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**SUPERMARKET SUPPLY CHAIN FOR FRESH FRUITS AND VEGETABLES:
OPPORTUNITIES AND CHALLENGES FOR SMALL FARMERS**

A Thesis

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ABSTRACT

SUPERMARKET SUPPLY CHAIN FOR FRESH FRUITS AND VEGETABLES: OPPORTUNITIES AND CHALLENGES FOR SMALL FARMERS

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Agrifood systems are facing dynamic changes in both developed and developing countries. Transactions of food products that were usually made in spot markets (SM) are now increasingly made in coordinated markets. One of the reasons for this change is the influence exerted by retail and food service chains as well as food processors. While this situation represents opportunities for small producers, the high standards set by buyers in terms of quantity, quality, timing, safety, packaging, etc., can prevent farmers from exploiting such opportunities, because of the significant changes required in their production and marketing systems. Further, the associated coordination and transaction costs can drive buyers towards a smaller supply base of large producers. Concerned about such changes in agrifood systems in developing countries, a New Institutional Economics (NIE) framework is used to analyze the supermarket supply chain (SSC) for fresh fruits and vegetables (FFV) in Honduras. Within the NIE framework, special emphasis is put on the role of transaction costs and collective action.

The purpose of this study is to assess the level and form of small farmer participation in the SSC for FFV in Honduras. Simultaneously, to identify mechanisms through which access problems faced by small farmers can be alleviated to the betterment

of their livelihoods. The main results are twofold. On the one hand, they reveal that important transaction and information costs prevent the direct participation of less endowed farmers in the SSC for FFV in Honduras. On the other hand, small farmer participation in collective action allows the smallest producers to actively participate in the SSC for FFV, suggesting that “institutions matter” to lower transaction costs and facilitate the participation of farmers in new agrifood systems. Nevertheless, small farmers’ participation is still minor, and in addition to that there is not conclusive evidence in this research that their participation in the SSC is impacting their livelihoods positively. This challenges the assumption that the rapid rise of supermarkets in developing countries can be used as an engine for generating economic development. The empirical results of this research provide policy, methodological and theoretical contributions consistent with the NIE framework.

*To my parents
Andres and Hilda*

*To my siblings
Gustavo, Victoria, Alba and Delia*

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Chapter I

Introduction

1.1 Overview of Local and Global Agrifood Systems

For the purpose of this research, agrifood systems involve all the stages that include farm production, processing, marketing and distribution of products to final consumers. Street (1990, p. 159) defines the food chain [agrifood system] as “the physical and organizational system linking producers and consumers.” Agriculture “as part of a wider food chain system... is constantly adapting in response to market opportunities and institutional and technical pressures” (Street, 1990, p. 159). Agrifood systems can be viewed in terms of local and global *supply chains* or *value chains*, which “refers to the entire vertical chain of activities: from production on the farm, through processing, distribution, and retailing to the consumer – in other words, the entire spectrum, from [farm] gate to [consumer’s] plate” (Hobbs *et al.*, 2000, p. 9).

Agrifood systems have been facing dramatic changes, especially in the last two decades. Among the driving factors of these changes are agricultural industrialization, globalization, trade liberalization, advances in technology, reduced government interventions in regulation and support programs, environmental concerns and consumers’ demands for food quality, safety and convenience (Saxowsky and Duncan, 1998; Brester and Penn, 1999; Reardon and Barret, 2000). These changes can bring opportunities to farmers, but at the same time great challenges (Saxowsky and Duncan, 1998; Brester and Penn, 1999; Reardon and Barret, 2000).

Agricultural transactions that were traditionally made through spot markets are now increasingly channeled through vertically-coordinated markets which impose new requirements on farmers and alter traditional marketing relationships (Saxowsky and Duncan, 1998; Reardon and Barrett, 2000; Peterson *et al.*, 2001). The rise of contractual exchange, which has largely replaced spot market transactions, is considered as the most prominent and widespread change in the agrifood systems of developing countries (Reardon and Barrett, 2000). One remarkable example of such change is the new procurement systems used by retailers and processors, which is largely based on contractual arrangements (Reardon and Berdegúé, 2002).

In the case of Latin America, the region has experienced a rapid rise, multinationalization and consolidation of supermarkets¹ (Reardon and Berdegúé, 2002). Contrary to a low market share in the early 1990s, supermarkets now increasingly dominate the agrifood economy of Latin American countries, causing profound transformations in supply chains. These changes have brought about major challenges to small farmers², but at the same time offer great opportunities associated with the premium provided by the ability to supply exacting standards and the size of their market demand (Reardon and Berdegúé, 2002).

Among the agricultural products for which there is the greatest demand by supermarkets are fresh fruits and vegetables (FFV). Even though FFVs in developing countries have been traditionally sold through wholesalers in spot markets, supermarket

¹ There are different types of retail stores that can fit into the supermarket definition. Stores range from multi-product retailers with two to three cash registers to large hypermarkets (Reardon and Berdegúé, 2002).

² The term of 'small farmer' is difficult to define since it can mean different things according to different geographical areas, socio-economic conditions, agricultural sub-sectors, and technologies used. In the case of this research, the majority of 'small farmers' included use low technology and grow one hectare or less of fresh fruits and vegetables (FFV).

chains prefer to use their own procurement systems based on contractual arrangements with specialized wholesalers³ and/or farmers that can meet the high standards they demand (Alvarado and Charmel, 2002; Reardon and Berdegúe, 2002; Schwentesius and Gomez, 2002).

Contract farming, which has been employed in many countries as a form of vertical coordination between agribusiness firms and small farmers (Glover, 1994; Key and Runsten, 1999; Rehber, 2000; Singh, 2002; Eaton and Shepherd, 2005; Schejtman, 2005) can help small farmers to access new agrifood systems such as supermarket supply chains. Nevertheless, small farmers in developing countries are more accustomed to producing FFV in specific seasons and selling it in spot markets without paying much attention to the requirements of the market. As pointed out by some authors, the predominant philosophy of some farmers is “produce first and then look for the market,” instead of analyzing the market first, making the necessary contractual arrangements with buyers, and then producing what the market really wants (Boehlje, 1996; Fairbairn, 2003).

Given the profound changes in agrifood systems, such as those brought about by supermarkets, contract farming is becoming an important component of small farmers’ production and marketing systems in developing countries (Dolan and Humphries, 2000; Reardon and Berdegúe, 2002; Masakure and Henson, 2005). Thus, it is especially important to determine the contribution that contractual arrangements between agribusiness firms and small farmers can make to reduce poverty and boost economic

³ They operate their own collection and distribution centres, and usually procure produce under contract farming schemes.

development (McCulloch and Ota, 2002; Humphrey *et al.*, 2004; Masakure and Henson, 2005).

In Central America one of the most important contractors for FFV is Hortifruti, a Costa Rica based company that contracts farmers from Honduras, Nicaragua and Costa Rica to supply the Corporación de Supermercados Unidos (CSU) across Central America. CSU is part of the Central American Retail Holding Company (CARHCO), which is the largest retail business in Central America. CARHCO is a consortium originally established in 2001 by CSU, Corporación de Compañías Agroindustriales (CCA), La Fragua from Guatemala, and Royal Ahold. In 2005 Wal-Mart bought 33 percent of CARHCO's shares, substituting Royal Ahold in the consortium. Less than one year later, Wal-Mart increased its shares to 51 percent (CCA, 2006). There are other specialized supermarket suppliers of FFV in Central America such as Interfrutd, Fruta International and La Carreta (Berdegué *et al.*, 2003).

In most cases, specialized supermarket suppliers procure products from small farmers who produce for them under contract farming schemes. Nevertheless, when farmers cannot meet specific requirements they are dropped in the following years, as happens with some Hortifruti suppliers. For instance, from a pool of about 500 growers, Hortifruti faces a turnover of about 40 percent each year (Alvarado and Charmel, 2002), which represents losses for the firm as well as for the farmers. While farmers lose market opportunities, the buyer increases its transaction costs by looking for new suppliers.

1.2 Economic Problem

In Latin America, among the leading countries where supermarkets have reached a significant share of the retail sector sales are Brazil, Argentina, and Mexico. However, the supermarket boom is not only a phenomenon present in large countries and big cities, but also supermarkets are spreading to small and poor countries, and small towns within them. In 2000, in Central America there were around 700 supermarket stores, with a clear rising tendency. The Central American Retail Holding Company (CARHCO), alone had 253 stores and sales of US\$1.3 billion in Central America (Reardon and Berdegue, 2002, p. 378). Five years later CARHCO increased its number of stores to 375, and its sales to US\$2.2 billion in Central America, and it is announcing new investments in the region (CCA, 2006).

Even though significant amount of research has been done and/or is currently underway in this emerging topic (Reardon and Berdegue, 2002; Weatherspoon and Reardon, 2003), there is yet a dearth of research in countries with smaller economies. For this reason, this study is focused on Honduras. Located in Central America, Honduras is a low-middle income country. In 2004 its annual per capita income was US\$1,030 dollars. In the same year, 46 percent of a total population of 7.1 million people lived in urban areas (World Bank, 2005). The two main urban centres of the country are Tegucigalpa, which is the capital city, and San Pedro Sula which is the most industrialized city of the country. Their population is about one million and half million people respectively (Banco Central de Honduras, 2005). In both cities are concentrated the majority of supermarket stores.

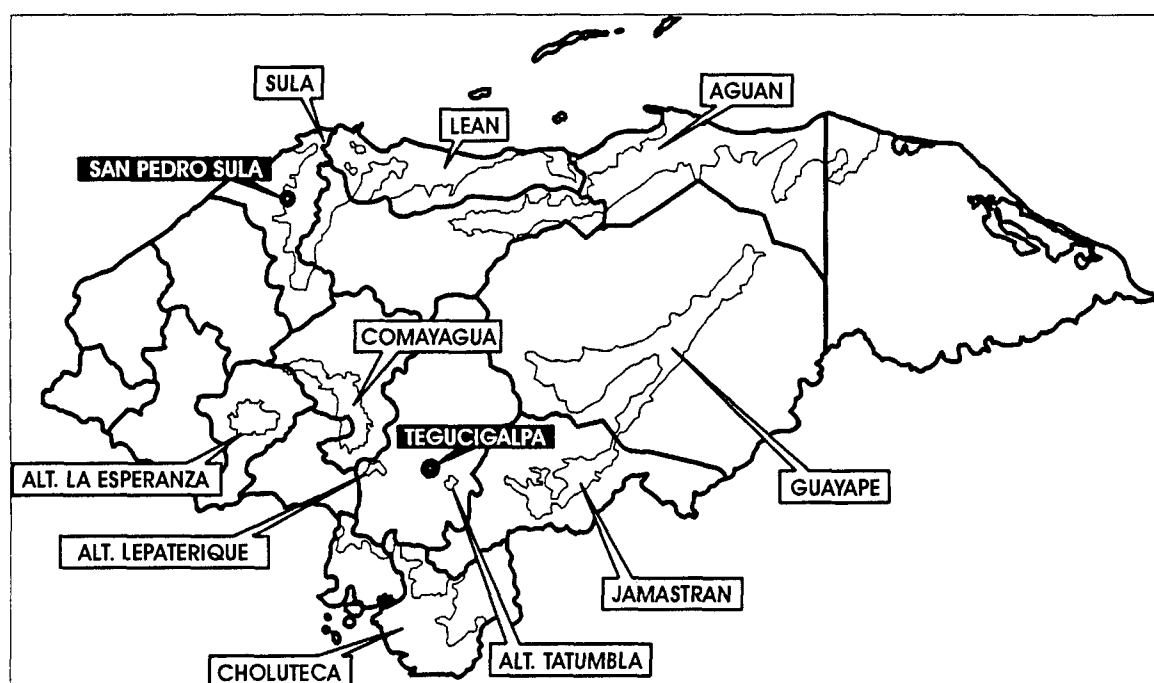
It is assumed that the share of supermarkets of the retail sector in Honduras (even though at a slower pace) is following the trend experienced in other Latin American countries. Consequently, it is assumed that market opportunities are rising for supermarket suppliers. The case of FFV is particularly important to small farmers in Honduras, since these products can be grown in relatively small scale. Honduras has several geographical zones for FFV production, and the most important for export are Comayagua and Choluteca (Figure 1.1). For national consumption, the most important zones are Lepaterique, Tatumbla and La Esperanza (Figure 1.1), which possess exceptional agro-climatic conditions favourable for growing a great array of FFV. The majority of FFV production in these zones is in the hands of small farmers that mainly sell in traditional spot markets (Secretaria de Agricultura y Ganaderia, 2006). If small farmers cannot meet supermarket requirements in terms of quantity, quality, timing, safety, packaging, etc., they will be unable to take advantage of new market opportunities. Thus, buyers can be reasonably driven toward a smaller supply base of large producers or even foreign markets that offer a reliable supply.

1.3 Economic Research Problem

The market share of supermarkets in the food retail sector is growing rapidly in Latin American countries, and Honduras is not an exception. FFV that was typically sold through local spot markets is now largely sold through supermarkets. While this situation represents opportunities to small producers, the high standards set by supermarkets in terms of quantity, quality, timing, safety, packaging, etc., can prevent small farmers from exploiting such opportunities, because of the significant changes required in their

production and marketing systems. Furthermore, the associated coordination and transaction costs can drive buyers toward a smaller supply base of large producers.

Figure 1.1 Main Geographical Zones of FFV Production in Honduras



Source: Secretaria de Agricultura y Ganaderia, 2006.

Reardon and Berdegú (2002) highlight the importance of the rise of supermarkets in developing countries, considering it as a huge market opportunity that can be used as an engine for poverty alleviation and development. The question that arises is what are the factors that hamper small farmers to participate in supermarket supply chains, and take advantage of these potential opportunities? While in the traditional spot markets, there is not necessary an *ex ante* or *ex post* relationship between buyers and sellers, supermarket procurement systems demand a coordinated relationship with suppliers in order to guarantee a reliable supply consistent with specific requirements. Thus, it is important to research the determinant factors of small farmer participation in such vertically-coordinated relationships.

While in spot markets, economic transactions are mainly governed by price, in vertically-coordinated markets additionally exist institutional arrangements between buyers and sellers (Peterson *et al.*, 2001). These institutional arrangements define the ‘rules of the game’ (North, 1995) between parties. In this sense, New Institutional Economics (NIE) attempts to incorporate the role of institutional environment and institutional arrangements in the coordination of the activities of economic players (Harris *et al.*, 1998; North, 1995). Given its goals, NIE is interdisciplinary based taking into account law, economics and organization theories (Williamson, 2005). Its main areas of work are transaction costs, contracts and property rights (Menard, 2005), which are inter-related.

As part of the core of NIE are the transaction costs associated with vertically-coordinated relationships. Transaction costs are classified as: 1) search and information costs; 2) bargaining and decision costs; and 3) supervision and enforcement costs (Furubotn and Richter, 1997, p. 44). Coase (2000) emphasizes the importance of institutions [to facilitate coordination] and lower the costs of economic transactions. In a small farmer context, for participating in the supermarket supply chain for FFV he/she needs information about requirements, and capacity to negotiate and manage contractual arrangements, which may represent prohibited costs for a single farmer. Thus, this research attempts to determine and assess the factors that explain farmers’ participation in the supermarket supply chain for FFV in Honduras at the light of the NIE framework, focusing on transaction costs and the role that institutions can play to reduce them.

1.4 Research Purpose and Objectives

To apply the New Institutional Economics (NIE) framework to assess the level and form of small farmer participation in the supermarket supply chain (SSC) for fresh fruits and vegetables (FFV) in Honduras. Simultaneously, to identify mechanisms through which access problems faced by small farmers can be alleviated to the betterment of their livelihoods. More specifically the objectives are:

- 1. To characterize the supply chain for FFV in Honduras.** The objective is to provide a general map of the supply chain for FFV in Honduras, including the traditional market and the supermarket channel. The following research questions are expected to be answered: 1) What are the advantages and challenges, forms of participation, and opportunities and threats associated with the participation of small farmers in the supermarket supply chain for FFV? 2) What are the differences between participant and non-participant farmers in the supermarket supply chain in terms of socioeconomic, farm and household, marketing, and organizational characteristics?
- 2. To assess the nature and level of transaction costs associated with the participation of small farmers in the SSC for FFV.** Comparing participant and non-participant farmers in the supermarket supply chain in terms of proxy variables of transaction costs⁴ it is attempted to determine and assess the factors that affect the probability of participating in the SSC for FFV.
- 3. To assess stated motivations and constraints associated with small farmers' participation in the SSC for FFV.** Using a choice-based conjoint model, the

⁴ Further details of these variables are provided in Ch. 4.

effect of several marketing attributes associated with the procurement systems used in the SSC for FFV will be assessed on the probability of selling FFV.

4. **To assess the role of collective action in small farmers' participation in the SSC for FFV.** By the nature of the requirements posed to SSC suppliers of FFV in terms of quantity, quality, frequency, etc., it is expected that a small farmer cannot participate in an individual basis in the SSC because of the associated transaction costs and lack of scale. Thus, the effect of collective action on the probability of participating in the SSC will be assessed.
5. **To determine the impacts of participating in the SSC for FFV on small farmers.** Given the incipient participation of small farmers in the SSC for FFV in Honduras it is quite difficult to determine the impacts of this activity on farmers' welfare. Nevertheless, participant and non-participant farmers in the SSC will be compared in terms of sales, income, performance, and overall situation now and five years ago. In the same way, farmers will be compared in terms of satisfaction with buyer and relative prices of their market compared with alternative markets. It is expected that participant farmers are better off than non-participant farmers in the above terms.

1.5 Significance of the Research

This research is significant mainly in two ways. Firstly, from the practical point of view, local and global agrifood systems are facing dynamic changes. These changes are bringing about opportunities to small farmers for the market opportunity they represent, but at the same time great challenges associated with new procurement systems, which

are switching from spot markets to vertically-coordinated markets. New procurement systems are characterized by high requirements in terms of quantity, quality, frequency, safety, and convenience. This research is focused on investigating the factors that hamper the active participation of small farmers from developing countries, specifically Honduras, in contemporary supply chains such as those of supermarkets in order to make policy recommendations for helping farmers to compete in the new economy and marketing systems. Furthermore, this research attempts to assess the contribution that relationships between small farmers and agribusiness firms can make to alleviate poverty and boost economic development.

Secondly, this research is using a New Institutional Economics framework, focusing on transaction costs, to analyze contemporary supply chains in developing countries. In the current agrifood systems ‘non-price’ factors are particularly important to make transactions between buyers and sellers. NIE goes beyond the ‘price mechanism,’ and introduces into the analysis the role that institutions can play for establishing win-win relationships between parties. Even though the NIE framework offers some advantages, it still faces methodological problems, and therefore more empirical research is needed to validate its main assumptions. It is expected that the findings of this research will make important methodological and theoretical contributions in this field.

1.6 Organization of the Thesis

This thesis is organized in six additional sections or chapters. The second chapter provides a survey of the importance of agriculture for developing countries, its traditional

and current problems, the dynamic of global changes faced by the sector, the driving factors of the changes, opportunities and challenges of new agrifood systems for poverty alleviation and development, and constraints faced by small farmers to access new supply chains.

In the third chapter the main theoretical considerations that support this research are presented and discussed. It addresses the evolutions of agribusiness research, considering the suggested move from a ‘choice’ to a ‘contractual’ analysis of the firm when positive transaction costs are present. In this sense, the contributions of NIE to deal with issues such as uncertainty and frictions in trade are introduced. Special emphasis is put on the role of transaction costs and collective action.

The fourth chapter provides a description of the methodology and data included in this study, which uses qualitative and quantitative data collected in two field research phases in Honduras. Both kinds of data are considered essential for this research. While qualitative data is interpreted and descriptively presented, quantitative data is analyzed using statistical and multivariate data analysis techniques, which are summarized and discussed in this chapter. An overview of the geographical scope of the study and the sample selection is also provided.

The fifth chapter starts with a general overview of the supply chain for FFV in Honduras, including ways of participation, advantages and challenges, and opportunities and threats offered to small farmers. Then, it continues with a characterization of farmers in terms of socio-economics, farm and household, marketing, and organizational issues.

In chapter six the motivations, success factors, and constraints faced by small farmers to participate in the SSC are presented and discussed. A logit regression is used

to assess the effect of socioeconomic, farm, transaction cost, and organization factors on the probability of participating in the SSC. In addition to that, a choice-based conjoint model is used to estimate the effect of marketing attributes on the market preference of farmers. The effect of specific organization services on the probability of farmer participation in the SSC is also assessed. Finally, ordered probit analyses are used to estimate the impact of market channel on farmers in terms of sales, income, performance, overall situation, satisfaction with buyer, and relative prices.

In this research the NIE framework is used to assess the level and form of small farmer participation in the SSC for FFV in Honduras. In chapter seven the assessment of the objectives and hypotheses originally set for that purpose, as well as policy implications are presented and discussed. Similarly, the contributions and limitations of the research, and recommendations for further research are drawn.

CHAPTER II

RESEARCH BACKGROUND

2.1 Introduction

This chapter provides a survey of the importance of agriculture for developing countries, its traditional and current problems, the dynamic of local and global changes faced by the sector, the driving factors of the changes, opportunities and challenges of new agrifood systems for poverty alleviation and development, and constraints faced by small farmers to access new supply chains. All these issues are motivational factors to undertake this research.

2.2 Importance and Problems of Agrifood Systems

The agriculture sector plays a substantial role in most developing countries, since it not only represents a livelihood for the majority of the rural population, but also contributes significantly to the overall economy. Currently, the rural population account for about 57 percent of the total population in developing countries, and the majority of the rural people are engaged in agricultural activities (FAO, 2005). According to FAO (2005), about 55 percent of the total economically-active population of developing countries was employed in the agricultural sector in 2000. The value-added of agriculture as a percentage of Gross Domestic Product (GDP) in 2004 for low-income countries⁵ was 23.2 percent, and for low and middle-income⁶ countries together the same figure was 11.9 percent (World Bank, 2005).

⁵ Countries with a total population of 2.3 billion and a GDP per capita of US\$510.00

⁶ Countries with a total population of 5.3 billion and a GDP per capita of US\$1,460.00

Thus, agriculture can be considered a key sector in the economic development of developing countries in view of its linkages with other sectors of the economy, which permits the flow of products and resources in and out of the sector. Agricultural products are used for local consumption as well as for export, representing significant foreign earnings for developing countries. Likewise, agriculture consumes industrial inputs such as fertilizers, seeds, machinery, and irrigation equipments, fostering in this manner the development of other sectors of the economy (Stevens and Jabara, 1988; Hellin and Higman, 2003).

In spite of the importance of agriculture, the sector is also associated with rural poverty. From the 1.2 billion people living on less than one dollar per day, about one billion live in rural areas and work in subsistence agriculture, with low access to assets (physical and financial), technology, markets and institutions (IFAD, 2003). This situation impedes the ability of these people to reach significant levels of progress and improve their living conditions.

Farmers, even in developed countries, have traditionally faced problems associated with the low profitability of agricultural activities (Saxowsky and Duncan, 1998; Reardon and Barrett, 2000; Levins, 2002). One of the reasons for farmers' low profitability is that they usually operate in 'perfectly competitive' markets (e.g., traditional open markets). The main characteristics of these markets are the presence of many buyers and sellers as well as the production of homogenous products (Doll and Orazem, 1984; Saxowsky and Duncan, 1998). These two conditions result in the incapacity of farmers to influence market prices that allow them to make higher profits. Conversely, when farmers purchase inputs, usually on an individual basis, they cannot

exert any bargaining power on market prices (Doll and Orazem, 1984). Consequently, market transactions made by farmers are usually characterized by low prices for farm products and high prices for goods consumed by farmers (IFAD, 2003). In the case of developed countries, different government policies have been tried to solve the farm income problem without providing a lasting solution (Levins, 2002); however, farmers in developing countries, especially small farmers, have not enjoyed similar government attention (Hellin and Higman, 2003).

In addition to the historical problem of low prices and profits faced by farmers, agrifood systems are undergoing profound changes, requiring institutional adaptation (Hobbs, 2004). Whilst these changes can bring opportunities to farmers, they also pose challenges and problems (Saxowsky and Duncan, 1998) especially for small producers (Reardon and Barrett, 2000). Agricultural transactions that were traditionally made through spot markets are now increasingly channeled through vertically-coordinated markets, which impose new requirements on farmers and alter traditional marketing relationships (Saxowsky and Duncan, 1998; Reardon and Barrett, 2000; Peterson *et al.*, 2001).

2.3 Driving Factors of Agrifood System Changes

The main driving factors behind changes in agrifood systems include agro-industrialization, globalization, changes in technology, trade liberalization, structural adjustment programs, reductions in government support to farmers, new consumer demands for terms of quality, safety and convenience, and environmental concerns (Saxowsky and Duncan, 1998; Brester and Penn, 1999; Reardon and Barrett, 2000;

Pinstrup-Andersen, 2002; Sheldon and McCorriston, 2003; Hobbs, 2004). Under new marketing conditions spot markets are not always appropriate, given their limited ability to consistently guarantee specific market requirements (Boehlje, 1996; Young and Hobbs, 2002). These driving factors are summarized below.

2.3.1 Agro-industrialization

The food and agribusiness sectors are rapidly globalizing and industrializing (Cook *et al.*, 2001). Boehlje (1996, p. 30) defines agricultural industrialization as “the application of modern industrial manufacturing, production, procurement, distribution, and coordination concepts to the food and industrial product chain.” In a similar way, Reardon and Barrett (2000, p. 196) associate agro-industrialization with: 1) changes in agro-processing and distribution of products and inputs; 2) changes in the institutional and organizational relationship between firm and farms, resulting in increased vertical coordination; and 3) changes in product composition, technology and market structures. These definitions are quite consistent with the approach of Saxowsky and Duncan (1998, p. 4) who see agro-industrialization as the adoption of “business strategies to shift farm businesses away from perfect competition,” through a variety of business arrangements in the agrifood systems.

From a micro-analytic point of view, the agro-industrialization process involves significant changes in organizational management and governance structures of the agrifood systems (Cook *et al.*, 2001). Therefore, with agro-industrialization, processors and retailers demand products with specific characteristics coming from reliable suppliers that guarantee quantity, quality, frequency and timing. Increased specificity of produce

requirements set by buyers make spot market an inappropriate source of supply, encouraging in this way contractual relationships between farmers and processors/retailers (Boehlje, 1996; Reardon and Berdegue, 2002; Nadvi and Waltring, 2004). According to Reardon and Barrett (2000) the pace that agro-industrialization has taken in Latin America, Central and Eastern Europe and Southeast Asia over the past 5-10 years has been remarkable, and this trend is now apparent in Africa and South Asia.

2.3.2 Globalization and Multinationalization

In the same way, increasing globalization is having great impacts on the structure of agrifood systems. This has been characterized by the increased flow of capital and information, exchange of technology, foreign direct investments and global economic integration, facilitating in this way agricultural industrialization and consequently vertical integration of agrifood systems (Abbot *et al.*, 2002; Reardon and Barrett, 2000; Pinstrup-Andersen, 2002). Foreign direct investment in Central America, for instance, increased from an annual average of US\$659.2 millions for the period 1991-1995 to US\$2,745.0 millions in 2005 (ECLAC, 2005). In the case of supermarket chains, it is noticeable the entrance in the region (Central America) of the retail giant Wal-Mart since 2005 (CCA, 2006). The fact is that with globalization, many of the world's economies are increasingly interdependent, causing structural changes in agrifood systems (Saxowsky and Duncan, 1998).

Globalization has also led to the consolidation of multinational companies. The high concentration of food processors and retailers in the United States (US) and the European Union (EU) has altered the structure of food marketing systems. These can be

characterized as successive oligopolies, affecting the *horizontal* and *vertical* dimensions of agrifood systems (Sheldon and McCorrison, 2003). For instance, Reardon and Berdegúe (2002) show how the concentration of food processors in the dairy sector and retailers in the fresh fruit and vegetable sector has impacted traditional marketing systems in Latin America, moving from spot markets to vertically-integrated markets through contractual arrangements between buyers and small producers.

2.3.3 *Changes in Technology*

Likewise, rapid technological advances are causing changes in agrifood systems. Advances in production, logistic and information technologies alter the outcome of producing commodities and their distribution along the supply chain. While the use of up-to-date technologies tends to increase outputs, the resulting increase in supply tends to reduce prices (Saxowsky and Duncan, 1998). Hence, the drive for farmers to produce differentiated products or increase value to commodities through manufacturing processes (Reardon and Barrett, 2000). Further advances in communication allow the coordination and management of businesses many miles away from the point of decision-making, facilitating relationships between [small] farmers and large processors and retailers in other countries (Saxowsky and Duncan, 1998). Thus, technological improvements can bring about competition among producers, but at the same time opportunities to those that are able to change. Technological changes that include global positioning systems, biotechnology and improvements in transportation and information systems increase global competition in agrifood systems, but at the same time can

enhance productivity and contribute to lower transaction costs (Reardon and Barrett, 2000).

2.3.4 *Trade Liberalization and Policies*

The increasing promotion of trade liberalization agreements through the General Agreement of Trade and Tariffs (GATT), the World Trade Organization (WTO), and the North American Free Trade Agreement (NAFTA) are impacting trade in agricultural and food products and hence global agrifood systems (Reardon and Barrett, 2000). In developing countries, structural adjustment programs often promoted by International Monetary Fund (IMF) and World Bank, as well as donors such as the US Agency for International Development (USAID) encourage changes in monetary policies, removal of tariff and non-tariff barriers to trade, removal of foreign direct investment restrictions and reduction of government involvement in agrifood marketing and trade. These changes are seen as necessary steps to facilitate the integration of goods and capital markets around the world (Abbot *et al.*, 2002; Reardon and Barrett, 2000). A recent example of trade liberalization and policies is the free trade agreement signed in 2005 between Dominican Republic-Central America and the US, known as DR-CAFTA (Paggi *et al.* 2005; World Bank, 2006a), which will expectedly increase the trade flow between the region and the US offering market opportunities to local producers, but at the same increase competition as US producers also launch their products to the region.

2.3.5 *Consumer Demands and Environmental Concerns*

A major concern of new agrifood systems is the stricter and more dynamic consumer demands. Increases in income and urbanization, and reductions in time available for cooking are driving people to look for convenience when buying food products. As incomes increase, consumers are shifting from staple foods to non-staples, demanding more quality, food safety and a list of other characteristics (Reardon and Barrett, 2000). This trend has stimulated changes in the supply side of food markets, as shown by the rise of supermarkets, for example, which try to take advantage of new consumer demands. In turn this has impacted the traditional production and marketing systems of their own suppliers, including producers of agrifood products (Reardon and Berdegue, 2002). Even though some consumers may still prefer small stores that guarantee them more personal and traditional relationships (Estrada, 2004; Schwentesius and Gomez, 2002), small businesses face the pressure of supermarkets' economic power and innovation capacity in trying to capture this market segment (e.g., by opening smaller stores).

New consumer demands include food safety issues, which are reflected through grades and standards (G&S) and certification labels. Agribusiness firms take advantage of consumer demands to differentiate their products, but at the same time impose new requirements on suppliers of raw materials or fresh products (Reardon *et al.*, 2001; Hobbs, 2004; Nadvi and Waltring, 2004). Consumers are also exhibiting heightened concerns about the environment. In order to increase productivity, the farm sector has intensified the use of agrochemical products (such as fertilizers and pesticides), which may not only represent a risk for human consumption, but also cause environmental

degradation (Pinstrup-Andersen, 2002). The challenge of new agrifood systems is to supply safe and low price food products, produced under environment-friendly conditions (Pinstrup-Andersen, 2002). However, this means that small farmers must adopt new technologies and management skills. For instance, the production of organic food products (e.g., coffee) for small farmers has been seen as an opportunity to reach niche markets and obtain premium prices. Nevertheless, the certification process can be a serious obstacle for small farmers (Hellin and Higman, 2003). In the case of Honduras consumers are not as strict as consumers in developed countries. Thus, the major concerns there are still associated with physical characteristics and price of agrifood products. Nevertheless, with the multinationalization of the agrifood systems standards are becoming similar in developed and developing countries.

2.4 From Traditional Agriculture to New Agriculture

While traditional agriculture is associated with production of commodities and spot markets, the “new agriculture” is characterized by the production of differentiated products and contractual relationships. Markets are generally more driven by products than by commodities, production is more capital intensive, decisions at the different levels of the market are more interdependent, and information is a key source of power and control (Boehlje, 1996; Fulton, 2001; Young and Hobbs, 2002). Table 2.1 presents Fulton’s (2001) taxonomies of the differences between traditional and new agriculture.

Table 2.1 From Traditional Agriculture to New Agriculture

<i>Traditional Agriculture</i>	<i>New Agriculture</i>
<ul style="list-style-type: none">• Commodities; spot markets• Farms carry out many activities• Product-chain stages seen as independent• Price and production risk• Concern about monopoly pricing• Money and assets prime source of control	<ul style="list-style-type: none">• Differentiated products; negotiation; contracts• Specialization; separation of production stages• Focus on a system; stages seen as interdependent• Relationship risk; food health and safety• Concerns about access to information• Information as prime source of control

Source: Adapted (by Fulton 2001) from M. Boehlje, Industrialization of agriculture: What are the implications? *Choices* 11, 1 (1996): 30-33.

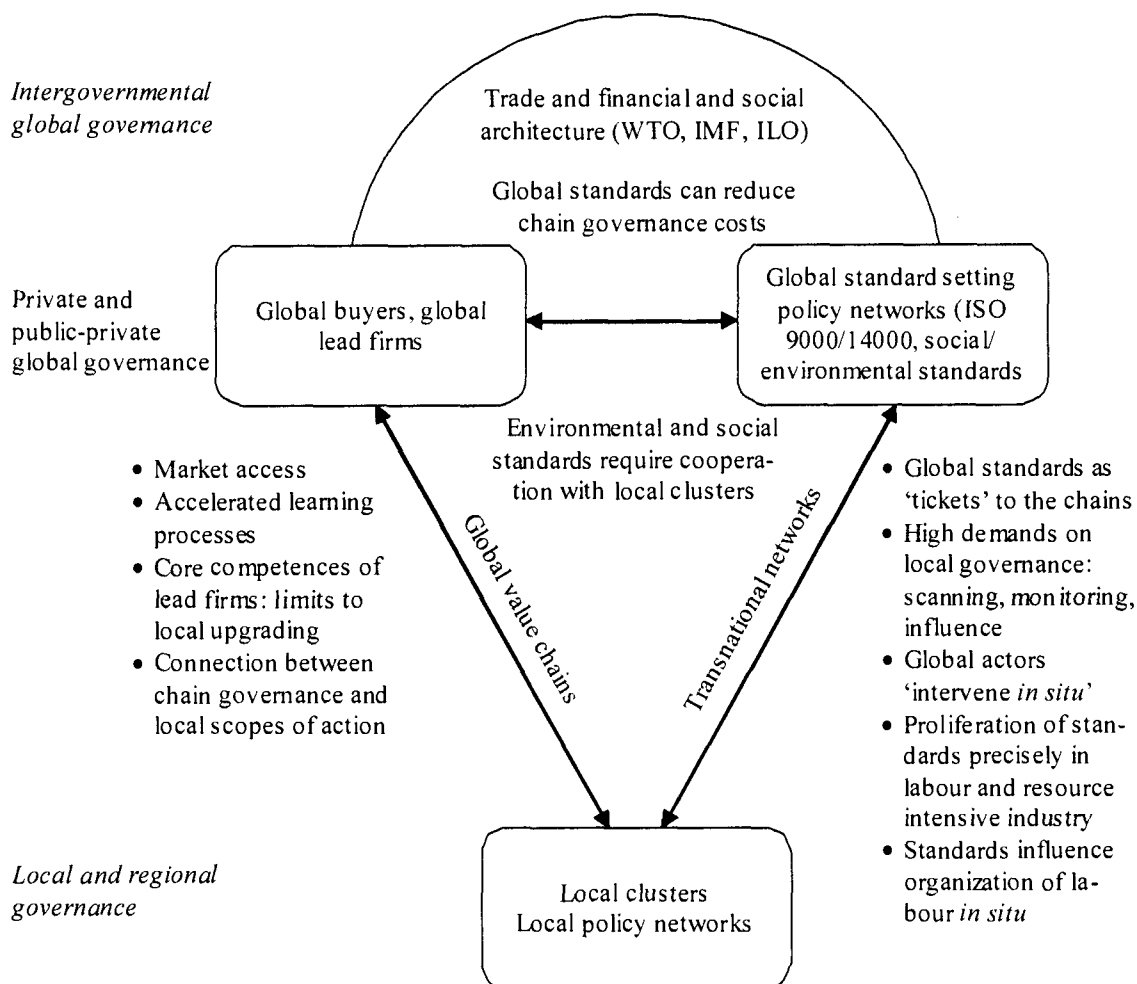
Whereas farmers in traditional agriculture are focused on producing commodities (Table 2.1) without paying much attention to what happens once they leave the farm gate, within the “new agriculture” farmers have to be more “networked, interdependent and entrepreneurial, [and] with high capacity to find and evaluate information” (Fairbairn, 2003, p. 14). In other words, they have to change the “produce and then sell” mentality and think strategically in order to produce what consumers are demanding (Boehlje, 1996; Fairbairn, 2003; Hellin and Higman, 2003). Farmers have to take into account important issues that shape new economic activities, such as knowledge and information, networks and alliances, outsourcing and contracts, and consumer choices, niches and preferences (Fairbairn, 2003). There are serious concerns about the capacity of small farmers from developing countries to adjust to these profound changes in agrifood systems within the context of the global economy (Reardon and Barrett, 2000; Berdegue, 2001).

