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Value Chain Analysis of Asian Vegetables produced in Honduras



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PRODUCED IN HONDURAS**

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Abstract

In Honduras, value chains analysis of agricultural products are scarce. In view of that, a value chain analysis is employed to analyze the scope of local strategies to access and secure continued participation of Honduran Asian vegetables producers and exporters in international markets. Within the framework of a qualitative research design, a comparative case study of two regions, Comayagua and Olancho where Asian vegetables sourced from Honduras are planted, was chosen. To provide a theoretical basis that guides the report and analysis of the study findings, five areas of the related literature were selected and critically reviewed: i) the horticultural sector in Honduras; ii) value chain approach focusing on theory of value chain governance; iii) transaction costs economics theory; iv) resource dependence theory; and v) social capital theory. Besides structured observations, document review, and visual data, the interview was chosen as the main method for collecting data in this study. The sample of informants was comprised by 59 respondents including producers, exporters, importers/wholesalers, government agencies, research agencies, input suppliers and a NGO. The analysis reveals several findings: i) Asian vegetables in Honduras were introduced by the private sector initiative influenced by the confluence of several distinctive elements but without direct intervention of the government; ii) local actors engage in contractual relations primarily to reduce the uncertainty involved in the exchange of Asian vegetables, whereas economizing on the main transaction costs iii) As a result of the existing lack of trust and power asymmetries, local actors still have not acknowledged the need for consensus and long-term perspective which would facilitate reaching a commitment of collaboration between them; iv) there is no clear chain leader, therefore evolution of the value chain of Asian vegetables is mainly defined by changes in importing country's government regulatory framework and external factors; v) strategic public services are not adequately provided to local actors which affect their performance in the chain, especially of producers; and vi) the major demand driver of this food system is ethnicity and currently the major opportunity lies in selling to Asians consumers groups in the U.S.

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List of Abbreviations

AMPROVOL	Asociación Micro-empresarial de Productores de Vegetales Orientales de Olancho/Olancho's Asian Vegetables Micro-entrepreneurial Producers Association
APHIS	United States Animal and Plant Health Inspection Service
APROVEFEX	Asociación de Productores de Vegetales y Frutas de Exportación/Exports' Vegetables and Fruits Producers Association
BANADESA	Banco Nacional de Desarrollo Agrícola/National Agricultural Development Bank
BCH	Banco Central de Honduras/Central Bank of Honduras
CBI	Caribbean Basin Initiative
CEPAL/ECLAC	Comisión Económica para América Latina/ Economic Commission for Latin America and the Caribbean
CNA	Consejo Nacional Anticorrupción/National Anti-Corruption Council
CNBS	Comisión Nacional de Bancos y Seguros de Honduras/National Commission of Banks and Insurance Companies
DICTA	Dirección General de Ciencia y Tecnología, Secretaría de Agricultura y Ganadería/Science and Technology General Direction, Ministry of Agriculture
DR-CAFTA	Dominican Republic-Central America Free Trade Agreement
EDA	Entrenamiento y Desarrollo de Agricultores/Farming Training and Development
ENEE	Empresa Nacional de Energía Eléctrica/National Electrical Energy Company
EPA	United States Environmental Protection Agency
FAO	Food and Agriculture Organization
FDA	United States Food and Drug Administration
FHIA	Fundación Hondureña de Investigación Agrícola/Honduran Agricultural Research Foundation

FIDE	Fundación para la Inversión y Desarrollo de las Exportaciones/Investment and Exports Development Foundation
FOB	Free On Board
FUNDER	Fundación para el Desarrollo Empresarial Rural/Rural Business Development Foundation
GAP	Good Agricultural Practices Program
GDP	Gross Domestic Product
GMP	Good Manufacturing Practices
GATT/WTO	General Agreement on Tariffs and Trade/World Trade Organization
GTZ	Gesellschaft für Technische Zusammenarbeit/German Technical Cooperation
ha	Hectares
HACCP	Hazard Analysis & Critical Control Points
HDI	Human Development Index
IICA	Instituto Interamericano de Cooperación para la Agricultura/Inter-American Institute for Cooperation on Agriculture
ILO	International Labour Organization
Lps.	Lempiras (Honduran Currency)
km	Kilometers
MAH	Mesa Agrícola Hondureña
MCC/CACM	Mercado Común Centroamericano/Central American Common Market
MTTH	Misión Técnica de Taiwán en Honduras/Taiwan Technical Mission in Honduras
NGO	Non Governmental Organization
OECD	Organization for Economic Cooperation and Development

OIRSA	Organismo Internacional Regional de Sanidad Agropecuaria/International Regional Organization for Plant and Animal Health
PNUD	Programa de las Naciones Unidas para el Desarrollo/United Nations Development Program
PROMORCO	Proyecto de Modernización del Riego en Micro Cuencas del Oeste del valle de Comayagua/Watering Modernization Project for Micro Watersheds in the Western Zone in the Valley of Comayagua
PRONAGRO	Programa Nacional de Desarrollo Agroalimentario/National Program of Agri-food Development
PROVEVSA	Productos Vegetales del Valle Sociedad Anónima/Valley's Vegetables Products Incorporated Company
PRS	Poverty Reduction Strategy
SAG	Secretaría de Agricultura y Ganadería/Ministry of Agriculture and Livestock
SENASA	Servicio Nacional de Sanidad Agropecuaria/National Service of Agricultural Health
SIECA	Secretaría de Integración Económica Centroamericana/Secretariat of Economic Integration of Central America
SOPTRAVI	Secretaría de Obras Públicas, Transporte y Vivienda/Ministry of Public Works, Transport and Housing
TCE	Transaction Cost Economics
RDT	Resource Dependence Theory
UNIDO	United Nations Industrial Development Organization
U.S.	United States of America
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
Exchange Rate	1 USD = 18.89 Lps. (November 2008)

1. INTRODUCTION

1.1 Background and Context

Non-traditional¹ agricultural products, such as Asian vegetables sourced from Honduras, represent a great potential to raise the country's participation in international markets. The exported volume of Asian vegetables cultivated in Honduras has increased from 21,000 pounds in 1990 to 47 million pounds in 2005 (Imbruce, 2008: 73).

In Honduras, Asian vegetables have been cultivated and exported since the beginning of the 90s; they were introduced in a juncture context by Asian immigrants with the purpose to supply the Asian community resident in the United States.

The increasing importance of high value products has enlightened Asian vegetables competence in contributing to improve the socioeconomic conditions of rural population and help to revitalize the country's economic growth, and this is of particular importance considering that they are mostly grown by small producers who sell their production to several local exports companies.

Honduras has an advantaged geographical location with respect to relevant markets² and a valuable variety of climates suitable for the production of diverse vegetable crops (Paz Cafferata, 2004; MAH, 2002: 3). Furthermore, the capability of year-round supplies from Honduras, combined with the increasing number of developed country's consumers aspiring to expand the variety of ingredients in their diet and more sensitive to health issues, provide an opportunity for enhancing producer's income and exporter's profit. That may possibly contribute to achieve national social and economic goals through their spreading effects.

In contrast, the contemporary nature of international horticulture markets place higher demands in terms of regulatory requirements of production and processing processes.

¹ Primary products, as well as processed, that were not part of Honduran exports before the '80s. In the case of agricultural products, these include cultivated shrimp, melon, pineapple, palm oil, and some legumes and vegetables. Foment of non-traditional exports in Honduras was especially done between 1980 and 1989 (Falck, 1995: 151).

² Particularly the USA market, so far the main importer of Honduran products.

In order to accomplish their sourcing strategies, buyers from industrialized countries try to build international networks substituting traditional arm's length market relationships³ by systems of vertical coordination (Gereffi, 1999: 37-45; Hendrikse, 2003: 2; Roduner, 2004: 5; Schmitz, 2005: 3; Humphrey, 2006: 22; Ruben et al., 2006: 11). In consequence, as McCormick and Schmitz (2001:7) claim, the local alternatives of enhancing skills and income of producers from countries as Honduras are subject to decisions taken in other parts of the world by dominant actors in the chain who control the flow of goods and information.

