²)	What price did you receive when selling potato grade AL?	What price did you receive when selling potato grade ABC beres?	What price did you receive when selling potato grade small size?	What price did you receive when selling potato grade BS ?	What price did you receive when selling seed potato?	What was the total revenue from selling potatoes?	Where did the sale take place?					Who was the main buyer of your potato crop? See Codes 1-14	Did the buyer contract you to grow this crop? 0 No 1 Yes
		Rupiah per kilogram Grade A-L	Rupiah per kilogram Grade ABC (beres)	Rupiah per kilogram Grade smallsize	Rupiah per kilogram Grade BS	Rupiah per kilogram Seed	Rupiah	1 On farm or home 2 Pasar lokal 3 Wholesale mkt 4 Processing plant 5 on the road close to farm 6 Contracting firm 7 Others						
								1	2	3	4	5		
E1	E2	E9	E10	E11	E12	E13	E14	E15a	E15b	E15c	E15d	E15e	E16	E17
Rainy Season Sep/Oct 2008 to Feb 2009	1													
	2													
	3													
	4													
	5													
	6													
	7													
Dry Season February 2008 to August 2008	1													
	2													
	3													
	4													
	5													
	6													
	7													

PART E. POTATO SALES (Continued 2)

Codes for question E12;

- 1 = trader type I (the trader comes to the farm to buy and collect picks the potatoes))
- 2 = trader type II (we delivered the potatoes to the trader)
- 3 = sold outside at the edge of the road
- 4 = sold by the farmer by going around to various places (goes around)
- 5 = cooperative or group
- 6 = traditional market in the village
- 7 = traditional market in the center of the sub district

- 8 = market in the center of the district
- 9 = supplier who supplied to supermarket
- 10 = Indofood the potato processor (= contract farming)
- 11 = sold to small potato processors
- 12 = contract farming (non indofood)
- 13 = exporter
- 14 = other specify (specify) _____

How are your potatoes transported to the point of sale (the main transportation used)?

Fill in with 0 = No, 1 = Yes, If Yes , how much the transportation cost?	Transportation cost a way (Rupiah)	Total transportation cost (Rupiah)
1 Buyer picks them up at the farm	<input type="text"/> E18	<input type="text"/> E18 a <input type="text"/> E18 b
2 Men and women carry	<input type="text"/> E19	<input type="text"/> E19 a <input type="text"/> E19 b
3 Use animals	<input type="text"/> E20	<input type="text"/> E20 a <input type="text"/> E20 b
4 Bicycle	<input type="text"/> E21	<input type="text"/> E21 a <input type="text"/> E21 b
5 Motor cycle	<input type="text"/> E22	<input type="text"/> E22 a <input type="text"/> E22 b
6 Pick up truck	<input type="text"/> E23	<input type="text"/> E23 a <input type="text"/> E23 b
7. Truck	<input type="text"/> E24	<input type="text"/> E24 a <input type="text"/> E24 b
8 Ojek (hire someone owned motorcycles)	<input type="text"/> E25	<input type="text"/> E25 a <input type="text"/> E25 b

Have you expanded or reduced are planted to potatoes in the past 3 years? E26

Fill in with : 1= Expanded 2=Reduced 3=no changes

By how much (in percent) E27

E28. Considering all of your potatoes produced (all plots together), for each season, please indicate what varieties of potatoes you produced in each season of each year from 2005-2008. Use the same codes as the previous table for varieties (Variety)

- 1= Granola
- 2 = Atlantic from Indofood
- 3 = Atlantic from Balitsa /BPBK
- 4= Tango (Balitsa)
- 5= Desiree
- 6 = Mata merah = red eye (Merbabu)
- 7 = purple potato
- 8 = Other, specify _____

2005-2006		2006-2007		2007-2008	
Dry Season February 2005 to August 2005	Rainy Season Sep/Oct 2005 to Feb 2006	Dry Season February 2006 to August 2006	Rainy Season Sep/Oct 2006 to Feb 2007	Dry Season February 2007 to August 2007	Rainy Season Sep/Oct 2007 to Feb 2008
E28a	E28b	E28c	E28d	E28e	E28f

PART F. CONTRACT RELATIONSHIPS AND INCOMES

Have you obtained production assistance and guidance for growing potatoes? Fill in with 0 = No, 1 = Yes

F1

If **Yes**, how do you obtain the assistance? Fill in with 0 = No, 1 = Yes on the list below

F2	FFS (extention)	
F3	Dinas (Extention workers)	
F4	Balitsa	
F5	Farmer	
F6	Trader	
F7	Processor	
F8	Input suppliers	
F9	Relative	
F10	Neighbour	
F11	Cooperative	
F12	Other _____	

What year did you first plant potatoes? (Year)

F13

What size area did you plant for your first potato crop regarding question F13 ? (Square meters)

F14 M²

Who was the buyer for your first crop of potatoes regarding question F13? See code 1-14 below

F15

Code for question F15

- | | |
|--|--|
| 1 = trader type I (the trader comes to the farm to buy and collect picks the potatoes) | 8 = market in the center of the district |
| 2 = trader type II (we delivered the potatoes to the trader) | 9 = supplier who supplied to supermarket |
| 3 = sold outside at the edge of the road | 10 = Indofood the potato processor (=contract) |
| 4 = sold by the farmer by going around to various places (goes around) | 11 = sold to small potato processors |
| 5 = cooperative or group | 12 = contract farming (non indofood) |
| 6 = traditional market in the village | 13 = exporter |
| 7 = traditional market in the center of the sub district | 14 = other specify (specify) |

Main reasons why you decided to produce potatoes?

Fill in with 0 = No, 1 = Yes

F16	Potato price remains stable	
F17	provides high return	
F18	the most popular product in the market	
F19	trader suggested	
F20	government extension officer suggested	
F21	potato processor suggested	
F22	wholesale market buyers suggested	
F23	lower inputs costs than other crops	
F24	lack of information regarding other crops	
F25	a generation activity	
F26	potato is compatible with the land	
F27	depend on available seed	

Which crop provides your main sources of farm income? (use crop code on the appendix 1.

F28

In the past year, what proportion of your farm income (crops and livestock) comes from your potato crop income? (average), fill in with code 1,2,3 and 4

F29

1 = Less than 25% 2 = 25 to 50% 3 = 50 to 75% 4 = More than 75%

In season 2008 and 2009, how much was farmer's income regarding;

a. Farm income	F30	<input type="text"/>
b. Potato income	F31	<input type="text"/>
c. Farm income excluding potato	F32	<input type="text"/>
d. Non farm income	F33	<input type="text"/>
e. Total income (a+d)	F34	<input type="text"/>

PART F. CONTRACT RELATIONSHIPS AND INCOMES (Continued)

What is the form the potatoes are sold? fill in with code 1,2,3 and 4 below

F35

- 1 = fresh, uncleaned, not graded
- 2 = fresh, uncleaned, graded

- 3 = fresh, cleaned, ungraded
- 4 = fresh, cleaned, graded

Do you always sel all of your potato crops to only one buyer? fill in with 0 = No, 1 = Yes

F36

How many different buyers have you sold to in the last five crop seasons? (persons)

F37

How do you contact your buyer?

Fill in with code 1,2,3 dan 4 below

F38

- 1 = Cell phone
- 2 = Buyer visits the farm
- 3 = I go to visit the buyer
- 4 = contracted farmers come to cooperative or intermediate persons
- 5= through middlemen
- 6= Farmer goes to buyers or meets at somewhere

At what point during the potato crop cycle do you organize with your buyer?

Fill in with code 1,2,3 and 4 below

F39

- 1 = Before planting 3 = During harvest
- 2 = Just before harvest 4 = After harvest

What type contract do you usually use?

Fill in with code 1,2 and 3 below

F40

- 1 = written contract
- 2 = oral or verbal (used to be deal by using mobile phone)
- 3 = spot market (oranize after harvest negotiate sale)
- 4= unlimited contract/ sub-contract

What are the main points you agree on with your buyer?

Fill in with 0 = No, 1 = Yes

Price	F41	<input type="text"/>
Quantity	F42	<input type="text"/>
Time of payment	F43	<input type="text"/>
Sorting by size	F44	<input type="text"/>
Premium pirce for Grade/Size	F45	<input type="text"/>
Cleaning	F46	<input type="text"/>
Loan repayments for advances	F47	<input type="text"/>
Transportation	F48	<input type="text"/>
Other _____	F49	<input type="text"/>

PART G. PRICE AND PRODUCT INCENTIVES

Where/from whom did you get the price information?

Fill in with 0 = No, 1 = Yes on the list below

Source of Price Information

- 1. government extension office
- 2. other farmer
- 3. trader
- 4. directly from the traditional market
- 5. wholesale market in big city (eg Bandung or Jakarta)
- 6. factory of potato product processing
- 7. NGO
- 8. supermarket
- 9. other, specify _____

G1	
G2	
G3	
G4	
G5	
G6	
G7	
G8	
G9	

What is channel of the price information?

Fill in with 0 = No, 1 = Yes on the list below

- 1. direct contact
- 2. news paper
- 3. cellular phone
- 4. extension officer
- 5. radio
- 6. TV
- 7. line phone
- 8. other, specify _____

G10	
G11	
G12	
G13	
G14	
G15	
G16	
G17	

Do you call other growers or traders or wholesale markets to find out current prices?

Fill in with 0 = No, 1 = Yes

G18

Does the buyer provide you with any incentives to encourage product quality?

Fill in with 0 = No, 1 = Yes

G19

If **Yes**, what incentives does your buyer provide to you?

Fill in with 0 = No, 1 = Yes

- 1. Higher prices G20
- 2. Access to certified seeds G21
- 3. More credit G22
- 4. Pays advance G23
- 5. Technical assistance G24
- 6. Transportation facilities are available G25

Does the buyer provide you with any incentives to grade and sort?

Fill in with 0 = No, 1 = Yes

G26

If **Yes**, what incentives does your buyer provide to you?

Fill in with 0 = No, 1 = Yes

- 1. Higher prices G27
- 2. Access to certified seeds G28
- 3. More credit G29
- 4. Pays advance G30
- 5. Technical assistance G31

PART H. PRICE AND PAYMENT SYSTEM

Average selling price in 2008 (Rp/kg)

H1

Average selling price in 2009 (Rp/kg)

H2

How did the payment system work in 2009?

Fill in with code 1,2,3 and 4 below

H3

1 = pay in advance

2 = pay cash after delivery the products

3 = 1 - 2 week delay

4 = more than 2 weeks delay

Have you made any equipment purchases specifically to support your potato production in the past three years?

Fill in with 0 = No, 1 = Yes on the list below

1. Land for potato cultivation

H4

2. Storage room or building

H5

3. Other buildings

H6

4. Water pump

H7

5. Other irrigation equipment

H8

6. Harvesting equipment

H9

7. Tractor

H10

8. Trailer

H11

9. Spraying equipment

H12

10. Other equipment

H13

11. Irrigation Well

H14

How do you pay for your seed potatoes?