New agriculture has brought about an increase in vertical coordination in developing countries. Reardon and Barrett (2000, p. 195) state that “an increasingly integrated global economy causes established agribusiness firms [in developed countries] to look increasingly to foreign suppliers and customers in order to improve profitability.” As an example, Watts (1994, p. 248) describes the rise of contract farming in Africa and

elsewhere as “one manifestation of the late twentieth-century restructuring of agriculture that can be fully comprehended as a global phenomenon.” Reardon and Barrett (2000) consider the rise of contractual exchange, which has largely replaced spot market transactions, as the most prominent and widespread change in the agrifood systems of developing countries.

In an attempt to take into account the interplay between local and global contexts in the new economy, and assess the contribution that this can make to local development Messner (2004) proposes a framework called “the world economic triangle” p. 23 (Figure 2.1). The central idea of this framework is that “regions are tied into specific global market segments and global governance systems that significantly influence options of local actors and the demands placed on their strategic capabilities” p. 22. As seen in Figure 2.1, local economies are increasingly linked to global buyers through global value chains. Instead of producing for anonymous buyers, as happens in traditional markets, local firms are now increasingly producing for specific local and international buyers. A typical example in the FFV sector is the relationship between big retailers and small farmers in Africa and Latin America (Dolan and Humphrey, 2000; Reardon and Berdegue, 2002). The economic development implications of this market relationship are that local producers can gain market access, learn new production processes and upgrade their capabilities (Messner, 2004). Nevertheless, in order to participate in global value chains local producers have to comply with an increasing set of global standards (See also Reardon *et al.*, 2001; Hobbs, 2004; Nadvi and Waltring, 2004).

Figure 2.1 The World Economic Triangle



Source: Messner, 2004.

In addition to global standards, there is a set of international institutions (public and private) which is shaping the global value chain governance (Messner, 2004).

Humphrey and Schmitz (2004, p 97) state that the main parameters of governance are related with 'what, how, how much, and when' is to be produced. Thus, "governance refers to the inter-firm relationships and institutional mechanisms through which non-market, or 'explicit,' coordination of activities in the chain is achieved." The big concern is the limited or null participation of local producers in setting global standards (Nadvi and Waltring, 2004) as well as in defining other institutions that determine global value

chain governance. Furthermore, local producers face the risk of being dependent on a small number of buyers (Humphrey and Schmitz, 2004).

Vertically-coordinated markets, on the one hand, can offer farmers the opportunity to produce and sell differentiated and value-added products focused on meeting particular consumer demands through relationships with processors and/or retailers (Saxowsky and Duncan, 1998; Key and Runsten, 1999; Reardon and Barrett, 2000; Reardon and Berdegue, 2002). In turn, this can result in obtaining premium prices for differentiated products and capturing a greater share of the total price paid by the final consumers as farmers move downstream within the supply chain (Hobbs *et al.*, 2000; Levins, 2002; Fairbairn, 2003). On the other hand, the high standards of vertically-coordinated markets impose challenges and constraints on farmers with outdated production and marketing systems (Hellin and Higman, 2003).

2.5 Types of Vertical Coordination

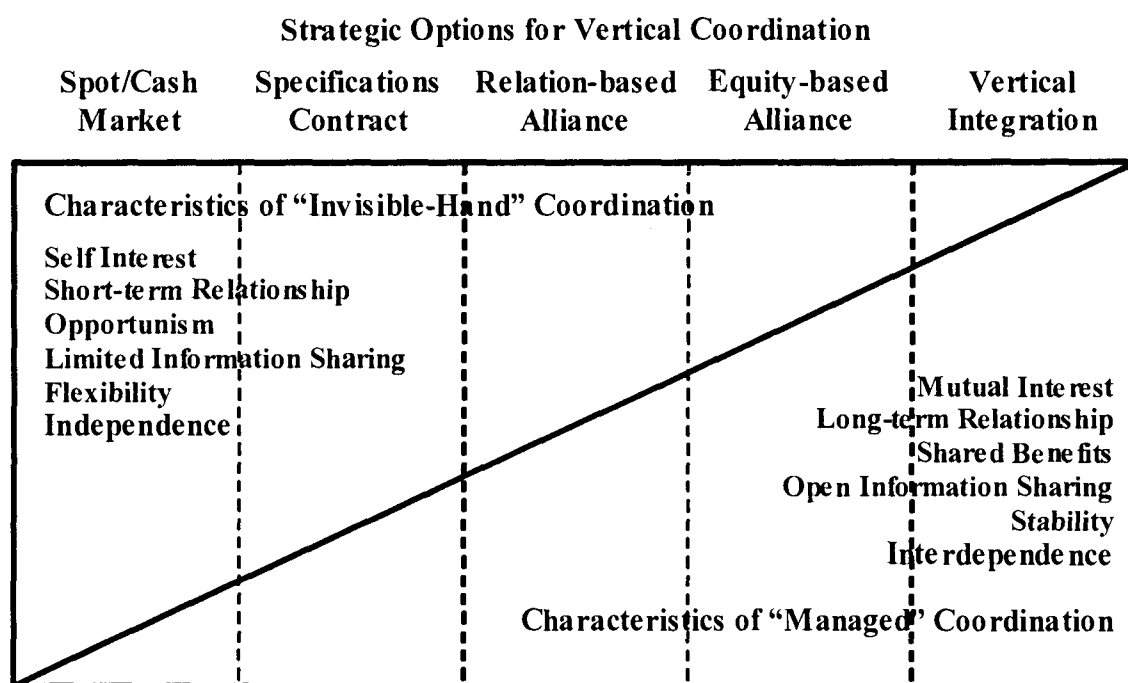
Williamson (2004) divides the modes of market governance in spot markets, hybrids, and hierarchies. Vertical coordination, which is based on relationships among related but independently owned businesses, fits in the hybrids. Menard (2004) makes a thorough analysis of the nature of the diversity of hybrid organizations. Given that there are many forms of vertical coordination, such as strategic alliances, joint ventures, and other contractual arrangements, a convenient way to present the change from spot markets to vertically-coordinated markets in agrifood systems is the framework developed by Peterson *et al.* (2001). This framework proposes a vertical coordination continuum where it may be difficult to establish clear boundaries. Peterson *et al.* (2001) suggest that

while coordination strategies are inter-related, no [real] classification exists to differentiate these inter-relationships, and instead they form a continuum of options running from open (spot) markets to vertical integration. Between these two extremes Peterson *et al.* (2001) situate specification contracting, relation-based alliances, and equity-based alliances (Figure 2.2). Open markets are characterized by the ‘invisible hand’ coordination, where self-interest, short-term relationships, opportunism, limited information sharing, flexibility and independence are predominant. As the continuum moves to coordination, mutual interest, long-term relationship, shared benefits, open sharing information, stability, and interdependence become more characteristic (Peterson *et al.*, 2001). When the continuum reaches full vertical integration, coordination is centralized under the policies and procedures of a single organization, although this does not necessarily mean single ownership (Peterson *et al.*, 2001).

The decision of where an individual firm should or is able to locate itself in the continuum is a complex task and it will depend on its own characteristics and goals. However, for small farmers in developing countries, decisions regarding location are usually imposed by external market forces or by resource constraints. Fairbairn (2003, p. 9) ironically establishes the analogy that running a farm will be like running a McDonald’s franchise: “it’s yours to run, within the rules set by the bigger company,” suggesting that new agriculture requires reorganization to balance the participation of farmers, processors/retailers and consumers. If small farmers prevail in producing commodities for spot markets, they will continue facing the historical problems of low commodity prices, or even worse scenarios as processors and retailers increasingly procure their products from specialized suppliers, by-passing traditional wholesalers

where small farmers sell their products (Reardon and Berdegúé, 2002). Conversely, if small farmers want to produce differentiated products and/or move downstream in the supply chain and increase value, they will face other constraints such as lack of technology, information, and capital resources (Reardon and Barrett, 2000).

Figure 2.2 The Vertical Coordination Continuum



NOTE: The diagonal line represents the mix of invisible-hand and managed coordination characteristics found in each of the five alternative strategies for vertical coordination. The area above the diagonal indicates the relative level of invisible-hand characteristics and the area below the diagonal indicates the relative level of managed characteristics.

Source: Peterson *et al.* (2001).

One mechanism that can help small farmers to access new agrifood systems is contract farming, which has been employed in many countries as a form of vertical coordination between agribusiness firms and small farmers (Glover, 1994; Rehber, 2000; Key and Runsten, 1999; Singh, 2002; Eaton and Shepherd, 2005; Schejtman, 2005). Under contract farming, small farmers can participate in such systems because it helps to reduce market imperfections and diminish transaction costs (Key and Runsten, 1999). Through contracts, small farmers can access credit, new technology, market information

and inputs under the commitment of delivering produce of specific characteristics to the contractor. However, contract farming has also been criticized for being biased in favour of contractors (Key and Runsten, 1999; Singh, 2002) and more privileged farmers. As a result, opinion on contract farming in developing countries is divided. While some authors argue that contract farming represents a great opportunity to boost agricultural development through foreign investment, technology and access to markets, other authors consider that this mechanism is biased in favour of large (often multinational) companies. Likewise, the benefits obtained in the short-run may be outweighed by negative consequences in the longer term such as environmental degradation caused by mono-crop systems and use of high cost market inputs, exploitation of women, and dependence on single buyers (Glover 1994; Rehber, 2000; Singh, 2002; Raynolds, 2002).

2.6 Opportunities and Challenges for Poverty Alleviation and Development

Many policy-makers view the changes in agrifood systems, within the context of globalization, as an engine for generating economic development in developing countries (Reardon and Berdegúe, 2002; Sanchez, 2003). It is believed that multinationalization and foreign direct investment can stimulate the production of new products, which can be exported thanks to trade liberalization agreements (Sanchez, 2003). Nevertheless, in the debate about relationships between agribusiness firms and small farmers there are some extreme points of view. While some authors see these relationships (e.g., contract farming) as a need for agribusiness firms to restructure agrifood systems in order to increase control over agricultural production that allows them new sources of profits and capital accumulation (Little and Watts, 1994), others see these arrangements as dynamic

relationships of mutual benefit that can be used as a rural development model (Williams and Karen, 1985).

Some studies discuss the impact of cash crop⁷ production by small farmers (Kennedy and Cogill, 1987; von Braun *et al.*, 1989; Jaffee and Bintein, 1996; Govereh and Jayne, 2003). A number of critics suggest that these ventures are not sustainable and in some cases jeopardize the production of food crops. Even though empirical evidence is not sufficient to make generalizations, some studies have found positive effects of cash crop production on small farmers' income without putting at risk the food crop production. Kennedy and Cogill (1987) found that productivity of land and labour significantly increased among sugar producers in Kenya. Farmers engaged in cash crop production under contract farming (sugar in this case) made substantially higher income than those farmers that only produced traditional crops, such as maize. The productivity of labour of sugar producers was four to five times higher than the daily wage rate and net income was positive for most producers. Net income per hectare per day of family labour was significantly higher for sugar production than for maize production. Similar results were found by von Braun *et al.* (1989) in Guatemala in small-farmer production of vegetables for export. In this case, the net returns on vegetable production were fifteen times higher than those of maize production. Besides increases in income, the authors also found positive effects on food crop productivity, employment and income distribution.

⁷ Cash crops refer to those crops that farmers grow with the main purpose of selling their production. Even, in some cases cash crops do not have an alternative use for farmers. Conversely, food crops are those crops grown with the main purpose of being consumed in the household (e.g., maize). However, farmers may still sell a proportion of the food crops.

A more recent study conducted by Govereh and Jayne (2003) in Zimbabwe found positive synergies between cash crop and food crop production. The authors found both “*household-level synergies*” and “*regional spill-over synergies*” (p. 48). Farmers that were producing cotton were much better off than non-cotton producers, partly explained by higher income from cash crop production. Indicators such as farm capital investment, number of animal draft teams, total crop income per hectare and total crop income per capita were substantially higher for cotton producers.

Evidence suggests that when parties involved in the production of high-value products act as partners and are willing to innovate, their ventures can be sustainable. Jaffee and Bintein (1996) report the relationship between Njoro Cannery/Hortiequip and about 20,000 poor small producers of French Beans: “The venture really has consisted of *a system of interdependent contracts and other relationships*, all of which have needed to be managed for the effective performance of the entire operation” (p. 78). After a troublesome start in 1982, the company made significant adjustments to expand during 1985-1988 and consolidate during the 1990s. The performance of this relationship is an example of commercial success as well as development impact, reached through strategic alliances that included manufacturers, distributors and small farmers. The sustainability of this system has been based on effective management and capacity to respond and adjust to internal and external conditions, such as those imposed by international markets.

Even though new agrifood systems can bring opportunities to small farmers, they can also pose great challenges. Under these systems farmers have to adjust their production systems to produce what the market demands at a particular point in time (Saxowsky and Duncan, 1998). This adjustment usually requires relatively large

investments in capital, as well as the use of new technologies and managerial skills. Further, farmers have to learn how sell their products in vertically-coordinated markets instead of spot markets (Peterson *et al.*, 2001). These new systems are based on contractual arrangements that specify a series of grades and standards related with quality and safety issues, which may be difficult to meet by small farmers with lack of economic resources and appropriate managerial skills (Reardon *et al.*, 2001). Brester and Penn (1999, p. 11) point out that “strategic management concepts, which have been commonly used by business outside the agricultural arena for the past fifteen years, will be essential tools for farmers, ranchers and commodity organizations to generate competitive advantages in response to global change.” Besides meeting quantity and quality requirements, small farmers have to deal with business management activities such as financial management and information analysis to predict market behaviour (Hellin and Higman, 2003).

In addition to the technological and managerial innovations that small farmers have to make in order to compete in new agrifood systems, several authors emphasize the need for institutional innovations (Boehlje, 1996; Reardon and Barrett, 2000; Cook *et al.*, 2001; Pinstrup-Andersen, 2002). According to Boehlje (1996, p. 30) farmers are more open to technological innovations; however, “institutional innovations or new ways of doing business have met with more resistance, possibly because they change relationships and frequently substitute interdependence for independence in the decision-making process” as suggested by Peterson *et al.* (2001) in their vertical coordination continuum.

2.7 Conclusions

The literature reviewed and discussed in this chapter constitutes the background to justify the importance of this research. It shows the significance of agriculture for the livelihood of people from developing countries. The majority of the rural population from these countries depends on farming activities. Thus, agriculture is significant not only for producing food, but also for generating income. In spite of the importance of agriculture in developing countries, the sector is associated with rural poverty especially for farmers practicing subsistence agriculture. In addition to that, current changes in local and global agrifood systems are posing new challenges to farmers. The most noticeable change is the switch of market transactions from traditional spot markets to vertically-coordinated markets.

The main driving factors of this change are agro-industrialization, globalization and multi-nationalization, changes in technology, trade liberalization and policies, and new consumer demands. The change from traditional agriculture to new agriculture can be assessed under the perspective of the global value chain governance, where coordination among large buyers, local producers, and public and private institutions is a key characteristic. Coordination between buyers and sellers can occur in different ways, along a 'vertical coordination continuum,' including contracts, alliances, and joint ventures. In the case of small farmers and agribusiness firms the most common way of coordination used is contract farming.

Even though these changes may be beneficial to farmers because they offer new opportunities to them for marketing, learning and upgrading, changes also bring challenges to farmers, because they have to adjust their traditional production and

marketing systems to meet new market demands. In the same way, these changes demand institutional innovations that allow farmers to access contemporary supply chains through new marketing arrangements. Thus, the opinion about the balance is still divided, since while some authors consider these changes as an opportunity to generate economic development others consider them as a restructure of global capital which just generates control and capital accumulation for large firms.

In the next chapter the main theoretical considerations that support this research, including a brief overview of the evolution of agribusiness research in order to deal with dynamic changes in the sector are presented and discussed. NIE is proposed as a suitable framework for addressing current changes in agrifood systems, such as the increase of vertical coordination in contemporary supply chains in developing countries.

CHAPTER III

ANALYTICAL FRAMEWORK

3.1 Introduction

In this chapter the main theoretical considerations that support this research are presented and discussed. The chapter includes a brief discussion about the evolution in agribusiness research, passing from a ‘choice’ to a ‘contractual’ analysis of the firm, which is suggested when there are positive transaction costs. In this sense, the contributions of NIE to deal with issues such as uncertainty and frictions in trade are introduced. The main postulate of NIE is that ‘institutions matter,’ and therefore, they can contribute to reduce transaction problems between parties (e.g., small farmers and the SSC for FFV).

Within NIE, special emphasis is put on the discussion about transaction costs and collective action. Transaction costs include the costs of searching information, establishing market relationships and monitoring them. Factors such as uncertainty, asset specificity and frequency of transactions determine the magnitude of transaction costs. Under this situation, collective action becomes useful for developing and implementing institutional arrangements that help to reduce transaction costs.

Also in this chapter the relationship between NIE and the main hypotheses of the research are discussed. And finally, a summary and discussion of empirical evidence related to this research are presented, including methodological limitations faced by NIE, such as the difficulty for measuring transaction costs, and the opportunism and free-riding problems faced by collective action.

3.2 The Need of an Analytical Framework

Given the complex environment faced by small farmers in developing countries in the context of current changes in agrifood systems, it is necessary to look for an analytical framework that helps us to understand these changes, and search for mechanisms that allow small farmers to tackle challenges and take advantage of potential opportunities offered by new agrifood systems. New Institutional Economics (NIE) is proposed here as a suitable approach.

NIE is focused on analyzing market imperfections (Harris *et al.*, 1995) (e.g., limitations of small farmers to participate in vertically-coordinated markets). NIE has its origin in the works⁸ of Coase, North and Williamson and focuses on the role of institutions in economic transactions (Ménard, 2000). According to mainstream economic theory, economic agents (farmers in this case) will coordinate their actions if the benefits of doing so outweigh the costs. However, in the real world this does not always happen regardless of the potential gains (Harris *et al.*, 1998). One reason for such behaviour is that while economic agents are inherently rational, limitations in information and frictions in trade hamper them in this pursuit, such that they are rationally bounded (Harris *et al.*, 1998; Williamson, 2000).

Reardon and Berdegue (2002) highlight the importance of the growth of supermarkets in developing countries, considering it as a huge market opportunity that can be used as an engine for poverty alleviation and development. The question that arises is what are the factors that hamper small farmers to participate in supermarket

⁸ Coase, R.H. (1937). The nature of the firm. *Economica*, 4, 386-405.

North, D.C. (1992). *Transaction costs, institutions, and economic performance*. San Francisco, CA: ICS Press

Williamson, O.E. (1985). *The economic institutions of capitalism: Firms, markets, relational contracting*. New York: The Free Press.

supply chains and take advantage of these potential opportunities? The traditional spot market is considered to be ‘inefficient’ under the new agrifood systems, thus supermarket chains look for coordinated relationships with their suppliers. Nevertheless, small farmers continue using the traditional market because it is where they are used to selling their products, and therefore, cannot switch to new marketing systems immediately just because of potential gains. A reasonable hypothesis is that farmers face positive transaction costs that limit their participation in coordinated markets such as the supermarket supply chains.

3.2.1 NIE and the Theories of the Firm: From Choice to Coordination

A firm has been traditionally depicted by mainstream economics as a production function, where inputs are converted into outputs. The role of the manager is to maximize the profits of the firm subject to technological and market conditions (e.g., prices). This task should be easy to accomplish in a world of perfect information and frictionless trade (Furubotn and Richter, 1997; Furubotn, 2001; Williamson, 2004). Coase (1937) calls this system the ‘price mechanism,’ and points out that using it requires some costs: “The most obvious cost of ‘organizing’ production through the price mechanism is that of discovering what the relevant prices are” (Coase, 1937, p. 390). He additionally considers that “the cost of negotiating and concluding a separate contract for each exchange transaction which takes place on a market must also be taken into account” (Coase, 1937, p. 391). Coase’s work is acknowledged as the origin of transaction cost economics, which is part of the core of NIE (Hobbs, 1996, Menard, 2001).

Original assumptions, that economic agents are inherently rational, have perfect information, and face zero transaction costs in their economic transactions, have been relaxed with the emergence of new bodies of theories based on transaction costs (Hobbs, 1996). New institutional economists claim that economic agents intend to be rational, but are limited to be so due to imperfect information, and therefore face uncertainty in their transactions/choices. In addition to the price mechanism, NIE incorporates institutions into the economic analysis of transactions (North, 1995; Williamson, 1985).

With the current changes in agrifood systems, where contractual arrangements are considerably increasing, a traditional paradigm of the firm may not be sufficient to understand the relationships between buyers and sellers along the agrifood supply chain (Hobbs, 1996). Instead of single product firms, homogeneous products, and perfectly competitive industries, contemporary supply chains, such as those of supermarkets, focus on differentiated products and operate through vertically-coordinated relationships (Young and Hobbs, 2002).

Williamson (2004, p. 27) compares the ‘traditional’ ideas with the ‘new ideas’ introduced by NIE to analyze market organization (Table 3.1). While ‘traditional’ economic ideas assume that individuals face zero transaction costs and make individual ‘rational choices’ to maximize their utilities, new institutional economics gives importance to contractual relationships, considering positive transaction costs, and assuming bounded rationality. The characteristics of supermarket supply chains, based on product specification and contractual arrangements, suggest that NIE is suitable to analyze small farmers’ participation in supermarket supply chains. When market conditions are not appropriate for using choice as the ‘analytical lens’ of the firm

(Furobotn, 2001) due to positive transaction costs and bounded rationality, contract is suggested as an alternative framework (Williamson, 2004). The mode of governance of a firm, therefore, - markets, hybrids or hierarchy - should be the most transaction cost economizing (Williamson, 1991). Hobbs (1996; 2004) considers that in current agrifood supply chains cooperation and exchange of information can significantly contribute to the reduction of transaction costs.

Table 3.1 The Challenges of New Ideas: From Choice to Contract

[Way of Analysis]	Orthodoxy*	New Ideas in TCE
Analytical lens	Choice	Contract
Concept of contract	Simple with costless court ordering	Complex contract as framework with private ordering
Efficiency focus	Resource allocation	Mutual gain
Transaction costs	Zero	Positive and variable
Unit of analysis	Composite (good and services)	Micro-analytic (separable transactions)
Cognition	Omniscience (complete contracting)	Bounded rationality (incomplete contracting)
Adaptation	Autonomous (market)	Coordinated (hierarchy)

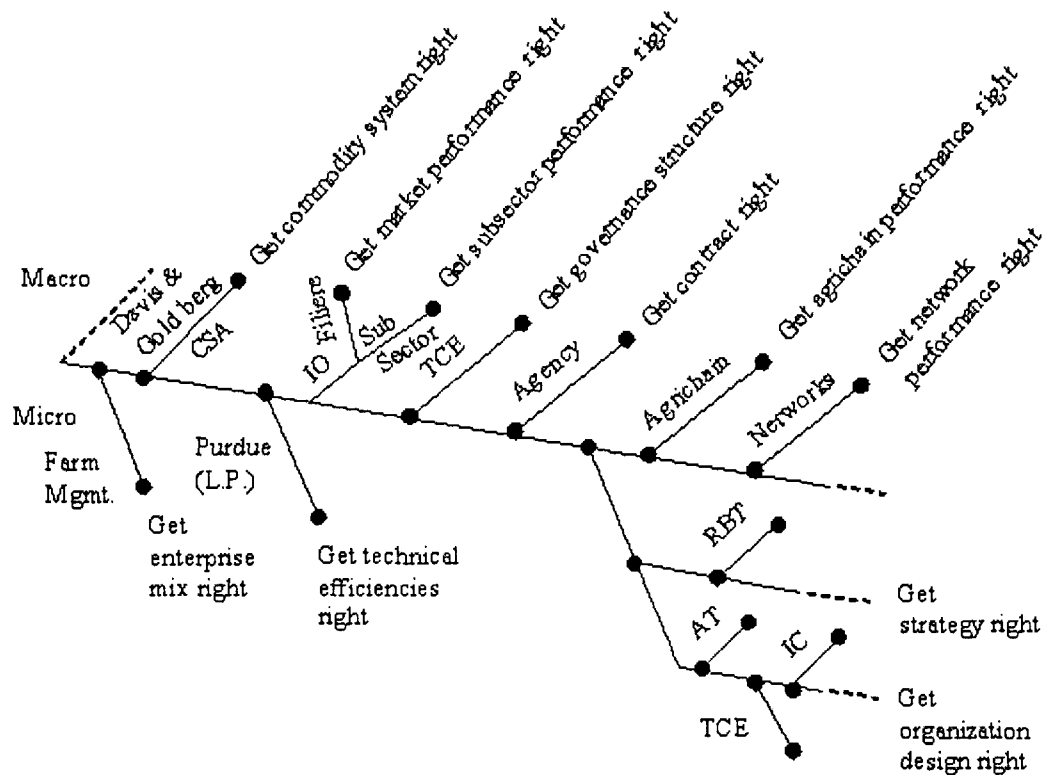
* Williamson, uses 'orthodoxy' to refer to the neoclassical theory of the firm as presented in intermediate microeconomic theory.

Source: From Williamson, 2004, p. 27.

Cook and Chaddad (2000), concerned with the agro-industrialization process of the global agrifood economy highlight the importance of multidisciplinary approaches to understand this phenomenon. They present a thorough review of the evolution of macro and micro agribusiness research since mid 1950s, illustrated in Figure 3.1. The macro level starts with the commodity systems approach (CSA), and continues with industrial organization (IO), transaction cost economics (TCE), agency theory, agrichain, and networks. The micro level starts with farm management, and continues with technical efficiencies, resource base theory (RBT), agency theory (AT), transaction cost economics (TCE), and incomplete contracts (IC). (The main scope of NIE relevant to this research is discussed in the next section). Reardon and Barrett (2000, p. 203) point out that

“technological and institutional changes in the agrifood sector of many developing countries are perhaps better understood using contemporary management theory than conventional production theory.”

Figure 3.1 Evolution of Agribusiness Research



Source: From Cook and Chaddad (2000, p. 210)

3.3 New Institutional Economics

Coase (2000) emphasizes the importance of institutions [to facilitate coordination] and lower the costs of economic transactions. For this reason, NIE attempts to incorporate the role of institutions and institutional arrangements in the coordination of the activities of economic players (Harris *et al.*, 1998; Menard and Shirley, 2005). NIE builds on neoclassical economics, keeping underlying assumptions such as scarcity and competition but relaxing the assumptions of inherent rationality and perfect information.

Additionally, NIE incorporates institutions into the economic analysis, which are not explicitly included by neoclassical economics (North, 1995). Furthermore, given the origins and scope of NIE, it “represents the culminating intersection of a number of different lines of investigation,” crossing discipline boundaries and engendering interdisciplinary studies, “allowing the cross-fertilization and mutual stimulation among historians, sociologist, political scientists, psychologists, lawyers, and of course, economists” (Nabli and Nugent, 1989, p. 1333).

Many authors have used the NIE approach to analyze the economic rationale of farmers’ decisions and the implications in their participation in farmer organizations and/or contractual relationships in the supply chain of contemporary agrifood systems (Dorward, *et al.*, 1998; Harris *et al.*, 1998; Rehber, 2000; Sykuta and Cook, 2001; Cook and Iliopoulos, 2000; Allen and Lueck, 2005). Even though there is no consensus about what should be included under the umbrella of NIE, Nabli and Nugent (1989) consider that contractual uncertainty (transaction and information costs) and collective action are the salient points. Harris *et al.* (1998) associate contractual uncertainty with information costs and asymmetry, transaction costs, and hold-up problems; and collective action with collective goods, common pool resources and free-ride problems. Recent publications consider that the main areas of NIE cover transaction cost economics, contractual relations, and property rights (Furobotn and Richter, 1997; Menard, 2005). However, all these areas are inter-related.

Transaction costs are associated with the process of exchange, and their extent determines the organizational forms of economics activities (Furobotn and Richter, 1997). Thus, through the analysis of transaction costs the characteristics of different

forms of organizational arrangements can be understood (Menard, 2005). Williamson (2005) argues that under the presence of positive transaction costs the governance structure of the firm should be analyzed with ‘contract’ lens rather than with ‘choice’ lens. Economic transactions usually face problems of asymmetric information, which may lead to bounded rationality and/or opportunism by one of the parties. Contractual relations can provide guidelines for relaxing these problems (Menard, 2005); however, it is practically impossible to be able to write complete contracts (Williamson, 2000). The common principal-agent problem which may result in *moral hazard* and *adverse selection* is a typical problem caused by asymmetric information (Miller, 2005). Finally, the presence of ‘well-defined’ property rights in economic transactions and appropriate enforcing institutions is important for NIE since it can help to reduce conflicts, facilitate cooperation, and hence reduce transaction costs (Nabli and Nugent, 1989; Furobotn and Richter, 1997; Menard, 2005). For the purpose of this research, the ideas about the main areas of NIE are encompassed in the analysis of the role of transaction costs and collective action in small farmers’ participation in new agrifood systems, specifically the SSC for FFV.

3.3.1 Transaction Costs and Participation in the SSC

Coase (1937) is considered to be the first author to introduce transaction costs into economic analysis. He challenges the assumption that the economic system is merely governed by the “price mechanism.” He considers that relevant prices have to be searched in order to use the price mechanism, and furthermore there are costs associated with negotiating and contracting, consequently, the need of economic organization to

reduce those costs. Transaction costs are classified as: 1) search and information costs; 2) bargaining and decision costs; and 3) supervision and enforcement costs (Furubotn and Richter, 1997, p. 44). Lack of information is a major impediment for economic players to be inherently rational. In decision-making processes, economic players need information, which often is costly and difficult to analyze (Harris *et al.*, 1998).

According to Ostrom *et al.* (1993) the costs needed to achieve an agreement can be classified as *ex ante* and *ex post*. *Ex ante* costs are associated with: 1) obtaining the relevant information needed to plan a particular undertaking; 2) negotiating with counterparts; 3) making side-payments to those who oppose the undertaking; and 4) communicating with all relevant participants. In order to participate in new agrifood systems small farmers need appropriate information about products and markets as well as potential partners with which to establish strategic ventures. In the same way, agribusiness firms need information about their potential suppliers, which is also costly. Agribusiness firms, lacking information about farmers, may make arrangements with ‘inappropriate’ producers. As a result, firms have to drop farmers in subsequent years once they do not meet the requirements, thereby increasing the transaction costs of the firm (Alvarado and Charmel, 2002). The searching and information costs make it difficult to establish contractual arrangements (negotiation) between agribusiness firms and individual small farmers.

Ex post costs are associated with governing, monitoring, sanctioning and renegotiating particular agreements (Ostrom *et al.*, 1993). With the increase use of grades and standards (G&S) in agrifood systems (Reardon *et al.*, 2001) small farmers face the risk that their products will not meet the exacting requirements specified in

contracts and consequently face hold-up problems. Given the high cost of monitoring particular characteristics of products (e.g., distinguishing between organic from non-organic products), relationships between buyers and sellers that include trust and reputation are recommended to reduce supervision and enforcement costs, and hence the risk of hold-up problems (Chambers and King, 2002).

Williamson (1985, p. 52) considers that the way that a transaction is organized (e.g., spot or coordinated market) depends on “rational economic reasons.” He suggests three principal dimensions of these reasons: 1) asset specificity; 2) uncertainty; and 3) frequency. Asset specificity deals with the degree to which a particular asset can be redeployed to alternative uses; uncertainty is usually derived by the incompleteness of contracts given imperfect information, which can lead to opportunism of one of the parties to an agreement; and frequency refers to the rate of recurrence of a transaction.

Asset specificity. When transactions involve assets with high specificity, the party that made the investment faces the risk that the other party behaves in an opportunistic way. This occurs because this party knows that the investor is tied to the agreement through the limited alternative uses of its assets (Harris *et al.*, 1998). For instance, in the production of vegetables, farmers need to make investments in greenhouses and irrigation systems that are not required in the production of traditional crops (e.g., maize). If a contractual relationship between small farmers and agribusiness firms is ended, these assets have little alternative uses. High asset specificity can cause hold-up problems. This can occur, for instance, when a particular product is already produced and there is only one specific buyer, who is tempted to adopt opportunistic behaviour through which it can buy the product on terms that disadvantage the seller. Critics of contract farming

schemes usually argue that monopsonistic characteristics of agribusiness firms, which contract small farmers, allow the first ones to behave opportunistically (Grosh, 1994; Little and Watts, 1994; Singh, 2002).

Uncertainty. Uncertainty is usually derived by the incompleteness of contracts given imperfect information, which can lead to opportunism of one of the parties to an agreement. In the case of contract farming, small farmers commonly do not understand the content of the contracts. This facilitates agribusiness firms to act opportunistically. However, firms also face uncertainty, because when farmers do not honor the contracts, firms usually do not sue farmers given the legal and social costs of suing small farmers (Singh, 2002). Uncertainty can also be caused by environment factors such as weather variability or pest damages. For instance, in the contract farming scheme farmers face a great risk of totally losing a cash crop production, which is usually related with relatively high investments. Under this situation a small farmer can be discouraged to produce a cash crop. Contracting agribusiness firms also face the risks that if farmers lose their production, they will not have the needed supply for processing plants or retail businesses.

Frequency. The frequency with which transactions occur can also affect the way that transactions are organized, and hence their associated transaction costs. New agrifood systems demand products with particular characteristics in a consistent and frequent way, which make spot markets inappropriate for some commodities (Boehlje, 1996) due to the need of constant monitoring (David and Han, 2004). Therefore, governance structures and trust between parties is needed to reduce transaction costs associated with frequency. Williamson (1991) considers that according to the degree of

asset specificity, uncertainty and frequency, the governance of transactions can be managed in markets, hybrids and hierarchies. Thus, the way that minimizes transaction costs should be used. Generally, in the presence of high asset specificity, uncertainty and frequency the use of market governance increases transaction costs, consequently the need of coordination (David and Han, 2004).

Transaction costs approach offers appropriate insights to address the relationship between small producers of FFV and the SSC. It is hypothesized in this research that several forms of transaction costs are associated with selling in the SSC. The SSC demands specific requirements in terms of quantity, quality, and frequency. Therefore, small farmers are uncertain if they will be able to supply the quantity and quality demanded. Information about grading and terms of contract also pose uncertainty on farmers (Table 3.2). In the same way, in order to participate in the SSC, small farmers need specific investments that allow them to continuously produce and meet the frequency required in the SSC (Table 3.2). Facing high transaction costs to enter the SSC, farmers may prefer to sell in the traditional market (SM), because it has lower requirements, and furthermore they are better known by farmers. Nevertheless, acting in this way, farmers would forego the potential benefits of selling in the SSC.

Table 3.2 Transaction Costs Associated with the Participation of Small Farmers in the Supermarket Supply Chain for FFV

No.	Transaction Costs		
	Uncertainty	Asset Specificity	Frequency
1	Output risk	Irrigation	Months of production
2	Quality risk	Greenhouse	Frequency of delivery
3	Information	Collect. & distrib. centres	
4	Payment mechanism	Transportation	
5	Price variability	Technical assistance	
6	Trust (buyer/seller)		
7	Grading		

Source: Own elaboration based on hypothetical transaction costs associated with farmer participation in the SSC for FFV.

3.3.2 *Collective Action and Participation in the SSC*

One of the core ideas of NIE is that institutions matter, and therefore, they are important to lower transaction costs (North, 1995; Williamson, 2000). While institutions are defined as the “rules of the game,” organizations are defined as the “players of the game.” According to North (1995, p. 23) institutions are “the rules of the game of a society, or more formally, are the humanly devised constraints that structure human interaction. They are composed of formal rules, informal constraints, and the enforcement characteristics of both.” Williamson (2000, p. 597) proposes four levels of social analysis of institutions. The levels include: 1) informal institutions, such as customs, traditions, norms, and religions; 2) institutional environment, which includes formal rules of the game, such as property rights (polity, judiciary, bureaucracy; 3) governance, which includes ‘the play of the game,’ specifically contractual arrangements; and 4) resource allocation and employment (prices and quantities; incentive alignment). NIE as the branch of economics that focuses on institutions is particularly interested in

Levels two and three that include institutional environment and institutions of governance (Williamson, 2000).

North (2000, p.9) emphasizes that informal institutions influence the development of formal ones, given that “beliefs [are] translated into institutions, and institutions [are] translated into the way economies evolve over time,” thus, the need for innovation to support the development of informal and formal institutions. An example of an informal institution may be the resistance of farmers to work interdependently given their traditional beliefs of independence (Boehlje, 1996). North (1995) points out that while formal institutions may be changed relatively rapidly, informal institutions may take longer to evolve.