In this context, producers and exporters from Honduras need to learn how to meet these demands set by those international buyers. As Humphrey (2006: 20) argues, the potential for poverty-reduction based on horticultural exports will only be seized if producers and exporters from developing countries are able to fulfill the complex and changing requirements of principal buyers from developed countries.

Today opportunities and restrictions to access international horticultural markets are related to the dynamics of these international chains of production and trade. Hence, development strategies oriented to export promotion, attraction of foreign investment and national innovation systems are not enough to provide a path to sustainable growth (Díaz and Pelupessy, 2004: 27).

However, there is a broad consensus that engagement of government is also of critical importance for the integration of local actors in coordinated chains. Moreover, a concerted effort between private and public sector institutions is a precondition in order to successfully link local actors to dynamic markets.

In Honduras, local chain relations predominantly in the Asian vegetables subsector are being developed and considerable efforts have been made to improve them. There is still, however, an enormous unrealized potential, several conditions prevail that hamper the optimal performance of the chain. Therefore, this study seeks to shed light on understanding the structure and dynamics of the value chain of Asian vegetables produced in Honduras and its potential to help improving the country's situation.

³ Arm's-length market relationships (spot market relationships) are uncoordinated free market transactions through which producers sell spontaneously to unknown buyers.

1.2 Problem Statement

The emergence of Asian vegetables chain in Honduras has brought with it opportunities and challenges for the whole local socioeconomic system involving heterogeneous actors and institutions. But, to assess the positive and negative impacts of Asian vegetables produced in the local system, it is necessary to reveal the interactions and relationships between all the actors and institutions influencing the operations of the chain.

In Honduras, much research has been devoted to describe and explain the agricultural sector, its significance to rural poverty and its role as the economic motor of the country. Subsequently, abundant evidence clearly suggests that constraints faced by local actors are complex and systemic. The scenario at this point is a notably deteriorated one; even though the expectations for positives changes are of consideration. Here again, given their small size and the fact that they are (comparatively speaking) less developed, local producers are far more vulnerable to external shocks.

In the other hand, although there has been a proliferation in the number of studies, relatively little attention has been assigned to analyze the interactions and relationships between the different local and external actors, the environment in which they operate and the influence of external factors in the existing process of creating and distributing value for specific agricultural products. Furthermore, empirical work describing the type of relations that characterize the production of Asian vegetables in Honduras is definitely not abundant.

This situation calls to engage in the critical analysis on how local actors of Asian vegetables, particularly producers, benefit from value chain integration and how the organization of the value chain allow them not only to supply raw materials but also to potentially participate in the adding of value and accrue significant benefits from that participation, e.g. a higher income and upgrading possibilities.

Therefore, this study analyzes the factors that influence the production of Asian vegetables sourced from Honduras and marketed internationally from a value chain perspective. The main challenge here is to provide a comprehensive view of the whole value chain of Asian vegetables sourced from Honduras in order to describe and understand the way it operates and those factors which affect its performance.

1.3 Statement of Purpose and Research Questions

By means of value chain analysis, this research project aims to analyze the scope of local strategies to access and secure continued participation of Honduran Asian vegetables producers and exporters in international markets. Consideration should be given to the line of reasoning which argues that local conditions are strongly influenced by global or international forces, hence increasing the importance of connections with external linkages to improve participation of local players in the global economy.

To focus on the problem, the research questions thus arise as to:

- i) Who are the different actors in the chain, their roles and their linkages (vertical and horizontal)?
- ii) How are the relationships and powers dynamics among actors in the value chain and its effect on learning, innovation, distribution of benefits and on incentives for behavior change?
- iii) What are the different constraints confronted by national actors of the chain in order to fulfill the requirements of international markets?

1.4 Purpose and Significance

The purpose for this study emanates from the researcher's interest in understanding the research process and developing the skills needed to write and complete a doctoral dissertation.

As mentioned before, value chain analysis has become a very accepted analytical tool to understand the process of value creation and simultaneously, as Richter (2006: 5) points out, has turned into a relevant intervention tool implemented by governments with the support of different cooperation and development agencies. In this perspective, the government of Honduras is promoting the strengthening of agri-food chains, with the intention of using them as a development instrument; but certainly, as Altenburg (2006: 32) suggests, there is need for more empirical research in order to understand the structure of the chains and the way they function prior to the application of intervention policies. It is also necessary to enable each actor of the chain to understand the other, through improved collaboration, built trust and reward.

In Honduras, research about value chain analysis is scarce. Jansen and Torero (2007: 154) regret that studies about value chains in Honduras are very limited in relation to the rest of Central American countries. In view of that, this study intends to point out the way in which the value chain of Asian vegetables produced in Honduras performs and contributes as input in the definition of value chain programs.

1.5 Organization of this Thesis

This thesis is organized in six chapters. Chapter 2 presents the theoretical background of this study. Five areas of the related literature were selected and critically reviewed. These areas include: i) the horticultural sector in Honduras; ii) value chain approach focusing on theory of value chain governance; iii) transaction costs economics theory; iv) resource dependence theory; and v) social capital theory. Finally, building on the revision of the literature, combined with the researcher's own insights a theoretical framework for the design and conduct of this study is presented.

Chapter 3 presents the methodology and research approach employed in the study. This chapter describes the following issues: i) rationale for research approach; ii) research strategy; iii) data-collection methods; iv) data analysis and syntheses; v) limitations of the study; and vi) study areas.

Chapter 4 presents the results of the study. This chapter presents the key findings derived from the empirical research carried out mainly in Comayagua and Olancho the regions where Asian vegetables are produced.

Chapter 5 presents the analysis and interpretation of results. The discussion takes into consideration the literature as relevant theories and the study are tied by comparing and contrasting them to relevant issues raised by the latter.

Chapter 6 presents the summary, conclusions and recommendations derived from the study.

1. THEORETICAL BACKGROUND

The selected review of literature explores critically the interconnectedness of different factors influencing the participation of local actors, particularly producers, in the value chain of Asian vegetables sourced from Honduras to U.S. In light of this, five areas of the related literature were selected and critically reviewed. These areas include: i) the horticultural sector in Honduras; ii) value chain approach focusing on theory of value chain governance; iii) transaction costs economics theory; iv) resource dependence theory; and v) social capital theory.

A review of the literature on the horticultural sector in Honduras provides an understanding of the history, context and structure under which local actors operate. The value chain approach is reviewed to describe what is distinctive about this type of analysis and then theory of value chain governance is reviewed to understand the predominant type of chain (network) governance in the value chain of Asian vegetables produced in Honduras. Since emphasis is given to local actors, transaction costs economics theory is reviewed to provide a framework for understanding the configuration of contractual relations between producers and exporters. Resource dependence and social capital theories are reviewed to satisfy two gaps identified in transaction costs analysis. Resource dependence theory is reviewed to understand the role of power and social capital theory to understand the role of trust in the relationship between producers and exporters.

Finally, building on the critically reviewed literature, combined with the researcher's own insights a theoretical framework for the design and conduct of this study is presented.

2.1 Development Strategies and their Effect on Horticultural Production

Within the framework of the Import Substitution Strategy adopted by the government between the 60s and 80s (Hernández Chávez, 2005: 112; Falck, 1995: 151), the agricultural sector policy was in general oriented to control the prices of agricultural products through cost reduction, based on a subsidy program⁴ marked primarily by low interest rates, free technical support, and reduced tariff for imported inputs (Falck, 1995: 152). In general, the result was the exclusion of subsistence producers concentrated in rural areas (Ibid). However, these policies, together with certain market incentives, provided a stimulus for agricultural sub-sectors more targeted to upper and middle class segments of the population, in local urban markets and also destined to supply the relatively small

⁴ For more detail see: Falck, 1995: 152-3.

processing agro-industry in the country. This included sub-sector fruits and vegetables, made up principally by medium size and no subsistence small producers. Moreover, in the mid 70s the government urged all agro-industries to purchase part of their raw materials from outgrowers, instead of cultivating entirely in their own farms (Glover 1987: 447).