Fill in with code 1,2 and 3 below

H15

1 = Cash

2 = Loan, pay after harvest

3 = Advance from buyer

4 = Owned seed

5 = Group seed (FFS)

PART I. FARMERS' REASONS NOT CONTRACT WITH INDOFOOD

Have you had the opportunity to contract your potatoes with Indofood? Fill in with 0 = No, 1 = Yes

I 1

If I1= 0 (**No**), questions are finished.

If I1=1 (**Yes**), Fill questions I.2, I.3 and I.4 below

I 2. If you had the opportunity at any time in the past to contract with Indofood and decided to NOT contract then please explain why you chose to NOT contract with Indofood by responding to the following questions? Fill in √ with in coloumn 1, 2, 3, 4 and 5

Reason	1 = Completely Disagree	2 = Somewhat Disagree	3 = Neither Agree nor Disagree	4 = Somewhat Agree	5 = Strongly Agree
I 2a. I am unsure of the quality of Indofood seed, not sure if the yield will be as high as seed I'm currently using.					
I 2b. Do not want to be committed to a contract in case the price goes up.					
I 2c. General riskiness is too high					
I 2d. Do not expect a higher price by selling to Indofood					
I 2e. Did not expect the yield from Indofood seed to be higher					
I 2f. Too many restrictions on how I produce					
I 2g. Do not trust the Indofood trader/buyer to give me a fair price					
I 2h. Would take too long to get paid for my potatoes					
I 2i. Not traditional – this is not what I am familiar with doing					
I 2j. I have not seen other farmers who contract with Indofood benefit					
I 2k. I do not need credit					
I 2l. I do not need technical help					
I 2m. Other (Please explain)					

Note; *) at least the respondent had been offered by friends, relatives or INDOFOOD representatives

I 3. Ask only those who contracted with Indofood either In the past Or currently. How important were the following factors in influencing your decision to contract with Indofood? Fill in √ with in coloumn 1, 2, 3, 4 and 5

	1 = Not at All Important	2 = Somewhat Important	3 = Important	4 = Very Important	5 = Extremely Important
I 3a. Ability to receive a higher price					
I 3b. Ability to increase yields					
I 3c. Ability to make new relationships with other farmers					
I 3d. Access high quality seed					
I 3e. Access to credit for purchasing fertilizer and pesticide					
I 3f. Access to credit for purchasing seed					
I 3g. Having a guaranteed market/buyer for crop					
I 3h. Acquire knowledge/technical assistance from contractor					
I 3i. To acquire knowledge for use on new crops					
I 3j. To acquire knowledge for use on traditional crops					
I 3k. Helps me to get involved in other projects					
I 3l. Saw other farmers were benefitting so I wanted to benefit too.					
I 3m. Guaranteed minimum price					
I 3n. Payment is more reliable					
I 3o. Transportation is organized /No need to organize transportation to market					
I 3p. Reliable supply of inputs					

If I1=1 (Yes), What categories are you? Fill in with code 1 and 2.

I 4

1= I have contracted with INDOFOOD previously (not anymore)
2= Now I involve in the contract with INDOFOOD (period 2008/2009)

If **I4=1**, go on the questions below (from I 5 to I 8 on page 16)

If **I4=2**, go on the questions Part J (page 17).

When was the last contract between you and INDOFOOD? (Year)

I

5

Who decided not to continue the contractual relationship,
you or the buyer? (Fill in with code 1-3)

1. Our household decided not to continue
2. INDOFOOD decided not to continue
3. Someone else _____

[If I6=1] Why did you decide not to grow under contract any more?

--

I

6

1. Prices/remuneration too low, can do better outside contract
2. INDOFOOD did not pay agreed price/remuneration
3. INDOFOOD did not supply agreed inputs/batches
4. Yields were lower than expected
5. Growing was more work than we expected
6. Other _____

[If I6=2] Why did the buyer decide not to contract you
to grow the crop anymore? (Fill in with code 1 - 7)

--

I

7

1. INDOFOOD stopped processing or exporting product
2. INDOFOOD no longer contracting any farmers
3. we can't produce enough
4. we can't produce desired quality
5. we broke terms of the agreement
6. Other reasons _____
7. Not able to achieve the desired FCR

PART J. CONTRACT PRODUCTION – ONLY FOR CONTRACT FARMING GROWERS (INDOFOOD)

Have you ever had a written contract or infomal agreement with a buyer concerning the sale of an agricultural product?

Fill in with: 0 = No,
1 = Yes,

I 1

How was the product delivery taken? (fill in with code 1-3)

- 1 deliver myself , directly to I10
- 2 firm collect at my farm
- 3.I ask other

J 9

Have you ever had a written contract or infomal agreement with In what year did you first have a contract from a buyer (INDOFOOD) to grow potato? (year)

J 2

If 1 deliver self, how do you deliver?
(isikan dengan kode pilihan 1-3)

- 1. cycle,
- 2. motor cycle
- 3. car / pick up/ other opened car

J 10

How long had the first contract been hold? (months)

J 3

How long was your 1st contract? (months)

J 4

How much spent for transportation? (Rupiah)

For how many years has your household grown potato under a contract? (months)

J 11

J 12

In how many years since then have you had a contract from INDOFOOD? (months)

J 5

Why did you choose this company? (fill in with 1-6)

- 1. That was the only company I knew or locally accessible
- 2. I heard good opinion from other contract farmers
- 3. This company give better contract terms
- 4. The company is big & have many experience (brand name)
- 5. I know someone who is contracted
- 6. There is flexibility

J 13

How did you originally become a contract grower potato?

Fill in with code 1- 4

- 1. Local official/extn.worker asked if I wanted to grow under contract
- 2. Indofood asked if we wanted to grow under contract
- 3. We asked or applied to buyer to grow under contract
- 4. We asked or applied to local official to grow under contract

J 6

Why were you offered a contract BY Indofood and not some other farmers? (rank)

- 1 We had more land, could produce more
- 2 We had experience in growing potato
- 3 We could meet high quality standards
- 4 We were closer geographically to buyer (Indofood)
- 5 INDOFOOD knew us and trusted us
- 6 I approached the company myself (INDOFOOD)
- 7 Had irrigation facility

J 7

Do you know other firms who contract this commodity before being contracted?

Fill in with 0 = No, 1 = Yes

J 14

J 8

If yes, would you want to change the company?

Fill in with 0 = No, 1 = Yes

J 15

If yes, what are the reasons?

J 16

.....
.....

PART J. CONTRACT PRODUCTION – ONLY FOR CONTRACT FARMING GROWERS (INDOFOOD) (Continued 1)

Last year, did the buyer offer seed/chicks/planting material for sale, on credit, or for free?
[Use codes 1-6]

- 1. No, did not offer J 17
- 2. Offered for cash sale
- 3. Offered on credit dengan mencicil)
- 4. Offered for free
- 5. Provided by the integrator/firm INDOFOOD, payed in hervest time
- 6. Offered, payed in hervest time

Did the Indofood offer you fertilizer/feed for sale, on credit, or for free?
Fill in with code 1-6 on J 17 J 18

Did the Indofood offer you pesticides/medicines for sale, on credit, or for free?
Fill in with code 1-6 on J 17 J 19

Did the Indofood offer you other inputs for sale, on credit, or for free?
Fill in with code 1-6 on J 17 J 20

Did the Indofood offer you spraying services for sale, on credit, or for free?
Fill in with code 1-6 on J 17 J 21

Did the Indofood offer you other services for sale, on credit, or for free?
Fill in with code 1-6 on J 17 J 22

How was the sale price of the product set?
(Fill in with code 1-5 below) J 23

- 1. Prices are fixed before planting/starting
- 2. INDOFOOD promises to pay market price
- 3. INDOFOOD promises to pay market price plus a fixed margin
- 4. Minimum price set, price may be higher depending on market
- 5. No price guarantee

Do you know the detailed rules for determining the quality ? J 24

Fill in with 0 = No, 1 = Yes

Do you trust the Indofood to do the quality grading fairly? J 25

Fill in with 0 = No, 1 = Yes

Is there someone who serves as intermediary between farmers and INDOFOOD (iFill in with 0 = No, 1 = Yes) J 26

[If J 26 = "yes"] Who serves as intermediary? J 27

- 1. Local government official(s)
- 2. Non-government organization
- 3. One of the contract farmers
- 4. Trader/broker
- 5. head of farmer groups

[If J 26 = "yes"] What services does this person provide?

- 1. Helps distribute inputs (0 =No, 1 = Yes) J 28
- 2. Helps market output (0 =No, 1 = Yes) J 29
- 3. Disseminates technical information (0 =No, 1 = Yes) J 30
- 4. Negotiates terms of contract (0 =No, 1 = Yes) J 31
- 5. Mediates in disagreementsn (0 =No, 1 = Yes) J 32

Which member of the household made the decision to produce under contract? J 33

- 1. Household head
- 2. Head's Spouse
- 3. Both
- 4. Other members

Which member of the household does most of the work to produce this product? [same codes as J33] J 34

What were the main advantages for you of agreeing to this contract? [in order of priority] J 35

- 1. Access to appropriate potato seed
- 2. Access to appropriate fertilizer/feed
- 3. Access to appropriate pesticides/medicienes
- 4. Information on how to produce
- 5. Good (high) price for product
- 6. Fixed price for crop, less risk, assured market
- 7. No investment

PART J. CONTRACT PRODUCTION – ONLY FOR CONTRACT FARMING GROWERS (INDOFOOD) (Continued 2)

Have you experienced any problems with contracting firm?

- 1. Poor quality seed J 38
- 2. Access to appropriate fertilizer J 39
- 3. Poor quality pesticide/medicine
- 4. High cost of inputs
- 5. Delays in delivery of inputs
- 6. Buyer (INDOFOOD) does not give promised price
- 7. Buyer (INDOFOOD) manipulates grading
- 8. No problems
- 9. Delay in Payment
- 10. Delay in collecting the harvest by Indofood

Has the company (INDOFOOD) ever rejected your product? J 40
Fill in with 0 = No, 1 = Yes

If rejected, how many times were you rejected? J 41

If rejected, how much (in quantity/value) the product was rejected in the latest?
 J 42
 J 43

How have you disposed the rejected produce of this latest rejected product? J 44
Fill in with code 1-4

- 1. Sold to local market,
- 2. Sold to processor
- 3. Consumed domestically
- 4. Throw it away

If rejected, did you have any penalty (in last 3 yrs)? 0.No 1Yes J 45

If rejected, what was the reason? Fill in with code 1-2 J 46

- 1. The quality was not met
- 2. Did not deliver/harvest on time

in what forms? Fill in with 1, 2 and 3 J 47

1. Deducted from next output 2.pay cash 3.other
If penalty yes, how much did you have to pay? (Rs) J 48

What types of actions can you take if the firm unfairly not buy your product? J 49

- 1. Sue the firm 2.Nothing can be done 3. others

How did your income change when you started producing under contract compared to before? (fill in with code 1-6) J 50

- 1 Large decrease (>50%) ; 2 Small decrease (<50%); 3 No change
- 4 Small increase (0-50%) ; 5 Large increase (50-100%) ; 6 Very large increase (>100%)

[If J50=increase] What is the main way the increase in income has changed the way your household lives? J 51