Institutions can be inherently related to collective action, because people are who make institutions. The concept of collective action embraces many institutional and organizational forms that would be impossible to define completely here. Indeed, they often mean different things to different people and there are inter-relationships among them, which make it difficult to establish clear boundaries. As in the case of the vertical coordination continuum proposed by Peterson *et al.* (2001), collective action can exist in different forms such as informal networks, cooperatives and strategic alliances. For the purpose of this research, special emphasis is put on relationships or collective arrangements (formal or informal) that facilitate the participation of small farmers in the SSC of FFV. Collective efforts can help farmers to pool resources to access specific assets needed in FFV production, reach scale and variety, and gain bargaining power to negotiate with buyers (Holloway, *et al.*, 2000; Lyon, 2003).

Organizations are “the players [of the game]: groups of individuals bounded by a common purpose to achieve objectives. They include political bodies [e.g., political parties]; economic bodies [e.g., firms]; social bodies [e.g., associations]; and educational bodies [e.g., schools]” (North, 1995, p. 23). Organizations are in continuous interaction with institutions. In the case of competition or unfavourable environments, organizations look for skills and knowledge that allow them to survive as well as to shape institutional changes that favour them (North, 1995). This reflects the concern of many authors (Reardon and Barrett, 2000; Cook *et al.*, 2001; Pinstруп-Andersen, 2002) regarding the need for innovation in order to guarantee a ‘fair game’ that allows small farmers to compete in new agrifood systems.

The key role of organizations is that they “could make numbers count as they could not when un-aggregated, that is, unorganized” (Esman and Uphoff, 1984, p. 54). Esman and Uphoff (1984, p. 54) discuss the cooperative movements launched in the nineteenth century in England and Germany (and later in Scandinavia), which allowed their members not only to exert economic and political pressure but also to achieve substantial self-help gains. Levins (2002) considers that one of the best alternatives for farmers, to deal with contemporary problems, is collective bargaining as a way of achieving market power to negotiate with buyers of farm products, input and machinery suppliers, and even with government. However, he also warns that “choosing collective action will require a new way of thinking, a great deal of organizational effort to gain economic power, and economic analysis to learn how to use that power effectively” (p. 18). Farmers can participate in different forms of collective action, depending on their own situation and needs. The most common forms of collective action that farmers

can participate in are networks, cooperatives and strategic alliances. Thus, the general hypothesis in this research is that collective action can help farmers to reduce transaction costs associated with their participation in contemporary supply chains.

Networks. Networks are defined as “simple associations of individuals or organizations which communicate with each other for mutual benefit” (Holmlund and Fulton, 1999, p. 6). In an era where information is very important for driving economic activities, the authors consider that networks are the most efficient way to share information and produce know-how. Casson (2000, p. 170) defines networks as “a set of high-trust linkages connecting a set of entities. ... The entities can be either people, forming an inter-personal network, or institutions forming an inter-institutional network.” Murdoch (2000) discusses the potential of networks to become a new paradigm in rural development, applicable to cope with problems in new agrifood systems. Networks can be useful in vertical relationships such as the commodity chain analysis and in horizontal relationships that help integrate agricultural and non-agricultural economic activities.

Even though networks can be formal or informal, they provide for quite flexible relationships. In networks, “information and services flow in more than one direction, and there is the possibility of reconfiguring the alliances as opportunities present themselves” (Holmlund and Fulton, 1999, p. 11). In this way, small farmers can establish networks among themselves as well as with private, governmental and non-governmental agencies in order to facilitate their integration into new agrifood systems.

Problems of cost and asymmetry of information can be substantially lowered through network relationships. Sporleder and Moss (2002) emphasize the importance of “network embeddedness” which refers to the “interdependence that develops over time

from a myriad of inter-firm relationships” (p. 1349). They consider that relationships matter and definitively affect the terms of trade. Ziggers and Trienekens (1999), stress the interdependence of the different stages of the supply chain [in the absence of vertical integration], and therefore, cooperation among firms engaged in each stage can help them to manage the flow of products and services with higher customer value. In this sense, successful partnerships, such as networking, are important to create competitive power and response capacity in changing agrifood systems.

Omta *et al.* (2002) call attention to the behavioural and social aspects involved in network relationships. They consider that several disciplines, such as business, sociology, economics and engineering contribute with their nature of interaction and communication. Moreover, the key success factors of networks rely on the ability of their members to adjust to particular circumstances and develop common means of interaction. In this process, networks can reach sustainability, stagnation or even disintegration. Therefore, in spite of the advantages of networks, they cannot be considered as an infallible vehicle for development. Rather than that, Murdoch (2000) recommends identifying different types of networks as well as the particular economic, social, cultural and natural conditions in which they operate and if necessary to encourage adjustments.

Casson (2000) separates good networking from bad one. While good networking is characterized by transparency, entrepreneurship, and ‘public good’ provision, bad networking is characterized by dense and closed relationships. The combination of ‘bad’ politicians with anti-entrepreneurial social elites can be an example of bad networking. He associates that kind of networking with rent-seeking behaviour “in which entrepreneurs combined with politicians make lobby to protect weak local industries

against competition” (p. 161). Consequently, in the promotion of networks to respond to changes in agrifood systems it is crucial to pay special attention to the management of collective power to guarantee an equitable and ethical use of it.

Cooperatives. “A cooperative is an autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a joint-owned and democratically-controlled enterprise” (Gertler, 2001, p. 18). Traditionally, cooperatives in the agricultural sector have focused on providing a unified voice in relation to commodity programs and other agricultural policies as well as performing clearinghouse functions. However, with ongoing changes in agrifood systems, farmer organizations such as cooperatives are also focusing on providing the resources and services needed to adjust and make profits (Brester and Penn, 1999). As an example, “New Generation Cooperatives,” have emerged especially during the last 10 to 15 years as an attempt to keep pace with these changes. New Generation Cooperatives are characterized by a farmer-owned closed membership and are focused on integrating production and processing activities. Each farmer has a contract for delivering unprocessed produce with specified quantity and quality to the cooperative (Stefanson *et al.*, 1995; Stefanson and Fulton, 1997; Merrett and Walzer, 2001). New Generation Cooperatives usually operate like any other vertically-integrated business, with the difference that they are owned and managed by farmers.

Holloway *et al.* (2000) point out that, in spite of unhappy stories of cooperatives in Africa, there are ‘interesting’ forms of organizational innovation that are helping small farmers to lower transaction costs and participate in commercialization activities, such as the case of milk-markets in the East-African highlands. Cooperation among farmers

through cooperatives can help to address market imperfections, such as those taken into account in the NIE framework. Small farmers can pool resources to meet a determined scale, share information and have access to inputs and services that they could not access if acting independently. Through bulking, farmers can facilitate the commercialization of perishable products with no market demand in local areas (Holloway *et al.*, 2000). Even though coordination and free-rider problems can arise in cooperatives, they can be reduced if property rights are well defined (Cook and Iliopoulos, 2000) and trust and reputation are encouraged among members (Chambers and King, 2002).

Strategic alliances. Strategic alliances can be considered a type of network although differentiated by the nature of the associated goals. Holmlund and Fulton (1999, p. 10) define strategic alliances as “groups of people [or organizations] who have gotten together to undertake activities they realize they could not undertake by themselves.” While networks can be used just for sharing information, in strategic alliances there are more specific goals. In the same way, while in networks there is more flexibility to establish linkages with different members of the network, strategic alliances are usually attached to specific partnerships. Even though strategic alliances are associated with specific commitments, one key element is that each firm involved in the partnership remains independent, except for the common goals (Dussauge and Garrette, 1999).

Strategic alliances can offer farmers and/or farmer organizations the opportunity to get involved in partnerships in order to respond to changes in the agrifood systems and at the same time maintain their independence. In order to participate in supply chains that move their products from the farm gate to the retail shelf, they need resources and

skills, which are difficult to access when acting independently (Holmlund and Fulton, 1999). Strategic alliances may offer a solution to this.

Ziggers and Trienekens (1999, p. 276) develop a model of the factors that influence the success of a partnership. These include the context in which the partnership operates, the interdependence that exists among actors and the behaviour of the actors (Figure 3.2). In order to be successful, a partnership should have: 1) clear benefits for all participants; 2) a good strategic fit for the partners; 3) the involvement of all management levels; and 4) organizational flexibility. With the exception of contract farming schemes, strategic alliances will most likely not occur between an individual small-farmer and a buyer. Most probably they will occur between a farmer organization (e.g., cooperative) and an agribusiness firm. Thus, small farmers have to cooperate first among themselves to achieve collective ventures, and then negotiate with other potential partners.

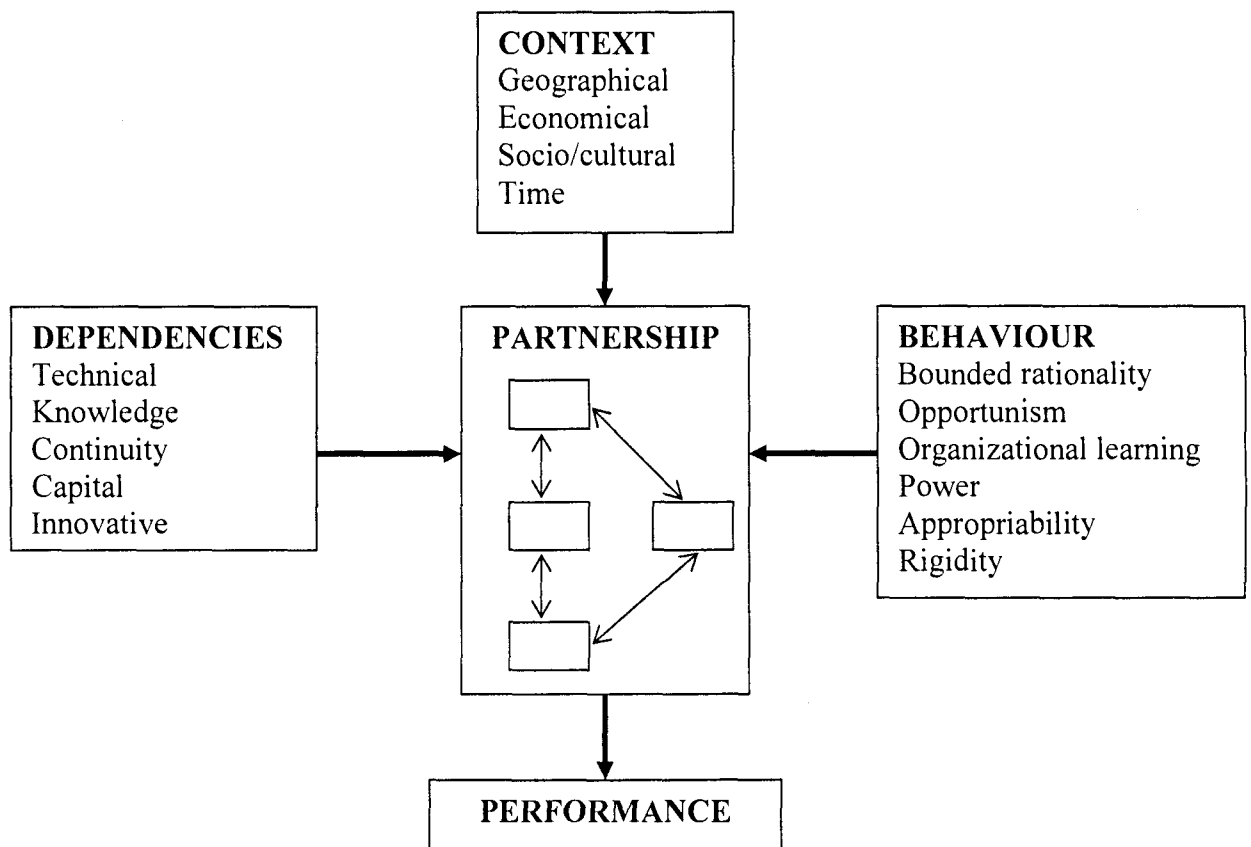
The three organizational arrangements presented here, as forms of collective action, are inter-related and the participation of small farmers in them will be based on their particular conditions (e.g., socio-economic and agro-ecological characteristics) and their willingness to cooperate.

3.3.3 *Limitations of New Institutional Economics*

In spite of the good contributions that NIE can make in analyzing and addressing the problems associated with new agrifood systems, it is also appropriate to keep in mind its main weaknesses. NIE has some theoretical and methodological problems. One is the tautological statement that “institutions minimize transaction costs because transaction cost minimization is their function” (Harris *et al.*, 1995, p. 7). The other one is the

insufficient effort put on measuring empirically the effects of property rights and transaction costs (Bardhan, 1989; Toye, 1995). Even though during the last decade the publications on empirically measuring transaction costs have exceeded 500 (Williamson, 2000), transaction cost economics and NIE can still benefit by more and better empirical work. Williamson (2000, p. 595) admits that “we are still very ignorant about institutions,” and he concludes that “the NIE is a boiling cauldron of ideas,” and the best day of the theory may lie ahead (p. 610).

Figure 3.2 The Concept of Partnerships



Source: From Ziggers and Trienekens, 1999, p. 276.

Regarding collective action, Bardhan (1989) emphasizes the high propensity of opportunism and free-riding problems in collective action that may limit the development of institutions to bring common benefits. In the same way, he mentions the problems of unbalanced power among agents that NIE seems to ignore in the development of institutions. Bates (1995, p. 42) criticizes that NIE has been “slow to acknowledge that the creation of economics institutions takes places not on the ‘level playing field’ of the market but rather within the political arena, in which some are endowed with greater power than others.” For this unbalance of power, dysfunctional institutions can stay around for long periods of time (Bardhan, 1989). Similarly, the World Development Report 2006 emphasizes how inequalities within and among countries, as is the case in Honduras, hamper economic growth and development. Therefore, equitable access to public services (e.g., health, education), resources (e.g., capital, land), and political power is needed to achieve development (World Bank, 2006b). Likewise, economic agents have to find mechanisms to reduce collective action problems, such as a good definition of property rights (Cook and Iliopoulos, 2000) and promotion of reputation and trust (Chambers and King, 2002; Sporleder and Moss, 2002).

3.4 Relationship of New Institutional Economics with the Main Research

Hypotheses

Following Nabli and Nugent (1989), the objectives set in chapter one can be summarized in three general hypotheses: 1) farmers selling FFV in the SSC are better off than farmers selling in traditional markets in terms of factors such as sales, income, performance, satisfaction with buyer, relative prices, and overall situation; 2) high contractual

uncertainty (transaction costs) impedes small farmers to participate in the SSC; and 3) participation in collective action helps farmers to reduce contractual uncertainty, and thus participate in the SSC. The relationship between the first hypothesis and NIE is based on the potential contribution that institutions can make for achieving economic development. NIE has been even seen as a “theory of development” especially because of the role that institutions play in the economic performance of a country (Harris, *et al.*, 1995; North, 1995; Dorward, *et al.*, 2005; North, 2005). In this sense, it is important to see if new marketing systems such as vertical coordination along the SSC, (seen as institutional arrangements), bring benefits to small farmers in developing countries. The relationship between small farmers and big retailers has been seen as a huge market opportunity that can contribute to economic development (Dolan and Humphrey, 2000; Reardon and Berdegúe, 2002; Humphrey *et al.*, 2004). For testing this hypothesis, participant and non-participant farmers in the SSC are interviewed and surveyed. Farmers are compared among themselves, and also over time through several questions regarding their farming and marketing systems. Tangible (e.g., income) and intangible (e.g., satisfaction) variables are considered (McCulloch and Ota, 2002; Masakure and Henson, 2005).

The second hypothesis has a very close relationship with transaction costs (Table 3.2). It is expected that farmers will choose the market channel that minimizes their transaction costs. If the hypothesis one is confirmed, then what would be the explanation of non-participant farmers in the SSC? The answer would be the bounded rationality of farmers due to imperfect information, and the transaction costs associated with their participation in the SSC, which impede them from getting the potential benefits offered by new marketing systems. NIE faces methodological issues, such as the measurement

of transaction costs (Ménard, 2001). Nevertheless, several proxy variables are used in this research to attempt the measurement of transaction costs, such as those mentioned in Table 3.2.

For the third hypothesis it is expected that collective action, in the form of institutional and organizational arrangements, helps reduce transaction costs. Collective action, which can be formal or informal, can contribute to increasing bargaining power of farmers to negotiate with buyers through the pooling of output. Similarly, by pooling resources farmers can access key assets that cannot be acquired on an individual basis. If collective action has a positive effect reducing transaction costs, then the core idea of NIE that “institutions matter” would be confirmed. Nevertheless, collective action also faces the methodological issues of measurement. As in the case of transaction costs, several proxy variables are used in this research to attempt to measure collective action effect.

3.4.1 Empirical Evidence

Williamson (2004) provides a thorough review of transaction costs, as a tool to analyze economic organization and its application in agriculture. He considers that transaction cost economics generally is “an empirical success story.” Nevertheless, its contribution in agriculture is fairly incipient. Issues such as perishability of some commodities (e.g., FFV) pose great risks. Given that for processors and retailers backward integration is not always practical, and for farmers forward integration is not always practical either, he considers that some forms of economic organization (e.g., cooperatives) that falls in between may be more appropriate in agriculture.

David and Han (2004) assess the empirical support for transaction costs economics. These authors meticulously selected a sample of 63 journal articles about transaction costs, which included 308 statistical tests regarding transaction cost variables. They found that from these tests, 47 percent were statistically significant ($p < 0.05$), 43 statistically non-significant, and 10 percent statistically significant but with the opposite sign according to theory (p. 44). The main independent variables included in these studies are related to asset specificity, uncertainty and transaction costs, and the main dependent variable is 'hierarchy vs. market.' David and Han (2004) conclude that according to their findings transaction costs economics still faces doubts about its empirical assessment.

Hobbs (1997) uses the transaction costs framework to measure the determinant factors of market choice of cattle farmers. She estimated the proportion sold through auctions as a function of transaction costs and socio-economic variables. She found that grade uncertainty, risk of not selling, time taken in the auction, adequacy of procurement staff, average number of cattle sold, and kind of cattle sold (bulls/no bulls) were significant at the 0.005 level and with the expected signs. Farmer membership to 'cattle association' was significant at the 0.1 level. She concluded that transaction costs and socio-economic characteristics of farmers [including some sort of collective action, represented by farmer membership to cattle association] were important in determining the decision of farmers regarding the degree of vertical coordination used by farmers in their transactions. She, nevertheless, acknowledges the difficulty of measuring transaction costs, because primary data and proxy variables were needed.

Winters *et al.* (2005) evaluates the contract participation of farmers for the production of hybrid seed in Indonesia using the transaction costs approach. Pioneer Hybrid International, a multinational seed company, contracts small farmers for producing hybrid seeds. The authors found that age (younger farmers), access to irrigated land, and participation in farmer groups significantly contribute to farmer participation in contracts. Results found also reveal that participant farmers are better off in terms of profitability of agricultural production, use of more non-family labour and use of more chemical inputs. In this case, both transaction costs and collective action are important to determine participation of farmers in contract production with an agribusiness firm.

Holloway *et al.* (2000) report that under remote conditions, such as those faced by farmers in East-African highlands, institutional innovation in terms of collective action (cooperatives), has allowed farmers to participate in the market of perishable products such as milk. Pooling resources for milk collection and transportation reduces transaction costs, however, coordinating and monitoring activities put at risk the potential gains. Staal *et al.* (1997) had previously hypothesized that high transaction costs faced by farmers prevent those benefiting from potential market opportunities brought by agrifood system changes in East Africa. Based on their empirical findings in Kenya and Ethiopia the authors conclude that farmers face high transaction costs due to remoteness, cost of information, and risk of spoiling their products (dairy) before reaching the market. Collective action, in the form of cooperatives, can help reduce transaction costs; however, the cost of managing and monitoring it properly may limit its effectiveness. As a mechanism to reduce coordination and free-riding problems in collective action

(e.g., cooperatives). Cook and Iliopoulos (2000) recommend the good definition of property rights. In empirical research they found that well-defined property rights, such as marketing agreements and closed membership, increased the probability of making investments and reducing free-ride problems in cooperatives. In the same way, Chambers and King (2002) found that trust and reputation among parties help lower coordination and monitoring costs.

So far, empirical evidence of NIE framework suggests that transaction costs are important to determine how economic transactions are organized. It also suggests that institutions matter to reduce transaction costs. Collective action can be vital to institutional and organizational innovation that allows small farmers to adjust to the requirements of new agrifood systems. Meinzen-Dick *et al.* (2002) provide several empirical studies about the role of property rights and collective action for technology adoption; nevertheless, its results are not conclusive and more research is encouraged.

Wilson and Kennedy (1999) consider trust as an economic asset important for making decisions under the conditions of new agrifood systems. They consider trust as “an important lubricant of a social system ... Trust is at the root of any economic system based on mutually beneficial exchange” (p. 179). Results of a six-case study indicate that “trustworthiness increases business flexibility, reduces risk, saves managerial time, and reduces monitoring costs” (Wilson and Kennedy, 1999, p. 185). These authors conclude that business decisions are taken under a bounded rationality environment, and, therefore, factors such as institutions, collective action and social capital are important to understand the nature of economic transactions.

Lyon (2003) analyzes the importance of collective action in rural areas of Africa for poverty reduction, and how it can be sustained. He found that group cooperation is helpful in food trading, crop storage and micro-credit, and market infrastructure and transportation. Also, among the factors that contribute to group sustainability are good incentives, mechanisms to reduce risk of cheating, simple flexible management, trust, leadership, and enforcement and ability to punish. Reynolds *et al.* (2004) analyze the relationship between fair trade coffee, collective action, capacity building and development. Fair trade is an example of opportunities brought by changes in agrifood systems; however, for obtaining its benefits, collective action is mandatory to establish relationships between producers and buyers. From a seven-case study of fair trade coffee, the authors conclude that “fair trade movement has built an impressive global network which harnesses Northern consumers ... with Southern producers” (p. 1118) creating new opportunities for the last ones. Fair trade has brought economic gains to producers, but most importantly has contributed to the “the empowerment and capacity building” of participant groups, which can potentially be used to look for new opportunities beyond fair trade (p. 1119).

3.5 Conclusions

In this chapter the analytical framework of this research has been discussed. Considering the increased vertical coordination of current agrifood systems, the relationship between small farmers and the SSC for FFV should better be analyzed using ‘contract lens,’ rather than ‘choice lens,’ as Williamson (2004; 2005) recommends. Contemporary supply chains are characterized by trading different products through vertically-coordinated

relationships between buyers and sellers, instead of homogeneous commodities traded in perfectly competitive markets. In this sense, it is considered that NIE provides a suitable analytical framework, because it keeps basic assumptions of neoclassical economics such as scarcity and competition, but relaxes others such as inherent rationality and perfect information. Furthermore, NIE incorporates the role of institutions into economic analyses, as a means to reduce transaction costs.

Within NIE special attention has been placed on the role of transaction costs and collective action as determinant factors of the participation of small farmers in the SSC of FFV. Transaction costs are associated with contractual uncertainty, since they represent the costs of searching information, establishing market relationships and monitoring their performance. Furthermore, transaction costs take into account the specificity of assets needed in FFV production and the frequency of transactions. When transaction costs are too high, the transaction between buyers and sellers does not occur in spite of potential gains. Under this situation collective action becomes a key factor to reduce transaction costs. According to particular situations, economic agents can participate in different forms of collective action such as networks, cooperatives and strategic alliances.

Of special importance for this research is to determine if market relationships between agribusiness firms and small farmers bring benefits to the latter. Thus, one of the main hypotheses to test in this research is related to that purpose. Similarly, the other two main hypotheses are related to test the effect of transaction costs and collective action in the participation of small farmers in the SSC. Empirical evidence reviewed in this chapter supports the importance of the hypotheses set for this research. Nevertheless, these empirical studies also acknowledge some methodological and practical limitations

of NIE such as the difficulty of measuring transaction costs as well as the difficulty of developing efficient and equitable institutions and organizations. Thus, NIE still needs more empirical research to support its main assumptions. In the following chapter the methodology and data used in this research is presented.

CHAPTER IV

METHODOLOGY AND DATA

4.1 Introduction

This chapter provides a description of the methodology and data included in this study. Data collection and analysis were carefully planned in order to facilitate the achievement of the objectives set for the research. An overview of the stages of data collection, the geographical scope of the study, and the sample selection is provided.

Both qualitative and quantitative data were collected. Qualitative data was used for making a general characterization of the supply chain for FFV in Honduras. This information provided essential input for designing a survey for collecting quantitative data. Furthermore, qualitative information becomes very useful for interpreting quantitative results and complementing them.

While qualitative data is interpreted and descriptively presented, quantitative data is analyzed using statistical and multivariate data analysis techniques, such as T-test and cross-tabulations, and logit and probit regressions. All these quantitative methods are summarized and discussed in this chapter according to research objectives.

4.2 Overview of Stages of Data Collection

Firstly, prior to leaving to the field in Honduras, a thorough review of secondary information was undertaken. It consisted of the review of information from local (Honduras) and international sources, including a literature review of previous studies in other countries. In this stage was contacted a ‘local partner’ called “Asociación Nacional

para el Fomento de la Agricultura Ecológica,” ANAFAE, which is a local non-governmental organization (NGO) working in the agricultural sector in the geographical areas of the research. ANAFAE provided local information and assisted to contact key informants. This information was essential for designing pre-structured interviews used in the following stage of the research.

NIE suggests that institutions and organizations play a critical role in the transactions of economic agents. Thus, a second stage of the research consisted of interviewing key informants of government institutions, NGOs, private organizations, farmer organizations, universities and donors. The objective of this activity was to determine the role of institutions and organizations in helping small farmers participate in contemporary supply chains. The interviews explore the involvement of institutions and organizations in the production and marketing of FFV, their current and future plans and limitations.

Thirdly, the main supermarket chains in each of the study cities, Tegucigalpa and San Pedro Sula, were interviewed in order to gather information about their marketing activities and procurement systems for FFV. Specialized supermarket suppliers of FFV were also interviewed in each city; such suppliers mostly rely on contracted small farmers to procure FFV. These interviews help to identify the nature and level of transaction costs associated with the participation of small farmers in supermarket supply chains and potential mechanisms through which these can be reduced. They also provide information about market opportunities and threats offered to small producers of FFV by supermarkets, the constraints faced by farmers trying to enter such supply chains, and key success factors associated with small farmers that are able to gain access.

As a fourth stage, in-depth interviews were undertaken with farmers selling in the SSC and farmers selling in the SM. Interviews were conducted in farmers' homes or in their fields which allowed me to better appreciate the real conditions in which farmers operate. Interviews encompassed the factors that facilitate or impede their participation in the SSC such as transaction costs and collective action. Interviewing participant and non-participant farmers enabled the exploration of the motivations, benefits and key success factors of these two groups, as well as the barriers to entry faced by non-sellers.

Following the analysis of secondary information and in-depth interviews, the fifth stage of data collection consisted of surveying a sample of participating and non-participating farmers in order to collect quantitative information about the issues addressed in the in-depth interviews. This stage provides quantitative data on the transaction costs faced by small farmers in supermarket supply chains, constraints faced by farmers that unable them to enter the supply chain, and key success factors of farmers that have been able to participate. Both qualitative and quantitative information contribute to achieving the objectives of the study.

4.3 Geographic Scope of the Study

The different stages of data collection were divided into two main phases in the field. The first phase was aimed at collecting qualitative data (secondary information and interviews), and was carried out during the period September-December 2004. The second phase was aimed at collecting quantitative data (survey), and was carried out during the period April-June 2005. For the first phase, the cities of Tegucigalpa and San Pedro Sula (Figure 1.1) were chosen to analyze the demand side for FFV. These two

cities are the most important cities in terms of population and economic activity.

Tegucigalpa is the capital of the nation with a population of about a million inhabitants (including the twin city of Comayaguela). San Pedro Sula, with a population of about half million people, is called “the industrial capital” of the country for its manufacturing activity and strong economy compared with the rest of the cities. Very near San Pedro Sula there are other important urban centers such as Choloma and El Progreso with populations of over 100,000 people (Banco Central de Honduras, 2005). For analyzing the supply area of FFV, three departments⁹ were selected between these two cities, namely Intibuca, La Paz and Comayagua, plus the department of Francisco Morazan around Tegucigalpa. These four departments are among the main producers of FFV in the country (Secretaria de Agricultura y Ganaderia, 2005).

For the second phase (survey), the department of Intibuca was selected (specifically *Alt. La Esperanza* in Figure 1.1). This department was particularly attractive because of its diverse production of FFV in hands of small farmers and its equidistant location to the main markets in Tegucigalpa and San Pedro Sula. As seen in Figure 1.1 there are other geographical zones producing FFV, however, Intibuca was considered the most relevant (for the survey) according to the interest of studying small farmers that are in the process of entering new supply chains¹⁰. Comayagua, for instance, is one of the most important geographical zones of FFV production in Honduras; however, its production is in the hands of middle and large farmers that even export. Budget constraints also limited the inclusion of other geographical zones in the research.

⁹ Provinces or estates, geographically speaking.

¹⁰ Furthermore, these farmers belong to the ethnic group called *Lencas*, which give them particular social characteristics and homogeneity. Nevertheless, studying the effect of ethnicity is beyond the scope of this research.

Within Intibuca, the municipalities of Intibuca and Yamaranguila were selected. These two municipalities are the main producers of FFV in the department, given their favourable agro-climatic conditions. The municipalities are sub-divided in small communities, and all of the communities producing FFV were included in the survey. The total population in 2001 in Intibuca and Yamaranguila municipalities was 38,792 and 15,761 inhabitants respectively (INE, 2005). From the total population of each municipality, 69.1 percent and 76.7 percent are considered rural for Intibuca and Yamaranguila respectively (excluding people leaving in Intibuca and Yamaranguila towns). The total population of the communities producing FFV in both municipalities is about 19,000 people. Considering that each household has an average of 6 people, the total number of households is about 3,050 (Own calculations based on INE, 2005). Thus, the sample for the survey included more than 10 percent of the households¹¹, which can be considered representative (See further discussion in next sections).

4.4 Qualitative Information

Qualitative information is very useful in this research for several reasons. First, it provides the opportunity to approach research participants, and make a preliminary characterization of the situation in the field. It is also noticeable that some research participants, especially from the private sector are reluctant to release quantitative information; therefore, qualitative data becomes very handy. In the case of farmers, the majority of them do not keep written records (just 32.6% of the survey sample), and if they do, the records are of very poor quality given the low literacy rate of farmers.

¹¹ This is considered that not all the 3,050 households produce FFV. However, there is not any reliable data about the proportion of households producing FFV in the region.

Second, qualitative information provides valuable inputs for designing the quantitative phase. Third, it is very useful to interpret and explain quantitative results. Denzin and Lincoln (2000, p. 10) highlight the importance of qualitative research to capture “the individual’s point of view,” which may not be captured through the exclusive use of quantitative methods.

The qualitative phase was carried out during the period September-December 2004, consisting of in-depth interviews with different actors involved in the FFV sector, including government, private sector (for example supermarket chains, suppliers), non-governmental organizations (NGOs), farmer organizations, donors, universities and small farmers. The general objective of this phase was to make a general characterization of the supply chain for FFV in Honduras, make a map of the system and collect inputs for the questionnaire design used in the second phase.

A total of 30 in-depth interviews were conducted with organizations and institutions, 30 with small farmers that participate in the supply chain for supermarkets and 30 with small farmers that sell FFV on spot markets (SM). A ‘snowball’ sampling was used to contact research informants (Robson, 1993). The original list of contacts selected was based on secondary information (internet search) or recommended by the Asociación Nacional para el Fomento de la Agricultura Ecológica, ANAFAE, which was the local partner for this research. Afterward, people interviewed recommended other institutions and organizations that should participate in the study, including participant and non-participant farmers in the SSC for FFV.

Semi-structured interviews were differently designed for organizations and institutions, buyers, and farmers (Annex 1). Each interview lasted between one hour and

one hour and a half, and in the case of farmers most of the interviews were conducted on their farms. For each interview hand-written notes were taken for posterior analysis. Similarly, most of the interviews were tape-recorded. For analyzing the data, notes and tapes were reviewed. This analysis allowed the making of a map of the system and identifying categories (coding) related to the research objectives (Robson, 1993).

4.5 Quantitative Information

The objective of the second phase was to collect quantitative information about variables that determine the participation of small farmers in new agrifood systems, such as the SSC for FFV. For this purpose, a survey including participant and non-participant farmers in the SSC for FFV was carried out during the period April-June 2005. The survey was made personally either in the farmers' houses or fields. A total of 325 questionnaires were filled, but the first ones were considered a pilot test. Excluding the pilot sample, 261 useful questionnaires were included in the analyses. In Annex 2 is shown a sample of the questionnaire used.

The sample size was neither based on the total population nor selected randomly, since there is not available a census about the number of farmers producing FFV. The list of farmers selling in the SSC was not available either. Thus, an alternative approach was used. Secondary information from different sources (triangulation) and the assistance of five local enumerators was a key to identify the producing communities in the two municipalities. Having the advantage of small communities, different transects were made starting from a center place in the community. Farmers were usually found working in their fields or in their homes. It is considered that the sample is highly

representative, according to the number of households producing FFV in the two municipalities (about 3,050 according to previous estimations). Furthermore, every effort was made to avoid sample selection bias.

In behavioural sciences the sample size for multiple regression analysis can be estimated using power analysis (Cohen, 1988). According to him, “the power of a statistical test is the probability that it will yield statistically significant results (p. 1). Assuming statistical assumptions of the F distribution, the null hypothesis is that the proportion of the variance in the dependent variable is zero. Thus, this expression for this test can be written as:

$$F = \frac{PV_S / u}{PV_E / v} \quad (df=u, v) \quad (4.1)$$

where PV_S is the proportion of the dependent variables’ variance caused by source of the sample; PV_E is the proportion of error; ‘ u ’ is the degrees of freedom (df) for the numerator, which is equal to the number of independent variables; and ‘ v ’ is the df of the denominator (error). Hence, F represents a ratio of means squares, where PV_S are functions of squared multiple correlations (R^2_s), and consequently the proportion of error (PV_E) would be equal to $(1 - R^2)$ (Cohen, 1988). Considering the case of ‘ Y ’ as a function of a set ‘ B ’ the equation 4.1 can be written as:

$$f^2 = \frac{R^2_{Y.B}}{1 - R^2_{Y.B}} \quad (4.2)$$

In this case, the power of this analysis test can be represented by ‘ λ ,’ which is a function of f^2 and the sample size (N). Thus, λ can be written as:

$$\lambda = f^2 \times N \quad (4.3)$$

$$\text{Hence, } N = \frac{\lambda}{f^2} \quad (4.4)$$

According to Cohen (1988), the recommended values of f^2 in power analysis are classified in small (0.02), medium (0.15), and large (0.35) size effects. The values of λ , as a function of 'u' and 'v' and α (significant criterion) have been estimated, and are available in power of F test tables (e.g., Cohen, 1988). In the regression analyses of this research the maximum number of independent variables is twenty. Thus, assuming $u=20$; $v=120$; $\alpha=0.5$; $f^2=0.15$; and a power of 0.95 the sample size 'N' should be equal to 233. In fact, the useful number of questionnaires is 261.

The quantitative part of this research also uses a choice-based conjoint analysis (see further details in the next sections). For estimating the sample size (N) for this kind of analysis, Louviere *et al.* (2003a) recommend the following formula:

$$N = \frac{q}{rpa^2} \Phi^{-1} \left(\frac{1+\alpha}{2} \right) \quad (4.5)$$

where 'p' is the true population proportion and 'q' is equal to 1- p; a represents the percent of the true value of p with probability α ; r is the number of choice replications; and $\Phi^{-1}(\cdot)$ represents the inverse cumulative normal distribution function. Assuming $p=q=0.5$; $a=0.10$; $\alpha=0.95$; and $r=1$ the sample size should be equal to 384 respondents. However, in a choice experiment each respondent usually answers several replications. In this research each farmer answers 32 market profiles, which yields a total number of observations of about 8,480, which should be more than enough under any scenario.

The questionnaire included questions about socio-economics, farm and household, marketing, and organizational characteristics of farmers. In the questionnaire different scales of measurement were used, such as nominal, ordinal, interval, and ratio

scales. Nominal scale is used for designating categories with exclusive characteristics, but without specifying order, distance between one and another or origin. Ordinal scale is used for ordering or ranking data, but without specifying distance between values or origin. Interval scale is used for ordering and measuring distance between values, but setting an arbitrary zero point; and ratio scale includes the features of previous scales, but additionally specifies an origin or zero point. Nominal and ordinal scale data are considered non-metric data, and interval and ratio scale data are considered metric data, which means that with these data arithmetic operations can be carried out (Lattin *et al.*, 2003). For collecting interval scale data, a five-point Likert scale from 1 to 5 was generally used, where “1” accounted for the minimum possible value and “5” for the maximum possible value. Considering the low literacy level of research participants, a scale marked from one to five was shown to them, and they were asked in which position they considered to be situated for each particular question. Explanatory variables measured with Likert scale are considered as continuous variables in regression analyses.