In the 80s, as a result of the profound social and economic imbalances affecting the country and under the sway of the United States, the government of Honduras embarked in a policy reform process designed to correct that situation. This led to the modification of the government interventionist role, via stabilization policies⁵ promoting export-led growth based on the restitution of free market principles (Hernández Chávez, 2005: 110-1; Noé Pino et al., 1992: 19-20 and 42). Certainly, these stabilization policies were the prelude in the emergence of a new development strategy, known as Structural Adjustment Program. Falck (1995: 151) distinguishes this as a transition period characterized by the encouragement of non-traditional exports.

The integration of Honduras in the Caribbean Basin Initiative (CBI) is a highlight of this phase. The CBI is a regional broad temporary program initiated by the U.S. in 1983 whose major goal was to expand foreign and domestic investment in non-traditional sectors through the diversification and expansion of exports in signatory Caribbean and Central American countries (US Department of Commerce, 2000: 1). The CBI provided beneficiary countries certain benefits such as duty free entry to the United States market for a wide spectrum of agricultural, semi manufactured and manufactured products as well as technical assistance to the exporters (Rosset, 1991: 31). The incipient dynamics exhibited by the horticultural sector during past decades was boosted in this period, including as the most successful horticultural products cucumbers, pumpkins, gherkins, tomatoes⁶, jalapeño pepper, melons, pineapples, and others. According to Merrill (1995) the US\$23.8 million export revenue derived from non-traditional fruits and vegetables in 1990 represented almost the double compared to 1983, consequently the contribution of non-traditional agricultural crops to the total value of exports grew from 2.8 percent in 1983 to 4.8 percent in 1990.

⁵ For more detail see: Hernández Chávez 2005: 13-16 & 105-11.

⁶ However, in 1989 Honduras stopped exporting tomatoes to the U.S. (See Imbruce, 2008: 72).

During the 90s and up to the current decade, the government of Honduras continued determinedly its course to liberalize the economy with the intention of achieving a better insertion of the country in the world economy.

The adoption at the beginning of the 90s of the anticipated Washington Consensus-supported Structural Adjustment Strategy⁷, which can be seen as the culmination of the policy reform process initiated in 1980, spurred trade liberalization efforts. Morley et al. (2008: 2) points out that in 1990 Honduras had the highest tariffs in Central America and five years later were the lowest in the region.

In the particular case of the agricultural sector, the Law for Modernization and Development of the Agricultural Sector (Ley para la Modernización y Desarrollo del Sector Agrícola)⁸ was conceived as the sectorial instrument of the Structural Adjustment Strategy (Noé Pino et al., 1992: 26; Baumeister and Wattel, 1996: 57; Jansen et al., 2006: 11). The fundamental purpose of this sectorial policy was to increase competitiveness through the intensification and diversification of the sector to increase foreign currency in the national economy and thus leading to higher incomes and decrease rural poverty (Rosset, 1991: 31; Baumeister and Wattel, 1996: 59; Jansen et al., 2005: 18; RUTA, 2006: 31; Paunovic and Rivas, 2007: 8). Accordingly, production of fresh vegetables and contractual relations between national producers and export companies, among other modalities, were promoted (Baumeister and Wattel, 1996: 59).

Besides, the country returned to the process of Central American economic integration and trade relations with extra regional countries were promoted; also notorious is the adhesion of Honduras to General Agreement on Tariffs and Trade/World Trade Organization (GATT/WTO) in 1994 (Núñez, 1994: 105-7; IICA, 2006: 3).

In the second half 2001, the Poverty Reduction Strategy (PRS⁹) was implemented as the new long-term national strategy. This strategy was prepared by the government of Honduras through a participatory process involving civil society and other partners, including the World Bank and the

⁷ For more detail see: Baumeister and Wattel , 1996.

⁸ For more detail see: Noé Pino et al., 1992 and Baumeister and Wattel , 1996.

⁹ In general, the fundamental objective of the strategy is to reduce poverty significantly and sustainably, based on accelerated and sustained economic growth. Under this framework several targets have to be accomplished by year 2015 based on five broad strategic guidelines. For more detail see World Bank, 2001: Honduras Poverty Reduction Strategy Paper.

International Monetary Fund. Thus, the PRS constitutes the new framework that guides the allocation of public resources, including those coming from external sources (World Bank, 2001: 1). In other words, it defines the policies, programs and projects that need to be prioritized by the country.

On April 1, 2006 the Dominican Republic-Central America Free Trade Agreement (DR-CAFTA¹⁰) took effect. DR-CAFTA is a free trade agreement with no expiration date, encompassing the United States, five Central American countries¹¹ and the Dominican Republic. Because of its indefinite time duration, the DR-CAFTA is seen as the way to consolidate the temporal benefits granted by the United States under the CBI and the Generalized System of Preferences (Medvedev, 2008: 1; Rosales, 2004: 145). In agriculture, almost all products will eventually be eligible for duty-free treatment, including vegetables crops and other non-traditional agricultural products (Medvedev, 2008: 1; Rosales, 2004: 148; Hernández Chávez: 2005: 258). Even when DR-CAFTA does not have the status of national development strategy, some authors as Hellin et al., (2007: 9) stress that this treaty more than any national policy will define the future for many horticultural producers in the country.

Almost simultaneously and together with the rest of Central American countries, Honduras has made efforts to move further away from Central American Common Market (CACM¹²) to a customs union (ECLAC, 2006: 140; Osterlof, 2004: 27), which agreement is currently in the process of ratification by the respective National Congresses (SIECA, 2008: 5). Additionally, Honduras has established Trade Agreements with Mexico since 2001; Dominican Republic since 2001; the Republic of China (Taiwan) since 2008; Panama since 2009; one is under ratification with Chile; and others are still in negotiation with Canada, Colombia and the European Community (SIECA, 2009: 16-22).

Under this scenario the patterns of production in the agricultural sector were clearly altered. As can be noticed, within this new productive structure, the expansion of non-traditional agricultural

¹⁰ After one year of negotiations, Honduras signed the DR-CAFTA agreement on May 2004, and its National Congress ratified it on March 2005. In the case of the U.S., its Congress ratified the free trade agreement on July 2005 (Jansen et al., 2006: 4).

¹¹ Panama negotiated separately.

¹² Established in 1960 by Central American countries to facilitate regional economic development through free trade and economic integration (SIECA, 2009: 1), to which Honduras returned in 1992.

products, including vegetables, continued to be favored. Participation of non-traditional exports in total exports has increased significantly: in 1990 they represented 20 percent of total exports and by 2007 they reached more than 50 percent (Figure 2.1.). The same tendency applies for non-traditional agricultural exports; in 1990 the most important crops reported revenues of almost US\$50 million while in 2007 they accounted for almost US\$450 million, representing an estimated annual average growth of 11 percent during that period (Figure 2.1.).