- 1. Able to eat better
- 2. Able to keep children in school longer
- 3. Able to spend more on health care
- 4. Able to improve house
- 5. Able to reduce debt
- 6. Able to buy or rent land
- 7. Able to buy more livestock
- 8. Able to add farming cost

[If J50=decrease] What is the main way the increase in income has changed the way your household lives? J 52

- 1. Eating worse than before
- 2. Need to take children out of school
- 3. Need to spend less on health care
- 4. Need to spend less on house
- 5. Need to borrow (increase debt)
- 6. Need to sell or rent out land
- 7. Need to sell livestock

When did you first hear about contracting? Year J 53

How many months since then to apply for contract? (months) J 54

When you first heard about contracting, who was it from? (Fill in with code 1-6) J 55

- 1 relative
- 2 friend
- 3 neighboring farmer
- 4 broker
- 5 farming cooperative
- 6 village gathering

PART J. CONTRACT PRODUCTION – ONLY FOR CONTRACT FARMING GROWERS (INDOFOOD) (Continued 3)

Before contractor approached you, what did information about contract system come from? Fill in with code 1-6	<input type="checkbox"/>	J 56	Who bears the cost of your visit? Fill in with 1.Self 2.Company	<input type="checkbox"/>	J 69
1 relative					
2 friend					
3 neighboring farmer					
4 broker					
5 farming cooperative					
6 village gathering					
How many contracted farmers did you directly know	<input type="checkbox"/>	J 57	How frequently the company staff visits your farm? 1. once a week 2. twice a week 3. thrice a week	<input type="checkbox"/>	J 70
What were the information you obtained from the contracted farmers about the contract? Fill in with code 1-7	<input type="checkbox"/>	J 58	4. Daily (7days/week) 5. routine and if there is any complains 6. Never		
1. Access to appropriate seed					
2. Access to appropriate fertilizer					
3. Access to appropriate pesticides/medicine					
4. Information on how to grow the crop					
5. Good (high) price for the crop					
6. Fixed price for crop					
7. Being sure to be able to sell harvest					
Do you bargain/negotiate in contract ? Fill in with 0 = No, 1 = Yes	<input type="checkbox"/>	J 59			
Process of contract negotiation (from entering until ending the contract)					
1. Number of visits undertaken to find out about business (times)	<input type="checkbox"/>	J 60			
2. Travel cost for all visits (Rupiah)	<input type="checkbox"/>	J 61			
3. Time spent each visit (hours)	<input type="checkbox"/>	J 62			
4. Communication cost (telephone calls, etc.) (Rupiah)	<input type="checkbox"/>	J 63			
5. Notary charges (Stamp paper) (Rupiah)	<input type="checkbox"/>	J 64			
6. Lawyer' fees (Rupiah)	<input type="checkbox"/>	J 65			
7. other required document by the firm (indicate items)	<input type="checkbox"/>	J 66			
How often do you visit the Company site? (per month)	<input type="checkbox"/>	J 67			
How many km is the site from your farm?	<input type="checkbox"/>	J 68			

AGRICULTURAL SOCIO ECONOMIC SURVEY - INDONESIA BEST-WORST QUESTIONNAIRE

February and March 2009
CIP - BALITSA – The University of Adelaide

B.1

Objective: The purpose of this survey is to improve our understanding of agricultural marketing patterns in Indonesia, particularly the relationship between farmers and traders and companies that buy potatoes from them.

The data collected as part of this survey are for research purposes ONLY.

Name of head family	CODE :	
Name of respondent	CODE :	
Location of house/Address	CODE :	
Village	CODE :	
Subdistrict	CODE :	
District/Town	CODE :	
Province	CODE :	
Phone/HP		_____

Household ID number

--	--	--	--

Interview date	Enumerator	House Hold	What is the relationship between [name] and the head of household?*)
	1. Asma S	ID_1	1 Head
	2. Dewi A	ID_2	2 Spouse
	3. Nana	Catt:	3 Son/daughter
	4. Pitri	1 = Male	4 Son/daughter in law
	5. Titie	2 = Female	5 Grandchild
	6. Wawan		6 Parent or parent in law
	7. Eka		7 Other related
			8 Other unrelated

BEST-WORST

1. Describe what “trust” in a buyer relationship means to you. (NOTE: *Please have respondent use their own terms as this will be used to develop “lead ins” for the final survey instrument. It would be a good idea to ask them to list 3 words that describe trust*).

.....
.....
.....
.....
.....

We would now like to ask you 11 questions regarding the importance of several buyers/trader characteristics/attributes that might be important to you when choosing who you sell your potatoes to.

The buyer characteristics that we would like you to consider are explained below:

Price per Kg:

Price means a high price that the buyer is willing to pay you for your potatoes. It is the price per kilogram that the buyer pays you for your potatoes.

Pays cash immediately:

The buyer pays you cash upon receipt of your potatoes. You do not have to wait to get paid for what you are selling. There is no delayed payment.

Access to certified potato seed:

In addition to providing a market for your potatoes, the buyer also helps you obtain access or credit to purchase certified potato seeds.

Credit or access for input purchases:

The buyer or trader helps finance inputs such as fertilizer or pesticides and allows you to pay at some later time.

Provides money for loan:

The buyers provide money for farmer’s capital such as to pay labours and to buy inputs.

Willing to negotiate or match another buyer’s price

The buyers offer bargaining in terms of price and harvest delivery.

Technical Assistance:

The buyer/trader provides information (e.g. extension programs) or technical assistance that can help you improve your quality and/or productivity

Opportunity for price premiums:

The buyer/trader is willing to negotiate a price premium for value adding (e.g. size or sorting)

Established relationship:

You have previous experience working with the buyer/trader. This may involve a long term relationship, they may be a family member.

Always follows through on their commitments to buy my product

You sell your potatoes to a particular buyer since he can ne trusted, such as he is always on time regarding payment.

Shares information about market conditions (e.g price, demand, supply)

The buyers always give market information, such as price, demand, and supply e.g. over-supply causing lower prices etc.

2. a. Who is the buyer who usually buys your product?

b. What are the *3 most important aspects* of the relationship with your buyer/trader (who you sell to)? (Rank 1-11 with 1 most important)

- Price per Kg
- Pays cash IMMEDIATELY on delivery
- Provides access to certified potato seeds
- Provides access to inputs (e.g. credit, provides financing for fertilizer)
- Willing to negotiate or match another buyer's price
- Provides money for loan
- Provide information or technical assistance allows me to improve quality and Productivity
- Established relationship (e.g. family or long time relationship)
- Always follows through on their commitments to buy my product
- Shares information about market conditions
- Provides price premiums for value adding (e.g. size)
- Other, Please explain below

The following example illustrates how to answer each question if you thought that “Established relationship” was the most important attribute and “Provides price premiums” was the least important attribute. This is only an example. Please answer questions A-G based on your personal preferences.

EXAMPLE ONLY:

Most important (tick one box)	Of these, which are the most and least important to choose a ...	Least important (tick one box)
<input type="checkbox"/>	Provides price premiums	✓
<input type="checkbox"/>	Credit or access for input purchases	<input type="checkbox"/>
<input type="checkbox"/>	Access to certified potato seed	<input type="checkbox"/>
✓	Established relationship	<input type="checkbox"/>
<input type="checkbox"/>	Price level	<input type="checkbox"/>
<input type="checkbox"/>	Pays cash immediately	<input type="checkbox"/>

END EXAMPLE

QUESTION A

For each of the following questions (A-K), check only one attribute as the **MOST important** (left hand side) and also check only one attribute as the **LEAST important** (right hand side).

- A. Considering the five characteristics presented below, please tick one box in the left column to indicate the characteristic that is **MOST important** to you and please tick one box in the right column to indicate the characteristic that is **LEAST important** to you. Please tick only one box per column.

Question A		
Most Important (tick one box)	Of these buyer characteristics, which are the Most and Least important to you...	Least important (tick one box)
<input type="checkbox"/>	Price per Kg	<input type="checkbox"/>
<input type="checkbox"/>	Credit or access for input purchases	<input type="checkbox"/>
<input type="checkbox"/>	Provides money for loan	<input type="checkbox"/>
<input type="checkbox"/>	Shares information about market conditions	<input type="checkbox"/>
<input type="checkbox"/>	Access to certified potato seed	<input type="checkbox"/>

- B. Considering the following five characteristics presented below, please tick one box in the left column to indicate the characteristic that is **MOST important** to you and please tick one box in the right column to indicate the characteristic that is **LEAST important** to you. Please tick only one box per column.

Question B		
Most important (tick one box)	Of these, which are the most and least important to choose a ...	Least important (tick one box)
<input type="checkbox"/>	Pays cash immediately	<input type="checkbox"/>
<input type="checkbox"/>	Provides money for loan	<input type="checkbox"/>
<input type="checkbox"/>	Technical Assistance	<input type="checkbox"/>
<input type="checkbox"/>	Provides price premiums	<input type="checkbox"/>
<input type="checkbox"/>	Credit or access for input purchases	<input type="checkbox"/>

- C. Considering the following five characteristics presented below, please tick one box in the left column to indicate the characteristic that is **MOST important** to you and please tick one box in the right column to indicate the characteristic that is **LEAST important** to you. Please tick only one box per column.

Question
C

Most important (tick one box)	Of these, which are the most and least important to choose a ...	Least important (tick one box)
<input type="checkbox"/>	Access to certified potato seed	<input type="checkbox"/>
<input type="checkbox"/>	Technical Assistance	<input type="checkbox"/>
<input type="checkbox"/>	Established relationship	<input type="checkbox"/>
<input type="checkbox"/>	Willing to negotiate or match another buyer's price	<input type="checkbox"/>
<input type="checkbox"/>	Provides money for loan	<input type="checkbox"/>

D. Considering the following five characteristics presented below, please tick one box in the left column to indicate the characteristic that is ***MOST important*** to you and please tick one box in the right column to indicate the characteristic that is ***LEAST important*** to you. Please tick only one box per column.

Question
D

Most important (tick one box)	Of these, which are the most and least important to choose a ...	Least important (tick one box)
<input type="checkbox"/>	Credit or access for input purchases	<input type="checkbox"/>
<input type="checkbox"/>	Established relationship	<input type="checkbox"/>
<input type="checkbox"/>	Always follows through on their commitments to buy my product	<input type="checkbox"/>
<input type="checkbox"/>	Price per Kg	<input type="checkbox"/>
<input type="checkbox"/>	Technical Assistance	<input type="checkbox"/>

E. Considering the following five characteristics presented below, please tick one box in the left column to indicate the characteristic that is ***MOST important*** to you and please tick one box in the right column to indicate the characteristic that is ***LEAST important*** to you. Please tick only one box per column.

Question
E

Most important (tick one box)	Of these, which are the most and least important to choose a ...	Least important (tick one box)
<input type="checkbox"/>	Provides money for loan	<input type="checkbox"/>
<input type="checkbox"/>	Always follows through on their commitments to buy my product	<input type="checkbox"/>
<input type="checkbox"/>	Shares information about market conditions	<input type="checkbox"/>
<input type="checkbox"/>	Pays cash immediately	<input type="checkbox"/>
<input type="checkbox"/>	Established relationship	<input type="checkbox"/>

F. Considering the following five characteristics presented below, please tick one box in the left column to indicate the characteristic that is ***MOST important*** to you and please tick one box in the right column to indicate the characteristic that is ***LEAST important*** to you. Please tick only one box per column.