4.6 Validity, Reliability and Practicability

One important issue to take into account in research is that measurement tools used meet the criteria of validity, reliability and practicability. A research instrument meets validity criterion if it is able to measure what it is supposed to measure; reliability if it provides accurate and stable measurements; and practicability if it is appropriate according to economic, convenience, and interpretability factors (Robson, 1994; Cooper and Emory, 1995). The terms of validity and reliability are usually associated with the quantitative paradigm. Qualitative research, instead, looks for alternative ways to deal with

credibility issues. According to Janesick (2000) “validity in qualitative research has to do with description and explanation and whether or not the explanation fits the description.” Furthermore, cross-checking results, and participant and outsider research reviews are mechanisms recommended by Janesick (2000).

The above measurement criteria are very difficult to evaluate. Nevertheless, an alternative and important tool is triangulation (Robson, 1994). It refers to the use of several data sources (data triangulation) and/or the use of multiple methods in the research (methodological triangulation) (Janesick, 2000). In this research, qualitative data come from different sources (e.g., public, private, NGO, farmer, buyer, donor, and academic research participants). In the same way, several statistical and multivariate research techniques that facilitate methodological triangulation are used in the quantitative analyses. Furthermore, qualitative and quantitative results can mutually validate.

Several authors have raised concerns about the validity of results elicited from stated choice methods, such as the methods used in this research (Fiebig *et al.*, 2003; Chandon *et al.*, 2005; Louviere and Islam, 2005). The general concern is how close is the choice intention and the real choice behaviour. Even though some studies report inconsistencies of stated choice methods (Louviere and Islam, 2005; Sælensminde, 2002), there are several studies that support the validity of this methodology (Fiebig *et al.*, 2003; Chandon *et al.*, 2005; Louviere *et al.*, 2003b). However, cautions should be taken when interpreting the results of these studies (Louviere and Islam, 2005).

Finally, practicability is taken into account, especially for the quantitative phase, which was conducted in just one department of the country. The geographical selection

was very practical in terms of budget limitations to conduct a nationwide research as well as in terms of agro-ecologic and socio-economics conditions. The research region selected for the survey is one of the most important producers of FFV in the country in hands of small farmers.

4.7 Methods of Analyses

Qualitative research differs from quantitative research in many ways. While quantitative research is focused on measuring and analyzing causal relationships between variables, qualitative research is focused on interpreting reality as a process. It seeks to know “how social experience is created and given meaning” (Denzin and Lincoln, 2000, p. 8).

Qualitative research results are not measured or presented in quantitative terms. In this research qualitative data are interpreted and described in a narrative way. Contrary to representing a dilemma the use of qualitative and quantitative analyses, both type of analyses complement each other. Qualitative data is very useful for accomplishing particular objectives where quantitative data is unavailable or insufficient. Objective one of this research heavily relies on qualitative data. Furthermore, qualitative information is used for interpreting and discussing statistical results as well as to make policy recommendations. For the quantitative analyses, several methods are used, such as analyses of difference and relationship, specifically *t*-test and cross-tabulations, and logit and probit regressions. These methods are described below.

4.7.1 Mean Difference and Relationship Analyses

T-test analysis is used for estimating the probability of whether two sample means are different, and therefore, represent different population means. This test is based on the observed difference of the two sample means and their distribution (Williams and Monge, 2001). For this purpose two hypotheses are set:

$$H_0: \mu_1 = \mu_2 \quad (4.6)$$

$$H_1: \mu_1 \neq \mu_2 \quad (4.7)$$

where H_0 is the null hypothesis and H_1 is the alternative hypothesis, and μ_1 and μ_2 are the sample mean one and two respectively. If the probability p estimated is equal to or less than a critical value set by the researcher (e.g. $\alpha = 0.05$), the null hypothesis is rejected and the alternative hypothesis is accepted, concluding that the sample means are significantly different. In this research, t -tests are conducted to statistically compare sample means of farmers according to the main market channel used (SM or SSC).

When an analysis does not directly include estimates related to the characteristics of the population, a nonparametric test, such as Chi-square (χ^2), is recommended (Williams and Monge, 2001). Chi-square test (χ^2), using cross-tabulation, is conducted when measurement tools are nominal or ordinal to assess association between variables. Its calculation is based on the difference between the observed and expected sample distribution. Like t -test, if the probability p estimated is equal to or less than a critical value set by the researcher, the null hypothesis that there is not association between variables is rejected, and the alternative hypothesis (there is association between variables) is accepted. Using t -tests and cross-tabulations participant and non-participant

farmers in the SSC are compared in several issues, such as socio-economics, farm and household, marketing, impacts, and organizational characteristics.

4.7.2 Regression Analyses

In analysis of dependence when the dependent variable is discrete or dichotomous, choice or probability models are used. A particular dependent variable used in this research is the main market channel used by farmers, which is binary (SSC/SM). Explanatory variables are used for determining the probability of the market channel used by farmers. Logit and probit regressions are associated with the estimation of the probability of choice (Greene, 2000; Lattin *et al.*, 2003).

Choice models are based on the assumptions of Random Utility Theory (RUT), which assumes that individuals try to maximize utility. However, as the utility associated with a choice has an observable component (v_{it}) and a random component (ε_{it}), the problem choice becomes probabilistic rather than deterministic (Greene, 2000; Louviere *et al.*, 2003a). Considering RUT assumptions, choice models are based on utility maximization, which implies that if an individual faces two alternatives, he/she chooses that with the highest utility (Lattin *et al.*, 2003). The utility of alternative i at choice occasion t (u_{it}) is:

$$u_{it} = v_{it} + \varepsilon_{it}, \quad (4.8)$$

where v_{it} denotes the deterministic component of the utility and ε_{it} denotes the stochastic component of the utility. Similarly, v_{it} can be modeled as a linear combination of independent variables:

$$v_{it} = \mathbf{x}'_{it}\boldsymbol{\beta} \quad (4.9)$$

where \mathbf{x}'_{it} is a vector influencing the choice of option i in time t and β is a vector of attribute weights.

Under appropriate assumptions of stochastic terms (independent and identically distributed), in a binary logit model (e.g., i/j options) the probability of choosing i at time t is given by:

$$p_{it} = \frac{\exp(\mathbf{x}'_{it} \beta)}{\exp(\mathbf{x}'_{it} \beta) + \exp(\mathbf{x}'_{jt} \beta)} \quad (4.10)$$

(Assuming that $v_{jt} = \mathbf{x}'_{jt} \beta = 0$)

The parameters of the utility function for a binary logit model can be estimated using maximum likelihood and their significance tested using t -tests, assuming asymptotic standard errors (Lattin *et al.*, 2003). The estimated parameters of probability models are easier to analyze in terms of their relative importance or in terms of their marginal effects, which measures the change in the probability of event given a unit change in one explanatory variable, keeping the others constant (Liao, 1994; Louviere *et al.*, 2003a). Marginal effects are the partial derivatives of the probability of event. However, in the case of dummy variables (e.g., 0, 1) the marginal effects are represented by the difference of the predicted probability of each category (Liao, 1994, Greene, 2000).

A common measure of goodness of fit in choice models is the Pseudo R^2 , which is estimated as:

$$\rho^2 = 1 - (LL_F/LL_0) \quad (4.11)$$

where LL_F denotes log likelihood of the full model and LL_0 denotes the log likelihood function of the intercept only (Lattin *et al.*, 2003). Pseudo R^2 rarely reaches values as

high as those of R^2 in linear regression; therefore, models with ρ^2 values between 0.2 and 0.4 are considered to have an extremely good fit (Louviere *et al.*, 2003a).

Likewise, a likelihood ratio (LRT) can be estimated, denoted by the following equation:

$$LR = -2(LL_R - LL_F) \quad (4.12)$$

where LL_F is log likelihood of the full model and LL_R is the log likelihood function of the restricted model (which can be restricted to the intercept only). The LR estimated is tested again a critical value of the χ^2 distribution in order to verify if there is a significant difference between the two models (Greene, 2000; Lattin *et al.*, 2003). The LRT can also be used to test significant difference between two nested models with a different number of parameters.

Sometimes the dependent variable is ordered in several categories, but there is difficulty in treating the distance among contiguous categories as the same, thus classical regression analysis is not appropriate. In this situation the ordered probit model is recommended to analyze such choice outcomes. This model is an extension of the binary choice model (Liao, 1994, Greene, 2000). According to Greene (2000, p. 876) the model is built around a latent regression y^* , which is unobservable. What is observable is:

$$\begin{aligned} y &= 0 \text{ if } y^* \leq 0, \\ y &= 1 \text{ if } 0 < y^* \leq \mu_1, \\ y &= 2 \text{ if } \mu_1 < y^* \leq \mu_2, \\ &\vdots \\ y &= J \text{ if } \mu_{J-1} < y^* \end{aligned} \quad (4.13)$$

where the μ 's are unknown parameters separating contiguous categories to be estimated with β s. This model is used in this research for estimating the impact of market channel (SSC/SM) on farmers in terms of several categorical variables.

4.8 Description of Variables Used in Regression Analyses

For choice or probability analyses two sets of variables were collected. The first one is based on real farmer situation (e.g., socioeconomics, farm characteristics, organization) and perceptions about transaction costs. The second set of variables is based on a choice-based conjoint model.

4.8.1 Explanatory Variables Determining Choice of Market Channel and Impact

In Table 4.1 is shown a list of socioeconomic, farm characteristic, transaction cost, and collective action variables that hypothetically determine small farmer participation in the SSC. This original set of variables has been chosen considering the literature review and the information provided by informants through in-depth interviews. Transaction costs are classified as search and information, negotiation, and monitoring costs. And the reasons that determine how transactions are organized are uncertainty, asset specificity and frequency (Furubotn and Richter, 1997; Williamson, 1991). However, as one variable can contribute to more than one kind of transaction costs (David and Han, 2004), they are generally classified as transaction costs. Further discussion about these variables will be presented in the results. The expected relationships of the explanatory variables and the probability of selling in the SSC are also presented in Table 4.1.

For the ordered probit analysis, the effect of market channel (SSC/SM) on the impact on farmers in terms of sales, income, performance, overall situation, satisfaction with buyer, and relative prices is tested. Socioeconomic, farm characteristic, and organization variables are also included in the models.

Table 4.1 Explanatory Variables Determining Choice of Market Channel

Variables	Unit	Expected Sign	Type**
Gender	Male/Female	?	SE
Age	Years	?	SE
Education	Years	+	SE
Actual area of FFV	Mz*	+	FC
Cattle	Heads	+	FC
Proportion of income from FFV	%	+	FC
Hire non-family labour	Yes/No	+ (Yes)	FC
Months of FFV production	# of months	+	TC
Risk of losing FFV due to weather	Likert Scale (1-5)	-	TC
Risk of losing FFV due to pests	Likert Scale (1-5)	-	TC
Risk of producing FFV of low quality	Likert Scale (1-5)	-	TC
Frequency of selling	Likert Scale (1-5)	-	TC
Transportation problems	Likert Scale (1-5)	-	TC
Relative prices	Likert Scale (1-5)	+	TC
Trust in buyer	Likert Scale (1-5)	+	TC
Trust in seller (from buyer)	Likert Scale (1-5)	+	TC
Satisfaction with buyer	Likert Scale (1-5)	+	TC
Problems of grading	Likert Scale (1-5)	-	TC
Familiar with supermarkets	Likert Scale (1-5)	+	TC
Organization member	Yes/No	+ (Yes)	CA

* Mz. stands for manzana, which is equivalent to 0.702 hectare

** Type of variable: SE stands for socioeconomics; FC for farm characteristics; TC for transaction costs; and CA for collective action

4.8.2 Choice-Based Conjoint Model

Several authors have analyzed marketing choice of farmers (Hobbs, 1997; Katchova and Miranda, 2004; Vergara *et al.*, 2004; Winters *et al.*, 2005) based on current market data or “revealed preference data (RP)” (Louviere *et al.*, 2003a). Roe *et al.* (2004) highlight the importance of stated preference data, considering the difficulty of collecting data that

reflect the actual contracting behaviour of producers. Many times this data is not available or very difficult to get. Stated preference data can be useful to research about new products or services that are not yet in the market (Louviere *et al.*, 2003a) or when they are relatively new and appropriate data does not exist yet, as is the case of contractual arrangements between supermarket supply chains and farmers in Honduras. In order to test the effect of several factors such as price structure, quantity, grading, payment mechanism, frequency of delivery, selling place, organization and entry cost on the market preference of farmers, a choice-based model was designed. The first five attributes have two levels and the last three attributes have three levels (Table 4.2).

As the number of possible combinations was equal to 864 ($2^5 \times 3^3$), a fractional orthogonal design was used. Farmers were asked to evaluate thirty-two market profiles one by one. Just one market profile was shown to the farmer at a time. For each market profile farmers answered if they would sell or not sell in this market. An example of a market profile is seen in Table 4.3.

The general model to estimate is in the form of:

$$\text{Marketing Choice} = f(\text{price, quantity, grading, payment mechanism, frequency of delivery, selling place, organization and entry cost}) \quad (4.14)$$

where market choice is a dichotomous variable: Yes = 1, and No = 0. The explanatory variables are also categorical variables (Table 4.2).

Table 4.2 Choice-Based Model Design (Yes/No)

Choice=f(Price, Quantity, Grading, Payment, Frequency, Selling Place, Organization, Entry Cost)		
No. Attribute	Levels	TC Hypothesis*
1 Price Structure	0 Price not fixed with buyer at planting 1 Fixed price with buyer at planting	+
2 Quantity demanded	0 Quantity not fixed with buyer at planting 1 Fixed quantity with buyer at planting	+
3 Grading	0 Grading required by buyers 1 No grading required by buyer	?
4 Payment	0 Payment two weeks after delivery by cheque 1 Payment immediately after delivery by cash	+
5 Frequency of delivery	0 Scheduled with buyer at planting 1 Free to deliver when product available	?
6 Selling Place	0 Produce sold in Tegucigalpa/SPS 1 Produce sold at farm-gate 2 Produce sold in La Esperanza	++
7 Organization	0 Formal organization of producers needed to supply market 1 Sellers can market products individually 2 Informal organization of producers needed to supply market	??
8 Entry Cost	0 Major/significant investments needed to enter market 1 No investments needed for producers to enter market 2 Minimal investments needed to enter market	++

* Expected relationship with choosing "Yes," related to transaction costs

Table 4.3 Example of a Market Profile

Profile Number 1		
Price	Price not fixed with buyer at planting	
Quantity demanded	Quantity not fixed with buyer at planting	
Grading	Grading required by buyers	
Payment	Payment immediately after delivery by cash	
Frequency of delivery	Free to deliver when product available	
Selling place	Produce sold at farm-gate	
Organization	Sellers can market products individually	
Entry cost	Minimal investments needed to enter market	
(Circle one)	Yes	1
	No	0

The relationship of the explanatory variables and transaction costs is shown in Table 4.2 and Table 4.4. Fixing or not fixing the price with buyer at planting is associated with negotiation costs as well as with uncertainty since price at the selling time can be higher or lower than the fixed price; however, it is hypothesized that fixing the price is preferred by farmers. Quantity has a similar relationship with transaction costs and price. Grading requirement is associated with information and monitoring costs, and consequently with uncertainty. Farmers' preference is expected to be ambiguous, since not grading may be easier for farmers but selling graded products may be more profitable. Payment mechanism is associated with negotiation costs and uncertainty. It is expected that farmers prefer cash and immediate payment. Frequency of delivery is associated with the access of some specific assets (e.g., irrigation) that allow farmers to produce continuously. Farmers' preference is expected to be ambiguous depending on farmers' conditions. Selling place is associated with some assets such as access to transportation as well as with uncertainty, because it is expected that the farther the market, the higher the costs and the uncertainty faced by farmers for supplying this market. Organization is associated with negotiation and monitoring costs, and consequently with uncertainty. Organization may help farmers commercialize their products, but also represents costs for coordinating and monitoring the performance of the organization. Therefore, farmers' preference is expected to be ambiguous. Finally, entry cost is associated with the capacity of investing in specific assets, and consequently with uncertainty, since once farmers invest they are tied to market uncertainties. It is expected that no investments and minimal investments are preferred by farmers.

Table 4.4 Relationship of Attributes with Transaction Costs

No. Attributes	Transaction Costs
1 Price	Negotiation/Uncertainty
2 Quantity (Demand)	Negotiation/Uncertainty
3 Grading	Information/Monitoring/Uncertainty
4 Payment	Negotiation/Uncertainty
5 Frequency of Delivery*	Frequency/Asset Specificity
6 Selling place**	Uncertainty/Asset Specificity
7 Organization	Negotiation/Monitoring/Uncertainty
8 Entry Cost	Uncertainty/Asset Specificity

* For frequent delivery it is necessary to own specific assets such as land and irrigation

** For selling in a determined market place, a specific asset such as transportation is needed.

4.9 Conclusions

In this chapter the methodology and data used in this study were presented and discussed. The data collection was divided into several stages in order to facilitate the achievement of research objectives. Similarly, the geographical area selected was the most representative in terms of demand and supply of FFV in the country according to research objectives. Both qualitative and quantitative information was collected. The first one consisted of secondary information and in-depth interviews with different players of the supply chain for FFV in Honduras. This information was very useful for making a general characterization of the supply chain as well as for designing the questionnaire used for collecting quantitative data through a survey of participant and non-participant farmers in the SSC. In the same way, qualitative information complements and helps to interpret quantitative results.

A summary and discussion of quantitative methods were provided in this chapter. T-test and cross-tabulation analyses are useful for identifying potential differences between participant and non-participant farmers in the SSC. Choice or probability analyses can assess the factors that determine farmer participation in the SSC as well as

the impact on farmers in terms of a number of variables. Issues of validity, reliability and practicability are also taken into consideration. The use of several sources of data (triangulation) contributes toward dealing with those issues.

In the next chapter the findings regarding the characterization of the supply chain for FFV in Honduras, including participant and non-participant farmers in the SSC are presented and discussed. The comparison of the two groups helps identify key success factors/constraints for participating in the SSC.

CHAPTER V

SUPPLY CHAIN FOR FFV AND THE ROLE OF SMALL FARMERS

5.1 Introduction

This chapter starts with a general overview of the supply chain for FFV in Honduras. It presents a map of the system, including the traditional market system and the emerging SSC. Once identified the main market channels, the ways of participation, advantages and challenges, and opportunities and threats offered to small farmers by each channel are discussed.

It continues with a characterization of farmers in terms of socio-economic, farm and household, marketing, and organizational issues. Assessing similarities and differences of farmers regarding these issues, the key success factors and constraints to participate in the SSC can be identified and discussed at the light of the analytical framework of the research. Finally, conclusions of the chapter are drawn.

5.2 Overview of the Country and the Supply Chain for FFV

For the purpose of this study, fruits and vegetables (FFV) as well as supermarket supply chains (SSC) are respectively aggregated in one category each. It is acknowledged here that these levels of aggregation may limit the analysis and conclusions of this study since procurement systems usually vary by product and supermarket chain. Nevertheless, there are reasons that justify this aggregation. First, in the FFV category not included are perennial fruits. Most of the products can be grown periodically (four to twelve weeks cycle) year-round. Second, the variables analyzed in this study are mainly associated

with general determinant factors of participating in traditional (spot markets) or vertically-coordinated markets such as the SSC, thus general conclusions can be made. Third, participation of small farmers in the SSC is still incipient in Honduras, thus, analyzing products individually would result in a very narrow study.

Honduras, located in Central America, is a low-middle income country. The annual per capita income in 2004 was US\$1,030 dollars. The contribution of agriculture to the Gross Domestic Product (GDP) in this year was 13.7 percent. From a total population of 7.1 million people, 46 percent lived in urban areas in 2004 (World Bank, 2005). The two main urban centers of the country are Tegucigalpa, which is the capital city, and San Pedro Sula that is the most industrialized city of the country. Their population is about one million and half million people respectively (Banco Central de Honduras, 2005).

Agriculture is very important to Honduran economy, as reflected by its contribution to the GDP. Besides traditional crops such as coffee, grains, banana, oilseeds and cocoa, FFV crops contribute significantly to agricultural GDP. In 2001 the vegetable and fruit contribution was 3.7 and 2.3 percent respectively. The vegetable and fruit sectors include about 15,000 and 10,000 farmers respectively. Most of these farms are small (less than one hectare), with the exception of exporting companies that have large farming areas (Secretaria de Agricultura y Ganaderia, 2005).

The trade balance of the FFV sector in Honduras is positive. While its total exports in 2003 were more than US\$300 million dollars, imports were only about US\$50 millions (FAO, 2005), including processed products. Just the fresh fruit and vegetable imports together were about US\$20 million dollars in 2003 (Secretaria de Agricultura y

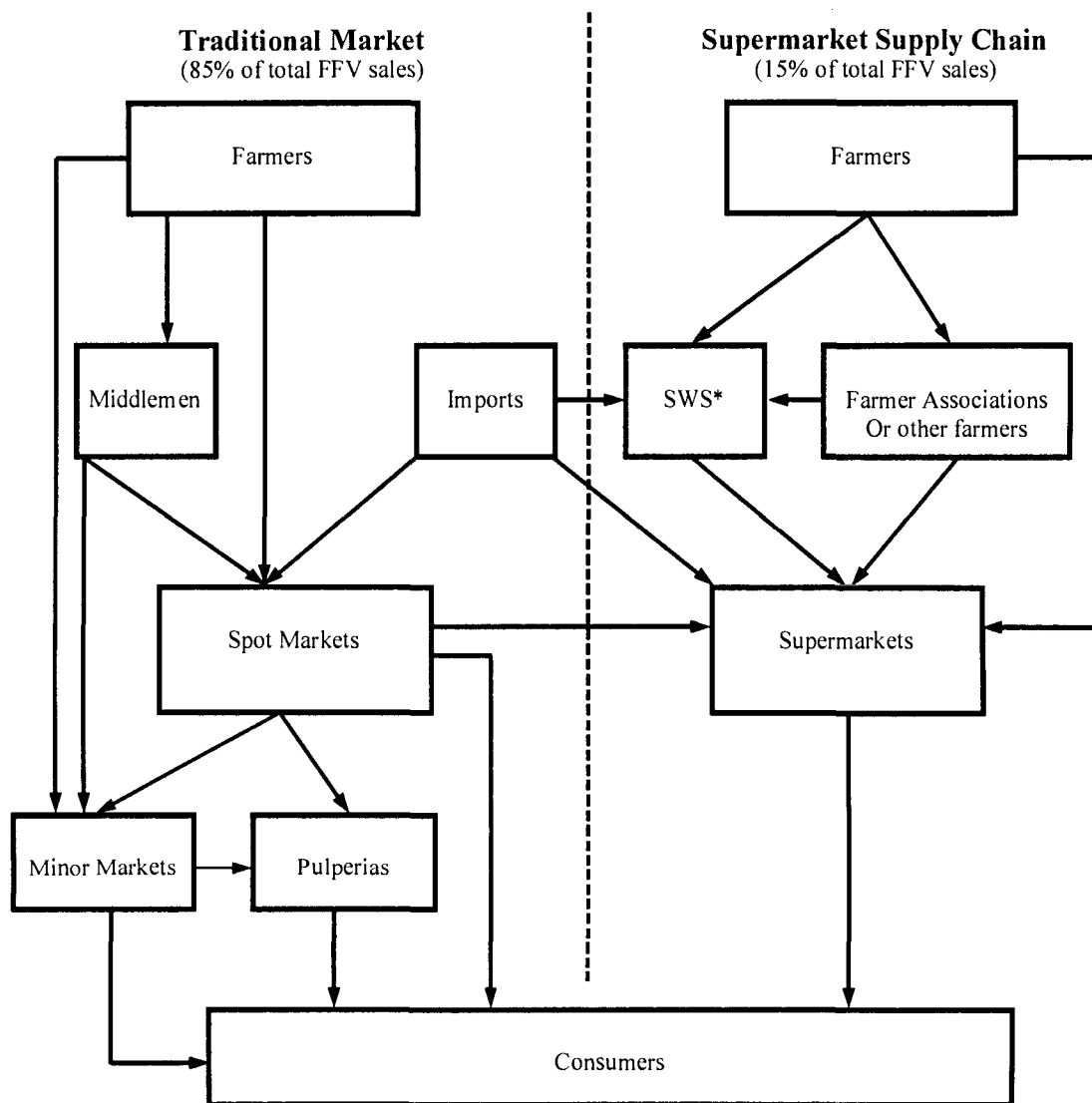
Ganaderia, 2005) implying a great opportunity for import substitution. Among the best geographical areas for FFV production are the departments of Comayagua, Intibuca and La Paz, and surrounding areas of Tegucigalpa in the department of Francisco Morazan. The Choluteca-Valle region is of great importance as well; however, the production in this region is mainly in the hands of large exporting companies (Secretaria de Agricultura y Ganaderia, 2005).

Most of the FFV used for local consumption in Honduras is channeled through traditional spot markets (SM) (Figure 5.1 and Table 5.1). According to recent studies (Berdaque *et al.*, 2003), supermarkets sell 12 percent of FFV consumed in Honduras, implying that the remaining FFV consumed is sold through traditional markets. The most important SMs are located in Tegucigalpa and San Pedro Sula; however, in every town or city there is a local market. Farmers can have access to SM mainly in two ways. They can bring the produce from the farm to the market in their own or rented transportation, or sell it at the farm gate to middlemen that go to farmers' communities in their own transportation. In any case, the farmer is never sure about finding a buyer and about the price that he/she will get for his/her produce.

Supermarkets have become an alternative market for selling FFV (Figure 5.1). The main supermarket chains in Tegucigalpa are La Colonia, Paiz/Despenzas and Price Smart. La Colonia has twelve stores and is owned by local capital. Paiz/Despenzas belong to the Corporación de Supermercados Unidos, which is a consortium of Central American supermarket chains. In Tegucigalpa there are four Paiz stores, which are focused on serving consumers with higher income while Despenzas are focused on consumers with lower income. The total number of Despenzas stores is fourteen and

they are in other small cities, besides Tegucigalpa and San Pedro Sula. Price Smart, which is a multinational company based on the United States (US), has only one store in Tegucigalpa, and it focuses on high-income consumers that can pay membership. Price Smart also puts restrictions on the minimum quantity of product that a consumer can buy.

Figure 5.1 Supply Chain for FFV in Honduras



* Specialized wholesalers: They operate their own distribution centers and procure products under contract farming scheme.

Table 5.1 Estimated Supply Source of FFV to Each Market¹²

Traditional Market Supply of FFV		Supermarket Supply of FFV	
Farmers	30.00%	Farmers directly	10.00%
Middlemen	50.00%	Specialized Wholesalers/Assoc.	50.00%
Imports	20.00%	Imports	30.00%
Total	100.00%	Spot Market	10.00%
		Total	100.00%

Source: Based on in-depth interviews.

In San Pedro Sula there are a smaller number of supermarket stores. Paiz and Price Smart have only one store each. However, there are several local retail businesses with only one supermarket store each. These supermarkets are Los Andes, Junior, El Colonial and La Económica. The first one is focused on consumers with higher income and the last three are focused on consumers with lower income. All supermarket stores in Tegucigalpa and San Pedro Sula have a section of FFV supplied with local and imported products.

Supermarkets procure their products in different ways. The Paiz/Despenzas chain has an exclusive supplier of FFV, which is Hortifruti. This supplier procures produce from farmers under contract farming scheme. When the local supply is not enough to meet supermarket demand, Hortifruti imports produce from Costa Rica, Nicaragua and/or Guatemala. Hortifruti has two main distribution centers, one in Tegucigalpa and one in San Pedro Sula, where producers make their deliveries under a pre-established calendar. Hortifruti does not supply supermarket competence of Paiz/Despenzas.

La Colonia has its own distribution center in Tegucigalpa where producers deliver FFV based on contract farming scheme. La Colonia has its own pool of suppliers (individual farmers and specialized wholesalers); however, it also buys from occasional farmers who show up to offer produce, wholesale market and import market. The rest of

¹² Market shares presented here are 'good guesses' according to interviews and secondary data.

the supermarket chains and supermarket stores, mostly present in San Pedro Sula do not have direct arrangements with farmers, and procure their products from specialized wholesalers, occasional farmers, wholesale market and imports. The most important cases of specialized suppliers identified in this study are Hortifruti, Evenezer, Provecar, Divefru, Zamorano, Aprofhi, Cohorsil and Funder. The first four operate with private capital, the next one belongs to the university “Escuela Agrícola El Zamorano,” and the last three operate with financial support of NGOs. Generally, there are only a small number of farmers supplying directly to supermarkets. Supermarkets are supplied mainly by specialized wholesalers, secondly by imports, and thirdly by individual farmers and SM. The majority of small farmers participate in the SSC through specialized wholesalers, farmer associations and even neighbour farmers that supply specialized wholesalers and/or supermarkets (Figure 5.1).

The local production of FFV in Honduras is not supplying all the local demand. Supermarkets import FFV for several reasons. First, to fill the deficit caused by insufficient production; second, to fill deficit caused by insufficient quality; third, to guarantee consistent supply throughout the year; and four, to buy FFV not locally produced.

5.2.1 Advantages and Challenges Associated with the SSC

The SSC can bring opportunities to small growers of FFV as well as challenges, as summarized in Table 5.2. The traditional SM is highly uncertain. A farmer is never sure if he/she will find a buyer for his/her product, and what price he/she will get. Under a usually “informal” contract scheme (verbal) in the SSC, farmers guarantee a market for

their products, provided that these meet specific requirements set in the contract. This scheme allows farmers to make better planning of their production and marketing activities, such as dates of planting, harvesting, delivering, and even expected cash flow. As supermarkets aim to offer a product all year-round in order to satisfy consumer needs, farmers in the SSC enjoy a relatively continuous and stable demand of their products throughout the year, which allows them to keep permanent production, instead of seasonal production as farmers in the SM traditionally do. This situation is an advantage for farmers, since it represents income for them during all months of the year; however, it can also be a challenge for those farmers who lack key assets for producing continuously, such as irrigation systems. Therefore, farmers relying on rainy seasons for producing, face a serious constraint to enter and/or stay in the SSC.

Table 5.2 Advantages and Challenges of the Supermarket Supply Chain

Advantages	Challenges
<ul style="list-style-type: none"> • Guaranteed market for contracted products • Allows better planning (production and delivery) • Continuous and stable demand • Stable prices • Higher average prices • Payment mechanism allows savings/better financial management • Information about products demanded • Learning curve 	<ul style="list-style-type: none"> • Grades and standards required • Percentage of product rejected • Frequency and time of deliveries • Travel to deliver produce and collect receivables • Payment mechanism, specially at the beginning of the relationship • Better prices at the spot market (sometimes) • Risk of losing market share (total or partial) for lack of complying • Decision power of buyers

Source: Based on in-depth interviews.

Prices in the SSC are characterized for being more stable, permitting farmers to forecast expected returns, which help them in their planning activities. Additionally, prices in the SSC are usually higher than average prices paid in the SM, resulting in

better profit margins for farmers participating in the SSC¹³. Prices in the SM may be higher during a short season in a year, motivating contracted farmers to ‘side-selling’ produce to this market instead of delivering to the SSC as set in contracts. Nevertheless, senior farmers in the SSC recognize that these short-term benefits usually result in long-term losses if they lose, totally or partially, the guaranteed market in the SSC as a sanction imposed by buyers. Besides a temporarily higher price in the SM, farmers may be motivated to ‘side-selling’ products to this market for obtaining immediate and cash payment. In the SSC farmers receive their payment two or three weeks after delivering produce and sometimes by cheque. Especially for farmers, who are new in the SSC this is a limitation because of their urgent need of operating capital. Nevertheless, when farmers are established in the SSC they do not consider this payment mechanism as a serious problem, since they have usually accumulated financial resources and/or have developed better financial management skills. Some farmers even consider that this payment mechanism allows them to make savings, since they get the money of several deliveries together. Having a bigger amount of money, farmers are able to make more expensive investments.

In the SM an *ex-ante* or *ex-post* relationship is not required between buyers and sellers. This lack of communication makes difficult the flow of information about the characteristics of products demanded in the market. In the SSC, on the contrary, farmers get feedback about the characteristics of their products as well as recommendations for production and post-harvest activities, which permits them to improve quality and/or reduce unitary costs. In the SSC, senior farmers agree that the percentage of product

¹³ This is based on in-depth interviews with farmers, and therefore no quantitative data is available to verify it.

rejected due to grades and standards is usually reduced throughout the years. The percentage of product rejected in the SSC is one of the main reasons that discourage farmers to enter and/or stay in this marketing system, since it has to be channeled to alternative markets where its price is typically low. For some products there is not an alternative market. New farmers can have even fifty percent of their production rejected due to low grades and standards. Successful farmers in the SSC, are not only able to reduce the percentage of product rejected, but also can be contracted in more exigent markets, such as those aimed at export. In this sense, the local SSC can be used as a school before thinking about more demanding markets.

The current requirements in the SSC in Honduras are mainly associated with periodic delivery (usually twice a week), quantity, appearance, size, and lack of physical and pest damages. So far there is not strict control about chemical inputs used in production; nevertheless, some buyers recommend ‘good agricultural and manufacturing practices,’ which imply the use of inputs and practices harmless to the environment and humans. It is noticeable that the decision power enjoyed by buyers gives them the privilege of setting requirements without much participation of suppliers. In the SM grades and standards are not important. All production can be sold without being graded, thus motivating farmers to sell in this market, especially those lacking information and capacity to meet the requirements of the SSC. The frequency required by the SSC to deliver produce and collect receivables is also a challenge for farmers with transport limitations. When farmers have access to roads, buyers operating in the SM (middlemen) show up in the communities to buy FFV production.

5.2.2 *Small-Farmer Participation in Supermarket Supply Chain for FFV*

There are different ways how a FFV product can go from the farm gate to the supermarket shelf (Table 5.3 and Figure 5.1). First, a small number of farmers supply directly to supermarket stores or to their distribution centers. These farmers usually have ‘well-developed’ managerial skills and important assets such as irrigation systems, greenhouses and own transportation. They see the farm as an enterprise, and for farming activities rely on hired labour. They have developed skills to understand market signals and negotiate directly with supermarket buyers. The area planted by these farmers ranges from one to five hectares.

Table 5.3 Ways of Small-Farmer Participation in the Supermarket Supply Chain

-
1. Farmer => Supermarket (minority)
 2. Farmer => Specialized Wholesaler => Supermarket
 3. Farmer => Farmer Association => Specialized Wholesaler and/or Supermarket
 4. Farmer => Farmer => Specialized Wholesaler and/or Supermarket
-

Source: Based on in-depth interviews

Second, there are farmers that sell to a specialized wholesaler, who supplies supermarkets. These farmers are almost similar to the previous ones, but lack a physical key asset, have a too small-scale operation or lack managerial skills to negotiate directly with supermarkets. In this case the specialized wholesaler plays a key role to guide/support farmers about producing, post-harvesting and delivering activities. As these farmers are less reliable than the first ones, specialized wholesalers must have alternative plans to comply with supermarket demand when one of these farmers fail to deliver produce. Specialized wholesalers can buy produce from occasional farmers or in the SM and make their own selection and packing to deliver to supermarkets.

Third, there are farmers that sell to a farmer association or collective enterprise, which can sell to a specialized wholesaler and/or to a supermarket. This is the case of smaller farmers that can produce FFV but have serious constraints to enter the SSC by themselves, and therefore rely on collective action to overcome these constraints. These farmers typically receive substantial support from development organizations such as NGOs or government programs. The support can go from technical assistance to subsidies or donations to acquire individual assets such as irrigation systems and/or collective assets such as distribution centers with cold storage and transportation to deliver produce to supermarkets. Furthermore, collective enterprises usually receive financial support to cover administrative costs. Most local and international NGOs are focused on this kind of farmer. Additionally, due to the lack of coordination among NGOs and government programs farmers usually receive support from different sources. At family level, participant farmers in these projects are typically better off, but there are concerns about the sustainability of their projects if the external support is ended.

Finally, there are farmers that are not necessarily involved in community collective action, but are associated with other farmers, especially from the first or second group. These farmers operate as ‘satellites’ of farmers that directly participate in the SSC. In order to guarantee enough quantity of produce, participant farmers make production arrangements with smaller farmers in their communities under the sharecropping system. Generally farmers receive in kind credit in the form of inputs (e.g., seeds, fertilizers, pesticides). In some cases the participant farmer also channels the smaller farmer produce into the SSC, but in other cases the smaller farmer is free to sell his/her produce in the SM. Therefore, the net benefit of these arrangements is very

variable, since it can go from a strategic alliance where both farmers are equitably benefited to a 'traditional' sharecropping arrangement where the participant farmer in the SSC makes the rules of the game according to his/her better convenience.

5.2.3 *Opportunities and Threats Offered by the Growth of Supermarkets*

The impact of supermarket growth in Honduras may not be seen as very important yet due to the limited participation of small farmers in this market, and the limited market share of supermarkets of the total FFV market in the country. This share, however, may reach up to US\$42 million dollars¹⁴. This market opportunity, however, is not entirely taken for local producers, since supermarkets in Honduras import a considerable quantity of FFV that may be produced in the country¹⁵. Furthermore, the positive trend of supermarkets continues not only in the main urban centres, but also in small towns, and is gradually impacting the behaviour of consumers. Problems associated with the SM motivate people to go to supermarkets. Even though Honduras people are very price sensitive when they buy FFV, issues such as hygiene, convenience and personal safety are motivating them to switch to supermarkets.