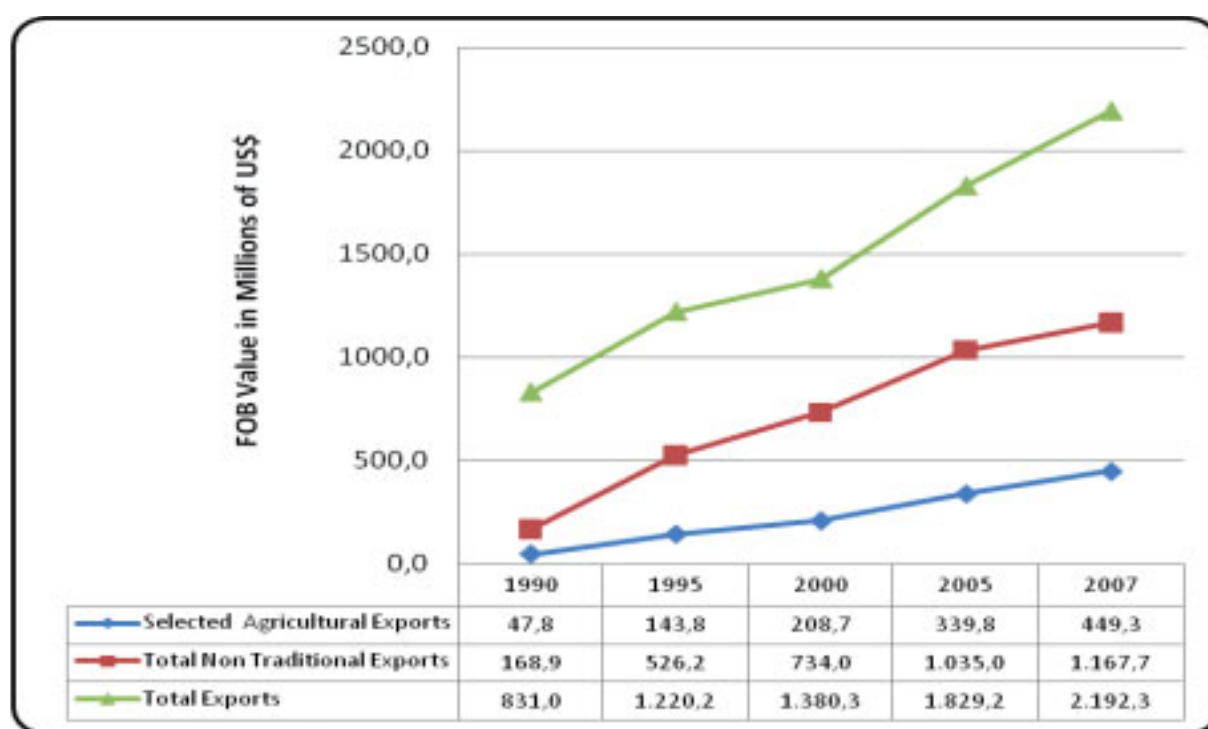


Figure 2.1. Value of non-traditional agricultural exports

Note: Selected Non Traditional Agricultural Exports include: cultivated shrimp, tilapia, melons, pineapples, palm oil, vegetables and prepared fruits and vegetables. 2005 and 2007 include preliminary data.

Source: Own elaboration based on data of Central Bank of Honduras, 2008

Exports of vegetables including fresh and prepared/preserved also reacted positively and continue showing dynamics. In 1994 they reported revenue of 4.5 US\$ millions while in 2007 it increased to almost US\$ 50 millions, registering an estimated annual average growth of 15 percent (Figure 2.2). In 2007, exports of vegetables accounted for 2.2 percent of total export. Trade of vegetables is particularly intense with the U.S. and with other Central American countries such as Guatemala, El Salvador and Nicaragua.

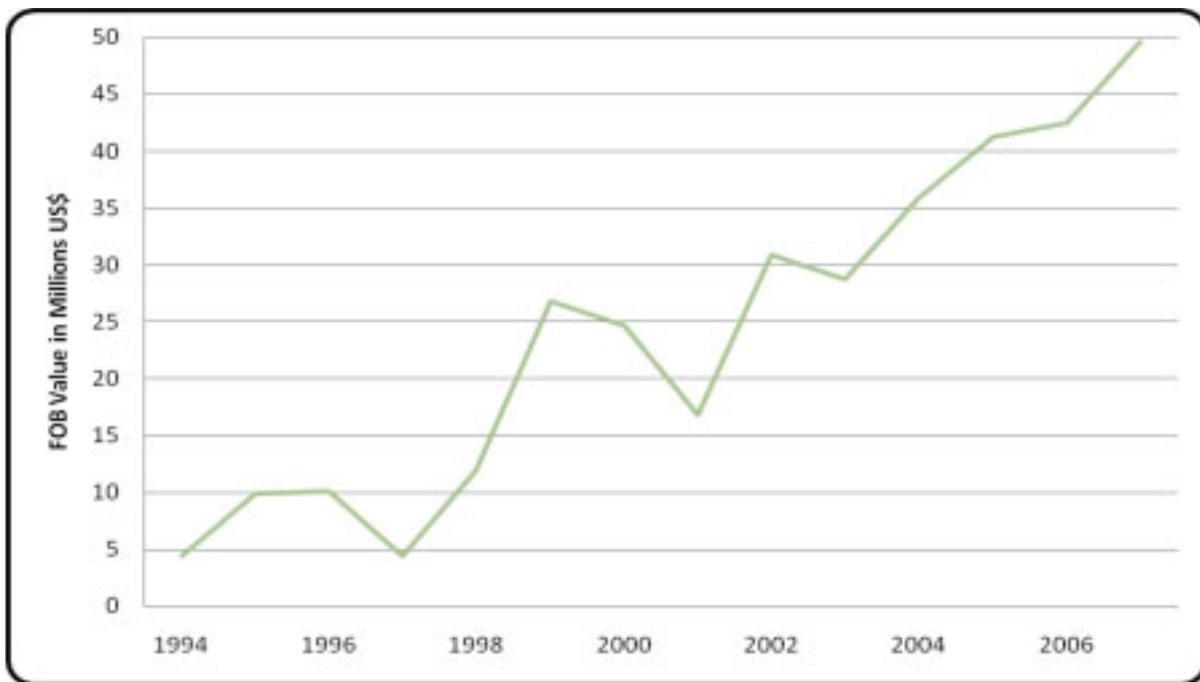


Figure 2.2. Value of vegetable exports (Millions US\$)
Source: SIECA, 2009

Nevertheless, the significance and participation of vegetable export crops along with other non-traditional agricultural exports such as shrimps, tilapia, melons and pineapples have progressively increased (Figure 2.1). Their contribution has not been enough to improve the situation of the agricultural sector, and the same tendency can be observed in general when referred to total non traditional agricultural exports in terms of the whole economy (Hernández Chávez, 2005: 263-70; RUTA, 2006: 33). As Paunovic and Rivas (2007: 8) reveals, in despite of the fact that that total exports have increased intensively during recent decades, the GDP has not grown at a constant and sustained rate. In fact, growth in the agricultural sector falls behind other sectors in the economy (Jansen et al., 2005: 19; Jansen et al., 2006: 16; RUTA, 2006: 33). As shown on Table 2.1 the contribution of the agricultural sector to the Gross Domestic Product has decreased from 23.7% in 1980 to 13.9% in 2005.

Table 2.1. Shares in GDP and growth rate by economic sector 1980-2005

Economic Sector	Percentage of GDP				Average Annual Growth (Percentage)		
	1980	1990	2000	2005	1980-1990	1990-2000	2000-2005
Agriculture	23.7	22.4	16.2	13.9	2.7	2.2	3.4
Industry	24.3	26.4	31.6	31.4	3.3	3.6	3.6
Manufacturing	15.0	16.3	19.6	20.1	3.7	4.0	4.2
Services	52.0	51.2	52.2	54.6	2.5	3.8	4.3

Source: World Bank, 2006

According to several analysis (RUTA, 2006: 33-4; Jansen et. al., 2006: 15-7; Paz Cafferata, 2004) this drop in the participation of agricultural sector in GDP, was mainly induced by several factors: i) structural changes in the sector derived from the application of inappropriate policies¹³; ii) declining terms of trade¹⁴; iii) appreciation of real exchange rate¹⁵; iv) lowering of import duties¹⁶ and; v) the negative effects caused by hurricane Mitch on agricultural production capabilities.