Question
F

Most important (tick one box)	Of these, which are the most and least important to choose a ...	Least important (tick one box)
<input type="checkbox"/>	Technical Assistance	<input type="checkbox"/>
<input type="checkbox"/>	Shares information about market conditions	<input type="checkbox"/>
<input type="checkbox"/>	Provides price premiums	<input type="checkbox"/>
<input type="checkbox"/>	Access to certified potato seed	<input type="checkbox"/>
<input type="checkbox"/>	Always follows through on their commitments to buy my product	<input type="checkbox"/>

G. Considering the following five characteristics presented below, please tick one box in the left column to indicate the characteristic that is ***MOST important*** to you and please tick one box in the right column to indicate the characteristic that is ***LEAST important*** to you. Please tick only one box per column.

Question
G

Most important (tick one box)	Of these, which are the most and least important to choose a ...	Least important (tick one box)
<input type="checkbox"/>	Established relationship	<input type="checkbox"/>
<input type="checkbox"/>	Provides price premiums	<input type="checkbox"/>
<input type="checkbox"/>	Willing to negotiate or match another buyer's price	<input type="checkbox"/>
<input type="checkbox"/>	Credit or access for input purchases	<input type="checkbox"/>
<input type="checkbox"/>	Shares information about market conditions	<input type="checkbox"/>

H. Considering the following five characteristics presented below, please tick one box in the left column to indicate the characteristic that is ***MOST important*** to you and please tick one box in the right column to indicate the characteristic that is ***LEAST important*** to you. Please tick only one box per column.

Question
H

Most important (tick one box)	Of these, which are the most and least important to choose a ...	Least important (tick one box)
<input type="checkbox"/>	Always follows through on their commitments to buy my product	<input type="checkbox"/>
<input type="checkbox"/>	Willing to negotiate or match another buyer's	<input type="checkbox"/>

Question
H

Most important (tick one box)	Of these, which are the most and least important to choose a ...	Least important (tick one box)
	price	
<input type="checkbox"/>	Price per Kg	<input type="checkbox"/>
<input type="checkbox"/>	Provides money for loan	<input type="checkbox"/>
<input type="checkbox"/>	Provides price premiums	<input type="checkbox"/>

- I. Considering the following five characteristics presented below, please tick one box in the left column to indicate the characteristic that is ***MOST important*** to you and please tick one box in the right column to indicate the characteristic that is ***LEAST important*** to you. Please tick only one box per column.

Question
I

Most important (tick one box)	Of these, which are the most and least important to choose a ...	Least important (tick one box)
<input type="checkbox"/>	Shares information about market conditions	<input type="checkbox"/>
<input type="checkbox"/>	Price per Kg	<input type="checkbox"/>
<input type="checkbox"/>	Pays cash immediately	<input type="checkbox"/>
<input type="checkbox"/>	Technical Assistance	<input type="checkbox"/>
<input type="checkbox"/>	Willing to negotiate or match another buyer's price	<input type="checkbox"/>

- J. Considering the following five characteristics presented below, please tick one box in the left column to indicate the characteristic that is ***MOST important*** to you and please tick one box in the right column to indicate the characteristic that is ***LEAST important*** to you. Please tick only one box per column.

Question
J

Most important (tick one box)	Of these, which are the most and least important to choose a ...	Least important (tick one box)
<input type="checkbox"/>	Provides price premiums	<input type="checkbox"/>
<input type="checkbox"/>	Pays cash immediately	<input type="checkbox"/>
<input type="checkbox"/>	Access to certified potato seed	<input type="checkbox"/>
<input type="checkbox"/>	Established relationship	<input type="checkbox"/>
<input type="checkbox"/>	Price per Kg	<input type="checkbox"/>

- K. Considering the following five characteristics presented below, please tick one box in the left column to indicate the characteristic that is ***MOST important*** to you and please tick one box in the right column to indicate the characteristic that is ***LEAST important*** to you. Please tick only one box per column.

Question
K

Most important (tick one box)	Of these, which are the most and least important to choose a ...	Least important (tick one box)
<input type="checkbox"/>	Willing to negotiate or match another buyer's price	<input type="checkbox"/>
<input type="checkbox"/>	Access to certified potato seed	<input type="checkbox"/>
<input type="checkbox"/>	Credit or access for input purchases	<input type="checkbox"/>
<input type="checkbox"/>	Always follows through on their commitments to buy my product	<input type="checkbox"/>
<input type="checkbox"/>	Pays cash immediately	<input type="checkbox"/>

AGRICULTURAL SOCIO ECONOMIC SURVEY - INDONESIA NON ECONOMIC FACTORS QUESTIONNAIRE

February and March 2009
CIP - IVAGRI – The University of Adelaide

C.1

Relationship quality questionnaire

Objective: The purpose of this survey is to improve our understanding of agricultural marketing patterns in Indonesia, particularly the relationship between farmers and traders and companies that buy potatoes from them
Use of data: The data collected as part of this survey are for research purposes ONLY.

Name of head family	CODE :	
Name of respondent	CODE :	
Location of house/Address	CODE :	
Village	CODE :	
Subdistrict	CODE :	
District/Town	CODE :	
Province	CODE :	
Phone/HP	_____	

Respondent ID number

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Date of interview	Enumerator	Household	What is the relationship ¹⁾ between [name] and the head of household?
	1. Asma S	ID_1	1 Head
	2. Dewi A	ID_2	2 Spouse
	3. Nana	Note:	3 Son/daughter
	4. Pitri	1 = Male	4 Son/daughter in law
	5. Titie	2 = Female	5 Grandchild
	6. Wawan		6 Parent or parent in law
	7. Eka		7 Other related
			8 Other unrelated

¹⁾ This number should match to the column A3 in the Socio economic questionnaire.

No	Construct	Measure items	1= strongly disagree	2= disag ree	3= partly agree/di sagree	4= agree	5= strong ly agree
1	Trust	1 Though circumstances change, I believe that the buyer will be ready and willing to offer me assistance and support 2 When making important decisions, the buyer is concerned about my welfare 3 When I share my problems with the buyer, I know that he will respond with understanding 4 In the future, I can count on the buyer to consider how his decisions and actions will affect me 5 Even when the buyer gives me a rather unlikely explanation, I am confident that he/she is telling the truth 6 The buyer usually keeps the promises that it makes to our firm 7 The buyer(s) gives me advices on my business operations 8 I can count on the buyer to be sincere					
2	Commitment	1 Even if I could, I would not drop the buyer because I like to be associated with him/her 2 I want to remain a member of the buyers' network because I genuinely enjoy our relationship 3 My positive feelings towards the buyers are a major reason why I continue to work with them					
3	Satisfaction	1 I am very pleased with my relationship with the buyer(s) 2 Generally, I am very satisfied with my relationship with the buyer 3 Our relationship has been an unhappy one (reversed)					
4	Ethical profile	1 The buyer(s) has a high reputation 2 I do not care about my buyers' reputation 3 When I have problem with my buyers, I meet them to get problem solving together 4 There is unwritten law that I have to sell to particular buyers					
5	Flexibility	1 When I have problem, my buyer will make sure the problem does not jeopardize our business relationship 2 My buyer is flexible in their contract and arrangement to fit with the current scenario 3 My buyer can adjust the contract condition to fit with my present requirement					
6	Price Satisfaction	1 The buyer keeps all promise regarding commodity price 2 Price changes are communicated to me properly and timely 3 The price information provided by the buyers is complete, correct and frank 4 I know what I pay and what I get 5 I do not believe other buyer/processor will have the same or even better offer 6 Terms and condition of my buyer/ processor are better than those of other buyers/ processors 7 I am convinced that my buyer/processor is the best choice					

	Construct	Measure items	1= strongly disagree	2= disag ree	3= partly agree/di sagree	4= agree	5= strong ly agree
6	Price Satisfac tion	8 I am satisfied with the potato price and grading system 9 I get a good price-quality ratio 10 The potato price depend on my potato quality 11 The potato price equivalent with the production cost 12 The buyer/processor offer me a fair and reasonable potato price 13 My processor does take advantages on me					
7	Communi cation	1 I frequently share general information to my buyer(s) 2 The buyers provide me with information in time 3 The buyers provide me with all relevant market information 4 Information sharing on important issues has become a critical element to maintain this partnership					
8	Restrain from the use of power	1 My buyer has all the power over my potato production 2 I have no alternative buyers 3 I have to always rely on my buyer(s) 4 My buyer(s) controls all the information of production 5 I can always find other buyers to buy my potato					
9	Cultural fit	1 My buyer and I have similar cultures of work 2 I know my buyer's ways of doing things 3 My buyer(s) understands my ways of doing my business 4 My buyer(s) respects to my belief and traditions					

Appendix B Descriptive characteristics of the three sample category in frequency (%)

Variable	GFP (N=192) (%)	FFS (N=50) (%)	Indofood (N=60) (%)
<i>Demographics</i>			
Head household sex			
Female	1.52	2.00	0.00
Male	98.48	98.00	100.00
Reading literary	97.46	100.00	100.00
Writing literary	97.46	100.00	100.00
Marital status			
Single	2.03	2.00	0.00
Married	96.45	98.00	98.33
Separated	0.51	0.00	0.00
Divorced	0.51	0.00	0.00
Widow/widower	0.51	0.00	1.67
Main source of drinking water			
Indoor tap	1.02	8.00	0.00
Outdoor private tap	16.24	28.00	63.33
Outdoor shared tap	17.26	16.00	23.33
Covered well	65.48	44.00	13.33
Mixed outdoor shared tap and covered well	0.00	4.00	0.00
Main type of toilet			
Own toilet with septic tank	74.62	84.00	95.00
Own toilet without septic tank	6.09	8.00	5.00
Shared toilet with other hh	5.58	2.00	0.00
Public toilet	4.06	4.00	0.00
Fishpond	9.64	2.00	0.00
Main type of lighting			
Electric lights	100.00	100.00	98.33
Oil lamps	0.00	0.00	1.67
<i>Capital</i>			
Asset			
Radio	59.39	62.00	66.67
Television	96.95	100.00	98.33
Fan	2.03	12.00	10.00
Computer	0.51	6.00	1.67
Washing machine	12.69	16.00	8.33
Refrigerator	19.80	28.00	30.00
Telephone	10.66	14.00	30.00
Mobile phone	67.51	82.00	86.67
Internet access	4.06	18.00	5.00
Bicycle	27.92	44.00	41.67
Motorbike	67.51	52.00	86.67
Car	20.81	26.00	25.00
Truck	5.08	6.00	1.67
Tractor	0.00	2.00	0.00