More than a market opportunity *per se*, local supermarkets can serve as schools where farmers can learn about new agrifood system requirements and its *modus operandi*. A farmer that can satisfy local supermarket requirements can easily enter other demanding markets such as fast food chains, food processors and exporters, as is the case of many participant farmers in the SSC in Honduras. Each time local and international

¹⁴ Assuming Berdagué *et al.*, 2003' estimates, that in Central America about 40% of per capita income is spent of food consumption, and from this value 10% is spent on FFV. In the same way, it is assumed that supermarkets control 15% of the total FFV market.

¹⁵ See SEPA/INFOAGRO, 2004, and CONTRADE (<http://unstats.un.org/unsd/comtrade/>).

grades and standards are becoming more similar, since supermarkets, even in Honduras are highly influenced by multinational retailers that have their own stores in the country (e.g., Price Smart) or have shares in the local supermarket chains (e.g., Wal-Mart, Selectos). Other retail companies operate regionally (Central America), facilitating the flow of FFV within the region (e.g., CSU). Therefore, the market opportunity is not just the nearest supermarket store, but also other local, regional or international businesses.

The most serious threat that supermarket growth represents to small farmers is that new agrifood systems are eroding the market share of traditional SM, where small farmers sell their products. Small farmers already consider the SM of FFV very uncertain and unprofitable, but it is the market that they know most, and with current changes it can become more uncertain or even demanding as it adjusts its *modus operandi* to respond to agrifood system changes, and compete with retailers. In the same way, it is expected that free trade agreements (e.g., the Central American Free Trade Agreement with the United States) will bring more challenges to local farmers in Honduras as new agribusinesses operating in the country demand international grades and standards.

5.3 Characteristics of Farmers and Level of Participation in the SSC

In this section, the characteristics of the studied farmers according to their main market channel are presented and discussed. Farmers are sub-divided into two groups, one selling to traditional markets and one selling to the supermarket supply chain. The first part of this chapter was based on in-depth interviews to several players of the FFV supply chain, including farmers from different geographical areas (Ch. 4). The rest of this

chapter and the next one are based on the survey of farmers from Intibuca (Ch. 4), who are very traditional and small scale farmers.

5.3.1 *Socio-economic Characteristics*

The proportion of the sample was slightly higher for the municipality of Yamaranguila, as seen in Table 5.4, but not enough to be statistically significant at the 10 percent level. In the case of gender, males account for a higher proportion of the total sample size (Table 5.4). However, female participation is proportionally higher in the SSC compared to their proportional participation in traditional market channels (SM).

Table 5.5 shows that farmers selling to the SSC are older than farmers selling to the SM. The age difference is significant at the 10 percent level. In the case of education and number of dependants (household size) there are not significant differences (Table 5.5). Thus, farmers are quite similar in terms of age, education and number of dependants.

Table 5.4 Municipality and Gender

Market Channel	Municipality		Total
	Intibuca	Yamaranguila	
Traditional	35.6%	44.8%	80.5%
Supermarket	10.7%	8.8%	19.5%
Total	46.4%	53.6%	100.0%
Market Channel	Gender*		Total
	Female	Male	
Traditional	9.6%	70.9%	80.5%
Supermarket	5.0%	14.6%	19.5%
Total	14.6%	85.4%	100.0%

* Pearson Chi-Square Sig. at the 1% level

Table 5.5 Age, Education and Household Size

Variable	Market Channel	N	Mean	Std. Dev.
Age***	Traditional	206	36.56	11.31
	Supermarket	51	39.57	13.25
Education (years of school)	Traditional	205	4.66	2.31
	Supermarket	50	4.54	2.32
Number of dependants	Traditional	210	5.32	2.62
	Supermarket	51	4.90	2.35

Note: Independent Sample t-test¹⁶

*** Sig. (2-tailed) at the 10% level

5.3.2 Farm and Household Characteristics

Farmers are quite similar in many aspects, independently that they mainly sell to the SM or to the SSC, as seen in Tables 5.4 and 5.5. Nevertheless, there are aspects in which these two groups of farmers are significantly different at least at the 10 percent level. Farmers selling to the SSC compared to farmers selling to SM have more cattle, make a higher proportion of income from the farm and from FFV production, produce FFV during a greater number of months in a year, have irrigation during a greater number of months in a year, and have less risk of producing FFV of low quality. In the same way, farmers selling to the SSC compared to farmers selling to SM produce a smaller proportion of their own food in their farms (Table 5.6a). As suggested by these results, farmers selling to the SSC are more commercially oriented, have more access to key assets such as irrigation, and face less production and quality risk. Unexpectedly there are not statistically significant differences in distance from farm to road, total farm area, area of FFV produced, and number of FFV crops (Table 5.6a).

¹⁶ For all t-tests in this study the Levene's Test for equality of variance was conducted. When it was found significant at least at the 10% level, non-equal variances were assumed.

Table 5.6a Farm and Household Characteristics of Respondent Farmers

Variable	Market Channel	N	Mean	Std. Dev.
Distance from farm to road (km.)	Traditional	209	0.79	0.95
	Supermarket	49	0.57	0.75
Total farm area (mz)	Traditional	209	4.17	6.52
	Supermarket	49	5.95	7.19
Area of FFV (mz)	Traditional	209	0.47	0.75
	Supermarket	51	0.55	0.75
Number of FFV crops	Traditional	201	6.37	2.37
	Supermarket	45	5.89	2.81
Cattle*** (heads)	Traditional	209	1.52	2.30
	Supermarket	51	2.59	4.41
Proportion of income from farm*	Traditional	209	77.50	22.75
	Supermarket	50	89.76	17.09
Proportion of income from FFV***	Traditional	209	75.34	23.85
	Supermarket	51	82.10	23.48
Proportion of food produced**	Traditional	209	68.16	22.49
	Supermarket	48	60.48	22.45
Months of FFV production*	Traditional	210	9.68	2.58
	Supermarket	51	11.16	2.03
Months of irrigation*	Traditional	207	10.23	2.89
	Supermarket	51	11.45	1.91
Risk of losing FFV due to weather (Likert scale, 1-5)	Traditional	210	3.62	0.95
	Supermarket	51	3.47	0.83
Risk of losing FFV due to pest (Likert scale, 1-5)	Traditional	209	3.35	0.95
	Supermarket	51	3.22	1.01
Risk of producing FFV of low quality** (Likert scale, 1-5)	Traditional	210	3.24	1.06
	Supermarket	51	2.84	0.99

Note: Independent sample t-test

* Sig. (2-tailed) at the 1% level

** Sig. (2-tailed) at the 5% level

*** Sig. (2-tailed) at the 10% level

Respondents to this survey are generally very small scale farmers in terms of land and area grown of FFV (Table 5.6a). Furthermore, the majority of them are still subsistence farmers relying on their own production of corn and beans for food (Table 5.6b). Even though farmers selling in the SSC have more cattle than those selling in the SM, the average is quite low as seen in Table 5.6a. Moreover, only 51.2 percent of the total sample have cattle (Table 5.6b).

Farmers selling in the SSC, however, proportionally depend less on non-farm income, sell less their own labour, and instead hire non-family labour. In the same way a higher proportion of this group of farmers keep written records and have access to technical assistance compared to farmers selling FFV in the SM. The main source of technical assistance for farmers is NGOs/Associations (Table 5.6b). Farmers selling to the SSC depend more on FFV production and produce almost all year-round, therefore, dedicate less time to generating non-farm income or selling their own labour compared to farmers selling to the SM. According to interviews, farmers consider an advantage their ability of making their livelihood without the need of selling their labour or going out of the farm to look for extra income. In the same way, farmers selling to the SSC have better managerial and technical skills (assets) as suggested by keeping written records and having access to technical assistance. Even though farmers have many similarities (Table 5.6a and 5.6b), the main differentiation of farmers selling to the SSC is their access to key assets and information, which apparently facilitate their participation in the SSC.

Table 5.6b Farm and Household Characteristics of Respondent Farmers

Market Channel	Corn		Total
	No	Yes	
Traditional	0.4%	80.1%	80.5%
Supermarket	1.6%	18.0%	19.5%
Total	2.0%	98.0%	100.0%
Market Channel	Bean		Total
	No	Yes	
Traditional	4.7%	75.9%	80.5%
Supermarket	1.6%	17.9%	19.5%
Total	6.2%	93.8%	100.0%
Market Channel	Cattle		Total
	No	Yes	
Traditional	39.6%	40.8%	80.4%
Supermarket	9.2%	10.4%	19.6%
Total	48.8%	51.2%	100.0%
Market Channel	Non farm income*		Total
	No	Yes	
Traditional	33.9%	46.6%	80.5%
Supermarket	13.1%	6.4%	19.5%
Total	47.0%	53.0%	100.0%
Market Channel	Off farm labour*		Total
	No	Yes	
Traditional	41.4%	42.4%	83.8%
Supermarket	13.3%	2.9%	16.2%
Total	54.8%	45.2%	100.0%
Market Channel	Hire non family labour*		Total
	No	Yes	
Traditional	25.5%	55.6%	81.1%
Supermarket	2.3%	16.6%	18.9%
Total	27.8%	72.2%	100.0%
Market Channel	Drip irrigation		Total
	No	Yes	
Traditional	63.6%	16.0%	79.6%
Supermarket	14.8%	5.6%	20.4%
Total	78.4%	21.6%	100.0%
Market Channel	Written records*		Total
	No	Yes	
Traditional	57.1%	23.4%	80.5%
Supermarket	10.3%	9.2%	19.5%
Total	67.4%	32.6%	100.0%

Table 5.6b (Cont'd)

Market Channel	Technical assistance*		Total
	No	Yes	
Traditional	27.9%	51.8%	79.7%
Supermarket	1.6%	18.7%	20.3%
Total	29.5%	70.5%	100.0%
Market Channel	Main source of tech. assistance		Total
	Other	NGO/Assoc.	
Traditional	16.0%	58.0%	74.0%
Supermarket	3.3%	22.7%	26.0%
Total	19.3%	80.7%	100.0%

Note: At least one cell of corn, bean and cattle has expected count less than 5.

* Pearson Chi-Square Sig. at the 1% level

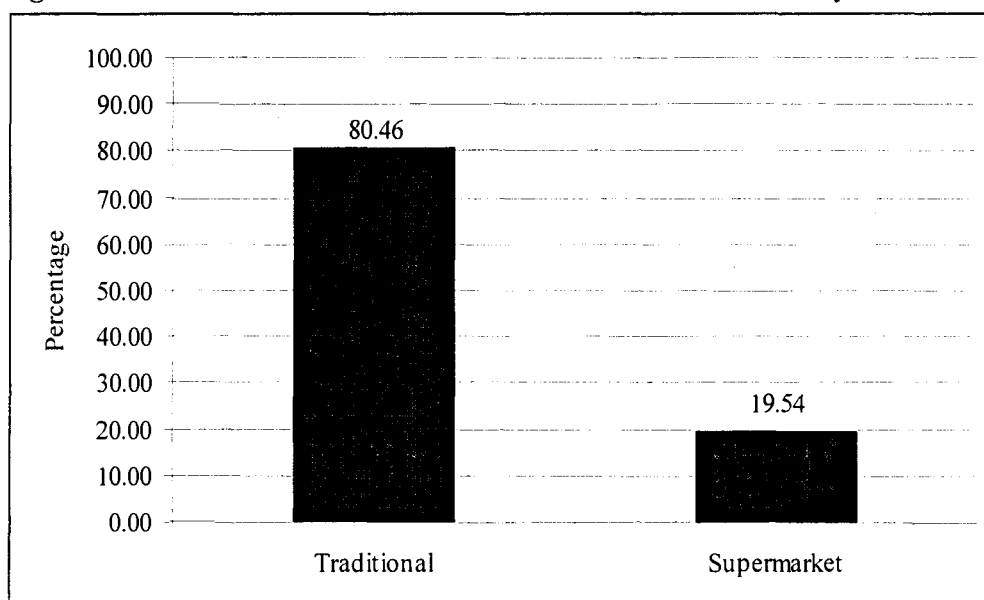
5.3.3 Marketing Characteristics

Currently, the proportion of farmers mainly selling to the SSC is 19.54 percent (Table 5.7 and Figure 5.2). The same figure for five years ago is shown in Table 5.8 and Figure 5.3, revealing that at this time only 13.49 percent of farmers used to sell mainly to the SSC.

The total change in the proportion of farmers selling mainly to the SSC is 6.05 percent in five years. Even though the change in the proportion of FFV sold to the SSC in the last five years is statistically significant at the 5 percent level (Table 5.9), practically it is not a remarkable change, suggesting that in Honduras the market share of supermarkets in this food sector has grown slowly, and not as generally implied by Reardon and Berdegue (2002). A possible reason for these results is that this study includes very traditional farmers. The percents shown in Tables 5.7 and 5.8 are greater than the means shown in Table 5.9, because the last table shows the total proportion of FFV sold to SSC while the previous tables show the percent of farmers selling mainly to each market. It is important to note that most farmers selling mainly to the SSC also sell a proportion to SM.

Table 5.7 Main Market Channel of FFV Farmers - Currently

Market Channel	Frequency	Percent
Traditional (SM)	210	80.46
Supermarket (SSC)	51	19.54
Total	261	100.00

Figure 5.2 Main Market Channel of FFV Farmers - Currently**Table 5.8 Main Market Channel of FFV Farmers – Five Years Ago**

Market Channel	Frequency	Percent
Traditional (SM)	218	86.51
Supermarket (SSC)	34	13.49
Total	252	100.00

Figure 5.3 Main Market Channel of FFV Farmers – Five Years Ago

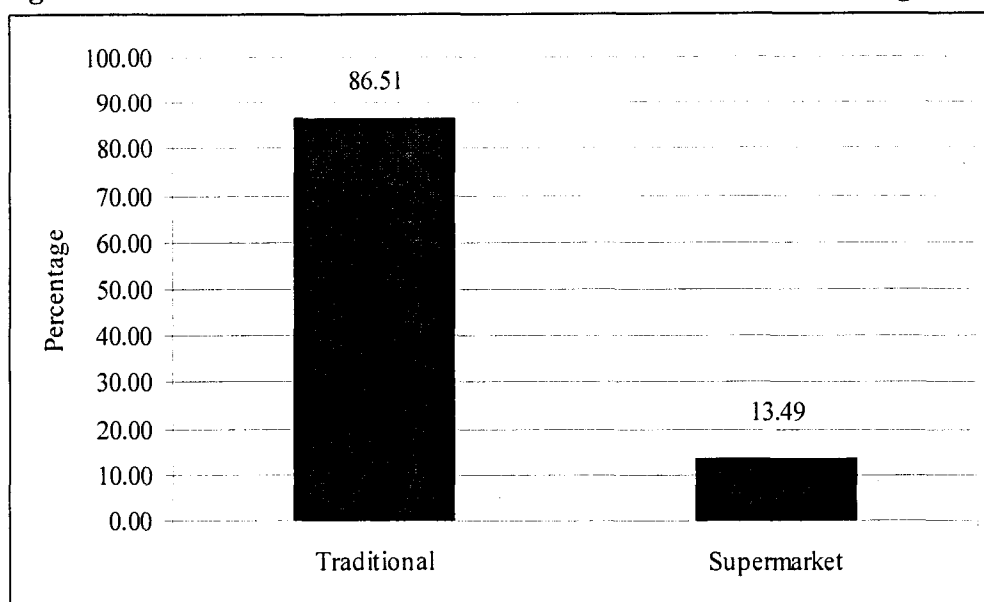


Table 5.9 Change in the Proportion of FFV Sold to the SSC in Five Years

Variable	Mean	N	Std. Dev.	Mean Difference
Proportion sold to the SSC currently	14.57	252	31.36	3.488**
Proportion sold to the SSC five y.a.	11.08	252	28.21	

Note: Paired Samples Statistics

** Sig. (2-tailed) at the 5% level

Farmers selling FFV to the SSC in the survey region are mainly doing it through two organizations: APROFHI and DIVEFRU. APROFHI is a private farmer organization with closed and paid membership. Even though it is private, it was originated by donor and NGO initiatives, and still depends on subsidies. APROFHI buys 12.63 percent of FFV in the region, according to survey results (Table 5.10 and Figure 5.4). DIVEFRU is a private organization, where farmers neither pay membership nor have shares; however, they have verbal contracts, and are benefited with technical assistance and transportation. This organization has a smaller pool of farmers and only buys 2.72 percent of the FFV in the region, according to survey results (Table 5.10 and Figure 5.4). The big buyers of FFV in the region are middlemen at farm gate and

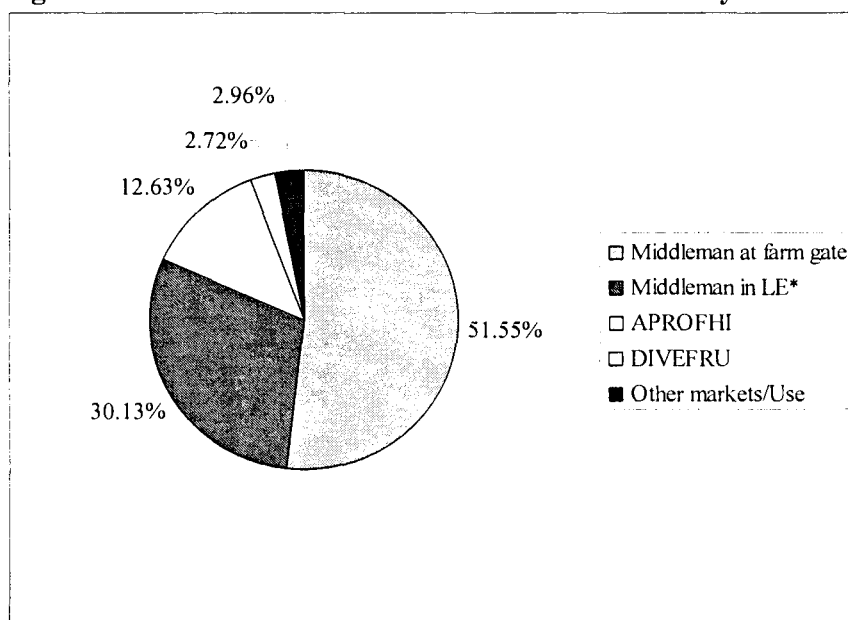
middlemen in La Esperanza¹⁷ with 51.55 percent and 30.13 percent of market share respectively (Table 5.10 and Figure 5.4), showing that traditional markets for FFV are still dominant in Honduras. The participation in collective action and contractual arrangements are key factors to participate in the SSC for small farmers in this region. APROFHI and DIVEFRU pool production to sell in San Pedro Sula (SPS) city that is at about 200 kms from La Esperanza. For a single small farmer of this region it would be unfeasible to sell directly in SPS.

Table 5.10 Destination of FFV Production - Currently

Average Proportion of FFV Sold to Each Market	Mean
Middleman at farm gate	51.55%
Middleman in La Esperanza*	30.13%
APROFHI	12.63%
DIVEFRU	2.72%
Other markets/Use	2.96%
Total	100.00%

* Nearest town

Figure 5.4 Destination of FFV Production - Currently



¹⁷ Nearest town at an average of 12.13 and 13.95 kms. from farm for farmers selling mainly to SM and SSC respectively.

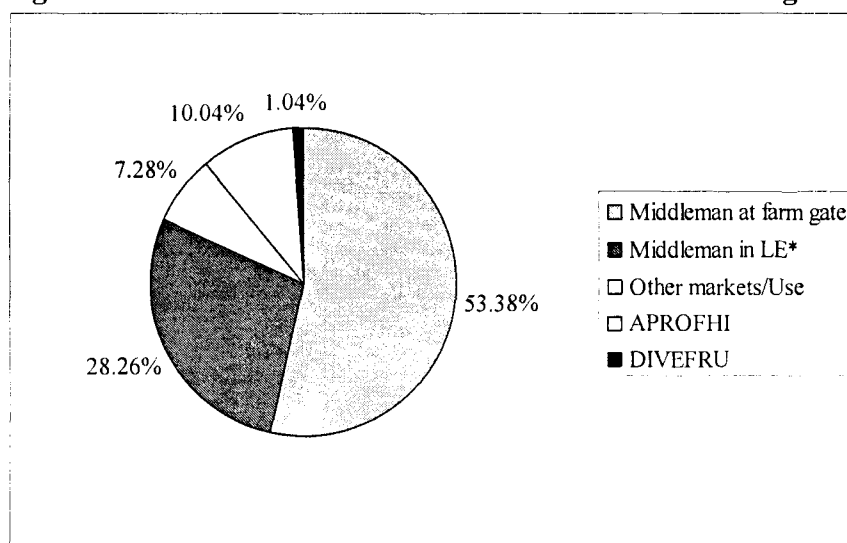
In Table 5.11 and Figure 5.5 the market share of FFV buyers in the region five years ago is shown. Middlemen (at farm gate and in La Esperanza together) controlled almost the same proportion of the market five years ago. However, farmers have reduced the proportion sold at farm gate and to other markets to increase the proportion sold in La Esperanza, APROFHI and DIVEFRU. Nevertheless, the growth of the market share of APROFHI and DIVEFRU has been quite slow for a five-year period.

Table 5.11 Destination of FFV Production – Five Years Ago

Average Proportion of FFV Sold to Each Market	Mean
Middleman at farm gate	53.38%
Middleman in La Esperanza*	28.26%
Other markets/Use	7.28%
APROFHI	10.04%
DIVEFRU	1.04%
Total	100.00%

* Nearest town

Figure 5.5 Destination of FFV Production – Five Years Ago



Farmers selling mainly in the SSC are significantly different from farmers selling just to the SM regarding to marketing characteristics (Table 5.12). Out of twelve variables shown in Table 5.12, nine are significantly different from zero at the 1 percent

level and two at the 10 percent level. Farmers participating in the SSC sell more frequently, have more market information, have fewer problems of grading, get higher and more stable prices, and have a better relationship with buyers. These results suggest that farmers selling to the SSC are more entrepreneurial, and have been able to establish coordinated relationship with buyers. They have been able to deal with problems associated with frequency and grading, which are mentioned by research participants as constraints to participate in the SSC. As a reward, farmers are getting more stable and better prices in the SSC. These results suggest that the capacity to sell frequently, the access of information, and the capacity to negotiate with buyers may be factors that favour farmer participation in the SSC.

5.3.4 Organizational Characteristics

In Table 5.13a some organizational characteristics by market channel are shown.

According to these figures, farmers in the SSC are more willing to pay for organization membership, give more importance to organization for selling, and are getting a greater number of services from organization, compared to farmers in the SM. It is important to note that about 80 percent of farmers selling to the SSC are doing it through APROFHI where they already pay for membership. Furthermore, they value the organization as important for selling their products, get benefits from the organization, and even have shares, thus their willingness to pay for membership because they may see it as an investment. In the case of DIVEFRU, about 20 percent of the farmers selling to the SSC, do not pay for membership, but they see the organization as important because they are getting significant benefits such as transportation from farm gate to the distribution centre

in La Esperanza. In both cases, APROFHI and DIVEFRU, farmers are indirectly benefited by transportation from La Esperanza to San Pedro Sula, where the pooled produce is finally sold.

Table 5.12 Farmer Characteristics Associated with Main Market Channel

Variable	Market Channel	N	Mean	Std. Dev.
Distance to local market*** (km.)	Traditional	210	12.13	5.57
	Supermarket	51	13.95	6.34
Frequency of selling* (Likert scale, 1-5)	Traditional	210	3.64	1.59
	Supermarket	50	4.32	1.08
Contract versus traditional market* (Likert scale, 1-5)	Traditional	210	3.78	1.03
	Supermarket	51	4.39	0.63
Problems of transportation (Likert scale, 1-5)	Traditional	209	3.35	1.29
	Supermarket	51	3.59	1.39
Price of main market compared to others* (Likert scale, 1-5)	Traditional	209	2.62	1.04
	Supermarket	51	3.47	0.78
Days to get paid*	Traditional	209	3.21	3.96
	Supermarket	51	16.29	4.30
Variability of prices* (Likert scale, 1-5)	Traditional	210	4.37	0.64
	Supermarket	51	2.80	1.04
Trust in buyer* (Likert scale, 1-5)	Traditional	209	2.93	1.15
	Supermarket	51	3.84	0.90
Buyer's trust in farmer*** (Likert scale, 1-5)	Traditional	210	3.60	1.00
	Supermarket	50	3.90	0.93
Satisfaction with buyer* (Likert scale, 1-5)	Traditional	209	3.14	0.98
	Supermarket	51	3.92	0.72
Problem of grading* (Likert scale, 1-5)	Traditional	204	2.21	1.17
	Supermarket	51	1.65	1.09
Familiarity with SSC requirements* (Likert scale, 1-5)	Traditional	210	2.21	1.26
	Supermarket	51	3.08	1.32

Note: Independent sample t-test.

* Sig. (2-tailed) at the 1% level

*** Sig. (2-tailed) at the 10% level

Table 5.13a Organizational Characteristics of Farmers

Variable	Market Channel	N	Mean	Std. Dev.
Years of being a member	Traditional	117	4.73	5.34
	Supermarket	49	4.88	3.59
Problem of paying for membership* (Likert scale, 1-5)	Traditional	145	2.38	1.24
	Supermarket	50	1.90	0.97
Performance of organization (Likert scale, 1-5)	Traditional	114	3.84	0.80
	Supermarket	47	3.77	0.76
Trust in organization (Likert scale, 1-5)	Traditional	114	3.91	0.96
	Supermarket	49	4.00	0.89
Importance of organization for selling* (Likert scale, 1-5)	Traditional	120	3.97	1.09
	Supermarket	49	4.55	0.61
Number of organization services***	Traditional	106	4.58	2.12
	Supermarket	46	5.20	1.64

Note: Independent sample t-test.

* Sig. (2-tailed) at the 1% level

*** Sig. (2-tailed) at the 10% level

From the total sample of this survey, 63.7 percent of farmers are organized¹⁸.

However, almost all farmers selling to the SSC are organized. A significant proportion of these farmers, compared to farmers selling to SM, also pays membership to their organization, and gets several services from organization (Table 5.13b). Regarding the opinion of farmers about the performance of their organizations, there is not a significant difference by main market channel. Overall, about 60 percent of farmers consider that their organizations are performing good or very good, and about 40 percent of farmers consider the organization performance regular (Table 5.13b).

¹⁸ Here are considered formal and informal organizations. Formal organizations are those legally established (e.g., cooperatives), and informal organizations are those non-legally established (e.g., networks or beneficiary groups of NGOs).

Table 5.13b Organizational Characteristics of Farmers

Market Channel	Organization member*		Total	
	No	Yes		
Traditional	35.5%	44.8%	80.3%	
Supermarket	0.8%	18.9%	19.7%	
Total	36.3%	63.7%	100.0%	
Market Channel	Membership payment*		Total	
	No	Yes		
Traditional	34.5%	35.8%	70.3%	
Supermarket	7.9%	21.8%	29.7%	
Total	42.4%	57.6%	100.0%	
Market Channel	Performance of organization			Total
	Regular	Good	Very good	
Traditional	28.0%	25.5%	17.4%	70.8%
Supermarket	12.4%	11.2%	5.6%	29.2%
Total	40.4%	36.6%	23.0%	100.0%

* Pearson Chi-Square Sig. at the 1% level

5.4 Conclusions

In this chapter a general overview of the supply chain for FFV in Honduras was presented. The majority of FFV is still channeled through traditional markets, which have a market share of about 85 percent. The rest of the market is controlled by supermarket chains. Even though the market share of the SSC is still quite low, it is expected that it will continue growing due to the influence exerted by local and international retail chains in the region. Thus, the SSC is offering new market opportunities to farmers, but at the same time great challenges because of the increasing coordination and required standards associated with SSC procurement systems. Furthermore, if small farmers are not able to upgrade their production and marketing systems they face the threat of being displaced by larger farmers or foreign suppliers.

A descriptive comparison of participant and non-participant farmers in the SSC in terms of socio-economic, farm and household, marketing, and organizational characteristics suggests that farmers from both groups are quite similar. However,

participant farmers are more entrepreneurial and have been able to adjust key farming and marketing activities to take advantage of the new market opportunity offered by the SSC. These farmers are gradually specializing in FFV production. Key physical and managerial assets such as months of irrigation availability to produce frequently, and information which helps to reduce risk differentiate participant to non-participant farmers in the SSC. Farmers selling in the SSC also have an active participation in collective action which helps them to pool resources. Given the low output of individual farmers it would be impossible for them to sell individually to supermarkets, which are located at more than 200 kilometers from their farms.

These results have several implications consistent with the analytical framework of this research. First, they help to identify key success factors and constraints associated with the participation of small farmers in the SSC; and second, they suggest that collective action matters. Nevertheless, the previous analyses are descriptive and not explanatory. For this reason, further analyses are presented and discussed in the next chapter in order to assess the motivations, success factors, and impacts of small farmer participation in the SSC for FFV.

CHAPTER VI

MOTIVATIONS, SUCCESS FACTORS AND IMPACTS

6.1 Introduction

In this chapter the motivations, success factors, constraints and impacts associated with small farmer participation in the SSC are presented and discussed. For this purpose a logit regression to assess the effect of several factors associated with socioeconomic, transaction cost, and organization characteristics on the market channel of farmers is used. In addition to that, a choice-based conjoint model is used to estimate the effect of several attributes on the marketing preference of farmers. These two particular empirical models are aimed to test the main hypotheses regarding contractual uncertainty and collective action presented in Section 3.4.

In the previous two models the effect of organization is assessed in a general way. However, in order to determine the effect of specific organization services on the probability of participating in the SSC, a logit regression is used for that purpose including just organized farmers. Nine organization services, usually provided to farmers in Honduras are included in this model, which helps to disaggregate the analysis of the role of collective action associated with hypothesis three of Section 3.4.

Finally, for assessing the impact of participating in the SSC on small farmers an ordered probit model is used. This model, which is associated with hypothesis one of Section 3.4, evaluates the probability of change in terms of sales, income, performance, and overall situation now and five years ago as a function of market channel, socioeconomic, and farm characteristics. In the same way, farmers are compared in

terms of satisfaction with buyer and relative prices of their market compared with alternative markets.

6.2 Determinant Factors Associated with Small Farmer Participation in the SSC.

With the original set of variables presented in chapter four (Table 4.1), as hypothetical determinants of market choice of farmers, a logit regression in the following form was run:

$$\text{Market Choice (SSC=1|X)} = \alpha + \beta_1 X_1 + \dots + \beta_{20} X_{20} + \varepsilon_i \quad (6.1)$$

The explanatory variables of this model include socioeconomic and farm characteristic variables, which are proxies of small farmers' capitalization. Likewise, proxies of transaction costs and collective action are included in the model.

The model three of Table 6.1 is considered the best, according to theoretical expectations and significant results. The model one of the same table shows that socioeconomics variables such as gender, age and education are not statistically significant. The probable reason of these results is that the population where the sample was taken from is quite homogeneous in these terms. Unexpectedly, the area of FFV grown and the quantity of cattle are not statistically significant. It was originally expected that farmers selling in the SSC grow larger areas of FFV and have more cattle. The non-significant differences may be explained by the fact that most of these farmers (participant and non-participant in the SSC) are very smallholders, and besides, the region is not important for cattle production in the country (Secretaria de Agricultura y Ganaderia, 2006). Familiarity with supermarkets is also insignificant, probably because farmers do not sell directly to retailers.

Table 6.1 Determinant Factors of Small Farmer Participation in the SSC

Model	One		Two		Three	
Variables	B	ME	B	ME	B	ME
Gender	0.00 (-0.68)	-0.0001				
Age	-0.01 (0.02)	-0.0002				
Education	-0.09 (0.13)	-0.0026				
Actual area of FFV	-0.14 (0.32)	-0.0039	-0.15 (0.00)	-0.0047		
Cattle	0.12 (0.10)	0.0035	0.14 (0.00)	0.0044		
Proportion of income from FFV	0.04 * (0.01)	0.0010	0.02 ** (0.00)	0.0008	0.02 *** (0.01)	0.0007
Hire non-family labour	0.99 (0.63)	0.0237	1.24 ** (0.03)	0.0329	1.42 ** (0.61)	0.0410
Months of FFV production	0.18 (0.14)	0.0052	0.14 (0.00)	0.0047	0.19 *** (0.11)	0.0068
Risk of losing FFV due to weather	-0.36 (0.30)	-0.0104				
Risk of losing FFV due to pests	0.27 (0.33)	0.0077				
Risk of produc. FFV of low quality	-0.84 * (0.31)	-0.0241	-0.82 * (-0.03)	-0.0264	-0.81 * (0.25)	-0.0293
Frequency of selling	0.23 (0.20)	0.0067	0.21 (0.01)	0.0067		
Transportation problems	0.44 ** (0.23)	0.0128	0.39 *** (0.01)	0.0127	0.44 ** (0.20)	0.0161
Relative prices	1.06 * (0.33)	0.0305	1.18 * (0.04)	0.0381	1.06 * (0.26)	0.0384
Trust in buyer	0.48 (0.32)	0.0138	0.91 * (0.03)	0.0293	1.01 * (0.25)	0.0367
Trust in seller (from buyer)	0.11 (0.31)	0.0032				
Satisfaction with buyer	0.68 *** (0.42)	0.0195				
Problems of grading	-0.52 *** (0.28)	-0.0148	-0.59 * (-0.02)	-0.0192	-0.61 * (0.24)	-0.0220
Familiar with supermarkets	0.29 (0.21)	0.0083				
Organization member	3.53 * (0.95)	0.0947	3.54 * (0.11)	0.1076	3.52 * (0.87)	0.1171
Constant	-16.51 * (4.02)		-14.25 * (2.56)		-13.51 * (2.41)	

Table 6.1 Cont'd.

LR $\chi^2(20, 12, 9)$	120.460	122.470	119.740
Prob > χ^2	0.000	0.000	0.000
ρ^2	0.519	0.505	0.486
Log likelihood	-55.746	-59.965	-63.393
LR Test _{1,2} = 8.44	LR Test _{1,3} = 15.29	LR Test _{2,3} = 6.86	
$\chi^2(8)$ at the 5% = 15.51	$\chi^2(11)$ at the 5% = 19.68	$\chi^2(3)$ at the 5% = 7.82	

* Sig. at the 1% level

** Sig. at the 5% level

*** Sig. at the 10% level

Note: B=Estimated coefficient; ME= Marginal Effect; Standard errors are in parenthesis.

In model two, eight variables were dropped, either because they were insignificant or highly correlated with other variables. The likelihood ratio test comparing model one and two is not significant, suggesting that the variables dropped were not contributing significantly to the fit of model one. The area of FFV grown and the quantity of cattle remain not statistically significant in model two as well as months of FFV production and frequency of selling. In model three, the area of FFV grown and the quantity of cattle were dropped as well as the frequency of selling, which is correlated with months of FFV production. The likelihood ratio test comparing model two and three is not significant, suggesting that the three variables dropped were not contributing significantly to the fit of model two (Table 6.1).

In model three (Table 6.1) all the explanatory variables are statistically significant. The proportion of income from FFV and months of FFV production are significant at the ten percent level; hiring non-family labour and transportation problems are significant at the five percent level; and the rest of variables are significant at the one percent level. All the variables have the expected sign (see Table 4.1), except transportation problems. It was originally expected that farmers selling in the SSC have less transportation problem. The logical explanation of an opposite result is that farmers

selling in the SM, especially to middlemen at the farm gate have less transportation problem, since the buyer, in this case, provides the transportation. Farmers selling in the SSC have serious problems to transporting the produce to the collection and distribution centres.

An easier way of interpreting the coefficients of model three is to look at the marginal effects (ME) shown in Table 6.1. The proportion of income from FFV and months of FFV production are significant at the ten percent level and have a positive relationship with participating in the SSC; however, their marginal effects are quite low (less than one percent). Hiring non-family labour, on the contrary, has a larger marginal effect. This result suggests that farmers selling in the SSC produce more intensively, and besides their own family labour they require additional labour force. Hiring non-family labour increases the probability of selling in the SSC by 4.10 percent. Risk of producing FFV of low quality and problems of grading have a negative relationship with participating in the SSC as expected, and one unit increase in these variables reduces the probability of selling in the SSC by 2.93 and 2.20 percent respectively. These two variables are related with contractual uncertainty, and hence with transaction costs. Producing FFV of quality and grading products according to specific requirements are key elements to participate in the SSC. Farmers lacking information about these requirements or having problems to implement them, have less probability of participating in the SSC.

Having higher relative prices in the SSC (compared with alternative markets) and trust in buyer increase the probability of participating in the SSC. One unit increase in these variables increases the probability of selling in the SSC by 3.84 and 3.87 percent

respectively. These two variables are related with uncertainty and negotiation costs. Farmers selling in the SSC consider that prices they receive are relatively higher than prices in the SM. A higher price reflects a 'premium' for meeting SSC requirements such as quality and frequency which buyers may not consistently find in the SM. In the same way, trusting the buyer is a key factor for selling in the SSC, since farmers selling in this market are usually paid two or three weeks after the product is delivered. Trusting the buyer also reduces problems related to grading, since buyers take the decision if a product meets the requirements or not, and farmers are paid according to the grade of products.