Additionally, Sanders et al., (2006: 6) argues that the inadequate performance of the sector derives from its low level of productivity, and the relative low efficiency in the use of capital. Those factors can subsequently be explained through the predominance of a low educated labor force and the modest application of modern technologies. These authors also refer to the lack of productive infrastructure which increases transaction costs.

Table 2.2. Shares in total exports by economic sector in 2007

Economic Sector	Percentage of Total Value of Exports
Agriculture	54.6
Agro Industry	11.7
Manufacturing Industry	28.4
Mining Industry	5.2
Total	100

Source: Central Bank of Honduras, 2008

Despite the reduction in participation of GDP, the agricultural sector remains essential for the economy. In 2007 agricultural exports represented 54.6 percent of total exports and agro industrial exports 11.7 percent (Table 2.2). Furthermore, the sector employs 34.5 percent of the economic active population, more than any other sector (Table 2.3); and it also influence the performance of other sectors such as industry, transport, storage and other productive activities as well as services.

¹³ Macroeconomic policies, such as monetary and fiscal policies, have reduced competitiveness of the sector through the promotion of relative low prices and high costs of production for national products (Paz Cafferata, 2004).

¹⁴ Diminution on international prices of the traditional exports (banana and coffee) not compensated by the revenue derived from non-traditional agricultural exports (RUTA, 2006: 33; Jansen et al., 2006: 15; Paz Cafferata, 2004)

¹⁵ Resulting from the increase in: revenues generated by maquilas, remittances from abroad and external aid received after devastation caused by hurricane Mitch in 1998 (RUTA, 2006: 33; Jansen et al., 2006: 17; Paz Cafferata, 2004).

¹⁶ Leading to the substitution of locally produced agricultural products by low-priced imports (Paz Cafferata, 2004).

Table 2.3. Shares in economically active population by economic sector in 2007

Economic Sector	Percentage of Total EAP
Agriculture	34.5
Manufacturing Industry	14.8
Construction	6.7
Transport, Storage and Communications	3.7
Restaurants and Hotels	21.2
Financial Services and Insurances	3.3
Others	15.8
Total	100

Source: Central Bank of Honduras, 2008

2.1.1 Structure of the Vegetables Sub-sector

In Honduras the production of vegetables is carried out mainly in a small scale by small producers¹⁷. It is estimated that approximately 15,000 small production units are involved in horticultural production (MAH 2002: 4; Lundy et al., 2007: 216). FAO (2005) reported 9654 production units of cassava, 3092 of tomato, and 2283 of cabbage. The size of these units oscillate between 0.3 and 5 ha (MAH 2002: 4), the average is less than 1 ha, with the exception of cucumbers which have an average of 5.32 ha (FAO, 2005). Production mostly remains in local markets (MAH 2002: 4; FAO, 2005), and as it will be observed ahead, the production of tomato, cabbages, and cucumbers stands out from the rest (Figure 2.7).

When referring to the domestic value chain of vegetables, it is possible to identify relationships between several direct actors such as producers, producers' organizations intermediaries, wholesalers, processors, open markets, importers, retailers and the consumer (Figure 2.3.).

Lundy et al. (2007: 214-15); Hellin et al. (2007: 11); and Rodriguez (2007:32-3), classify producers of vegetables according to their linkages to markets in three categories (figure 2.3): Type I includes unorganized small producers without exclusive buyers. Type II comprises small producers organized in formal producers associations (e.g. cooperatives, associations or farmer owned business) which commercialize the product through associative enterprises. Type III includes independent small producers with a secure buyer, usually local supermarkets. Accordingly, Type II and III producers have more access to improved technology¹⁸; technical assistance¹⁹, better

¹⁷ Here, small producers are defined as those who own less than 5 ha of land, lack capital and sometimes labor.

¹⁸ Inputs, irrigation, and seed beds.

¹⁹ Type III have no access but they have good knowledge based on experience.

conditions to access market²⁰ and more resources²¹ compared to Type I producers. The vast majority of producers are those belonging to Type I, small producers participating in the chain individually and only 2.6 percent of total farmers take part in producer's organizations (Lundy et al., 2007: 216 based on Agropyme, 2005).

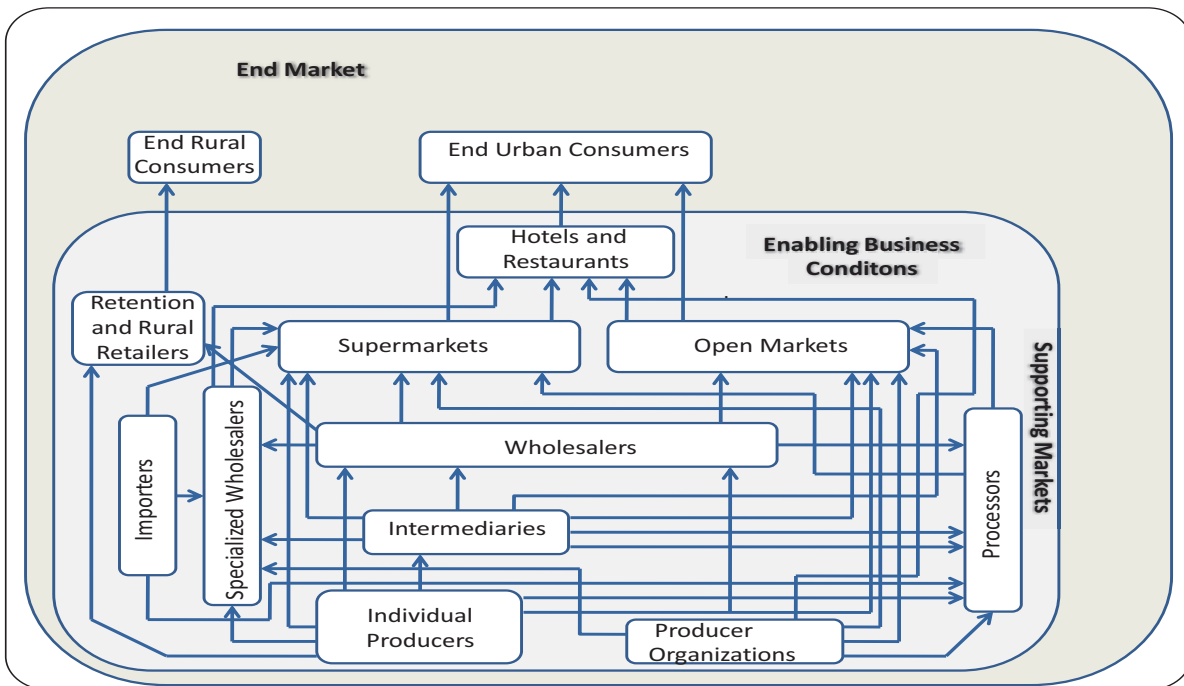


Figure 2.3. Domestic value chain of vegetables (flow of product)
 Source: Own elaboration based on Rodríguez, 2007; MAH, 2002; and Loma-Ossorio et al., 2000.

Traditionally, producers have been connected to regional and local markets through intermediaries or informal traders known as “coyotes”, they buy the grower’s products at the farm gate to be sold to urban wholesalers (Lundy et al., 2007: 216; Hellin et al., 2007: 9; Chambers et al., 2005: 7; MAH, 2002: 7). Payment for supplies is normally done in cash and intermediaries command limited product quality (Lundy et al., 2007: 216; Hellin et al., 2007: 9). Chambers et al., (2005: 7) and MAH (2002: 7) claim that “coyotes” have usually pursued exploitative rather than win-win relationships. They tend to keep as much information as possible from both their suppliers (producers) and their buyers. In fact, Chambers et al., (2005: 3) extrapolate this lack of credibility to other actors, which has led to an ever present mistrust atmosphere in the chain. For instance, large buyers do not trust small producers to deliver the product in right quantities and quality, and

²⁰ Packaging, transport, market information, price conditions, and use of standards.