Variable	GFP (N=192) (%)	FFS (N=50) (%)	Indofood (N=60) (%)
Cart	2.54	2.00	0.00
Water pump	42.13	50.00	91.67
CD player	63.45	78.00	75.00
Television channel	13.20	12.00	13.33
Livestock	0.00	2.00	5.00
Type of kitchen stove			
Electric	1.52	0.00	0.00
LPG	60.91	78.00	86.67
Biogas	0.51	0.00	0.00
Kerosene	6.60	0.00	8.33
Wood	30.46	22.00	5.00
Investment			
Tractor/Power Tiller	0.00	2.00	1.67
Pump set	44.16	56.00	83.33
Agricultural equipments	95.43	100.00	93.33
Renovate house	28.93	36.00	40.00
Motorbike	68.02	58.00	86.67
Supporting Business Equipment	39.09	40.00	31.67
Education for children	59.39	78.00	75.00
Land	77.66	64.00	80.00
Mist blower	79.19	86.00	95.00
Car	21.83	22.00	26.67
Storehouse	37.56	42.00	58.33
Adornment and saving	49.75	46.00	56.67
Purchased Assets which come from potato income	0.00	0.00	0.00
Tractor/Power Tiller	0.00	0.00	0.00
Pump set	37.06	42.00	75.00
Agricultural equipments	83.25	88.00	83.33
Renovate house	24.37	28.00	36.67
Motorbike	55.33	50.00	76.67
Supporting business equipment	31.47	30.00	30.00
Education for children	52.28	70.00	73.33
Mist blower	70.05	76.00	90.00
Storehouse	35.03	40.00	51.67
Car	16.75	22.00	25.00
<i>Land</i>			
Land tenure system			
Owned and farmed	63.96	44.00	71.67
Owned and rent it out	0.00	2.00	0.00
Owned and sharecropped	1.02	4.00	0.00
Rent land	18.78	36.00	51.67
Sharecropped	2.03	10.00	3.33
Leased from the government	7.61	4.00	0.00
Borrow/leased from family	6.60	18.00	6.67
Pawn	0.51	0.00	10.00

Variable	GFP (N=192) (%)	FFS (N=50) (%)	Indofood (N=60) (%)
Utilized land	27.92	30.00	13.33
Owned and borrowed	0.00	0.00	0.00
Group (FFS)	0.51	80.00	0.00
Owned and not used	0.00	0.00	0.00
Owned and pawned	0.00	0.00	0.00
The top three commodities cultivated in 3 years; 1st rank			
Beans (<i>Phaseolus vulgaris</i>)	1.02	0.00	0.00
Broccolis	2.03	0.00	0.00
White broccolis/ cabbage flower	1.02	0.00	0.00
Mustard green	0.51	4.00	0.00
Curly chilly	0.00	0.00	1.67
Beans	0.51	0.00	0.00
Potato	77.66	84.00	91.67
Tomato	3.05	4.00	0.00
Gherkin	0.00	2.00	0.00
Cabbage	6.60	2.00	6.67
Spring onion	0.51	0.00	0.00
Small green chilly	0.51	0.00	0.00
Other tree crops (tea, coffee, vetiver root)	0.51	0.00	0.00
Carrot	6.09	4.00	0.00
The top three commodities cultivated in 3 years; 2nd rank			
Beans (<i>Phaseolus vulgaris</i>)	4.06	0.00	0.00
Maize	1.02	2.00	3.33
Broccolis	3.55	0.00	0.00
White broccolis/ cabbage flower	1.52	0.00	0.00
Mustard green	1.52	4.00	8.33
Curly chilly	10.15	6.00	5.00
Beans	0.51	0.00	0.00
Groundnuts	0.51	0.00	0.00
Other pulses	0.51	0.00	0.00
Potato	12.69	4.00	6.67
Other tubers	0.51	0.00	0.00
Tomato	10.66	12.00	18.33
Other vegetable, including shallot	0.51	0.00	0.00
Gherkin	0.00	0.00	1.67
Cabbage	36.55	48.00	53.33
Spring onion	4.06	2.00	0.00
Red chilly	0.00	4.00	0.00
Small green chilly	0.00	0.00	1.67
Other tree crops (tea, coffee, vetiver root)	1.02	0.00	0.00
Carrot	10.15	16.00	0.00
The top three commodities cultivated in 3 years; 3rd rank			
Beans (<i>Phaseolus vulgaris</i>)	3.05	0.00	0.00
Maize	3.55	6.00	16.67
Broccolis	0.51	0.00	0.00
White broccolis/ cabbage flower	4.57	2.00	1.67

Variable	GFP (N=192) (%)	FFS (N=50) (%)	Indofood (N=60) (%)
Mustard green	5.08	6.00	8.33
Curly chilly	9.64	4.00	11.67
Soy beans	0.51	0.00	0.00
Groundnuts	0.51	0.00	0.00
Other pulses	2.03	0.00	0.00
Potato	2.03	8.00	1.67
Sweet potato	1.02	0.00	0.00
Other tubers	1.02	2.00	1.67
Tomato	12.69	26.00	23.33
Chinese cabbage	0.51	0.00	0.00
Other vegetable, including shallot	0.51	2.00	0.00
Gherkin	0.00	0.00	1.67
Cabbage	19.29	16.00	11.67
Spring onion	4.57	6.00	0.00
Red chilly	4.06	4.00	1.67
Small green chilly	2.03	4.00	0.00
Other tree crops (tea, coffee, vetiver root)	4.57	0.00	3.33
Other annual crops	0.51	0.00	0.00
Carrot	10.66	2.00	5.00
<i>Transportation</i>			
Main transportation for moving potato			
Buyer picks them up at the farm	27.92	40.00	26.67
Men and women carry	41.12	60.00	53.33
Bicycle	0.00	2.00	0.00
Motor cycle	0.51	0.00	1.67
Pick up trucks	4.06	2.00	0.00
Truck	9.64	8.00	0.00
Ojek (hire someone who owns motorcycles)	33.50	14.00	56.67
<i>Potato varieties</i>			
Expanded or reduced are planted to potatoes?			
Expanded	24.37	28.00	56.67
Reduced	13.20	18.00	10.00
No changes	62.44	54.00	33.33
Variety of potato planting in dry Season February 2005 to August 2005			
Not planting	1.52	0.00	0.00
Granola	55.33	48.00	25.00
Atlantic from Indofood	0.00	0.00	28.33
Atlantic from Balitsa /BPBK	1.02	0.00	0.00
Mata merah (red eye) or Merbabu	4.57	0.00	0.00
Granola; 2 = Atlantic from Indofood	1.02	2.00	1.67
Granola; 3 = Atlantic from Balitsa /BPBK	0.51	0.00	0.00
Variety of potato planting in rainy Season Sep/Oct 2005 to Feb 2006			
Not planting	1.52	0.00	0.00
Granola	60.91	58.00	45.00
Atlantic from Indofood	0.51	0.00	33.33

Variable	GFP (N=192) (%)	FFS (N=50) (%)	Indofood (N=60) (%)
Tango (Balitsa)	0.51	0.00	0.00
Mata merah (red eye) or Merbabu	5.08	0.00	0.00
Granola; 2 = Atlantic from Indofood	1.02	2.00	3.33
Variety of potato planting in dry Season February 2006 to August 2006			
Not planting	1.52	0.00	0.00
Granola	58.88	46.00	16.67
Atlantic from Indofood	0.00	2.00	36.67
Atlantic from Balitsa /BPBK	0.00	2.00	0.00
Mata merah = red eye (Merbabu)	5.58	0.00	0.00
Granola; 2 = Atlantic from Indofood	1.02	4.00	3.33
Variety of potato planting in rainy Season Sep/Oct 2006 to Feb 2007			
Not planting	2.03	0.00	0.00
Granola	65.99	60.00	26.67
Atlantic from Indofood	0.00	4.00	51.67
Tango (Balitsa)	0.51	0.00	0.00
Mata merah = red eye (Merbabu)	7.11	0.00	0.00
Granola; 2 = Atlantic from Indofood	1.02	4.00	3.33
Granola; 6 = Mata merah = red eye (Merbabu)	0.51	0.00	0.00
Variety of potato planting in dry Season February 2007 to August 2007			
Not planting	2.03	0.00	0.00
Granola	60.91	56.00	11.67
Atlantic from Indofood	0.00	0.00	48.33
Mata merah = red eye (Merbabu)	6.60	0.00	0.00
Granola; 2 = Atlantic from Indofood	0.00	4.00	3.33
Mata merah = red eye (Merbabu); 7 = purple potato	0.00	2.00	0.00
Variety of potato planting in rainy Season Sep/Oct 2007 to Feb 2008			
Granola	73.60	62.00	6.67
Atlantic from Indofood	0.51	4.00	73.33
Tango (Balitsa)	0.51	0.00	0.00
Mata merah = red eye (Merbabu)	7.61	0.00	0.00
Purple potato	0.51	0.00	0.00
Granola; 2 = Atlantic from Indofood	0.00	4.00	5.00
Granola; 6 = Mata merah = red eye (Merbabu); 7 = purple potato	0.00	2.00	0.00
<i>Contract relationships</i>			
Obtained production assistance and guidance	92.89	100.00	93.33
The 1st buyer	0.00	0.00	0.00
Trader type I (the trader comes to the farm to buy and collect picks the potatoes)	57.87	66.00	60.00
Trader type II (we delivered the potatoes to the trader)	12.18	2.00	1.67
Sold outside at the edge of the road	19.80	22.00	23.33
Traditional market in the center of the sub district	0.00	2.00	3.33

Variable	GFP (N=192) (%)	FFS (N=50) (%)	Indofood (N=60) (%)
Market in the center of the district	4.06	0.00	1.67
Supplier who supplied to supermarket	0.51	0.00	0.00
Indofood the potato processor (=contract farming)	0.51	0.00	3.33
Contract farming (non indofood)	1.02	0.00	1.67
Other	4.06	8.00	3.33
Sold outside at the edge of the road; 7 = traditional market in the center of the sub district	0.00	0.00	1.67
Main reasons producing potatoes			
Potato price remains stable	51.27	44.00	85.00
Provides high return	37.06	48.00	61.67
The most popular product in the market	80.71	90.00	85.00
Trader suggested	9.64	6.00	18.33
Government extension officer suggested	5.58	12.00	11.67
Potato processor suggested	0.51	4.00	43.33
Wholesale market buyers suggested	3.55	8.00	3.33
Lower inputs costs than other crops	9.64	0.00	5.00
Lack of information regarding other crops	20.81	28.00	21.67
A generation activity	84.26	94.00	90.00
Potato is compatible with the land	91.37	98.00	96.67
Depend on available seed	75.13	90.00	91.67
Main crop as main sources of farm income			
Broccolis	3.05	0.00	0.00
Curly chilly	3.55	2.00	0.00
Big livestock (cows, buffalos, horses)	2.54	2.00	0.00
Potato	49.75	52.00	81.67
Tomato	8.12	20.00	15.00
Cabbage	5.58	12.00	3.33
Spring onion	2.54	2.00	0.00
Red chilly	2.03	4.00	0.00
Other tree crops (tea, coffee, vetiver root)	8.12	0.00	0.00
Carrot	12.18	4.00	0.00
Proportion between potato and farm income last year			
Less than 25%	43.65	36.00	20.00
25 to 50%	28.93	30.00	38.33
50 to 75%	20.30	22.00	31.67
More than 75%	7.11	12.00	10.00
Type of the sold potatoes			
fresh, uncleaned, not graded	3.05	4.00	0.00
fresh, uncleaned, graded	96.95	96.00	98.33
fresh, cleaned, ungraded	0.00	0.00	1.67
Always sell potatoes to one buyer	50.76	50.00	90.00
How to contact the buyer			
By phone	25.89	26.00	46.67
Buyer visits the farm	39.09	30.00	10.00
I go to visit the buyer	10.66	6.00	3.33
Contracted farmers come to cooperative or intermediate persons	0.51	0.00	15.00