Finally, being a member of an organization has a positive relationship with selling in the SSC, as originally expected. Actually, being organized is the most important factor for selling in the SSC as suggested by the marginal effect of this variable. The probability of selling in the SSC increases by 11.71 percent when farmers are organized compared to non-organized farmers. This result is consistent with the way that farmers from the survey region are participating in the SSC. They sell small quantities of FFV to APROFHI and/or DIVEFRU, which are two local companies that pool FFV from several small farmers and supply supermarket chains in San Pedro Sula. For the average small farmer considered in this study it is practically impossible to sell individually to a market that is located about 200 kms. away, demands a large quantity and variety of FFV, and involves high information and negotiation costs.

6.3 Marketing Preferences of Farmers Elicited from the Choice-Based Model

Using the choice-based conjoint model presented in chapter four, the effect of price structure, quantity, grading, payment system, frequency of delivery, selling place, organization and entry cost on the market preference of farmers was estimated. As the dependent variable of this model is binary (Yes/No) the following coding is used: Yes = 1, and No = 0. Using a logit regression the effect of each attribute on farmers' preference was estimated. Farmers evaluated 32 market profiles one by one, and answered if they would sell or not sell based on the conditions of each profile. Results presented in Table 6.2 show that all the explanatory variables (attributes), except grading are significant. Selling through informal organization is significant at the five percent level, and the rest of explanatory variables are significant at the one percent level. The fit of the model, reflected by the pseudo R^2 (ρ^2), is considered excellent according to the range suggested by Louviere *et al.* (2003a). The signs of the coefficients are generally as expected.

The marginal effects in the model are generally large. When the price is fixed with the buyer at planting, the probability of selling is increased by 22.58 percent. Fixing the price at planting helps farmers reduce uncertainty about future prices, but also carries out a cost of negotiation. In the SM prices are characterized for being highly variable. In the SSC prices are not really fixed, but are significantly less variable than in the SM.

Fixing the quantity with the buyer at planting has a positive and significant effect on the probability of selling, which is increased by 7.75 percent compared to not fixing the quantity. This suggests that fixing the quantity at planting helps farmers reduce uncertainty about a market for selling their products. Retailers' information about the expected demand for FFV facilitates the production planning with their suppliers.

Table 6.2 Marketing Preferences of Farmers

Variables	B	ME
Fixed Price	1.12 * (0.06)	0.2258
Fixed Quantity	0.38 * (0.05)	0.0775
No Grading	0.07 (0.05)	0.0151
Cash Payment	1.20 * (0.05)	0.2405
No Frequency	0.13 * (0.05)	0.0271
Selling at Farm Gate	2.53 * (0.09)	0.4845
Selling in La Esperanza	1.78 * (0.10)	0.3997
Selling Individually	0.16 * (0.07)	0.0333
Selling Through Informal Organization	-0.19 ** (0.08)	-0.0375
No Entry Cost	0.78 * (0.07)	0.1577
Minimal Entry Cost	0.60 * (0.08)	0.1289
Constant	-4.66 * (0.13)	

N = 8460

LR $\chi^2(11) = 2276.5100$

Prob > $\chi^2 = 0.0000$

$\rho^2 = 0.2096$

Log likelihood = -4292.5622

* Sig. at the 1% level

** Sig. at the 5% level

Note: B=Estimated coefficient; ME= Marginal Effect; Standard errors are in parenthesis.

Unexpectedly, grading is not statistically significant. This result may be associated with the ambiguous nature of grading. Farmers selling in the SM are not accustomed to grading their products for selling, because the market does not require it.

Grading is required in the SSC, and involves information and skills to carry it out correctly. Thus, grading demands an extra effort for farmers, but it also can be associated with premium prices due to quality issues.

It is not surprising that farmers prefer cash and immediate payment after delivering products instead of payment by cheque two weeks later. Cash and immediate payment increases the probability of selling by 24.05 percent. Nevertheless, the payment system used in the SSC is not like that. The main implication of this result is that cash payment is a strong incentive for farmers to sell in the SM. Payment by cheque and two weeks later, as is usually done in the SSC, is considered very risky for farmers, especially if they do not trust the buyer. Picking up and cashing the cheque also involve additional transaction costs to farmers.

An additional preference of farmers associated with the SM is that they prefer a marketing arrangement that does not require frequent deliveries scheduled at planting. The probability of selling is increased by 2.71 percent when farmers are free to deliver when they can. Nevertheless, the SSC requires frequent deliveries, which are usually scheduled at planting, or even before. Adjusting to a delivery schedule involves planning activities and the availability of specific assets such as irrigation systems, which represent transaction costs to farmers.

The most important attribute for deciding to sell or not sell for farmers, according to the marginal effects of the model is place. Selling at farm gate increases the probability of selling by 48.45 percent compared to selling in San Pedro Sula or Tegucigalpa. This result implies a great incentive for farmers to sell in the SM, especially to middlemen that buy at the farm gate. In the same way, it represents a

serious constraint to participating in the SSC, because SSC suppliers do not usually buy at the farm gate. Selling individually in San Pedro Sula or Tegucigalpa involves relatively high transaction costs to farmers, such as negotiating with buyers; reaching volume, meeting variety and frequency required as well as dealing with transportation problems. The second preference of farmers regarding selling place is La Esperanza (nearest town). The probability of selling in La Esperanza is increased by 39.97 percent compared to selling in San Pedro Sula or Tegucigalpa. This preference opens the possibility of participating in the SSC through supermarket suppliers that have collection and distribution centres in La Esperanza, as is the case of APROFHI and DIVEFRU. However, these options require participation in collective action and negotiation between buyers and sellers.

In spite of the limitations of participating in new supply chains individually, farmers prefer to sell their products in this way. The probability of selling is increased by 3.33 percent if the transaction is made individually, and not through a formal organization. However, farmers prefer formal organizations more than informal ones. The probability of selling through an informal organization is decreased by 3.75 percent compared to selling through a formal organization. Informal organizations pose higher risks to farmers, since property rights may not be well defined. According to in-depth interviews, free-riding and management problems of informal organization discourage farmer from participating in them.

Finally, the results of this model suggest that farmers prefer to sell if the market does not require major/significant investments. The probability of selling is increased by 15.77 and 12.89 percent if the entry costs are zero or minimal respectively, compared to

major/significant entry costs. These results suggest that farmers face limitations to make new investments in their farms, which is consistent with the small scale of the farmers included in this study. However, for participating in the SSC for FFV specific assets such as drip irrigation systems and greenhouses are highly important. Moreover, these assets are relatively expensive for farmers.

6.4 Organization Services and Market Channel Used by Farmers

The results presented so far suggest the importance of organization for participating in the SSC. Organizations offer different kinds of services to participant and non-participant farmers in the SSC; therefore, it is important to identify and assess those services that really have an effect on the main market channel used by farmers. For that purpose, a logit regression, including just organized farmers, in the form of probability of selling to the SSC as a function of organization services was run. Organizational assistance regarding marketing services and collection and distribution centers is highly significant for participating in the SSC (Table 6.3). When the organization provides these two services to farmers, the probability of selling in the SSC is increased by 40.96 and 20.55 percent respectively.

The other seven variables included in the regression are not statistically significant at the five percent level. Providing assets to farmers in individual basis is significant, but at the ten percent level, and even with a negative sign, suggesting that this service does not contribute to the collective action required for participating in the SSC. The non-significant effect of the other variables in the model may be explained by the fact that organizations provide these services to participant and non-participant farmers in

the SSC. However, these services are not always oriented to promote farmer participation in the SSC, as is the case of marketing services and collection and distribution centre services which have a very specific objective.

Table 6.3 Effect of Organization Services on Market Channel Used by Farmers

Variables	B	ME
Marketing Services	3.10* (0.82)	0.4096
Credit	-0.94 (0.59)	-0.1353
Inputs	-0.45 (0.62)	-0.0617
Training	-0.61 (1.05)	-0.0979
Technical Assistance	0.63 (0.93)	0.0749
Transportation	-0.45 (0.62)	-0.0561
Collection and Distribution Centres	1.35** (0.56)	0.2055
Individual Assets	-0.98*** (0.53)	-0.1236
Collective Assets	0.18 (0.55)	0.0246
Constant	-2.74 (1.06)	

N = 152

LR $\chi^2(9) = 77.050$

Prob > $\chi^2 = 0.000$

$\rho^2 = 0.413$

Log likelihood = -54.662

* Sig. at the 1% level

** Sig. at the 5% level

*** Sig. at the 10% level

Note: B=Estimated coefficient; ME= Marginal Effect; Standard errors are in parenthesis.

Organizations (e.g., NGOs, cooperatives) traditionally provide credit, inputs, training, technical assistance and assets oriented to the production process, and not necessarily to commercialize produce. In the same way, these services are often

subsidized and provided to subsistence farmers for food production. As pointed out by Berdegue (2001), traditional agricultural development programs have been focused on “teaching” independent farmers how to increase productivity. However, under the new agrifood systems institutional and organizational innovation is needed (Reardon and Barrett, 2000; Pinstup-Andersen, 2002). Marketing and collection and distribution center services offered by organizations have the specific objective to insert small farmers into the SSC.

From previous results the importance of transportation for choosing the main market channel can be deduced. Many farmers are motivated to sell to middlemen at the farm gate, because the buyer provides transportation. However, farmers selling in the SSC through APROFHI have to procure the transportation of their produce to the main collection and distribution center located in La Esperanza, which represents high costs for farmers. First, transportation is expensive, and second is not always reliable. Through the organization (APROFHI) farmers get transportation service from the collection and distribution center to the market (about 200 kilometers); however, farmers do not see this service as a direct benefit. The reason for this behaviour is that many farmers still consider APROFHI as the final buyer, even though they pay for membership and have shares in the organization.

6.5 Impacts of Participating in the SSC

Determining the impacts of participating in the SSC on farmers is not quite simple when there are data limitations regarding ‘now’ and ‘before.’ Nevertheless, an effort is made to compare farmers according to their market channel in terms of sales, income,

performance, and overall situation now and five years ago. In the same way, farmers are compared in terms of satisfaction with buyer and relative prices of their market compared with alternative markets. Farmers were asked to give their opinion in a Likert scale from 1 to 5, where 1 is the worst scenario and 5 is the best. As categories 1 and 5 had just a few observations, categories 1 and 2, and 4 and 5 were merged, keeping just three categories. An ordered probit model for each 'impact' variable was run as a function of market channel (SSC/SM) and other socioeconomic and farm characteristic variables.

Results for sales are not presented, since the model did not yield any significant variable. It is important to mention that farmers included in this study are not accustomed to participating in research, and thus, do not like to talk about money issues (e.g., sales) with strangers. This situation may have hidden possible differences between now and five years ago.

In the case of income the results are shown in Table 6.4. Unexpectedly, the market channel is statistically insignificant. Nevertheless, cattle and organization are significant at the five percent level. According to the marginal effect, a unit of cattle increases the probability of having a higher income now than five years ago by 3.32 percent. This result may be associated with the selling of milk production or even a unit of cattle. In the same way, being a member of an organization increases the probability of having a higher income now than five years ago by 14.94 percent. Organization provides different kinds of services to farmers; thus, it is reasonable that organized farmers are having higher income now than five years ago. However, as discussed in the previous section not all organization services are oriented to promote small farmer participation in the SSC.

Table 6.4 Difference in Income Now and Five Years Ago

Variables	B	Marginal Effects		
		Prob(y=1)	Prob(y=2)	Prob(y=3)
Gender (Male)	0.07 (0.24)	-0.0135	-0.0113	0.0248
Age	0.00 (0.01)	-0.0008	-0.0007	0.0014
Education	0.03 (0.04)	-0.0056	-0.0050	0.0106
Area of FFV	0.09 (0.12)	-0.0177	-0.0156	0.0333
Cattle	0.09** (0.04)	-0.0171	-0.0150	0.0322
Proportion of income from FFV	0.00 (0.00)	0.0008	0.0007	-0.0015
Organization (Yes)	0.41** (0.18)	-0.0840	-0.0654	0.1494
Market Channel (SSC=Yes)	-0.29 (0.23)	0.0619	0.0466	-0.1085
cut1	-0.79	(Ancillary parameters)		
cut2	-0.03			

LR $\chi^2(8) = 17.490$

Prob > $\chi^2 = 0.025$

$\rho^2 = 0.043$

Log likelihood = -193.747

** Sig. at the 5% level

Note: B=Estimated coefficient; Standard errors are in parenthesis.

Prob(y=1): Lower; Prob(y=2): Equal; Prob(y=3): Higher

The results regarding change in overall performance now and five years ago are presented in Table 6.5. While the market channel used by farmers is statistically insignificant, gender is significant at the one percent level, and education and organization at the five percent level. According to marginal effects, if the farmer is male the probability of having better performance now than five years ago is increased by 23.92 percent. This result is consistent with the fact that in Honduras men are the traditional managers of farms. In the same way, education contributes to the overall

performance of the farmer. One year of education increases the probability of having better performance now than five years ago by 2.78 percent. However, education is not statistically significant on the market channel used by farmers (see Table 6.1). Finally, if the farmer is a member of an organization, the probability of having better performance now than five years ago is increased by 14.48 percent. As in the case of income, organization has a positive effect on performance.

Table 6.5 Difference in Performance Now and Five Years Ago

Variables	B	Marginal Effects		
		Prob(y=1)	Prob(y=2)	Prob(y=3)
Gender (Male)	0.62* (0.22)	-0.1266	-0.1126	0.2392
Age	0.00 (0.01)	0.0003	0.0004	-0.0007
Education	0.07** (0.04)	-0.0116	-0.0162	0.0278
Area of FFV	-0.06 (0.10)	0.0090	0.0126	-0.0216
Cattle	0.01 (0.03)	-0.0021	-0.0029	0.0050
Proportion of income from FFV	0.00 (0.00)	-0.0006	-0.0008	0.0013
Organization (Yes)	0.38** (0.18)	-0.0643	-0.0805	0.1448
Market Channel (SSC=Yes)	-0.05 (0.23)	0.0074	0.0101	-0.0175
cut1	-0.07	(Ancillary parameters)		
cut2	0.94			

$$\text{LR } \chi^2(8) = 21.740$$

$$\text{Prob} > \chi^2 = 0.005$$

$$\rho^2 = 0.052$$

$$\text{Log likelihood} = -199.318$$

* Sig. at the 1% level

** Sig. at the 5% level

Note: B=Estimated coefficient; Standard errors are in parenthesis.

Prob(y=1): Worse; Prob(y=2): Equal; Prob(y=3): Better

In Table 6.6 the results regarding overall situation now and five years ago are shown. The market channel used by farmers does not have a significant effect on the overall situation of farmers now and five years ago. Nevertheless, three variables are statistically significant. Cattle and organization are significant at the one percent level, and gender at the five percent level. One unit of cattle increases the probability of having a better situation now than five years ago by 5.19 percent. In the case of small farmers in developing countries a unit of cattle is usually considered as a kind of saving, a source of food (e.g., milk) as well as a source of extra income (e.g., sells of milk); thus, it is reasonable that households with cattle have a better situation. However, as shown in Table 6.1, the quantity of cattle does not have a significant effect on the market channel used by farmers. The probability of having a better situation now than five years ago is also increased by 17.17 percent when farmers are organized. This result is similar to the cases of income and performance previously discussed. Finally, the probability of having a better situation now than five years ago is increased by 18.63 percent when the farmer is a male, which is consistent with the traditional practice in Honduras that farms are usually managed by males.

Unexpectedly, the market channel used by farmers does not have a significant effect on the difference in sales, income, performance, and overall situation of farmers now and five years ago. In-depth interviews and site visits during the interviews and survey suggest that farmers selling in the SSC are better off in terms of these factors. However, the quantitative analysis does not support that hypothesis. These apparent different results may be explained by the fact that in-depth interviews were conducted with a smaller sample and included other geographical regions besides Intubuca, where

the survey was made. Nevertheless, the lack of conclusive results about the hypothetical positive impacts of farmer participation in the SSC raises concerns regarding the assumption that the supermarket rise can be used as an engine for generating economic development. Organization, on the contrary, besides being statistically significant also has large marginal effects on the probability that farmers are better off in terms of income, performance, and situation now than five years ago.

Table 6.6 Difference in Situation Now and Five Years Ago

Variables	B	Marginal Effects		
		Prob(y=1)	Prob(y=2)	Prob(y=3)
Gender (Male)	0.50** (0.23)	-0.0915	-0.0948	0.1863
Age	0.00 (0.01)	0.0001	0.0002	-0.0003
Education	-0.01 (0.04)	0.0011	0.0016	-0.0027
Area of FFV	0.05 (0.11)	-0.0076	-0.0109	0.0184
Cattle	0.15* (0.05)	-0.0213	-0.0305	0.0519
Proportion of income from FFV	0.00 (0.00)	0.0005	0.0007	-0.0012
Organization (Yes)	0.48* (0.18)	-0.0764	-0.0953	0.1717
Market Channel (SSC=Yes)	-0.19 (0.23)	0.0301	0.0391	-0.0692
cut1	-0.79	(Ancillary parameters)		
cut2	0.13			

LR $\chi^2(8) = 26.800$

Prob > $\chi^2 = 0.001$

$\rho^2 = 0.065$

Log likelihood = -192.104

* Sig. at the 1% level

** Sig. at the 5% level

Note: B=Estimated coefficient; Standard errors are in parenthesis.

Prob(y=1): Worse; Prob(y=2): Equal; Prob(y=3): Better

Market channel, nevertheless, has a significant effect on satisfaction with buyer and relative prices as is shown below. In Table 6.7 the results regarding to satisfaction with buyer are presented. Selling in the SSC is statistically significant at the one percent level, and the probability of being satisfied with the buyer is increased by 44.74 percent, compared to selling in the SM. This satisfaction may be given by the long term and coordinated relationship between buyers and sellers existent in the SSC, which potentially helps to reduce uncertainty and build trust between parties. Organization is also significant at the one percent level, however, with an opposite direction than market channel. The probability of being dissatisfied with the buyer is increased by 14.27 when farmers are organized, compared to non organized farmers. This result may look contradictory; however, from the total survey sample, 63.7 of farmers are organized, but only 19.5 percent are participating in the SSC. Thus, a great proportion of organized farmers are selling in the SM (See Table 5.13 b). Quantity of cattle is also significant at the five percent level, and a unit of cattle increases the probability of being satisfied by 3.25 percent. The hypothetical explanation of this result is that farmers with more resources (e.g., cattle) have more power of negotiation with buyers.

The results regarding relative prices in the SSC compared to prices in alternative markets are presented in Table 6.8. The market channel is statistically significant at the one percent level. The probability that farmers selling in the SSC get higher prices is increased by 38.39 percent, compared to their counterparts' selling in alternative markets such as the SM. The net benefit, nevertheless, cannot be estimated here because of the lack of information about costs. However, the results of satisfaction previously presented

and relative prices suggest that farmers selling in the SSC are better off than farmers selling in the SM.

Table 6.7 Satisfaction with Buyer

Variables	B	Marginal Effects		
		Prob(y=1)	Prob(y=2)	Prob(y=3)
Gender (Male)	0.00 (0.23)	-0.0010	-0.0003	0.0014
Age	0.00 (0.01)	0.0006	0.0002	-0.0008
Education	-0.01 (0.04)	0.0025	0.0008	-0.0033
Area of FFV	0.08 (0.11)	-0.0244	-0.0082	0.0326
Cattle	0.08 ** (0.04)	-0.0244	-0.0081	0.0325
Proportion of income from FFV	-0.01 (0.00)	0.0015	0.0005	-0.0020
Organization (Yes)	-0.51 * (0.17)	0.1427	0.0570	-0.1996
Market Channel (SSC=Yes)	1.27 * (0.23)	-0.2694	-0.1781	0.4474
cut1	-1.16	(Ancillary parameters)		
cut2	-0.38			

LR $\chi^2(8) = 43.450$

Prob > $\chi^2 = 0.000$

$\rho^2 = 0.084$

Log likelihood = -236.768

* Sig. at the 1% level

** Sig. at the 5% level

Note: B=Estimated coefficient; Standard errors are in parenthesis.

Prob(y=1): Dissatisfied; Prob(y=2): Neither satisfied nor dissatisfied; Prob(y=3): Satisfied

Table 6.8 Relative Prices in the SSC

Variables	B	Marginal Effects		
		Prob(y=1)	Prob(y=2)	Prob(y=3)
Gender (Male)	-0.22 (0.22)	0.0886	-0.0069	-0.0817
Age	0.01 (0.01)	-0.0027	0.0003	0.0024
Education	-0.03 (0.04)	0.0109	-0.0013	-0.0096
Area of FFV	0.05 (0.10)	-0.0181	0.0021	0.0160
Cattle	-0.03 (0.03)	0.0136	-0.0016	-0.0120
Proportion of income from FFV	0.00 (0.00)	0.0006	-0.0001	-0.0005
Organization (Yes)	-0.13 (0.17)	0.0523	-0.0056	-0.0466
Market Channel (SSC=Yes)	1.02 * (0.21)	-0.3700	-0.0138	0.3839
cut1	-0.13	(Ancillary parameters)		
cut2	0.41			

LR $\chi^2(8) = 32.610$

Prob > $\chi^2 = 0.000$

$\rho^2 = 0.064$

Log likelihood = -238.495

* Sig. at the 1% level

Note: B=Estimated coefficient; Standard errors are in parenthesis.

Prob(y=1): Lower; Prob(y=2): Equal; Prob(y=3): Higher

6.6 Conclusions

In this chapter the motivations, success factors, constraints, and impacts associated with small farmers' participation in the SSC have been presented and discussed. According to the results of the first regression model (Table 6.1) socioeconomic and farm characteristics do not have a statistically significant effect, or have very small marginal effects (proportion of income from FFV and months of FFV production), on the probability of farmer participation in the SSC. The reason for these results may be the homogeneity of farmers included in the study, which are mainly smallholders with very similar socioeconomic characteristics. Nevertheless, when farmers hire non-family labour the probability of participating in the SSC is significantly increased, suggesting that farmers selling in the SSC produce more intensively, and besides their own family labour require additional labour force.

In the same model (Table 6.1), seven additional variables associated with transaction costs are statistically significant. On the one hand, risk of producing low quality, and transportation and grading problems pose constraints to farmer participation in the SSC. On the other hand, higher relative prices in the SSC and trust in buyer have a positive effect on the probability of farmer participation in the SSC. In the same way, when farmers are organized their probability of participating in the SSC is significantly increased. This result suggests that collective action helps farmers to reduce transaction costs associated with their participation in the SSC.

The marketing attributes evaluated in the choice-based conjoint model are highly significant, with the exception of grading (Table 6.2). Farmers prefer fixing price and quantity with buyers at planting, which are characteristics associated with the SSC for

FFV, but prefer other attributes associated with the SM, such as cash payment, non-scheduled delivery, selling at the farm gate, and selling individually. Furthermore, farmers prefer market conditions that do not require major/significant entry costs, suggesting that they have limitations to make significant investments in their farms, which are usually required to participate in the SSC for FFV. In spite of their constraints to participate in the SSC, farmers prefer to sell their products individually. The results shown in Tables 6.1 and 6.2 support the hypothesis that farmers sell in the market with lower transaction costs. However, other factors such as ‘preferences’ associated with traditional ways of doing things may also be important, since institutional innovation usually takes time to occur (North, 1995; Williamson, 2000).

Organization, in general, plays an important role in farmer participation in the SSC. However, two organization services are significantly important. These services are organizational assistance for marketing and for accessing collection and distribution centres. Assistance for marketing is associated with help for establishing and managing relationships with buyers in the SSC. This is a key assistance because individual small farmers lack managerial capacity and bargaining power to negotiate with buyers in the SSC. Assistance with collection and distribution centres is also a key service, because it allows farmers to pool and assemble produce for selling in the SSC. Organization (collective action), nevertheless, may also inhibit participation of small farmers in the SSC when the goal of the collective effort is not market driven, as is the case of many collective action efforts supported by NGOs in Honduras (e.g., projects focused on traditional commodities and not on high-value agricultural products such as FFV).

Regarding impacts, the market channel used by farmers does not have a significant effect on the difference in sales, income, performance, and overall situation of farmers now and five years ago, even though in-depth interviews and site visits during interviews and survey suggest that farmers selling in the SSC are better off in terms of these factors. This apparent difference in results may be explained by the difference in size and geographical location of the samples included in the interviews and the survey. Furthermore, these inconclusive results raise concerns about the potential opportunities that the supermarket rise supposedly represents for small farmers. Organization, on the contrary, besides being statistically significant also has large marginal effects on the probability that farmers are better off in terms of income, performance, and situation now than five years ago, suggesting the importance of collective action for farmers.

Market channel, nevertheless, has a significant effect on satisfaction with buyer and relative prices received. The probability of being satisfied with the buyer is significantly increased when farmers sell in the SSC. Similarly, the probability of getting higher prices in the SSC, compared with prices in alternative markets (SM) is significantly high. Satisfaction with buyer in the SSC may be associated with the contractual relationship between buyers and sellers which potentially help to reduce uncertainty and built trust; and higher relative prices in the SSC may be associated with a premium for supplying produce with specific requirements set by the buyer. In the next chapter the main conclusions and policy implications of this research are summarized and discussed.

CHAPTER VII

CONCLUSIONS

7.1 Introduction

In this research the NIE framework has been used to assess the level and form of small farmer participation in the SSC for FFV in Honduras. Simultaneously, this research is aimed at identifying mechanisms through which access problems faced by small farmers can be alleviated to the betterment of their livelihoods. For that purpose five specific objectives were originally set. The assessment of these objectives are presented and discussed in this chapter. Similarly, three main hypotheses related to contractual uncertainty, collective action, and impacts on farmers' livelihoods were also originally set. Empirical evidence used to test these hypotheses is also presented and discussed in this chapter.

The main contributions of the research are also addressed. Firstly, research results are of special importance for designing policies aimed at facilitating small farmer participation in new supply chains. Secondly, results contribute to theory development providing evidence regarding NIE assumptions. And thirdly, this research provides methodological contributions such as the combination of data used (revealed and stated preference data) and its ways of collection (qualitative and quantitative). Finally, the limitations found in this research are presented as well as recommendations for further research.

7.2 Assessment of Objectives

For achieving the general objective of the research, five specific objectives were originally established. In the following four sections are summarized and discussed the main findings of this research based on those specific objectives.

7.2.1 Characterization of the Supply Chain of FFV (Objective No. 1)

The results of this thesis start with an overview of the country and the description of the supply chain of FFV. Honduras has two main urban centers, namely Tegucigalpa and San Pedro Sula, which are separated by a distance of 248 kilometers. The demand for FFV of these two cities, which together account for about 1.5 million people, is basically driving the changes in the supply chain for FFV. In these two cities are located the majority of supermarket stores and food services that demand FFV with specific characteristics in a regular basis. Furthermore, these food businesses are also moving to cities and towns with lower population located between and around the two main urban centers (e.g., Choloma, El Progreso, La Ceiba, Comayagua, Siguatepeque, Choluteca, and others).

About 85 percent of FFV consumed in the country is still channeled through traditional markets, passing from producers to middlemen, spot markets and consumers (Figure 5.1). In this market, price is the main determinant factor of the transaction between buyers and sellers. However, the rise of new businesses such as supermarkets and food chains is offering new marketing mechanisms where, besides price, coordination between producers and buyers is a key factor. This market is controlling about 15 percent of the total market (Figure 5.1). Yet, for a five-year period the change

has not been remarkable. For the survey sample, taken from La Esperanza region, 19.54 percent of farmers are currently selling in the SSC, compared to 13.49 percent that were selling five years ago. The average proportion they sell to the SSC changed from 11.08 five years ago to 14.57 percent currently, which suggests that the participation of small farmers in the SSC for FFV in Honduras is increasing at a very slow rate.

Even though the change in the marketing of FFV is quite low for a five-year period, it still represents new marketing opportunities as well as challenges to small producers of FFV. According to approximate figures, the value share of supermarket chains in the FFV industry is about US\$42 million dollars (without including food service chains), which represents a considerable market opportunity for local farmers. It is expected that this share value will considerably grow in the next few years, given the rapid multi-nationalization of supermarket and food service chains in the country. Foreign direct investment attracted by free trade agreements, such as the Central America Free Trade Agreement (DR-CAFTA) recently signed between Central America and the U.S. is expected to boost the multi-nationalization of supermarket, processors and food service chains (World Bank, 2006a).

Besides local demand, market opportunities can potentially be regional or even international. For instance the CSU, which is now mainly owned by Wal-Mart, operates in three Central American countries, and if there is a shortage in one country the CSU imports from neighbour countries in which it operates. International market opportunities are also arising for those farmers that have successfully entered the local SSC. Given the similar requirements established by the SSC and export markets, agribusiness companies

focused on exporting contract local farmers that have succeed in the local SSC. Thus, the local SSC serves as a kind of school for learning about new supply chains.

The main challenge for farmers is to meet the SSC requirements in terms of quantity, quality, variety, frequency, etc. Additionally, farmers have to deal with selling place and payment system used in the SSC. Given the insufficient capacity of local producers to meet those requirements, the SSC is currently importing about 30 percent of their quantity demanded. The gap between demand of the SSC and small farmer supply can potentially increase for two reasons. First, it is expected the FFV market share of the SSC will continue growing in the next few years due to more investments in supermarket chains (e.g., entering of Wal-Mart in the region and DR-CAFTA). Second, if small farmers do not adjust their production and marketing systems to respond to the SSC requirements, they will be displaced by larger producers or foreign suppliers.

For a small scale farmer it is practically impossible to establish a direct marketing relationship with a supermarket chain. Just a minority of farmers, the most endowed of them, are selling directly to supermarket chains in Honduras. The vast majority of small farmers selling in the SSC are doing it through different coordination mechanisms.

Instead of a single way of participating, this research has identified different ways according to farmer conditions and preferences. A brief discussion of them is as follows.

1) In the 'satellite' farm scheme, the farmer who has the relationship with the supermarket chain establishes relationships with a pool of smaller farmers in order to guarantee enough quantity, variety and frequency. 2) Another common way of participating in the SSC is through specialized wholesalers that buy produce from small farmers in a contract farming scheme. 3) Finally, participation in the SSC can be through

small farmer organizations. However, this way requires a high level of collective action and coordination. From the survey sample, the majority of participant farmers in the SSC are doing it through their own farmer organization. Nevertheless, the other forms of participation deserve further analysis, in order to determine their appropriateness according to different farmer conditions in terms of socioeconomic and agro-ecological characteristics.

For instance, farmers included in the survey sample are characterized in terms of socioeconomic, farm and household, marketing, and organizational characteristics. This characterization suggests that participant and non-participant farmers in the SCC are quite similar; however, it seems to be that participant farmers are more entrepreneurial and have been able to adjust key farming and marketing activities to take advantage of the new market opportunity offered by the SSC. Even though this characterization is mainly descriptive, it helps to identify key success factors and constraints associated with the participation of small farmers in the SSC. It is also acknowledged that the characterization of the supply chain of FFV presented in this research is very general, since FFV and SSC have been respectively aggregated in one category each. Nevertheless, it is considered that the main factors that differentiate traditional and vertically-coordinated markets have been addressed, and inferences can be made for different FFV products.

7.2.2 Transaction Costs, Motivations and Constraints (Objectives No. 2 and 3)

Objectives two and three are focused on assessing the factors associated with small farmer participation in the SSC for FFV in Honduras. For achieving this objective the

data coming from the survey conducted in La Esperanza region was analyzed. First, the probability of participating in the SSC was estimated as a function of socioeconomic, farm, transaction cost, and organization variables. Results of this analysis show that socioeconomic and farm characteristics are not statistically significant. This result may be explained by the homogeneity of the survey population, which mainly included small scale farmers with similar conditions. Nevertheless, transaction cost factors associated with risk of producing low quality, and transportation and grading problems are highly significant, posing constraints on farmer participation in the SSC. Conversely, higher relative prices in the SSC and trust in buyer have a positive effect on the probability of farmer participation in the SSC. Results regarding transaction costs are consistent with theoretical expectations set in the analytical framework of this research.

In addition to the previous results, a choice-based conjoint analysis was used to estimate the effect of eight marketing attributes on the choice of selling or not in a market. These attributes are also proxies of transaction costs, based on the analytical framework and on the determinant factors mentioned in the in-depth interviews. Results of this analysis are highly significant. While farmers are motivated by some characteristics associated with the SSC such as fixing price and quantity with buyer at planting, they also significantly prefer market arrangements associated with the SM, which represent constraints to participate in the SSC for FFV. Farmers have significant preferences to marketing attributes such as unscheduled delivery, cash payment, selling at farm gate, selling individually, and zero/minimal entry costs. These results suggest that in order to be able to participate in the SSC, and take advantage of potential market opportunities, farmers would have to make substantial adjustments in their production

and marketing practices as well as solve investment constraints. Institutional innovation and collective action, which are suggested for reducing transaction costs, are discussed in the next section.

7.2.3 Role of Collective Action (Objective No. 4)

According to the results discussed in the previous section, small farmers face positive transaction costs to participate in the SSC for FFV, which lead them to sell in the SM. However, through the participation in collective action (formal and informal organizations) small farmers are reducing transaction costs and participating in the SSC, as supported by this research's findings. When farmers are organized, their probability of participating in the SSC is significantly increased.

Even though organization is highly important for participating in the SSC, there are specific organization services that positively affect farmer participation in the SSC. Results of this research suggest that services in marketing and collection and distribution centres are particularly important. Marketing services are mainly associated with negotiation with buyers. Small farmers do not negotiate directly with buyers such as supermarket chains for two main reasons. First, individual farmers do not have enough scale to negotiate, and therefore it is too costly for them. Second, for supermarket chains it is impractical (too high transaction costs) to negotiate with a large number of individual farmers. Instead, for farmer and buyer convenience, farmer representatives such as organization leaders or managers of farmer organizations do the negotiations. From the survey sample, none of the small farmers is selling directly to supermarket chains, therefore, confirming the importance of collective action to participate in the SSC.

The organizational assistance with collection and distribution centres is also a key factor because of a matter of scale. The volume produced by a single small farmer is not enough to justify its individual assemblage and transportation to supermarket stores. In local collection and distribution centres the produce of several farmers is gathered, classified, packed and transported to supermarket stores. Collection and distribution centres require a scale to operate efficiently, and this cannot be reached by an individual small farmer. For this study, two organizations, APROFHI and DIVEFRU, are linking small farmers with the SSC for FFV in Honduras.

7.2.4 Impacts of Participating in the SSC (Objective No. 5)

Given the current changes in the agrifood systems, it is particularly important to determine if these changes, specifically the participation in the SSC, are bringing positive impacts for small farmers. In spite of the limitations to collect data about ‘now’ and ‘before,’ an effort was made to evaluate the impact of market channel on farmers in terms of sales, income, performance, overall situation, satisfaction with buyer, and relative price. Unexpectedly, the market channel used by farmers does not have any significant effect on the difference in sales, income, performance, and overall situation now and five years ago. Market channel, nevertheless, has a significant effect on satisfaction with buyer and relative prices.

Although the above results may look contradictory, there are several possible explanations. First, farmers are generally reluctant to talk about money issues with strangers (e.g., researchers), which may hide some information about pecuniary impacts. Second, satisfaction may be qualified as an intangible impact (see Masakure and Henson,

2005), and therefore, it is not necessarily associated with higher sales or income. Third, higher relative prices in the SSC are associated with a premium for meeting specific requirements, which may also be associated with higher costs. In spite of the quantitative results, and their possible explanations, qualitative information (in-depth interviews and site visits) suggests that farmers selling in the SSC are better off than their counterparts that sell in the SM. Even though the limitations faced for measuring impacts in this research are acknowledged, the lack of conclusive results raises questions about the potential market opportunities offered by the supermarket rise and their positive economic impact on farmers' livelihoods.

7.3 Assessment of the Hypotheses

At the light of NIE, the objectives of this research were summarized in three main hypotheses. First, it was originally expected that the higher the contractual uncertainty associated with participating in the SSC faced by farmers, the lower the probability of them of participating in it. Second, it was expected that the higher the small farmers' participation in collective action, the higher the probability of them of participating in the SSC. And third, it was expected that farmers selling FFV in the SSC are better off than farmers selling in traditional markets in terms of tangible and intangible factors. The assessment of the above hypotheses is discussed in the following three sections.

7.3.1 Contractual Uncertainty

Contractual uncertainty is associated with information asymmetry and transaction cost economics, which is one of the salient points of NIE. Transaction costs include search

and information costs, bargaining and decision costs, and supervision and enforcement costs (Furubotn and Richter, 1997). Furthermore, the way that a transaction is organized (e.g., spot or coordinated market) depends on “rational economic reasons” such as asset specificity, uncertainty, and frequency (Williamson, 1985, p. 52). If transaction costs are too high, the transaction never occurs in spite of potential gains. A generally accepted limitation of transaction costs is the difficulty of their measurement (David and Han, 2004). In this research several variables have been used as proxies of transaction costs.