²¹ Land, labor and capital.

farmers do not trust extension services because of ineffective advice. However, in the modern retail system, formal producers associations (Type II) and individual producers (mainly Type III) are linked to specialized wholesalers and/or directly into supermarkets, restaurant and hotels (Rodríguez, 2007: 36-7; Lundy et al., 2007: 216; Hellin et al., 2007: 9).

Because of the increasing number of consumers demanding more variety, at flexible hours and in a safe place, presence of supermarkets in the country is growing fast (Rodríguez, 2007: 12). Some sources state that supermarket industry in the country is growing at a rate of 20 percent per annum. Moreover, since beginning of 2006 the global retailer Wal-Mart has consolidated its participation in the retail sector of the country. In March 2009, Walt-Mart reported 51 retail units in Honduras (Walt-Mart, 2009: 1). The retailer now operates hypermarkets, supermarkets and discount stores and is becoming the largest retailer in the country. Currently, Walt-Mart/Honduras, obtains more than sixty percent of their supply needs from approximately 100 producers (Painter, 2009: 1). As a result, concentration is emerging in the retail sector.

According to Hellin et al. (2007: 13) the application of standards and grades by supermarkets vary depending on the availability of the product in the market, the relationship with the supplier, and the going price. The same authors have observed that specialized wholesalers enjoy improved bargaining power due to investments in refrigeration, grades and standards, and consistent supply, therefore are able to negotiate with supermarkets in better position.

Although it is quite clear that retail sector is consolidating rapidly in the country, one has to be aware that currently they are concentrated around major cities. For instance, the two most populated cities, Tegucigalpa and San Pedro Sula, together have approximately 2 million inhabitants (approximately 25% percent of the country's total population) and according to Rodríguez (2007: 19) only 30% of them buy in supermarkets. Additionally, Reardon (2005: 4) argues that empirical studies have clearly revealed that supermarkets' share in fresh produce retail is lower than its overall food retail. Based on this, we can affirm that open markets such as fairs, local markets and street traders are still the predominant channel of distribution for vegetables in the country. This particularly is due to the low income of the majority of the urban population.

These traditional open markets offer competitive prices, but are characterized by lower quality products and inferior hygienic conditions. There is some grading though not standardized. Grading

is based on visual attributes such as size, cleanliness, maturity, colour, shape, etc. However, they continue serving the poor in urban areas.

In rural areas, household consumption of vegetables is either from own production, neighbor, roadside traders, local markets or local retailers. Similar to the open markets in urban areas, prices are competitive and quality as well as hygienic conditions are also limited and standards are absent.

In the case of processors of vegetables, they are primarily supplied by producers, intermediaries and wholesalers. However, the amount produced locally is less than the demanded and therefore, in order to sustain the market processing companies more often do not buy from importers (Loma-Ossorio et al., 2000: 103). Furthermore, supplying from individual or associated local producers didn't work out, unless the processor provided them technical assistance and financial support (Loma-Ossorio et al., 2000: 104). The reason is the need to ensure a constant supply of quality and cost competitive raw materials (FINTRAC/CDA, 2003: 1).

Correspondingly, the processing activity of vegetables in Honduras is scarce, prepared and canned vegetables are mainly imported (MAH, 2002: 8). As a result, in Honduras, vegetables are mainly consumed fresh, and the country is a net importer of processed vegetables. The main processed vegetables include concentrated tomato and tomato sauce, as well as pepper in brine. The production of some handcrafted products such as pickled vegetables and cassava chips still subsists. Some local processors have the capacity to distribute their products throughout the entire country, either through their own means of transport or through specialized wholesalers (Loma-Ossorio et al., 2000: 103).

In relation to the production of vegetables for export (Figure 2.4.), this activity is also mainly done by small producers. However, some products²² as cucumbers, gherkins and peppers are grown in exporters' own plantations. In effect, this is an expression of the vertical integration exercised by several companies present in the sub-sector and at least one of them joins the category of transnational company. This foreign company performs practically all functions in the chain including growing, packing, importing and distribution of vegetables sourced from diverse locations in Latin America and then sold in the U.S. market.

²² Melons and watermelons export companies, which also include integrated processing activities (MAH, 2002: 5).

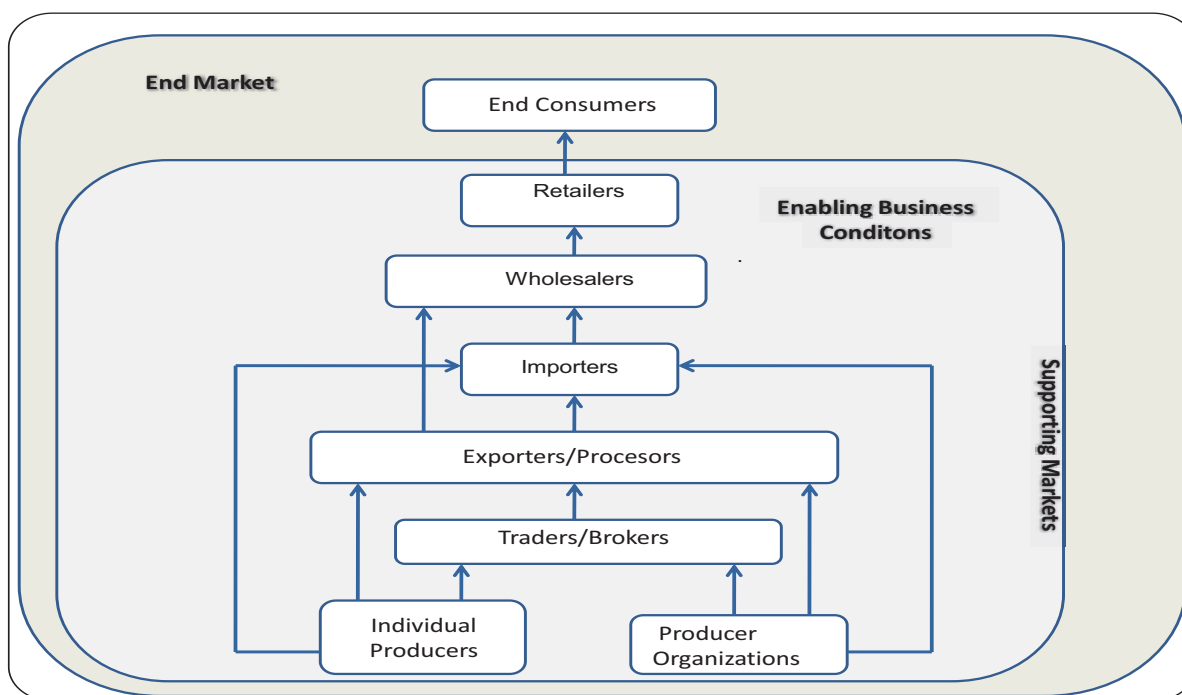


Figure 2.4. Exports value chain of vegetables (flow of product)

Source: Own compilation

Nevertheless, contract farming is apparently the main way used to regulate the exchange of agricultural production. Even those large companies with their own plantations rely on local producers' supplies. Imbruce (2007: 73) states that in 2004 there were fifteen agro-exporting companies in Honduras and at least five out of these fifteen practice contracts with small farmers. Through production contracts, these companies handle all aspects of production, including provision of inputs, monitoring of production, technical assistance, collection (sometimes), processing of the harvest²³ and export of the produce. As can be seen, these contractual arrangements with agro-exporters define producers' resources access, in some particular cases contracts have even served as collateral for producers to obtain credit from banks as has been the case in production of Asian vegetables.