Variable	GFP (N=192) (%)	FFS (N=50) (%)	Indofood (N=60) (%)
Through middlemen	17.26	18.00	15.00
Farmer goes to buyers or meets at somewhere	3.55	6.00	0.00
Time to deal with the buyer			
Before planting	3.55	10.00	96.67
Just before harvest	4.57	10.00	0.00
During harvest	1.02	0.00	0.00
After harvest	90.86	80.00	0.00
Type of contract			
Written contract	3.05	0.00	0.00
Oral or verbal (used to be deal by using mobile phone)	12.69	20.00	3.33
Spot market (organize after harvest negotiate sale)	81.73	68.00	0.00
Unlimited contract/ sub-contract	2.54	12.00	95.00
The main point of agreement with the buyer:			
Quantity	79.19	68.00	45.00
Time of payment	87.82	88.00	95.00
Sorting by size	79.19	86.00	86.67
Premium price for Grade/Size	63.96	66.00	21.67
Cleaning	33.50	22.00	26.67
Loan repayments for advances	31.98	28.00	21.67
Transportation	29.44	32.00	46.67
Other	2.54	2.00	5.00
Source of Price Information			
Government extension office	0.51	6.00	0.00
Other farmer	72.59	86.00	25.00
Trader	86.80	90.00	31.67
Directly from the traditional market	28.93	46.00	16.67
Wholesale market in big city (eg Bandung or Jakarta)	20.30	30.00	1.67
Factory of potato product processing	0.00	4.00	91.67
Other	4.57	0.00	5.00
Channel of the price information			
Direct contact	94.92	94.00	96.67
News paper	2.03	4.00	1.67
Cellular phone	38.58	66.00	31.67
Extension officer	0.51	0.00	0.00
Radio	3.05	12.00	0.00
TV	0.51	4.00	0.00
Line phone	1.02	0.00	0.00
Other	1.52	2.00	3.33
Calling other growers or traders or wholesale markets to find out current prices	92.89	96.00	35.00
The buyer provided incentives to encourage product quality	55.84	54.00	5.00
Incentives providing the buyer to encourage product quality			
Higher prices	55.84	52.00	5.00
Access to certified seeds	1.52	8.00	3.33
More credit	8.63	18.00	0.00
Pays advance	2.54	14.00	3.33

Variable	GFP (N=192) (%)	FFS (N=50) (%)	Indofood (N=60) (%)
Technical assistance	0.51	2.00	1.67
Transportation facilities are available	6.09	18.00	6.67
The buyer provided incentives to grade and sort	45.18	38.00	0.00
Incentives providing the buyer for grading and sorting			
Higher prices	44.67	36.00	0.00
Access to certified seeds	0.51	2.00	0.00
More credit	1.02	4.00	0.00
Pays advance	1.02	2.00	0.00
Technical assistance	0.51	0.00	0.00
Equipment purchases to support potato production in the past three years			
Land for potato cultivation	14.21	4.00	21.67
Storage room or building	8.63	2.00	5.00
Other buildings	2.03	2.00	3.33
Water pump	13.20	18.00	20.00
Other irrigation equipment	15.74	16.00	10.00
Harvesting equipment	11.17	6.00	6.67
Spraying equipment	28.43	38.00	41.67
Other equipment	23.35	28.00	23.33
Irrigation Well	1.52	2.00	1.67

Appendix C Tests for check the validity of the variables in the study

Levene's Test of Equality of Error Variances^a

	F	df1	df2	Sig.
Age of respondents (years)	3.286	2	304	.039
Length time of formal education (years)	5.178	2	304	.006
Owned land (meter squares)	.436	2	304	.647
Land for potatoes (meter squares)	2.449	2	304	.088
Experience in potato farming (years)	6.084	2	304	.003
Flexibility	4.061	2	304	.018
Price satisfaction in general definition	9.916	2	304	.000
Relative price satisfaction	2.798	2	304	.063
Price satisfaction regarding potatoes quality	6.144	2	304	.002
Communication	1.286	2	304	.278
Excessive use of power	.650	2	304	.523
Organisational culture	2.497	2	304	.084
Reputation	6.565	2	304	.002
When I have problem with my buyers, I meet them to get problem solving together:	17.846	2	304	.000

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + category

Tukey HSD Test

No	Dependent Variable	Group mean		
		FFS	Indofood	GPF
1	Communication	0.121	0.075	-0.054
2	Price transparency	-0.123	0.466 ^a	-0.110 ^b
3	Relative price	0.725	-0.224 ^a	-0.034 ^b
4	Price quality ratio	0.999	0.053 ^a	0.169 ^b
5	Joint problem solving	3.600	3.850	3.500 ^b
6	Reputation	0.013	0.282	-0.089 ^b
7	Flexibility	0.036	0.340	-0.113 ^b
8	Dependence	-0.170	0.804 ^a	-0.202 ^b
9	Firm size (ha)	1.224	1.239	0.911
10	Experience (years)	16 ^c	19	21 ^a
11	Age (years)	41 ^c	44	47
12	Actual price (rupiah)	3169	3463	3225 ^b

^a = Mean is significantly different than FFS.

^b = Mean is significantly different than Indofood.

^c = Mean is significantly different than GPF.

KMO and Bartlett's Test for Commitment

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.677
Bartlett's Test of Sphericity	Approx. Chi-Square
	341.126
	df
	3
	Sig.
	.000

KMO and Bartlett's Test Communication

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.809
Bartlett's Test of Sphericity	Approx. Chi-Square
	485.449
	df
	6
	Sig.
	.000

KMO and Bartlett's Test Flexibility

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.517
Bartlett's Test of Sphericity	Approx. Chi-Square
	61.410
	df
	3
	Sig.
	.000

KMO and Bartlett's Test for Organisational culture

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.657
Bartlett's Test of Sphericity	Approx. Chi-Square
	138.813
	df
	6
	Sig.
	.000

KMO and Bartlett's Test for Power

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.613
Bartlett's Test of Sphericity	104.668
df	6
Sig.	.000

KMO and Bartlett's Test for Price satisfaction

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.810
Bartlett's Test of Sphericity	818.995
df	66
Sig.	.000

KMO and Bartlett's Test for Reputation

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.500
Bartlett's Test of Sphericity	.600
df	1
Sig.	.439

KMO and Bartlett's Test for Trust

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.795
Bartlett's Test of Sphericity	626.279
df	28
Sig.	.000

```
. ttest Satisfy_1 if var102==3 ,by(gender)
Two-sample t test with equal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
1	60	3.983333	.0557013	.4314605	3.871875	4.094791
2	60	3.983333	.0650583	.5039393	3.853152	4.113515
combined	120	3.983333	.0426426	.4671266	3.898897	4.06777
diff		0	.0856459		-.1696022	.1696022

diff = mean(1) - mean(2) t = 0.0000
 Ho: diff = 0 degrees of freedom = 118
 Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr(T < t) = 0.5000 Pr(|T| > |t|) = 1.0000 Pr(T > t) = 0.5000

```
. ttest Satisfy_2 if var102==3 ,by(gender)
Two-sample t test with equal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
1	60	3.733333	.1004697	.778235	3.532294	3.934373
2	60	3.7	.104422	.8088494	3.491052	3.908948
combined	120	3.716667	.0721647	.7905251	3.573773	3.85956
diff		.0333333	.1449073		-.2536225	.3202892

diff = mean(1) - mean(2) t = 0.2300
 Ho: diff = 0 degrees of freedom = 118
 Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr(T < t) = 0.5908 Pr(|T| > |t|) = 0.8185 Pr(T > t) = 0.4092

```
. ttest Satisfy_3b if var102==3 ,by(gender)
Two-sample t test with equal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
1	60	3.966667	.0750392	.5812513	3.816514	4.11682
2	60	4	.0628872	.4871223	3.874163	4.125837

```

combined |      120      3.983333      .0487711      .5342604      3.886762      4.079905
-----+-----
diff |      -0.0333333      .0979065      -0.2272149      .1605482
-----+-----
diff = mean(1) - mean(2)                                t = -0.3405
Ho: diff = 0                                             degrees of freedom = 118
Ha: diff < 0                                             Ha: diff != 0
Pr(T < t) = 0.3671      Pr(|T| > |t|) = 0.7341      Pr(T > t) = 0.6329

```

```

. ttest Trust_5 if var102==3 ,by(gender)
Two-sample t test with equal variances

```

```

-----+-----
Group |      Obs      Mean      Std. Err.      Std. Dev.      [95% Conf. Interval]
-----+-----
1 |      60      3.533333      .1222821      .9471933      3.288647      3.778019
2 |      60      3.633333      .1139101      .8823441      3.4054      3.861267
-----+-----
combined |      120      3.583333      .0833333      .9128709      3.418325      3.748342
-----+-----
diff |      -0.1      .167118      -0.4309392      .2309392
-----+-----
diff = mean(1) - mean(2)                                t = -0.5984
Ho: diff = 0                                             degrees of freedom = 118
Ha: diff < 0                                             Ha: diff != 0
Pr(T < t) = 0.2754      Pr(|T| > |t|) = 0.5507      Pr(T > t) = 0.7246

```

```

. ttest Trust_6 if var102==3 ,by(gender)
Two-sample t test with equal variances

```

```

-----+-----
Group |      Obs      Mean      Std. Err.      Std. Dev.      [95% Conf. Interval]
-----+-----
1 |      60      3.8      .0944804      .7318423      3.610945      3.989055
2 |      60      3.75      .0997879      .7729538      3.550325      3.949675
-----+-----
combined |      120      3.775      .0684589      .74993      3.639444      3.910556
-----+-----
diff |      0.05      .1374197      -0.2221285      .3221285
-----+-----
diff = mean(1) - mean(2)                                t = 0.3638
Ho: diff = 0                                             degrees of freedom = 118
Ha: diff < 0                                             Ha: diff != 0
Pr(T < t) = 0.6417      Pr(|T| > |t|) = 0.7166      Pr(T > t) = 0.3583

```

```

. ttest Trust_8 if var102==3 ,by(gender)
Two-sample t test with equal variances

```

```

-----+-----
Group |      Obs      Mean      Std. Err.      Std. Dev.      [95% Conf. Interval]
-----+-----
1 |      60      3.5      .1127469      .8733338      3.274394      3.725606
2 |      60      3.366667      .1211216      .9382036      3.124303      3.60903
-----+-----
combined |      120      3.433333      .082616      .9050125      3.269745      3.596921
-----+-----
diff |      0.1333333      .165476      -0.1943541      .4610208
-----+-----
diff = mean(1) - mean(2)                                t = 0.8058
Ho: diff = 0                                             degrees of freedom = 118
Ha: diff < 0                                             Ha: diff != 0
Pr(T < t) = 0.7890      Pr(|T| > |t|) = 0.4220      Pr(T > t) = 0.2110

```