The results of this research, at least partially, imply that the participation in the SSC has positive impacts on farmers; however, just about 20 percent (from the survey sample) of farmers are participating in the SSC for FFV, presumably because they have been able to reduce transaction costs associated with their participation in the SSC. The two models used in this research to assess transaction costs faced by farmers are considered successful for estimating the effect of significant factors on the probability of participating in the SSC. While problems of quality, grading, and transportation pose significant constraints to participate in the SSC, other factors such as relative price and trust in buyer facilitate it. In the same way, while farmers are motivated by some attributes associated with the SSC, such as fixing price and quantity with buyer at planting, because it reduces uncertainty about future markets, there are other attributes such as payment system, frequency of delivery, selling place, organization, and entry costs that constrain them from participating in the SSC. Thus, according to these results, the original hypothesis about contractual uncertainty can be accepted. Nevertheless, it is acknowledged that other factors may also facilitate/impede the participation of small farmers in the SSC, such as the influence/promotion exerted by the action of donors (e.g.,

NGOs) that try to link small farmers with contemporary supply chains. Under this situation farmers may not be minimizing their transaction costs, but maximizing their subsidies. For example, the majority of farmers participating in the SSC (from the survey sample) are doing it through APROFHI which is a local farmer organization that has received considerable support from international development organizations.

7.3.2 *Collective Action and Institutional Innovation*

One of the main premises of NIE is that “institutions matter,” and therefore, they can help reduce transactions costs. The results of this research show the importance of collective action for participating in the SSC. Almost all the participant farmers (from the survey sample) are involved in some sort of collective action, and furthermore, being a member of an organization significantly increases the probability of participating in the SSC, supporting the hypothesis that the higher the participation in collective action, the higher the probability of selling in this kind of market.

In the same way, results suggest that organization *per se* is not enough to facilitate the participation in the SSC. On the contrary, there are specific organizational services aimed at linking farmers with buyers that positively affect the probability of participating in the SSC. In this sense, innovation in the kind of services provided by organizations is highly important (Levitsky, 2000; Berdegue, 2001). Thus, results of this research support the hypothesis that the higher the participation in collective action, the higher the probability of selling in new supply chains, especially if organization provides key services to link farmers with markets. However, as stated in the previous section, the role of collective action and hence the influence of it in facilitating the participation of small

farmers in the SSC may be affected by the mission/goals of external agents such as donors. As found in this research, NGOs play a significant role in the promotion of collective action and provision of services to small farmers in Honduras. Thus, if these agents are not market oriented, collective action may not lead to participation of small farmers in the SSC.

7.3.3 Impacts of Small Farmer Participation in the SSC

Of particular importance of this research is to determine if small farmer participation in SSC can contribute to poverty reduction and economic development, as suggested by several authors (Dolan and Humphrey, 2000; Reardon and Berdegúe, 2002; Humphrey *et al.*, 2004). In the same way, it is important to determine the contribution of institutions to facilitate farmer participation in new marketing systems, and thus economic development. In this sense, NIE has been even seen as a “theory of development” especially because of the role that institutions play in the economic performance of a country (Harris, *et al.* 1995; North, 1995; North, 2000).

It was originally hypothesized in this research that participant farmers in the SSC are better off than non-participant ones in terms of tangible and intangible factors (Masakure and Henson, 2005). Results of this research partially support this hypothesis. Quantitative analyses do not reveal significant differences in sales, income, performance, and overall situation due to market channel used by farmers. However, farmers selling in the SSC are more satisfied with farmers and receive higher relative prices than farmers selling in the SM. Moreover, qualitative information suggests that farmers selling in the SSC are better off than farmers selling in the SM in the evaluated terms; however, further

analysis is required to reach conclusive results regarding impacts. Thus, the hypothesis that farmers selling in the SSC are better off than farmers selling in the SM (in the above terms) cannot be completely confirmed here.

7.4 Policy Implications

The results of this research provide evidence that, even though at a slow rate, traditional agrifood systems are changing in Honduras due to the rise of supermarket chains and other driving factors such as globalization, agro-industrialization, foreign direct investment, free trade agreements, and consumer preferences; therefore, there is a need to make policies that facilitate the adjustment of small farmers to new agrifood systems.

It is expected that with the free trade agreement between Central America and the US (DR-CAFTA), recently signed, the changes in agrifood systems will be more pronounced. For instance, the entrance in the region of large retailers such as Wal-Mart, fast food chains, and processors which bring new procurement systems will considerably change traditional supply chains. As these companies are usually multinationals, they may offer local, regional and even international market opportunities. The challenge, however, is to comply with the grades and standards associated with their procurement systems.

The identification and assessment in this research of transaction costs, motivations and constraints associated with the participation of small farmers in the SSC provide excellent inputs for policy makers interested in promoting small farmer participation in new supply chains. Policies oriented to overcome technological barriers such as those associated with entry cost, output, quality, and frequent production are

particularly important. Furthermore, policies also must be aimed at tackling marketing barriers associated with particular characteristics of procurement systems used in the SSC, such as grading, selling place and payment system. Even though special emphasis has been put on the SSC for FFV, these research results can be used more generally for understanding the limitations faced by producers to switch from traditional spot markets to vertically-coordinated markets.

Factors associated with scale have two implications. On the one hand, for a small scale farmer such as those included in the survey it is practically impossible to establish a direct relationship with a supermarket chain due to the volume required and frequency. For retailers it is also impractical to be negotiating with a large number of small producers. Thus, small farmers face the risks of being excluded from new marketing systems. On the other hand, however, farmers can be integrated to new marketing systems through collective action, as is the case of participant farmers in the SSC in this research. Collective action allows farmers to pool produce in order to guarantee frequency and variety. In the same way, collection, manufacture, transportation, and distribution costs can be lowered.

However, promoting collective action *per se* may not be a solution. Collective enterprises must carefully identify the main constraints and focus on them. For instance, in this research it was found that from several organization services, two are the most significant on the probability of participating in the SSC. In the same way, policies oriented to improve the management and monitoring of collective action in order to reduce free-riding and opportunistic problems are also important. From the survey sample of this study, farmers prefer to sell their products individually instead of selling

through formal organizations. The reasons for this behaviour, according to reluctant farmers, are bad experiences from the past.

This research also suggests that small farmers can be integrated to new supply chains through additional mechanisms. Pioneer farmers in the SSC can be of great importance to encourage the participation of other farmers, for instance, through ‘satellite’ farms. While farmers willing to get involved in collective action can participate in the SSC through formal farmer organizations, other farmers may participate through alternative mechanisms. Policies should not promote organization just for social reasons, and instead explore other mechanisms according to farmer conditions and preferences.

In a country like Honduras, where the majority of the population lives in rural areas (54%) and highly depends on agricultural production, changes in agrifood systems can bring serious problems for those excluded from new market opportunities. Furthermore, it is expected that facing the pressure of new supply chains traditional markets also change their practices putting more challenges to small farmers. As the rural population have very few alternatives other than the agricultural sector, farmers would have to stay in it even if the sector became more uncertain and unprofitable, which would finally result in increased poverty and inequality. Thus, policies are needed not only to facilitate farmer participation in new supply chains, but also to provide alternatives to those farmers that cannot enter. In this sense, alternative markets and/or even new economic activities should be explored.

An additional warning is that the rapid rise of supermarkets and its associated potential opportunities for small farmers, which can be used for boosting economic

development and alleviating poverty, has to be seen with caution. On the one hand, results show that the insertion of small farmers in Honduras to the SSC has been quite slow (increased just about six percent in five years). On the second hand, in spite of the limitations faced in this research for measuring impacts, there were not found robust evidences that participant farmers in the SSC are significantly better off than non-participant farmers. Thus, the benefits of the dynamic changes of current agrifood systems may not be taken by small farmers.

7.5 Contributions of the Research

The main contribution of this research is the application of the NIE framework to current problems such as the dynamic changes of the local and global agrifood systems. In spite of the recognized advances of the NIE, there is still a need for empirical research that supports its theoretical assumptions. In this research, NIE has been very useful to explain the economic behaviour of small farmers in developing countries regarding current changes in their traditional agrifood systems. The role of contractual uncertainty, specifically transaction costs, and collective action for determining small farmer participation in the SSC has been assessed in this research, and its results generally support NIE assumptions.

At the methodological level, this research has combined qualitative and quantitative information to achieve its objectives. The first one, helped to make a general characterization of the supply chain of FFV in Honduras as well as to identify the potential factors that determine small farmer participation in the SSC for FFV.

Quantitative information was used to estimate probability models to determine and assess

the factors associated with participation of small farmers in the SSC. Given the incipient participation of retailers in the supply chain for FFV in Honduras, stated preference data collected through a choice-based conjoint model was very useful to elicit marketing preferences of farmers. In this sense, marketing methodological tools were successfully used to conduct research under farmer conditions in a developing country.

Finally, the case of small producers of FFV and the SSC provides an empirical illustration of the potential of establishing vertical-coordinated relationships between agribusiness firms and small farmers, in which both parties can be benefited, since buyers get a reliable supply and farmers get a secure market. In the same way, these results offer important information that can be used for making policies aimed at enhancing the small farmers' capacity to participate in rapidly evolving supply chains of agricultural and food products.

7.6 Limitations of the Research

In spite of the results of this research it is worthwhile to recognize its following limitations. Firstly, most of the information used for describing the supply chain for vegetables in Honduras is qualitative. Buyers in the SSC such as specialized wholesalers and supermarket chains did not provide quantitative information such as past, current and projection of future sales in order to accurately estimate changes over time, and make projections about future market opportunities. Furthermore, there is not a reliable source of public statistics in government offices. Lack of quantitative information was also faced for measuring impacts of farmer participation the SSC. Secondly, final consumers were not directly included in the research in order to know about changes in their

preferences in the last years, and see how these changes may affect the growth of the supermarket chains' share of FFV. Finally, the survey sample just covered a geographical area in the country. Even though it was considered the most important and representative according to the research objectives, there are other areas that also deserved to be included in the survey.

7.7 Recommendations for Further Research

Considering the limitations of this research, it is recommended to conduct a survey in other geographical areas of importance, and compare it with the current results.

Similarly, it is recommended to research consumer preferences in the main urban center such as Tegucigalpa, San Pedro Sula and other cities with at least 100,000 inhabitants, since they have been targeted by supermarket chains and food service chains. Finally, it is suggested that any new research project makes efforts to guarantee a more positive participation of private agents such as buyers. In countries, where research institutions are not well developed, such as Honduras, private agents are hesitant to actively participate.

References

- Abbot, P., Boehlje, M., & Doering, O. (2002). Coming to grips with globalization. *Choices*, Winter 43-46.
- Allen, D. W., & Lueck, D. (2005). Agricultural contracts. In C. Menard & M. M. Shirley (Eds.), *Handbook of new institutional economics* (pp. 465-490). Dordrecht, The Netherlands: Springer.
- Alvarado, I., & Charmel, K. (2002). The rapid rise of supermarkets in Costa Rica: Impact on horticultural markets. *Development Policy Review*, 20(4), 473-485.
- Banco Central de Honduras. (2005). *Honduras en cifras 2001-2003*. Retrieved January 10, 2005, from http://www.bch.hn/download/hencifras2001_2003.pdf
- Bardhan, P. (1989). The new institutional economics and development theory: A brief critical assessment. *World Development*, 17(9), 1389-1395.
- Bates, R. H. (1995). Social dilemmas and rational individuals: An assessment of the new institutionalism. In J. Harris, J. Hunter & C. M. Lewis (Eds.), *The new institutional economics and third world development* (pp. 27-48). New York: Routledge.
- Berdegúe, J. A. (2001). *Cooperating to compete: Associative peasant business firms in Chile*. Unpublished doctoral dissertation, Wageningen University, Wageningen, Netherlands.
- Berdegúe, J. A., Balsevich, F., Flores, L., and Reardon, T. (2003). *The rise of supermarkets in Central America: Implications for private standards for Quality and Safety of fresh fruits and vegetables*. Retrieved March 17, 2004, from <http://www.rimisp.org/getdoc.php?docid=898>
- Boehlje, M. (1996). Industrialization of agriculture: What are the implications? *Choices*, First Quarter, 30-33.
- Brester, W. W., & Penn, J. B. (1999). *Strategic business management principles for the agricultural production sector in a changing global food system* (Policy Issue Paper No. 11). Bozeman, MT: Montana State University, Trade Research Center.
- Casson, M. (2000). *Enterprise and leadership: Studies on firms, markets and networks*. Northampton, Massachusetts: Edward Elgar Publishing, Inc.
- CCA. (2006). *Corporacion de compañías agroindustriales*. Retrieved March 16, 2006, from http://www.cca.co.cr/artman/publish/article_58.shtml

- Chambers, W., & King, R. P. (2002). Changing agricultural markets: Industrialization and vertical coordination in the dry edible bean industry. *Review of Agricultural Economics*, 24(2), 495-511.
- Chandon, P., Morwitz, V. G., & Reinartz, W. J. (2005). Do intentions really predict behavior? Self-generated validity effects in survey research. *Journal of Marketing*, 69(April, 2005), pp. 1-14.
- Coase, R.H. (1937). The nature of the firm. *Economica*, 4, 386-405.
- Coase, R. H. (2000). The new institutional economics. In C. Ménard (Ed.), *Institutions, contracts, and organizations: Perspectives from new institutional economics* (pp. 3-6). Northampton, MA: Edward Elgar Publishing, Inc.
- Cohen, J. (1988). *Statistical power analysis for the behavioural Sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.
- Cook, M. L., and Chaddad, F. R. (2000). Agroindustrialization of the global agrifood economy: Bridging development economics and agribusiness research. *Agricultural Economics*, 23, 207-218.
- Cook, M. L., & Iliopoulos, C. (2000). Ill-defined property rights in collective action: The case of US agricultural cooperatives. In C. Ménard (Ed.), *Institutions, contracts, and organizations: Perspectives from new institutional economics* (pp. 335-348). Northampton, MA: Edward Elgar Publishing, Inc.
- Cook, M. L., Reardon, T., Barrett C., & Cacho, J. (2001). Agroindustrialization in emerging markets: Overview and strategic context. *International Food and Agribusiness Management Review*, 2(3/4), 277-288.
- Cooper, D. R., & Emory. (1995). *Business research methods* (5th ed.). Chicago, IL: Richard D. Irwin, Inc.
- David, R. J., & Han, S. K. (2004). A systematic assessment of empirical support for transaction cost economics. *Strategic Management Journal*, 25, 39-58.
- Denzin, N. K., & Lincoln, Y. S. (2000). Introduction: The discipline and practice of qualitative research. In N. K. Denzin & Y. S. Lincholin (Eds.), *Handbook of Qualitative Research* (2nd ed.) (pp. 1-28). Thousand Oaks, CA: Sage Publications, Inc.
- Dolan, C., & Humphrey, J. (2000). Governance and trade in fresh vegetables: The impact of UK supermarkets on the African horticulture industry. *Journal of Development Studies*, 37(2), 147-176.

- Doll, J. P., & Orazem, F. (1984). *Production economics: Theory with applications* (2nd ed.). New York: John Wiley and Sons.
- Dorward, A., Kydd, J., & Poulton, C. (Eds.). (1998). *Smallholder cash crop production under market liberalisation: A new institutional economics perspective*. Oxon, UK: Cab International.
- Dorward, A., Kydd, J., Morrison, J., & Poulton, C. (2005). Institutions, markets and economic coordination: Linking development policy to theory and praxis. *Development and Change*, 36(1), 1-25.
- Dussauge, P. & Garrette, B. (1999). *Cooperative strategy: Competing successfully through strategic alliances*. New York: John Wiley and Sons.
- Eaton C., & Shepherd, A. W. (2005). *Agricultura por contrato. Alianzas para el crecimiento*. Retrieved July 18, 2006, from <http://www.rimisp.org/boletines/bol56/>
- ECLAC. (2005). *Foreign investment in Latin America and the Caribbean*. Retrieved July 18, 2006, from <http://www.eclac.org/>
- Esman, M. J., & Uphoff, N. T. (1984). *Local organizations: Intermediates in rural development*. Ithaca, New York: Cornell University Press.
- Estrada, J. (2004, March 10). El regreso de los pequeños negocios. *La Prensa*. Retrieved March 10, 2004, from <http://www-usa.laprensa.com.ni/>
- Fairbairn, B. (2003). *The role of farmers in the future economy*. Saskatoon, SK: University of Saskatchewan, Centre for the Study of Cooperatives.
- FAO. (2005). *FAOSTAT*. Retrieved January 10, 2005, from <http://faostat.fao.org/faostat/>
- Fiebig, D. G., Louviere, J. J., & Waldman, D. M. (2003). *Contemporary issues in modeling discrete choice experimental data in health economics*. Paper presented at the Conference of Australian Health Economics Society, Canberra, Australia.
- Fulton, M. (2001). Traditional versus new generation cooperatives. In C. D. Merrett & N. Walzer (Eds.), *A cooperative approach to local economic development* (pp. 11-24). Westport, CT: Quorum Books.
- Furubotn, E.G. & Richter, R. (1997). *Institutions and economics theory: The contribution of the new institutional economics*. Ann Arbor, MI: The University of Michigan Press.
- Furubotn, E. G. (2001). The new institutional economics and theory of the firm. *Journal of Economic Behavior & Organization*, 45, 133-153.

- Gertler, M. (2001). *Rural cooperatives and sustainable development*. Saskatoon, SK: University of Saskatchewan, Centre for the Study of Cooperatives.
- Glover, D. (1994). Contract farming and commercialization of agriculture in developing countries. In J. V. Braun & E. Kennedy (Eds.), *Agricultural commercialization, economic development, and nutrition* (pp. 166-175). Baltimore: Johns Hopkins University Press.
- Govere, J., & Jayne, T. S. (2003). Cash cropping and food crop productivity: synergies or trade-offs? *Agricultural Economics*, 28, 39-50.
- Green, W. H. (2000). *Econometric analysis* 4th ed.). Upper Saddle River, NJ: Prentice-Hall, Inc.
- Grosh, B. (1994). Contract farming in Africa: An application of the new institutional economics. *Journal of African Economies*, 3(2), 231-261.
- Harris, J., Hunter, J., & Lewis, C. M. (Eds.). (1995). *The new institutional economics and third world development*. New York: Routledge.
- Harris, A., Fulton, M., Stefanson, B. & Lysyshyn, D. (1998). *Working together: The role of external agents in the development of agriculture-based industries*. Saskatoon, SK: University of Saskatchewan, Centre for the Study of Cooperatives.
- Hellin, J., & Higman, S. (2003). *Feeding the market: South American farmers, trade and globalization*. Bloomfield, CT: Kumarian Press, Inc.
- Hobbs, J. E. (1996). A transaction cost approach to supply chain management. *Supply Chain Management*, 1(2), 2-15.
- Hobbs, J.E. (1997). Measuring the importance of transaction costs in cattle marketing. *American Journal of Agricultural Economics*, 82(Nov), 1083-1095.
- Hobbs, J. E., Cooney, A., & Murray, F. (2000). *Value chain in the agrifood sector*. Saskatoon, SK: University of Saskatchewan, Department of Agricultural Economics.
- Hobbs, J. E. (2004). Markets in metamorphosis: The rise and fall of policy institutions. In G. Van Huylenbroeck, W. Verbeke & L. Lauwers (Eds.), *Role of institutions in rural policies and agricultural markets* (pp. 199-212). Amsterdam, The Netherlands: Elsevier B.V.
- Holloway, G., Nicholson, C., Delgado, C., Staal, S., & Ehui, S. (2000). Agroindustrialization through institutional innovation: Transaction costs, cooperatives and milk-market development in East-African highlands. *Agricultural Economics*, 23, 279-288.

- Holmlund, M. & Fulton, M. (1999). *Networking for success: Strategic alliances in the new agriculture*. Saskatoon, SK: University of Saskatchewan, Centre for the Study of Cooperatives.
- Humphrey, J., & Schmitz, H. (2004). Governance in global value chains. In H. Schmitz (Ed.), *Local enterprises in the global economy: Issues of governance and upgrading* (95-109). Cheltenham, UK: Edward Elgar Publishing, Inc.
- Humphrey, J., McCulloch, N., & Ota, M. (2004). The impact of European market changes on employment in the Kenian horticultural sector. *Journal of International Development*, 16, 63-80.
- IFAD. (2003). *Rural poverty report 2000/2001*. Retrieved September 30, 2003, from <http://www.ifad.org>
- INE. (2005). *Censo nacional de poblacion y vivienda 2001*. Retrieved December 1st, 2005, from <http://www.ine-hn.org/>
- Jaffee, S., & Bintein, G. (1996). French beans connections: Sustaining success in a Kenyan contract farming venture. *African Rural and Urban Studies*, 3(3), 63-99.
- Janesick, V. J. (2000). The choreography of qualitative research design: Minuets, improvisations, and crystallization. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of Qualitative Research* (2nd ed.) (pp. 379-399). Thousand Oaks, CA: Sage Publications, Inc.
- Katchova, A.L., & Miranda, M.J. (2004). Two-steps econometric estimation of farm characteristics affecting marketing contract decisions. *American Journal of Agricultural Economics*, 86(1), 88-102.
- Kennedy, E. T., & Cogill, B. (1987). *Income and nutritional effects of the commercialization of agriculture in Southwestern Kenya* (Research Report No. 63). Washington, DC: International Food Policy Research Institute
- Key, N., & Runsten, D. (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.
- Lattin, J.M., Carroll, J.D., & Green, P.E. (2003). *Analyzing multivariate data*. Pacific Grove, CA: Brooks/Cole-Thomson Learning.
- Levins, R. (2002). Collective bargaining by farmers: Fresh look? *Choices*, Winter 2001-2002, 15-18.

- Levitsky, J. (Ed.). (2000). *Business development services: A review of international experience*. London, UK: Intermediate Technology Publications.
- Liao, T. F. (1994). *Interpreting probability models: Logit, probit, and other generalized linear models*. Thousand Oaks, CA: Sage Publications, Inc.
- Little, P. D., & Watts, M. J. (Eds.). (1994). *Living under contract: Contract farming and agrarian transformations*. Madison, WI: The University of Wisconsin Press.
- Louviere, J. J. & Islam, T. (2005). *A comparison of importance weight/measures derived from choice-based conjoint, constant sum scales and best-worst scaling*. Unpublished manuscript, University of Guelph, Guelph, ON, Canada.
- Louviere, J. J., Hensher, D. A., & Swait, J. D. (2003a). *Stated choice methods: Analysis and application*. Cambridge, UK: Cambridge University Press.
- Louviere, J. J., Hensher, D. A., & Swait, J. D. (2003b). Conjoint preference elicitation methods in the broader context of random utility theory preference elicitation methods. In A. Gustafsson, A. Herrmann, & F. Huber (Eds.), *Conjoint measurement: Methods and Applications* (pp. 331-370) (3rd ed.). Berlin: Springer-Verlag.
- Lyon, F. (2003). Community groups and livelihoods in remote rural areas of Ghana: How small-scale farmers sustain collective action. *Community Development Journal*, 38(4), 323-331.
- Masakure, O., & Henson, S. (2005). Why do small-scale producers choose to produce under contract? Lessons from non-traditional vegetable exports from Zimbabwe. *World Development*, 33(10), 1721-1733.
- McCulloch, N., & Ota, M. (2002). *Export horticulture and poverty in Kenia* (Working Paper 174). Sussex, UK: Institute of Development Studies.
- Meinzen-Dick, R., Knox, A., Place, F., & Swallow, B. (Eds.) (2002). *Innovation in natural resource management: The role of property rights and collective action in developing countries*. Baltimore, MD: The Johns Hopkins University Press.
- Ménard, C. (Ed.) 2000. *Institutions, contracts, and organizations: Perspectives from new institutional economics*. Northampton, MA: Edward Elgar Publishing, Inc.
- Ménard, C. (2001). Methodological issues in new institutional economics. *Journal of Economics Methodology*, 8(1), 85-92.
- Ménard, C. (2004). The economics of hybrid organizations. *Journal of Institutional and Theoretical Economics*, 160, 345-376.

- Ménard, C. & Shirley, M. M. (Eds.). (2005). *Handbook of new institutional economics*. Dordrecht, The Netherlands: Springer.
- Ménard, C. (2005). A new institutional approach to organization. In C. Menard & M. M. Shirley (Eds.), *Handbook of new institutional economics* (pp. 281-318). Dordrecht, The Netherlands: Springer.
- Merrett, C. D. & Walzer, N. (2001). A survey of new generation cooperatives: Exploring alternative forms of rural economic development. In C. D. Merrett & N. Walzer (Eds.), *A cooperative approach to local economic development* (pp. 91-115). Westport, CT: Quorum Books.
- Messner, D. (2004). Region in the 'world economic triangle.' In H. Schmitz (Ed.), *Local enterprises in the global economy: Issues of governance and upgrading* (20-52). Cheltenham, UK: Edward Elgar Publishing, Inc.
- Miller, G. J. (2005). Solutions to principal-agent problems in firms. In C. Menard & M. M. Shirley (Eds.), *Handbook of new institutional economics* (pp. 349-370). Dordrecht, The Netherlands: Springer.
- Murdoch, J. (2000). Networks: a new paradigm of rural development? *Journal of Rural Studies*, 16, 407-419.
- Nabli, M. K., & Nugent, J. B. (1989). The new institutional economics and its applicability to development. *World Development*, 17(9), 1333-1347.
- Nadvi, K., & Waltring, F. (2004). Making sense of global standards. In H. Schmitz (Ed.), *Local enterprises in the global economy: Issues of governance and upgrading* (53-94). Cheltenham, UK: Edward Elgar Publishing, Inc.
- North, D.C. (1992). *Transaction costs, institutions, and economic performance*. San Francisco, CA: ICS Press
- North, D. C. (1995). The new institutional economics and third world development. In J. Harris, J. Hunter & C. M. Lewis (Eds.), *The new institutional economics and third world development* (pp. 17-26). New York: Routledge.
- North, D. C. (2000). Understanding Institutions. In C. Ménard (Ed.), *Institutions, contracts, and organizations: Perspectives from new institutional economics* (pp. 7-10). Northampton, MA: Edward Elgar Publishing, Inc.
- North, D. C. (2005). *Understanding the process of economic change*. Princeton, NJ: Princeton University Press.
- Omta, S. W. F., Trienekens, J., and Beers, G. (2002). A framework for the knowledge domain of chain and network science. In J. H. Trienekens & S.W.F. Omta (Eds.),

- Paradoxes in food chains and networks* (pp. 13-20). Wageningen, Netherlands: Wageningen Academic Publishers.
- Ostrom, E., Schroeder, L., & Wynne, S. (1993). *Institutional incentives and sustainable development: Infrastructure policies in perspective*. Oxford, UK: Westview Press, Inc.
- Paggi, M. S., Kennedy, P. L., Yamazaki, F., & Josling, T. (2005). Regional trade agreements and implications for US agriculture: The case of CAFTA-DR. *Choices*, 20(2), 137-142.
- Peterson, H. C., Wysocki, A., & Harsh, S. B. (2001). Strategic choice along the vertical coordination continuum. *International Food and Agribusiness Management Review*, 4, 149-166.
- Pinstrup-Andersen, P. (2002). Food and agricultural policy for a globalizing world: Preparing for the future. *American Journal of Agricultural Economics*, 84(5), 1201-1214.
- Raynolds, L.T. (2002). Wages for wives: Renegotiating gender and production relations in contract farming in the Dominican Republic. *World Development*, 30(5), 783-798.
- Reardon, T., & Barrett, C. B. (2000). Agroindustrialization, globalization, and international development: An overview of issues, patterns, and determinants. *Agricultural Economics*, 23, 195-205.
- Reardon, T., & Berdegue, J. (2002). The rapid rise of supermarkets in Latin America: Challenges and opportunities for development. *Development Policy Review*, 20(4), 371-388.
- Reardon, T., Codron, J-M., Busch, L., Bingen, J., & Harris, C. (2001). Global change in agrifood grades and standards: Agribusiness strategic response in developing countries. *International Food and Agribusiness Management Review*, 2(3/4), 421-435.
- Rehber, E. (2000). *Vertical coordination in the agro-food industry and contracting farming: A comparative study of Turkey and the USA* (Research Report No. 52). Storrs, CT: University of Connecticut, Food Marketing Policy Center.
- Reynolds, L. T., Murray, D., & Taylor, P. L. (2004). Fair trade coffee: Building producer capacity via global networks. *Journal of International Development*, 16, 1109-1121.
- Robson, C. (1993). *A resource for social scientists and practitioner researchers*. Oxford, UK: Blackwell Publishers.

- Roe, B., Sporleder, T. L., & Belleville, B. (2004). Hog producer preferences for marketing contract attributes. *American Journal of Agricultural Economics*, 86(1), 115-123.
- Sælensminde, K. (2002). The impact of choice inconsistencies in stated choice studies. *Environmental and Resource Economics*, 23, 403-420.
- Sanchez, O. (2003). Globalization as a development strategy in Latin America? *World Development*, 31(12), 1977-1995.
- Saxowsky, D. M., & Duncan, M. R. (1998). *Understanding agriculture's transition into the 21st century* (Miscellaneous Report No. 181). Fargo, ND: North Dakota State University, Department of Agricultural Economics.
- Schejtman, A. (2005). *Agroindustria y pequeña agricultura: Experiencias y opciones de transformación*. Retrieved July 18, 2006, from <http://www.rimisp.org/boletines/bol56/>
- Schwentenius, R. & Gomez, M. A. (2002). Supermarkets in Mexico: Impacts on horticulture systems. *Development Policy Review*, 20(4), 487-502.
- Secretaria de Agricultura y Ganaderia (2005). *Mercados agrícolas*. Retrieved January 10, 2005, from <http://www.sag.gob.hn/infoagro/mercados/introduccion.html>
- Secretaria de Agricultura y Ganaderia (2006). *Cadena hortofrutícola*. Retrieved January 10, 2006, from <http://www.sag.gob.hn/>
- SEPA/INFOAGRO (2004). *Servicio de Protección Agropecuaria*. Database of imports provided by INFOAGRO. Secretaria de Agricultura y Ganaderia.
- Sheldon, I. M., & McCorriston, S. (2003, April). *Globalization, food industry consolidation and market access: Implications for developing countries*. Paper presented at the conference on Globalization, Agricultural Development and Rural Livelihoods, Cornell University, Ithaca, NY.
- Singh, S. (2002). Multi-national corporations and agricultural development: A study of contract farming in the Indian Punjab. *Journal of International Development*, 14, 181-194.
- Sporleder, T. L., & Moss, L. E. (2002). Knowledge management in the global food system: Network embeddedness and social capital. *American Journal of Agricultural Economics*, 84(5), 1345-1352.
- Staal, S., Delgado, C., & Nicholson, C. (1997). Smallholder dairying under transaction costs in east Africa. *World Development*, 25(5), 779-794.

- Stefanson, B. Fulton, M., & Harris, A. (1995). *New generation cooperatives: Rebuilding rural economies*. Saskatoon, SK: University of Saskatchewan, Centre for the Study of Cooperatives.
- Stefanson, B. & Fulton, M. (1997). *New generation cooperatives: Responding to changes in agriculture*. Saskatoon, SK: University of Saskatchewan, Centre for the Study of Cooperatives.
- Stevens, R. D., & Jabara, C. L. (1988). *Agricultural Development Principles: Economic Theory and Empirical Evidence*. Baltimore: John Hopkins University Press.
- Street, P.R. (1990). A systems view of commercial supply and marketing links. In J.G.W. Jones & P.R. Street (Eds.), *Systems theory applied to agriculture and the food chain* (pp. 159-203). London: Elsevier Science Publishers Ltd.
- Sykuta, M. E., & Cook, M. L. (2001). A new institutional economics approach to contracts and cooperatives. *American Journal of Agricultural Economics*, 83(5), 1273-1279.
- Toye, J. (1995). The new institutional economics and its implications for development theory. In J. Harris, J. Hunter & C. M. Lewis (Eds.), *The new institutional economics and third world development* (pp. 49-70). New York: Routledge.
- Vergara, O., Coble, K.H., Knight, T.O., Patrick, G.F., & Baquet, A.E. (2004). Cotton producers' choice of marketing techniques. *Agribusiness*, 20(4), 465-479.
- von Braun, J., Hotchkiss, D., & Immink, M. (1989). *Nontraditional export crops in Guatemala: Effects on production, income, and nutrition*. (Research Report No. 73). Washington, DC: International Food Policy Research Institute
- Watts, M. J. (1994). Epilogue: Contracting, social labor and agrarian transitions. In P. D. Little & M. J. Wattss (Eds.), *Living under contract: Contract farming and agrarian transformations* (pp. 248-257). Madison, WI: The University of Wisconsin Press.
- Weatherspoon, D. D., & Reardon, T. (2003). The rise of supermarkets in Africa: Implications for agrifood systems and the rural poor. *Development Policy Review*, 21(3), 333-355.
- Williams, S. & Karen, R. (Eds.). (1985). *Agribusiness and small-scale farmers: A dynamic partnership for development*. Boulder, CO: Westview Press, Inc.
- Williams, F., and Monge, P. (2001). *Reasoning with statistics: How to read quantitative research* (5th ed.). Fort Worth, TX: Harcourt College Publishers.
- Williamson, O.E. (1985). *The economic institutions of capitalism: Firms, markets, relational contracting*. New York: The Free Press.

- Williamson, O. E. (1991). Comparative economic organization: The analysis of discrete structural alternatives. *Administrative Science Quarterly*, 36, 269-296.
- Williamson, O. E. (2000). The new institutional economics: Taking stock, looking ahead. *Journal of Economics Literature*, 38 (Sept.), 595-613.
- Williamson, O. E. (2004). Transaction cost economics and agriculture: An extension. In G. Van Huylenbroeck, W. Verbeke & L. Lauwers (Eds.), *Role of institutions in rural policies and agricultural markets* (pp. 19-38). Amsterdam, The Netherlands: Elsevier B.V.
- Williamson, O. E. (2005). Transaction cost economics. In C. Menard & M. M. Shirley (Eds.), *Handbook of new institutional economics* (pp. 41-65). Dordrecht, The Netherlands: Springer.
- Wilson, P. N., & Kennedy, A. M. (1999). Trustworthiness as an economic asset. *International Food and Agribusiness Management Review*, 2(2), 179-193.
- Winters, P., Simmons, P., & Patrick, I. (2005). Evaluation of a hybrid seed contract between smallholders and a multinational company in East Java, Indonesia. *The Journal of Development Studies*, 41(1), 62-89.
- World Bank. (2005). *Honduras data at a glance*. Retrieved January 10, 2005, from <http://www.worldbank.org>
- World Bank. (2006a). *DR-CAFTA: Challenges and opportunities for Central America*. Retrieved March 30, 2006, from <http://www.worldbank.org>
- World Bank. (2006b). *World development report 2006: Equity and development*. Retrieved July 18, 2006, from <http://www.worldbank.org>
- Young, L. M., & Hobbs, J. E. (2002). Vertical linkages in agri-food supply chains: Changing roles for producers, commodity groups, and government policy. *Review of Agricultural Economics*, 24(2), 428-441.
- Ziggers, G. W., & Trienekens, J. (1999). Quality assurance in food and agribusiness supply chains: Developing successful partnerships. *International Journal of Production Economics*, 60-61, 271-279.

**ANNEX 1:
SEMI-STRUCTURED INTERVIEWS**

Semi-structured Interviews with Key Informants (Government, NGOs, Private Sector, Farmer Organizations, Donors, Universities).

1. First, we would like to have some general information about your organization: Name, vision, mission, goals, specific projects, relationship with the fresh fruit and vegetable (FFV) sector.
2. What do you know about the FFV industry in Honduras? Importance for the economy, number of farmers involved, value of national market, percentage imported, value imported, value exported, supply chain of FFV, geographical location, main crops, main buyers, main suppliers, other information.
3. What is your organization specifically doing in the FFV sector? Programs, projects, etc. Where? How many farmers are involved? How women are involved?
4. In your opinion, what are the main limitations faced by the FFV sector, especially by small farmers? Do you know about farmer exclusion? What kind of farmers is excluded?
5. What are the advantages and disadvantages of traditional marketing systems used by small farmers (spot markets)?
6. What are the advantages and disadvantages of new marketing systems used by small farmers (coordinated markets, e.g., supermarkets)?
7. Do you know any experience of farmers producing FFV under contract to supply supermarket chains or specialized wholesalers? If yes, what can you tell about that experience?
8. Do you know about requirements imposed by procurement systems used by supermarket chains or specialized wholesalers? What are the main key success factors to meet the requirements of the new supply chains?
9. What are the main challenges or problems to enter and/or stay in the new supply chains?
10. What do you know about the participation of women in the production and marketing of FFV? What is their contribution, what are benefits are they getting?
11. Does gender of FFV producers play a significant role in their performance, benefits, etc.?
12. What specific plans do you have in the near future to support the FFV sector?
13. What recommendations do you have for constructing 'best practice' models to enhance the competitiveness of the FFV sector, and specially the competitiveness of small farmers?
14. What role should play institutions and organizations to construct these models? Other comments?