Exports of processed vegetables are minor. Furthermore, the majority of Honduran exports in the non-traditional agriculture sector are based on fresh products, which clearly show that Honduras is positioned in the segment of commodities rather than in value adding activities. FINTRAC (2003) indicates that only a small percentage is exported as fully processed products, most of them are

²³This is the case when the company is also involved in export of processed products.

semi-processed products. Exports of semi processed vegetables include jalapeño pepper and concentrates. Exporters of these semi-processed vegetables are supplied through contract production.

2.1.2 National Production of Vegetables

Vegetables are grown in various parts of the country (Table 2.4). However, production in a commercial scale is mainly concentrated in the central region, which covers the departments of Comayagua, La Paz and Francisco Morazán, as well as in the Western region, which covers the departments of Intibucá and Ocotepeque (Figure 2.5) (Loma-Ossorio et al., 2000: 91; MAH, 2002: 5). The Southern region (departments of Choluteca and Valle) of the country has witnessed the development of a creditable melon industry; concentrating approximately 7,000 ha of crop managed by 8 companies integrating processing and export activities (MAH, 2002: 5).

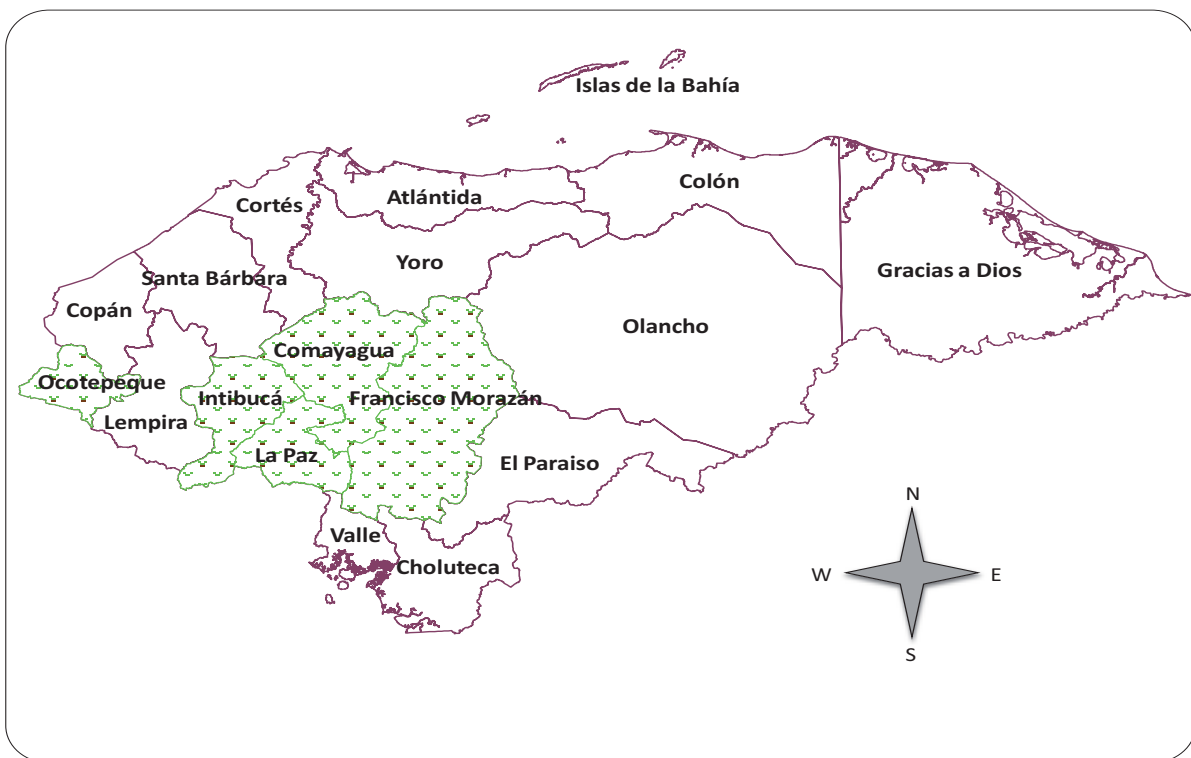


Figure 2.5. Main areas of vegetables production in Honduras
Source: Own elaboration based on MAH, 2002

These regions present comparative advantages to produce and deliver horticultural crops into the market. They offer natural conditions, infrastructure and services that producers and firms can draw upon to produce vegetables in a commercial scale (Ibid).

Table 2.4. Vegetables production areas in Honduras

Production Areas*	Major Vegetables		Notes
	Domestic Market	Export	
Central Region			
Comayagua, La Paz and Francisco Morazán	Tomatoes, onions, peppers	Asian vegetables, cucumbers, gherkins, Tabasco pepper	Comayagua is country's main exporting region of vegetables
Western Region			
Intibucá and Ocotepeque	Lettuce, cabbage broccoli, cauliflower, carrot, potatoes, onions	Potatoes and onions	Ocotepeque is country's main producing region of onions
Oriental Region			
Olancho, El Paraíso and Yoro	Tomatoes, pepper, water melons, onions, cassava, pumpkins	Asian vegetables	
Southern Region			
Choluteca and Valle	Onions, jalapeno pepper, okra	Melons and watermelons	
Northern Region			
Cortés, Colón and Gracias a Dios	Cassava and jalapeno pepper		

*Includes only the main departments in terms of horticultural production in each region.

Source: Own elaboration based on MAH, 2002

In spite of the restrictions it confronts, the subsector has showed an outstanding dynamism on the last years. In 2007, total production of vegetables (melons and watermelons are not included) doubled in comparison to 1997; the harvested area has also increased as can be seen in Figure 2.6. This increase in productivity has been influenced by the adoption of new technologies such as drop irrigation, hybrid seed, crop rotation and transplant practices, predominantly introduced by companies producing and trading tomato, cucumbers and Asian vegetables (FAO, 2005).

As has been previously indicated, prominent among the variety of vegetables, is the production of tomato, cabbages, cucumbers, gherkins and potatoes (Figure 2.7.). Based on FAO data, production of tomatoes in Honduras between 2001 and 2007 has grown at an estimated average annual rate of approximately 20 percent, but as Hellin et al. (2007: 13) points out, production of tomatoes is mainly done by medium and large scale producers with access to capital. Cabbages have been less dynamic, yet their production has registered growth of approximately 9 percent and cucumbers and gherkins exhibited approximately 4 percent growth during the same period. Although production volume has increased, the country remains a net importer of vegetables and the tendency is to import processed products.