```

. ttest Trust_1 if var102==3 ,by(gender)
Two-sample t test with equal variances

```

```

-----+-----
Group |      Obs      Mean      Std. Err.      Std. Dev.      [95% Conf. Interval]
-----+-----
1 |      60      3.783333      .1091613      .84556      3.564902      4.001765
2 |      60      3.866667      .0804882      .6234586      3.70561      4.027723
-----+-----
combined |      120      3.825      .0676356      .7409113      3.691075      3.958925
-----+-----

```

```

diff |          -.0833333   .1356265           -.3519107   .185244
-----+-----
diff = mean(1) - mean(2)                                t =  -0.6144
Ho: diff = 0                                           degrees of freedom = 118
Ha: diff < 0                                           Ha: diff != 0       Ha: diff > 0
Pr(T < t) = 0.2701      Pr(|T| > |t|) = 0.5401      Pr(T > t) = 0.7299

```

```

. ttest Trust_2 if var102==3 ,by(gender)
Two-sample t test with equal variances

```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
1	60	3.666667	.1180507	.9144169	3.430448	3.902886
2	60	3.533333	.1101275	.8530437	3.312969	3.753698
combined	120	3.6	.0806139	.8830809	3.440376	3.759624
diff		.1333333	.1614436		-.1863689	.4530356

```

diff = mean(1) - mean(2)                                t =  0.8259
Ho: diff = 0                                           degrees of freedom = 118
Ha: diff < 0                                           Ha: diff != 0       Ha: diff > 0
Pr(T < t) = 0.7947      Pr(|T| > |t|) = 0.4105      Pr(T > t) = 0.2053

```

```

. ttest Trust_3 if var102==3 ,by(gender)
Two-sample t test with equal variances

```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
1	60	3.616667	.1259801	.975838	3.364581	3.868752
2	60	3.483333	.1200086	.9295829	3.243197	3.72347
combined	120	3.55	.0868448	.951337	3.378039	3.721961
diff		.1333333	.1739916		-.2112174	.477884

```

diff = mean(1) - mean(2)                                t =  0.7663
Ho: diff = 0                                           degrees of freedom = 118
Ha: diff < 0                                           Ha: diff != 0       Ha: diff > 0
Pr(T < t) = 0.7775      Pr(|T| > |t|) = 0.4450      Pr(T > t) = 0.2225

```

```

. ttest Trust_7 if var102==3 ,by(gender)
Two-sample t test with equal variances

```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
1	60	3.633333	.1114026	.8629211	3.410417	3.856249
2	60	3.4	.1216645	.9424095	3.15655	3.64345
combined	120	3.516667	.0828276	.9073309	3.35266	3.680674
diff		.2333333	.164963		-.0933384	.5600051

```

diff = mean(1) - mean(2)                                t =  1.4145
Ho: diff = 0                                           degrees of freedom = 118
Ha: diff < 0                                           Ha: diff != 0       Ha: diff > 0
Pr(T < t) = 0.9201      Pr(|T| > |t|) = 0.1599      Pr(T > t) = 0.0799

```

```

. ttest Commit_1 if var102==3 ,by(gender)
Two-sample t test with equal variances

```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
1	60	4.033333	.0750392	.5812513	3.88318	4.183486
2	60	3.966667	.08883	.6880744	3.788918	4.144415
combined	120	4	.0579771	.6351073	3.8852	4.1148
diff		.0666667	.1162827		-.1636047	.296938

```

diff = mean(1) - mean(2)                                t = 0.5733
Ho: diff = 0                                           degrees of freedom = 118
Ha: diff < 0                                           Ha: diff != 0                                           Ha: diff > 0
Pr(T < t) = 0.7162                                     Pr(|T| > |t|) = 0.5675                                     Pr(T > t) = 0.2838

```

```

. ttest Commit_2 if var102==3 ,by(gender)
Two-sample t test with equal variances

```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
1	60	4.133333	.0555744	.4304773	4.022129	4.244537
2	60	4.116667	.0417936	.3237318	4.033038	4.200295
combined	120	4.125	.0346299	.3793515	4.056429	4.193571
diff		.0166667	.0695357		-.121033	.1543663

```

diff = mean(1) - mean(2)                                t = 0.2397
Ho: diff = 0                                           degrees of freedom = 118
Ha: diff < 0                                           Ha: diff != 0                                           Ha: diff > 0
Pr(T < t) = 0.5945                                     Pr(|T| > |t|) = 0.8110                                     Pr(T > t) = 0.4055

```

```

. ttest Commit_3 if var102==3 ,by(gender)
Two-sample t test with equal variances

```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
1	60	4	.0713074	.5523448	3.857314	4.142686
2	60	4.083333	.0596206	.4618191	3.964033	4.202634
combined	120	4.041667	.0464358	.5086782	3.949719	4.133614
diff		-.0833333	.0929482		-.267396	.1007293

```

diff = mean(1) - mean(2)                                t = -0.8966
Ho: diff = 0                                           degrees of freedom = 118
Ha: diff < 0                                           Ha: diff != 0                                           Ha: diff > 0
Pr(T < t) = 0.1859                                     Pr(|T| > |t|) = 0.3718                                     Pr(T > t) = 0.8141

```

```

. ttest PriceSat_8 if var102==3 ,by(gender)
Two-sample t test with equal variances

```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
1	60	3.466667	.1222821	.9471933	3.221981	3.711353
2	60	3.5	.1102129	.8537058	3.279464	3.720536
combined	120	3.483333	.0819778	.8980215	3.321009	3.645658
diff		-.0333333	.1646202		-.3593262	.2926595

```

diff = mean(1) - mean(2)                                t = -0.2025
Ho: diff = 0                                           degrees of freedom = 118
Ha: diff < 0                                           Ha: diff != 0                                           Ha: diff > 0
Pr(T < t) = 0.4199                                     Pr(|T| > |t|) = 0.8399                                     Pr(T > t) = 0.5801

```

```

. ttest PriceSat_9 if var102==3 ,by(gender)
Two-sample t test with equal variances

```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
1	60	3.65	.0915189	.7089022	3.466871	3.833129
2	60	3.5	.1127469	.8733338	3.274394	3.725606
combined	120	3.575	.0726282	.7956024	3.431189	3.718811
diff		.15	.1452156		-.1375664	.4375664

```

diff = mean(1) - mean(2)                                t = 1.0329
Ho: diff = 0                                           degrees of freedom = 118

```

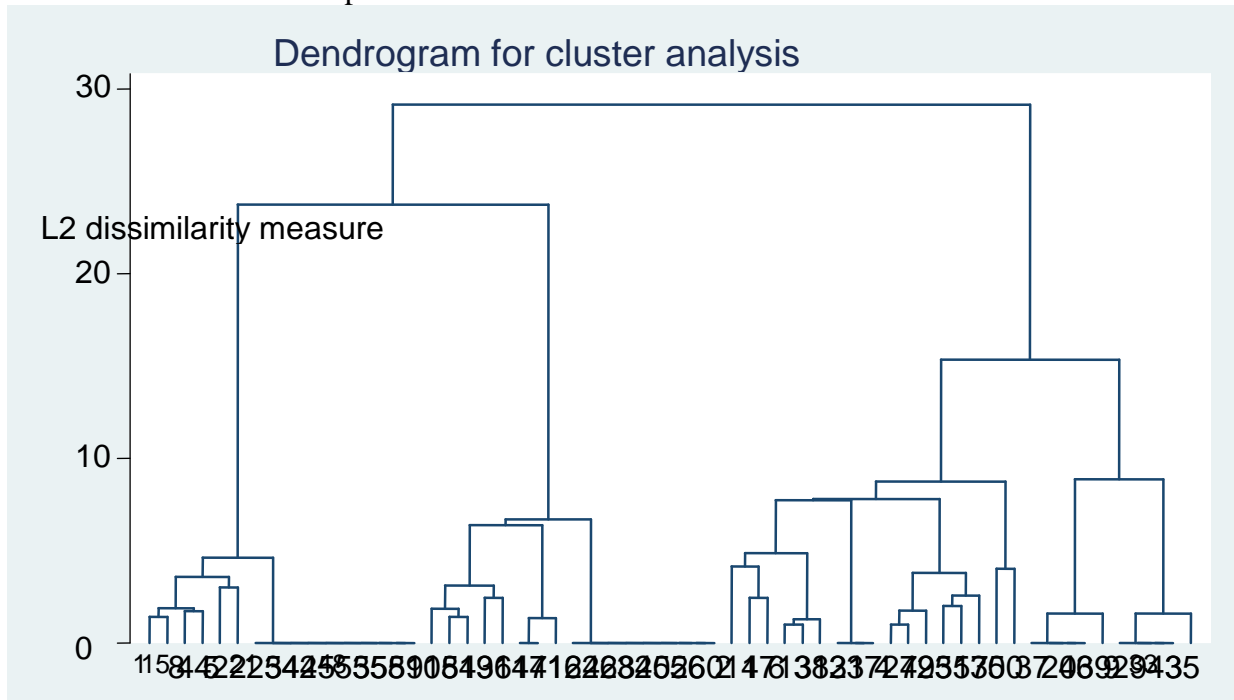


```
. ttest PriceSat_12 if var102==3 ,by(gender)
Two-sample t test with equal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
1	60	3.616667	.1011003	.7831199	3.414365	3.818968
2	60	3.55	.0992201	.7685558	3.351461	3.748539
combined	120	3.583333	.070595	.77333	3.443548	3.723119
diff		.0666667	.1416542		-.2138472	.3471806

```
diff = mean(1) - mean(2)                                t = 0.4706
Ho: diff = 0                                           degrees of freedom = 118
Ha: diff < 0                                           Ha: diff != 0
Pr(T < t) = 0.6806                                     Pr(|T| > |t|) = 0.6388
Pr(T > t) = 0.3194
```

Appendix D Analysis of number of clusters based on dendrogram and Calinski and Harabasz procedure.



Calinski and Harabasz procedure

Number of clusters	Calinski / Harabasz pseudo-F
2	18.23
3	17.09
4	17.63
5	14.91
6	17.11
7	17.98
8	18.24
9	16.63
10	17.76
11	18.62
12	16.95
13	18.27
14	20.14
15	21.57

Appendix E Statement of authorship

Statement of Authorship

Eka Puspitawati developed the survey questionnaire, collected and analyzed the data, developed the conceptual model and wrote the article of “Determinants of Trust in the Indonesian Potato Industry: A Comparison between Groups of Potato Farmers”, published in *Journal of Agribusiness*, 2011 Vol.29, No.1 (Spring 2011), pp. 117-140.

Signature

Date 27th July 2012

Amos Gyau supervised the conceptual model and helped interpret the data, and edits the text of the article and gives consent to Eka Puspitawati to present this article for the Doctor of Philosophy examination.