Semi-structured Interviews With Buyers (Supermarkets Chains and Specialized Wholesalers).

1. What kind of FFV do you buy/sell? How long have you been in the business?
2. How do you procure your products? Contract or wholesale market?
3. Do you use written contracts, verbal contracts? How can you enforce them? How do you deal with risk? What are the most important risks?
4. How do you choose your suppliers? What are the main parameters? How do you establish the relationship? How do you know about suppliers? How do suppliers know about you?
5. What are the general standards required for the products? Quantity, quality, frequency, variety, packing, safety? What are the specific requirements for the products that you trade?
6. What are the main key success factors of successful suppliers?
7. What are the main limitations faced by suppliers to enter and stay in the supply chain?
8. What opportunities are offered by your business to small farmers? What benefits?
9. What are the motivations of your suppliers for selling to your business?
10. What percentage of suppliers that enter the supply chain can stay on it?
11. How is the gender distribution of your suppliers? Does gender play a significant role in performance? How can woman participation be enhanced?
12. What is the volume and value of FFV that you buy/sell? What is the forecast for the next five years? How do you expect that the FFV industry will evolve?
13. What recommendations do you have for constructing 'best practice' models to enhance the competitiveness of the FFV sector, and specially the competitiveness of small farmers?
14. What role should play institutions, organizations and private sector to construct these models? Other comments or specific experiences that you would like to share?

Semi-structured Interviews with Contracted Farmers

1. What about your personal information? Name, age, gender, education, household size.
2. What are your farm characteristics? Size of the farm, crops cultivated, economic importance of crops, food importance of crops, labour used in farming (own/hired), female participation, off-farm activities, income generated by off-farm activities, ownership of the land.
3. What kind of FFV do you produce? How many years of experience in FFV production do you have? What other particulars skills do you have? Where did you learn them?
4. Where/to whom do you sell the produce? Do you have written contracts, verbal contracts? How can you enforce them? How do you deal with risk? What are the most important risks that you face? What are the payment mechanisms used in your transactions? Advantages, disadvantages, risk?
5. How did you enter to a contract-farming scheme? How long have you been producing under contract? How did you know about the buyer? How did the buyer

- know about you? How were you chosen/did you choose to participate in contract farming? What are the main parameters set by your buyers?
6. What specific investments are required for producing under contract? Irrigation equipment, greenhouses, etc.? If you go out of contract farming, are there alternative markets? Do the specific investments have an alternative use?
 7. How is your produce graded? Who sets the grades? Do you agree with them? Percentage rejected? Is there alternative market or use for rejected produce?
 8. What are the general standards required for your produce? Quantity, quality, frequency, variety, packing, safety? What are the specific requirements for the products that you sell?
 9. What are the main key success factors to enter and stay in the supply chain?
 10. Where and how do you get credit, inputs, transportation, technical and market information? How difficult is to access all the items mentioned before?
 11. What are the main limitations to enter and stay in the supply chain? What opportunities do buyers offer to small farmers? What benefits? Do you know about farmer exclusion? What kind of farmers is excluded?
 12. What are the main motivations to produce under contract?
 13. What are the advantages and disadvantages of producing under contract instead of producing to sell in traditional markets (spot markets)?
 14. What is the participation of women in the production and marketing of FFV? What is their contribution, what benefits are they getting? Can women participation and benefits be enhanced? How?
 15. What is your participation in collective actions (e.g., networks, cooperatives, alliances, etc.)? How does this participation help you in the production and marketing of FFV? What specific benefits do you get from participating in collective actions? What are the main limitations of collective actions? How can they be ameliorated?
 16. What recommendations do you have for constructing 'best practice' models to enhance the competitiveness of the FFV sector, and specially the competitiveness of small farmers?

Semi-structured Interviews with Non-contracted Farmers

1. What about your personal information? Name, age, gender, education, household size.
2. What are your farm characteristics? Size of the farm, crops cultivated, economic importance of crops, food importance of crops, labour used in farming (own/hired), female participation, off-farm activities, income generated by off-farm activities, ownership of the land.
3. What kind of FFV do you produce? How many years of experience in FFV production do you have? What other particular skills do you have? Where did you learn them?
4. Where/to whom do you sell the produce? How do you get in touch with buyers? Do you look for them, or do they look for you? What are the most important risks that you face in producing and marketing FFV? What are the payment mechanisms used in your transactions? Advantages, disadvantages, risk?

5. How is your produce graded? Who sets the grades? Do you agree with them? Percentage rejected? Is there alternative market or use for rejected produce?
6. What are the general standards required for your produce? Quantity, quality, frequency, variety, packing, safety? What are the specific requirements for the products that you sell?
7. What specific investments do you have for producing FFV? Irrigation equipment, greenhouses, etc.? If you go out of FFV production do these specific investments have an alternative use?
8. Have you heard about contract farming? Have you tried to produce under contract farming schemes? If yes, what are the reasons that hamper you to produce under contract farming? If not, what are the reasons that motivate you to stay away of contract farming? Do you know about the advantages and disadvantages of producing under contract instead of producing to sell in traditional markets (spot markets)?
9. Where and how do you get credit, inputs, transportation, technical and market information? How difficult is to access all the items mentioned before?
10. What are the main key success factors to enter and stay in FFV production?
11. What are the main limitations to enter and stay in the FFV production? What opportunities do buyers offer to small farmers? What benefits? Do you know about farmer exclusion? What kind of farmers is excluded?
12. What is the participation of women in the production and marketing of FFV? What is their contribution, what benefits are they getting? Can women participation and benefits be enhanced? How?
13. What is your participation in collective actions (e.g., networks, cooperatives, alliances, etc.)? How does this participation help you in the production and marketing of FFV? What specific benefits do you get from participating in collective actions? What are the main limitations of collective actions? How can they be ameliorated?
14. What recommendations do you have for constructing 'best practice' models to enhance the competitiveness of the FFV sector, and specially the competitiveness of small farmers?

ANNEX 2:
QUESTIONNAIRE USED FOR THE SURVEY

Agricultural Economics & Business
University of Guelph
Ontario, Canada

No. _____

GENERAL INFORMATION

First, we are going to ask you for some general information about yourself

1. What is your name? _____

2. What is the name of your community (*aldea*)? _____

3. What is your municipality? (*Circle one*)

La Esperanza 1
Intibuca 2
Yamaranguila 3
Other _____

4. Sex of farmer (*Circle one*)

Male 1
Female 2

5. What is your age? _____

6. How many years of school do you have? _____

7. Can you tell me who is in your household, their age and gender including yourself?

#	Gender (<i>Circle one</i>)		Age
	Male	Female	
1	1	2	
2	1	2	
3	1	2	
4	1	2	
5	1	2	
6	1	2	
7	1	2	
8	1	2	
9	1	2	
10	1	2	

FARM AND COMMUNITY CHARACTERISTICS

Now we are going to talk about your farm and community

8. How far is your farm from the road (*km*)? _____
9. What is the total size of your farm (in mz^{19}) (*owned, rented and/or borrowed, and including all farming activities*)? _____
10. What area of the farm belongs to you (*mz*)? _____
11. What area of the farm is rented or borrowed (*mz*)? _____
12. How many years have you been farming? _____
13. What did you do previously (*If not farming all life*)? (*Record verbatim*)
 - 13.1 _____
 - 13.2 _____
 - 13.3 _____
14. What is the current area cultivated with fruits and vegetables (FFV) (*mz*)? _____
15. What area of FFV (*mz*) did you grow five years ago? _____
16. How many years have you been growing FFV? _____
17. Why did you start growing FFV? (*Record verbatim*)
 - 17.1 _____
 - 17.2 _____
 - 17.3 _____

¹⁹ Mz stands for 'manzana,' is equivalent to 0.7 hectares, and it's the area measure used by farmers in Honduras.

18. What FFV crops do you currently grow? (*Circle all that apply*)

	Yes	No
a. Lettuce	1	0
b. Cauliflower	1	0
c. Broccoli	1	0
d. Carrots	1	0
e. Chiles	1	0
f. Cabbage	1	0
g. Tomato	1	0
h. Squash	1	0
i. Chayote	1	0
j. Beets	1	0
k. Eggplant	1	0
l. Potato	1	0
m. Cucumber	1	0
n. Strawberry	1	0

Others (*Specify*): _____

19. What FFV crops did you grow five years ago? (*Circle all that apply*)

	Yes	No
a. Lettuce	1	0
b. Cauliflower	1	0
c. Broccoli	1	0
d. Carrots	1	0
e. Chiles	1	0
f. Cabbage	1	0
g. Tomato	1	0
h. Squash	1	0
i. Chayote	1	0
j. Beets	1	0
k. Eggplant	1	0
l. Potato	1	0
m. Cucumber	1	0
n. Strawberry	1	0

Others (*Specify*): _____

20. How many head of cattle do you have? _____

21. How many head of cattle did you have five years ago? _____

22. Does your household have any income from off of the farm? (*Circle one*)

Yes 1
No 0

23. If yes, (*previous question*), what other sources of income does your household have?
(*Circle all that apply*)

	Yes	No
Off-farm labour	1	0
Micro-enterprise ²⁰	1	0
Remittance from family	1	0
Middleman	1	0
Others (<i>Specify</i>):		

24. What other sources of income did your household have five years ago? (*Circle all that apply*)

	Yes	No
Off-farm labour	1	0
Micro-enterprise	1	0
Remittance from family	1	0
Middleman	1	0
Others (<i>Specify</i>):		

25. What proportion of your household's income is from the farm (%)? _____

26. What proportion of your household's income was from the farm five years ago (%)? _____

27. Do you grow any crops other than FFV? (*Circle one*)

Yes 1
No 0

²⁰ E.g., 'pop and mom store,' sewing machine, cafeteria, etc.

28. If yes (*previous question*), what are they?

	Yes	No
Corn	1	0
Beans	1	0
Coffee	1	0
Forest	1	0
Medicinal plants	1	0
Others (<i>Specify</i>):		

29. What other crops did you grow five years ago?

	Yes	No
Corn	1	0
Beans	1	0
Coffee	1	0
Forest	1	0
Medicinal plants	1	0
Others (<i>Specify</i>):		

30. What proportion of your household's income is from FFV (%)? _____

31. What proportion of your household's income was from FFV five years ago (%)? _____

32. How many people from your household work full time in the farm? _____

33. How many people from your household work part-time in the farm? _____

34. Do you hire any non-family labour? (*Circle one*)

Yes 1
No 0

If yes (previous question), please answer questions 35 and 36, if no go to question 37

35. How many full-time? _____

36. How many casual (worker day/week)? _____

37. How many months in a year do you normally grow FFV? _____

38. How many months in a year did you grow FFV five years ago? _____

39. How many months in a year do you have irrigation availability? _____

40. Did you have any irrigation system five years ago?

Yes 1

No 0

41. Do you have drip irrigation? (*Circle one*)

Yes 1

No 0

If yes, please answer question 42, if no go to question 43

42. How many years ago did you obtain drip irrigation? _____

43. How do you currently do soil preparation? (*Circle one*)

Manually 1

With oxen 2

With tractor 3

Other (*Specify*): _____

44. How did you do soil preparation five years ago? (*Circle one*)

Manually 1

With oxen 2

With tractor 3

Other (*Specify*): _____

45. If you did not grow FFV what crops would you grow instead? (*Circle all that apply*)

	Yes	No
--	------------	-----------

Corn	1	0
------	---	---

Beans	1	0
-------	---	---

Coffee	1	0
--------	---	---

Forest	1	0
--------	---	---

Medicinal plants	1	0
------------------	---	---

Others (<i>Specify</i>): _____		
----------------------------------	--	--

46. How high is the risk of losing your FFV production due to bad weather? (*Circle one*)

Very low	1
Low	2
Moderate	3
High	4
Very high	5

47. How high is the risk of losing the production of these crops you might grow instead due to bad weather? (*Circle one*)

Very low	1
Low	2
Moderate	3
High	4
Very high	5

48. How high is the risk of losing your FFV production due to pest damages? (*Circle one*)

Very low	1
Low	2
Moderate	3
High	4
Very high	5

49. How high is the risk of losing the production of these crops you might grow instead due to pest damages? (*Circle one*)

Very low	1
Low	2
Moderate	3
High	4
Very high	5

50. How high is the risk that your FFV production is of low quality? (*Circle one*)

Very low	1
Low	2
Moderate	3
High	4
Very high	5

51. How high is the risk that the production of these crops you might grow instead is of low quality? (*Circle one*)

Very low	1
Low	2
Moderate	3
High	4
Very high	5

52. Do you currently have access to any of the following? (*Circle all that apply*)

	Yes	No
Car/truck	1	0
Bicycle	1	0
Horse	1	0
Cart	1	0
Public transportation	1	0
Electricity	1	0
Telephone	1	0
Internet/email	1	0

53. Did you have access to any of the following five years ago? (*Circle all that apply*)

	Yes	No
Car/truck	1	0
Bicycle	1	0
Horse	1	0
Cart	1	0
Own transportation	1	0
Public transportation	1	0
Electricity	1	0
Telephone	1	0
Internet/email	1	0

54. Do you keep written records of FFV production? (*Circle one*)

Yes	1
No	0

55. If no, why not? (*Record verbatim*):

55.1 _____

55.2 _____

55.3 _____

If yes question 54, please answer question 56, if no go to question 57

56. How many years ago did you start to keep written records? _____

57. Have you received any technical assistance during the last five years?

Yes 1

No 0

58. If yes (*previous question*), who has provided you with technical assistance? (*Circle all that apply*)

	Yes	No
Buyer	1	0
NGO/Association	1	0
Government	1	0
Input supplier	1	0
Neighbour/friends	1	0
Others (<i>Specify</i>):	_____	

59. What has been your main source of technical assistance? (*Tick one*)

Buyer	1
NGO/Association	2
Government	3
Input supplier	4
Neighbour/friends	5
Other (<i>Specify</i>):	_____

60. Do you have access to credit (*in cash or in kind*)? (*Circle one*)

Yes 1

No 0

If yes, please answer questions 61 and 62, if no go to question 63

61. Who provides you with credit? (*Circle all that apply*)

	Yes	No
Buyer	1	2
NGO/Association	1	2
Government	1	2
Input supplier	1	2
Commercial banks	1	2
Others (<i>Specify</i>):	_____	

62. What is your main source of credit? (*Tick one*)

- Buyer 1
 NGO/Association 2
 Government 3
 Input supplier 4
 Commercial banks 5
 Other (*Specify*): _____

63. Have you ever applied for credit and not been able to get it? (*Circle one*)

- Yes 1
 No 0

64. What proportion of your FFV production is sold to each of the following?

FFV Buyer	Percentage
Middlemen (at farm gate)	
Local spot market (La Esperanza)	
Spot market in SPS ²¹ or Tegucigalpa	
Supermarkets ²² in SPS	
Supermarkets in Tegucigalpa	
Divefru ²³ (La Esperanza)	
Aprohi (La Esperanza)	
Others (<i>Specify</i>):	
Total	100

²¹ SPS=San Pedro Sula

²² Selling directly to SPS and/or Tegucigalpa. Including specialized wholesalers such as Hortifruti, Evezezer and others that supply supermarkets.

²³ Divefru and Aprohi are local specialized wholesalers

65. What proportion of your FFV production was sold to each of the following five years ago?

FFV Buyer	Percentage
Middlemen (at farm gate)	
Local spot market (La Esperanza)	
Spot market in SPS or Tegucigalpa	
Supermarkets in SPS	
Supermarkets in Tegucigalpa	
Divefru (La Esperanza)	
Aprohi (La Esperanza)	
Others (<i>Specify</i>):	
Total	100

66. What is the distance to each of the following markets even if you do not supply them?

Market	Distance from farm to the market (<i>km</i>)
Middlemen (at farm gate)	
Local spot market (La Esperanza)	
Spot market in SPS or Tegucigalpa	
Supermarkets in SPS	
Supermarkets in Tegucigalpa	
Divefru (La Esperanza)	
Aprohi (La Esperanza)	
Others (<i>Specify</i>):	
Total	

67. How frequently do you normally sell your FFV production? (*Circle one*)

- | | |
|------------------------|---|
| Less than once a month | 1 |
| Once a month | 2 |
| Every two weeks | 3 |
| Once a week | 4 |
| Twice a week | 5 |

68. How frequently did you sell your FFV production five years ago? (*Circle one*)

- | | |
|------------------------|---|
| Less than once a month | 1 |
| Once a month | 2 |
| Every two weeks | 3 |
| Once a week | 4 |
| Twice a week | 5 |

69. How important are each of the following factors in your choice of market? (*Circle the number that apply for each factor*)

Factor	Highly unimportant	Un- important	Neither unimportant nor important	Important	Highly important
69.1 Level of market prices	1	2	3	4	5
69.2 Variability of market prices	1	2	3	4	5
69.3 Level of market demand	1	2	3	4	5
69.4 Variability of market demand	1	2	3	4	5
69.5 Specific products demanded	1	2	3	4	5
69.6 Grading requirements	1	2	3	4	5
69.7 Access to information	1	2	3	4	5
69.8 Frequency of selling	1	2	3	4	5
69.9 Place of selling	1	2	3	4	5
69.10 Payment mechanism	1	2	3	4	5
69.11 Need for producer organiz.	1	2	3	4	5
69.12 Costs to enter market	1	2	3	4	5
69.13 Cost of transportation	1	2	3	4	5
69.14 Ease of transportation	1	2	3	4	5

70. Based on your own views or perceptions how does marketing FFV under contract²⁴ compare to traditional marketing of FFV?

- Much worse 1
- Worse 2
- Equal 3
- Better 4
- Much better 5

71. Why? (*Record verbatim*)

- 71.1 _____
- 71.2 _____
- 71.3 _____

72. How much of a problem is transportation to your markets for you? (*Circle one*)

- Not a problem at all 1
- Minor problem 2
- Moderate problem 3
- Major problem 4
- Very major problem 5

²⁴ Farmers in Honduras usually mean by traditional market middlemen and spot markets. The term under contract is the alternative market (e.g., retailers and processors), and it is understood by farmers.

73. Why? (*Record verbatim*)

73.1 _____
73.2 _____
73.3 _____

74. How does the price paid by the buyer that you sell most to²⁵ compare to the other markets you might supply? (*Circle one*)

Much lower	1
Lower	2
Equal	3
Higher	4
Much higher	5

75. How many days after delivering your product in the market that you sell most to do you normally get paid? _____

76. How satisfied are you with the time taken to receive payment? (*Circle one*)

Very dissatisfied	1
Dissatisfied	2
Neither satisfied nor dissatisfied	3
Satisfied	4
Very satisfied	5

77. How does the buyer that you sell most to, pay you? (*Circle one*)

By cheque	1
By cash	2

78. How satisfied are you with this payment mechanism? (*Circle one*)

Very dissatisfied	1
Dissatisfied	2
Neither satisfied nor dissatisfied	3
Satisfied	4
Very satisfied	5

²⁵ According to the answer of question 65

79. How variable are the prices that you receive in the market that you sell most to? (*Circle one*)

- | | |
|----------------------|---|
| Very invariable | 1 |
| Invariable | 2 |
| Moderate variable | 3 |
| Highly variable | 4 |
| Very highly variable | 5 |

80. How much trust do you have in the buyer that you sell most to? (*Circle one*)

- | | |
|-----------|---|
| Very low | 1 |
| Low | 2 |
| Moderate | 3 |
| High | 4 |
| Very high | 5 |

81. How much trust does the buyer that you sell most to have in you? (*Circle one*)

- | | |
|-----------|---|
| Very low | 1 |
| Low | 2 |
| Moderate | 3 |
| High | 4 |
| Very high | 5 |

82. Overall, how satisfied are you with the buyer that you sell most to? (*Circle one*)

- | | |
|------------------------------------|---|
| Very dissatisfied | 1 |
| Dissatisfied | 2 |
| Neither satisfied nor dissatisfied | 3 |
| Satisfied | 4 |
| Very satisfied | 5 |

83. Do you normally grade any of your products before selling? (*Circle one*)

- | | |
|-----|---|
| Yes | 1 |
| No | 0 |

84. What proportion of your production do you grade (%)? _____

85. How much of a problem is grading for you? (*Circle one*)

- | | |
|--------------------|---|
| Not a problem | 1 |
| Minor problem | 2 |
| Moderate problem | 3 |
| Major problem | 4 |
| Very major problem | 5 |

86. What percentage (*average*) of your production generally meets the grade required by your main buyer? _____

87. What do you do with produce that does not meet the grade? (*Record verbatim*):

- 87.1 _____
- 87.2 _____
- 87.3 _____

88. How familiar are you with the requirements of supermarkets? (*Circle one*)

- | | |
|---------------------------------|---|
| Very unfamiliar | 1 |
| Unfamiliar | 2 |
| Neither familiar nor unfamiliar | 3 |
| Familiar | 4 |
| Very familiar | 5 |

89. When was the last time you were in a supermarket store in San Pedro Sula or Tegucigalpa? (*Circle one*)

- | | |
|--------------------------|---|
| Never | 1 |
| Five years ago | 2 |
| One year ago | 3 |
| Six months ago | 4 |
| Less than six months ago | 5 |

90. What was your total value of FFV sales during the last year (L\$)? _____

91. How does the total value of FFV sales compare to five years ago? (*Circle one*)

- | | |
|--------------|---|
| Much smaller | 1 |
| Smaller | 2 |
| Equal | 3 |
| Greater | 4 |
| Much greater | 5 |

92. How does your current performance in FFV production compare to five years ago?
(Circle one)

Much worse 1
Worse 2
Equal 3
Better 4
Much better 5

93. What kind of investments have you made to your farm during the last five years?
(Circle all that apply)

	Yes	No
Irrigation system	1	0
Greenhouse	1	0
Oxen	1	0
Land	1	0
Well	1	0
Buildings	1	0
Transportation	1	0
Others (Specify):	_____	

94. What proportion of your household's food do you grow yourself (%)? _____

95. What proportion of your household's food did you grow yourself five years ago (%)? _____

96. How does the overall situation of your household compare to five years ago? (Circle one)

Much worse 1
Worse 2
Equal 3
Better 4
Much better 5

97. How has the market (*traditional or contracted*) you sell most to impacted your household's economic situation during the last five years? (Circle one)

Highly negatively 1
Negatively 2
Neither negatively nor positively 3
Positively 4
Highly positively 5

98. Are you able to meet the basic needs of your family with respect to each of the following? (*Circle all that apply*)

	Yes	No
School fees	1	0
Health expenses	1	0
Sufficient food	1	0
Clothing	1	0
Others (<i>Specify</i>): _____	1	0

99. Were you able to meet the basic needs of your family with respect to each of the following five years ago? (*Circle all that apply*)

	Yes	No
School fees	1	0
Health expenses	1	0
Sufficient food	1	0
Clothing	1	0
Others (<i>Specify</i>): _____	1	0

100. Have you made household investments in any of the following over the last five years? (*Circle all that apply*)

	Yes	No
Radio	1	0
Television	1	0
Bicycle	1	0
Sewing machine	1	0
Furniture	1	0
Cell phone	1	0
House improvement	1	0
Others (<i>Specify</i>): _____		

101. What was the total cash income of your household last year (L\$)? _____

102. How does this income compare to five years ago? (*Circle one*)

Much smaller	1
Smaller	2
Equal	3
Greater	4
Much greater	5

COLLECTIVE ACTION

Now we are going to talk about farmer organizations in your area

103. Are you member of any active farmer organization (*formal or informal*) (*Circle one*)

Yes 1
No 0

104. If yes (*previous question*), how many years have you been a member? (*Circle one*)

Yes 1
No 0

105. If yes (*question 103*), do you have to pay for membership? (*Circle one*)

Yes 1
No 0

106. How much of a problem is it for you to pay for organization membership? (*Circle one*)

Not a problem at all	1
Not a problem	2
A moderate problem	3
A problem	4
A big problem	5

107. If yes (*question 103*) how do you consider the general performance of the organization that you belong to? (*Circle one*)

Very bad	1
Bad	2
Regular	3
Good	4
Excellent	5

108. How could it be improved? (*If yes question 103*) (*Record verbatim*)

108.1 _____
108.2 _____
108.3 _____

109. How much trust do you have in this organization? (*If yes question 103*) (*Circle one*)

Very low	1
Low	2
Moderate	3
High	4
Very high	5

110. What do you get from/or how do you use the organization? (*If yes question 103*)
(*Circle all that apply*)

	Yes	No
Marketing	1	0
Credit (in cash or in kind)	1	0
Inputs	1	0
Training	1	0
Technical assistance	1	0
Transportation	1	0
Packing services/distribution center	1	0
Individual assets	1	0
Collective assets	1	0
Other (<i>Specify</i>):		

111. How important is this organization for the marketing of FFV? (*If yes question 103*)
(*Circle one*)

Very important	1
Important	2
Neither important nor unimportant	3
Unimportant	4
Very unimportant	5

112. If you are not a member of an organization, would you like to be? (*Circle one*)

Yes	1
No	0

113. Why? (*Record verbatim*)

113.1 _____
113.2 _____
113.3 _____

114. If yes (*question 112*), what stop you from becoming a member? (*Record verbatim*)

114.1 _____
114.2 _____
114.3 _____

115. Do you ever market products with other farmers on a more informal basis?

Yes 1
No 0

116. Why? (*Record verbatim*)

116.1 _____
116.2 _____
116.3 _____

117. If yes, (*question 115*), how many years have you been doing this? _____

118. Do you ever buy inputs with other farmers on a more informal basis?

Yes 1
No 0

119. Why? (*Record verbatim*)

119.1 _____
119.2 _____
119.3 _____

120. If yes, (*question 117*), how many years have you been doing this? _____

121. Now I am going to propose to you several possible markets where you might sell your FFV. For each market profile I would like you to consider whether you would be prepared to market the FFV you produce in this market.

Profile Number 1

Price	Price not fixed with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	Grading required by buyers
Payment	Payment immediately after delivery by cash
Frequency of delivery	Free to deliver when product available
Selling place	Produce sold at farm-gate
Organization	Sellers can market products individually
Entry cost	Minimal investments needed to enter market

(*Circle one*) Yes 1
No 0

Profile Number 2

Price	Fixed price with buyer at planting
Quantity demanded	Fixed quantity with buyer at planting
Grading	Grading required by buyers
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold in Tegucigalpa/SPS
Organization	Sellers can market products individually
Entry cost	No investments needed for producers to enter market

(Circle one) Yes 1
 No 0

Profile Number 3

Price	Price not fixed with buyer at planting
Quantity demanded	Fixed quantity with buyer at planting
Grading	No grading required by buyer
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Free to deliver when product available
Selling place	Produce sold at farm-gate
Organization	Informal organization of producers needed to supply market
Entry cost	Major/significant investments needed to enter market

(Circle one) Yes 1
 No 0

Profile Number 4

Price	Fixed price with buyer at planting
Quantity demanded	Fixed quantity with buyer at planting
Grading	Grading required by buyers
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Free to deliver when product available
Selling place	Produce sold at farm-gate
Organization	Sellers can market products individually
Entry cost	No investments needed for producers to enter market

(Circle one) Yes 1
 No 0

Profile Number 5

Price	Fixed price with buyer at planting
Quantity demanded	Fixed quantity with buyer at planting
Grading	No grading required by buyer
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold at farm-gate
Organization	Sellers can market products individually
Entry cost	Minimal investments needed to enter market

(Circle one) Yes 1
 No 0

Profile Number 6

Price	Fixed price with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	No grading required by buyer
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Free to deliver when product available
Selling place	Produce sold in Tegucigalpa/SPS
Organization	Informal organization of producers needed to supply market
Entry cost	Minimal investments needed to enter market

(Circle one) Yes 1
 No 0

Profile Number 7

Price	Fixed price with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	Grading required by buyers
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold in La Esperanza
Organization	Formal organization of producers needed to supply market
Entry cost	No investments needed for producers to enter market

(Circle one) Yes 1
 No 0

Profile Number 8

Price	Price not fixed with buyer at planting
Quantity demanded	Fixed quantity with buyer at planting
Grading	Grading required by buyers
Payment	Payment immediately after delivery by cash
Frequency of delivery	Free to deliver when product available
Selling place	Produce sold at farm-gate
Organization	Formal organization of producers needed to supply market
Entry cost	Minimal investments needed to enter market

(Circle one) Yes 1
 No 0

Profile Number 9

Price	Fixed price with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	Grading required by buyers
Payment	Payment immediately after delivery by cash
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold at farm-gate
Organization	Informal organization of producers needed to supply market
Entry cost	Major/significant investments needed to enter market

(Circle one) Yes 1
 No 0

Profile Number 10

Price	Price not fixed with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	No grading required by buyer
Payment	Payment immediately after delivery by cash
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold at farm-gate
Organization	Sellers can market products individually
Entry cost	No investments needed for producers to enter market

(Circle one) Yes 1
 No 0

Profile Number 11

Price	Price not fixed with buyer at planting
Quantity demanded	Fixed quantity with buyer at planting
Grading	No grading required by buyer
Payment	Payment immediately after delivery by cash
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold at farm-gate
Organization	Informal organization of producers needed to supply market
Entry cost	No investments needed for producers to enter market

(Circle one) Yes 1
 No 0

Profile Number 12

Price	Price not fixed with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	Grading required by buyers
Payment	Payment immediately after delivery by cash
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold in Tegucigalpa/SPS
Organization	Sellers can market products individually
Entry cost	Minimal investments needed to enter market

(Circle one) Yes 1
 No 0

Profile Number 13

Price	Fixed price with buyer at planting
Quantity demanded	Fixed quantity with buyer at planting
Grading	No grading required by buyer
Payment	Payment immediately after delivery by cash
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold in La Esperanza
Organization	Sellers can market products individually
Entry cost	No investments needed for producers to enter market

(Circle one) Yes 1
 No 0

Profile Number 14

Price	Fixed price with buyer at planting
Quantity demanded	Fixed quantity with buyer at planting
Grading	Grading required by buyers
Payment	Payment immediately after delivery by cash
Frequency of delivery	Free to deliver when product available
Selling place	Produce sold in Tegucigalpa/SPS
Organization	Sellers can market products individually
Entry cost	Major/significant investments needed to enter market

(Circle one) Yes 1
 No 0

Profile Number 15

Price	Fixed price with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	No grading required by buyer
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold at farm-gate
Organization	Formal organization of producers needed to supply market
Entry cost	Minimal investments needed to enter market

(Circle one) Yes 1
 No 0

Profile Number 16

Price	Price not fixed with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	No grading required by buyer
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold in La Esperanza
Organization	Sellers can market products individually
Entry cost	Major/significant investments needed to enter market

(Circle one) Yes 1
 No 0

Profile Number 17

Price	Price not fixed with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	No grading required by buyer
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Free to deliver when product available
Selling place	Produce sold at farm-gate
Organization	Sellers can market products individually
Entry cost	Major/significant investments needed to enter market

(Circle one) Yes 1
 No 0

Profile Number 18

Price	Fixed price with buyer at planting
Quantity demanded	Fixed quantity with buyer at planting
Grading	No grading required by buyer
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Free to deliver when product available
Selling place	Produce sold in La Esperanza
Organization	Sellers can market products individually
Entry cost	Minimal investments needed to enter market

(Circle one) Yes 1
 No 0

Profile Number 19

Price	Price not fixed with buyer at planting
Quantity demanded	Fixed quantity with buyer at planting
Grading	Grading required by buyers
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold at farm-gate
Organization	Formal organization of producers needed to supply market
Entry cost	No investments needed for producers to enter market

(Circle one) Yes 1
 No 0

Profile Number 20

Price	Fixed price with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	Grading required by buyers
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Free to deliver when product available
Selling place	Produce sold at farm-gate
Organization	Informal organization of producers needed to supply market
Entry cost	No investments needed for producers to enter market

(Circle one) Yes 1
 No 0

Profile Number 21

Price	Price not fixed with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	Grading required by buyers
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Free to deliver when product available
Selling place	Produce sold in Tegucigalpa/SPS
Organization	Sellers can market products individually
Entry cost	No investments needed for producers to enter market

(Circle one) Yes 1
 No 0

Profile Number 22

Price	Fixed price with buyer at planting
Quantity demanded	Fixed quantity with buyer at planting
Grading	No grading required by buyer
Payment	Payment immediately after delivery by cash
Frequency of delivery	Free to deliver when product available
Selling place	Produce sold at farm-gate
Organization	Sellers can market products individually
Entry cost	No investments needed for producers to enter market

(Circle one) Yes 1
 No 0

Profile Number 23

Price	Price not fixed with buyer at planting
Quantity demanded	Fixed quantity with buyer at planting
Grading	No grading required by buyer
Payment	Payment immediately after delivery by cash
Frequency of delivery	Free to deliver when product available
Selling place	Produce sold in Tegucigalpa/SPS
Organization	Formal organization of producers needed to supply market
Entry cost	No investments needed for producers to enter market

(Circle one) Yes 1
 No 0

Profile Number 24

Price	Price not fixed with buyer at planting
Quantity demanded	Fixed quantity with buyer at planting
Grading	Grading required by buyers
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Free to deliver when product available
Selling place	Produce sold in La Esperanza
Organization	Informal organization of producers needed to supply market
Entry cost	No investments needed for producers to enter market

(Circle one) Yes 1
 No 0

Profile Number 25

Price	Price not fixed with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	No grading required by buyer
Payment	Payment immediately after delivery by cash
Frequency of delivery	Free to deliver when product available
Selling place	Produce sold in La Esperanza
Organization	Sellers can market products individually
Entry cost	No investments needed for producers to enter market

(Circle one) Yes 1
 No 0

Profile Number 26

Price	Price not fixed with buyer at planting
Quantity demanded	Fixed quantity with buyer at planting
Grading	Grading required by buyers
Payment	Payment immediately after delivery by cash
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold in La Esperanza
Organization	Informal organization of producers needed to supply market
Entry cost	Minimal investments needed to enter market

(Circle one) Yes 1
 No 0

Profile Number 27

Price	Price not fixed with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	Grading required by buyers
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold at farm-gate
Organization	Sellers can market products individually
Entry cost	No investments needed for producers to enter market

(Circle one) Yes 1
 No 0

Profile Number 28

Price	Fixed price with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	Grading required by buyers
Payment	Payment immediately after delivery by cash
Frequency of delivery	Free to deliver when product available
Selling place	Produce sold in La Esperanza
Organization	Formal organization of producers needed to supply market
Entry cost	Major/significant investments needed to enter market

(Circle one) Yes 1
 No 0

Profile Number 29

Price	Fixed price with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	No grading required by buyer
Payment	Payment immediately after delivery by cash
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold in Tegucigalpa/SPS
Organization	Informal organization of producers needed to supply market
Entry cost	No investments needed for producers to enter market

(Circle one) Yes 1
 No 0

Profile Number 30

Price	Price not fixed with buyer at planting
Quantity demanded	Fixed quantity with buyer at planting
Grading	No grading required by buyer
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold in Tegucigalpa/SPS
Organization	Formal organization of producers needed to supply market
Entry cost	Major/significant investments needed to enter market

(Circle one) Yes 1
 No 0

Profile Number 31

Price	Fixed price with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	No grading required by buyer
Payment	Payment immediately after delivery by cash
Frequency of delivery	Free to deliver when product available
Selling place	Produce sold at farm-gate
Organization	Formal organization of producers needed to supply market
Entry cost	No investments needed for producers to enter market

(Circle one) Yes 1
 No 0

Profile Number 32

Price	Fixed price with buyer at planting
Quantity demanded	Fixed quantity with buyer at planting
Grading	Grading required by buyers
Payment	Payment immediately after delivery by cash
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold at farm-gate
Organization	Sellers can market products individually
Entry cost	Major/significant investments needed to enter market

(Circle one) Yes 1
 No 0

Profile Number 33 (Holdout)

Price	Price not fixed with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	Grading required by buyers
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold in La Esperanza
Organization	Informal organization of producers needed to supply market
Entry cost	No investments needed for producers to enter market

(Circle one) Yes 1
 No 0

Profile Number 34 (Holdout)

Price	Fixed price with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	Grading required by buyers
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold at farm-gate
Organization	Informal organization of producers needed to supply market
Entry cost	Minimal investments needed to enter market

(Circle one) Yes 1
 No 0

Profile Number 35 (Holdout)

Price	Fixed price with buyer at planting
Quantity demanded	Quantity not fixed with buyer at planting
Grading	Grading required by buyers
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Scheduled with buyer at planting
Selling place	Produce sold at farm-gate
Organization	Informal organization of producers needed to supply market
Entry cost	Major/significant investments needed to enter market

(Circle one) Yes 1
 No 0

Profile Number 36 (Holdout)

Price	Price not fixed with buyer at planting
Quantity demanded	Fixed quantity with buyer at planting
Grading	Grading required by buyers
Payment	Payment two weeks after delivery by cheque
Frequency of delivery	Free to deliver when product available
Selling place	Produce sold in La Esperanza
Organization	Informal organization of producers needed to supply market
Entry cost	Minimal investments needed to enter market

(Circle one) Yes 1
 No 0

122. Is there anything else you would like to say? (*Record verbatim*)

122.1 _____
122.2 _____
122.3 _____
122.4 _____

Thanks!!!