Signature

Date 1st August 2012

Randy Stringer supervised the development of this work, and edits the text of the article and gives consent to Eka Puspitawati to present this article for the Doctor of Philosophy examination.

Signature

Date 1st August 2012

Wendy J. Umberger reviewed and commented on the final draft of the article and gives consent to Eka Puspitawati to present this article for the Doctor of Philosophy examination.

Signature

Date 1st August 2012

Appendix F Journal Publication

Puspitawati, E., Gyau, A., Stringer, R. & Umberger, W.J. (2011) Determinants of Trust in the Indonesian Potato Industry: A Comparison Between Groups of Potato Farmers. *Journal of Agribusiness*, v. 29(1), pp. 433-456

NOTE:

This publication is included on pages 300-325 in the print copy of the thesis held in the University of Adelaide Library.

Appendix G Glossary

Although some of the terms contained in this glossary are generic, they may be defined in reference to the agricultural marketing or relationship quality.

agrifood transformation profoundly and rapidly supply chain structure changes on agrifood markets which relate to various economic dimensions, distributional consequences, supply chain consolidation, and environmental outcomes.

ANOVA one way Analysis of Variance a test to determine whether there is a significant difference between the means of the two variables.

atlantic marketing channel a supply chain involving farmers' groups producing Atlantic potatoes for potato chips and the Indofood Company.

bargaining costs costs of gathering information on prices in other transactions, and on factors that may influence the willingness to buy by the other party to the transaction, on implications of contract terms.

buyer type I buyers who come to the farms for buying and collecting the potatoes.

buyer type II buyers who delivers potatoes to the buyer.

cluster analysis a method to identify the actual groups of individuals or objects that are similar to each other but different from individuals in other groups.

commitment a dimension of trust which conveys a desire for stable relationships, willingness to make short term sacrifices for the sake of maintaining the relationship, and a belief in relationship stability.

communication a dimension of trust which conveys formal as well as informal sharing of meaningful, timely and frequent information between firms.

contextual characteristics aspects factors influencing farmers' participation in the modern channels i.e. experience in farming, income structure (proportion of potato income), involving in farm groups and farm with one potato variety are expected to support farmers' participation.

contract farming an agreement between farmers and processing and/or marketing firms for the production and supply of agricultural products under forward agreements, frequently at predetermined prices.

contract oriented group (CO) a contract farmer cluster which has characteristics as follow less assets and income, forming a long term relationship with the firm and gaining as much as possible from the contract.

contractual arrangement a formal/non-formal agreement between buyers and sellers which conveys monitoring systems, technical assistance, and private standards and quality.

Cronbach's Alpha a reliability test to analyze the measurement scale used for all the relational variables.

dependency partners feeling under rewarded, angry and resentful and may result in suspicion and mistrust in the relationship between the buyers and sellers.

enforcement costs costs incurred in ensuring contract provisions are met, including the costs of default provisions.

ex ante motivations the nature of the motives of farmers' participating in modern markets.

ex post motivations motives of farmers' participating after involving in the modern channels.

export supply chain a modern supply chain which supplies the high value agribusiness products to export markets.

farm capacity aspects factors influencing farmers' participation in the modern channels including land cultivated for potato, land irrigated, ownership of water pumps, ownership of motorbikes, ownership of land for agriculture, ownership of cars, and farms with phones

Farmer Field School (FFS) a group of farmers who involve the FFS project.

Farmer Field School (FFS) project a project by ACIAR which provides an opportunity for learning-by-doing, based on principles of non-formal education in order to agroecological concepts and develop integrated pest management (IPM) skills through self-discovery activities practiced in the field.

financial performance of relationships short-term results in the relationships and focuses on the goals of the buyer and seller in their relationships (Beugelsdijk et al. 2006).

five-point likert scale respondents' levels of agreement from 1 = strongly disagree to 5 = strongly agree.

flexibility a dimension of trust which conveys a result of the bounded rationality of manager's decision making, the limited availability of information and the non-constant state of the environment.

general farmer population (GFP) a group of farmers who involve in traditional channels.

goodwill trust farmers' perceptions of their buyers based on the buyers' responsibility, dependability, and integrity.

granola marketing channel a supply chain involving farmers and traders who sell to the main traditional markets for household consumption.

Heckman two-stage a method to avoid biased estimates and control for the conditional probability of a farm being in a given group such as modern channel group.

Heuratic model a model which explains how retailers as modern markets and suppliers represented by farmers make decisions in the diffusion process of procurement system innovations in the agrifood chain system.

hierarchical clustering a method to form clusters using some criterions such as a criterion for determining similarity or distance between cases, a criterion for determining which clusters are merged at successive steps, and the number of clusters that are needed to represent the data.

high value agribusiness products (HVAP) products that are typically perishable, specific high-value, and are sold through specialized markets.

honesty trust farmers' perceptions of their partners' words, fulfilling their promised obligations and sincerity.

incentives aspects factors influencing farmers' participation in the modern channels which show relative cost and risk of the farm and post-harvested handling technologies which are needed to meet the commodity quality and transactional requirements of the modern channel.

Indofood a group of farmers who sell their potatoes under forward contracts to the modern channels particularly Indofood.

integrated pest management (IPM) an FAO program which contains: (1) 80% of study time and evaluation are in the field; (2) adopting Learning by doing as demonstrated in full comprehension, expression, analysis and summary by the farmer; (3) Understanding the ecosystem through weekly, systematic and detailed analysis over the whole season; (4) Using methods and materials which are practical and available at village level; and (5) A curriculum based on acquiring field skills, group facilitation skills, process, analysis, presentation and discussion.

Inverse Mills Ratio (IMR) a value in the treatment effects model calculated from the selection equation and adjusts the outcome equation for the selection bias.

joint problem solving a dimension of trust which conveys a departure from the anchor point of discreteness that underlies spot-market transactions towards a relational, bilateral exchange.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO-MSA) a test for the appropriateness of the PCA for the scales. The measurements are accepted if the KMO-MSA value greater than 0.5.

k-means clustering a method to form clusters which do not require computation of all possible distances.

large food processing supply chain a modern supply chain which supplies the high value agribusiness products to large food processors.

linear regression an approach to model the relationship between a random variable called a dependent variable and one or more explanatory variables.

MANOVA multivariate analysis of variance a test for comparing multivariate means of two sample groups.

market-channel adoption an appropriately ‘post-harvest technology’ decision (Goetz 1992; Hernández, Reardon, and Berdegué 2007) where farmers are pushed to make decisions on adoption of technology as a result of procurement and output marketing.

market-derived (MD) a contract farmer cluster which has characteristics as follow more income and assets, less motivated to involve in contracts, and can easily exit from the contract.

mixed supply chain a modern supply chain which supplies the high value agribusiness products to export, supermarket, and large food processing markets.

modern supply chains various chains which require high value agribusiness products (HVAP) and their markets are export, supermarket, and agribusiness food processor.

monitoring costs costs associated with monitoring contract performance.

Neo-classical economic theory a theory based on a perfect competitive market as an ideal condition to be achieved in an economy.

New Institutional Economics (NIE) a theory concerned with induced technological changes, organizational, and institutional changes.

non-financial performance of relationship the behavioral dimensions such as satisfaction, commitment, communication and flexibility in the relationships (O’Toole and Donaldson 2000; O’Toole and Donaldson 2002).

ordinary least squares (OLS) an estimation technique for linear regression which estimates the maximum likelihood.

organizational culture a dimension of satisfaction in gender relationship which represents assumptions, values, beliefs and norms affecting deeply on thinking and social action of decision makers.

orientation a dimension of satisfaction in gender relationship which refers to a selling behavior that focuses on maintaining long-term buyer satisfaction.

perfect competition a market condition which is characterized by free and complete information, homogenous goods, the absence of externalities, and no control over prices by buyers and sellers.

performance a dimension of satisfaction which refers to perceived business relationship performance by looking at the financial and non financial performance attributes.

price fairness a dimension of satisfaction in gender relationship which refers to perceptions on the accepted price is reasonable, acceptable, and justifiable.

price quality ratio a dimension of trust which expresses an emotional state that occurs in response to an evaluation of all interaction experience with a partner.

price transparency a dimension of trust which conveys clear, comprehensive, current, and effortless overview about offered buyers' prices.

Principal Components Analysis (PCA) a method to transform into new variables and tries to re-express the data as a sum of uncorrelated components.

principal-agent theory a theory which applies two assumptions; (1) that goal conflicts exist between the principals and agents, and (2) that agents have more information than their principals.

probit analysis a type of regression used to analyze binomial response variables.

random sampling a sampling technique where a group of subjects (a sample) for study from a larger group (a population) is selected.

relationship marketing the producers' perception on how their relationships fulfil the expectations, predictions, goals and desires of the customer.

relative price satisfaction a dimension of trust that farmers do not only consider the price paid to them, but also compare the price to some reference price levels.

reputation partners' ability to attract the best and brightest in competitive markets and showing a high and credible reputation.

satisfaction a positive state resulted an emotional state that occurs in response to an evaluation of all interaction experience with the partner. In this study, satisfaction represents a multidimensional of trust.

screening costs costs associated with gathering information about the reliability of a buyer/seller and the quality of goods being transacted.

search costs costs associated with identifying potential buyers and sellers.

small-scale farmers farmers who are seen by buyers operating small scales of potato lands on average.

socio-demographics aspects factors influencing farmers' participation in the modern channels such as the age of the household head, the education of the household head, and the household size.

SPSS Statistical Package for Social Sciences statistical software for social sciences.

STATA Analysis and Statistical Software statistical software for windows.

structural ambiguity a degree of uncertainty in parties' understanding which occurs when the farmers are uncertain about their partners' conditions and partners' expectations with respect to the relationships.

supermarket supply chain a modern supply chain which supplies the high value agribusiness products to modern markets such as minimarket, supermarket, hypermart, etc.

traditional marketing supply chain a marketing channel which its main market is household consumption.

transaction costs economic and non-economic costs which include (1) search costs; (2) screening costs; (3) bargaining costs; (4) monitoring costs; (5) enforcement costs; and (6) transfer costs.

transfer costs costs which calculate expenses for transport, storage, processing, retailing, wholesaling and losses.

treatment effect model a model (called the Heckman selection-correction) which corrects for self-selection in groups, and the sample selection bias in turn can be avoided.

trust a willingness to rely on an exchange partner in whom one has confidence.

t-test a test to assess the means of two groups are statistically different from each other.

Tukey test or Tukey's Honestly Significant Difference (HSD) test a post-hoc test in statistics to know all possible pairwise comparisons (comparing sets of two) among the variable means.

uncertainty a dimension of satisfaction in gender relationship which refers to the difficulty experienced by decision makers (buyer/sellers) in predicting the outcomes.

vertical coordination an integrated and coordinated supply chain in the vertical stages of production where market power can be transferred via integration to neighboring stages in a market channel.

Ward's hierarchical clustering a method to find the number of clusters in the hierarchical procedure.

Wilcoxon sign-rank test a non-parametric statistical hypothesis test which is used to compare two related samples, matched samples, or repeated measurements on a single sample.