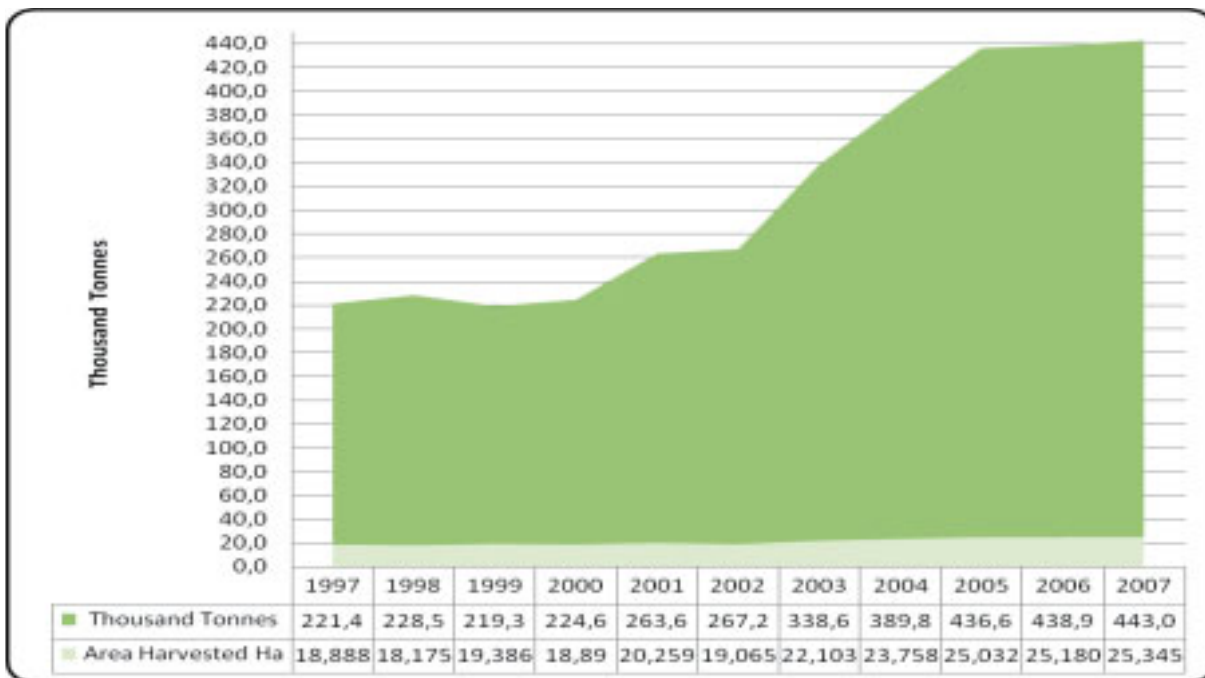


Figure 2.6. Production and harvested area of vegetables (1997-2007)
 Note: Includes vegetables, roots and tubers. melons and watermelons are not included.
 Source: Own calculations based on FAOSTAT, 2009

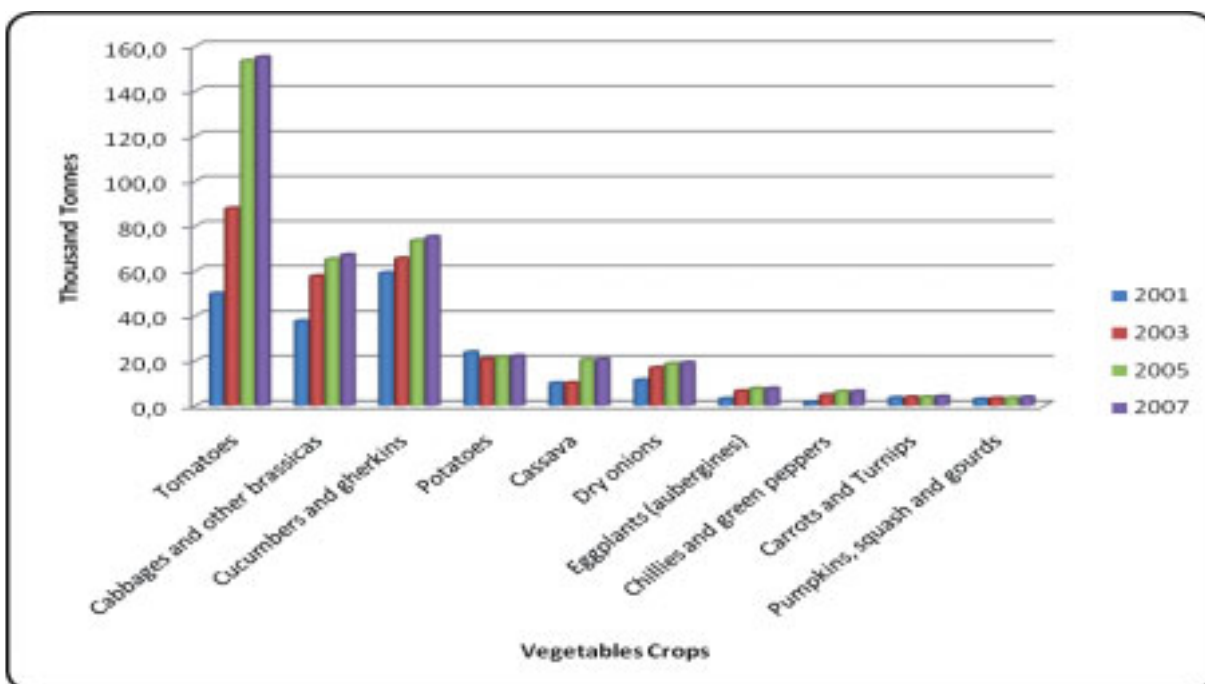


Figure 2.7. Production quantity of main vegetables for selected years
 Source: FAOSTAT, 2009

On the other hand, taking into consideration the potential of the country to produce vegetables, this continuous increase in production and harvested area observed in the last years becomes modest

when compared with neighboring countries such as Guatemala and Costa Rica, the main producers and exporters of vegetables from Central America (Table 2.5). However, we can deduce from the same table that in 2005 and 2007 the yield in vegetables production was slightly higher in Honduras compared to the yield in those two countries.

Table 2.5. Production and harvested area of vegetables for selected years in Central American Countries

Country	2001		2003		2005		2007	
	Tons	Hectares	Tons	Hectares	Tons	Hectares	Tons	Hectares
Guatemala	904,7	63,110	1.047	69,977	1.137	71,739	1.002	69,400
Costa Rica	567,6	43,569	479,3	37,961	597,3	39,612	553,7	37,070
HONDURAS	263,6	20,269	338,6	22,103	435,7	25,032	443,0	25,345
El Salvador	153,0	10,405	160,0	10,346	186,4	11,978	250,5	14,063
Nicaragua	141,6	22,000	173,4	26,050	192,0	31,450	190,9	30,300

Note: Production in Thousand Tones. Melons and water melons are not included. Include roots and tubers.

Source: Own elaboration based on FAOSTAT, 2009

2.1.3 Critical Issues and Challenges for the Subsector

Horticultural production in Honduras evidences a limited development, basically attributable to the small scale of production (MAH, 2002: 4; Loma-Ossorio et al., 2000: 91). In turn, this reduced scale of horticultural production is in general a consequence of the constraints faced by small producers such as: i) limited productivity (lack of capital, land, technology and skills); ii) insufficient knowledge of markets (lack of timely, relevant and reliable information); iii) high risk (poor bargaining power, insufficient logistic and inadequate infrastructure); iv) high transactions costs (geographical isolation and lack of knowledge on markets); and v) land fragmentation and many of those who own land have only tiny plots to cultivate (Ibid).

In addition, as MAH (2002: 8) stresses, that commercialization of vegetables in Honduras is mainly done in an informal regime²⁴ characterized by speculation²⁵, absence of clearly defined standards²⁶, and application of a biased measurement system²⁷, intensifying the difficulties faced by producers.

²⁴Take place in the informal economy: In reference to the small-scaled operations, the predominance of family ownerships and performance of unofficial business activities (no registration of the company, therefore, without guarantee and legal protection).

²⁵Price volatility, they change from one day to another.

²⁶As has been mentioned before, there is some grading though not standardized. Grading is based on visual attributes such as size, cleanliness, maturity, colour, shape, etc.

²⁷Vegetables are bought in loads composed by bulks or sacks employing as standard the number of units in the sack.

These constraints indicated above are magnified when several factors²⁸ which distinguish vegetables production are taken into consideration. Given their characteristics, production of vegetables requires more skills and modern technologies, with respect to traditional crops; production costs of vegetables are higher; more labor is required; they are more sensible to pests and diseases as well as adverse environmental conditions; vegetables have a reduced shelf life, which therefore requires adequate post harvest handle, storage and distribution in order to sell them fresh.

Collective action²⁹ on the part of the producers in the sub-sector is weak. There is no formal organization that brings together all horticultural producers of Honduras and just a narrow number of vegetables crops present some sort of producers association (Loma-Ossorio et al., 2000: 105). This has critical consequences on the way producers carry on their activities and participate in the subsector, because they lack negotiating power in relation to their buyers and input suppliers, likewise they have no capacity to lobby at a political level. According to Hellin et al. (2007: 20) existing vegetable producer organizations in Honduras include less than 5 percent of total producers. These authors have identified as possible causes for this, the limited business skills within existing producer organizations; non replicable organizational models for linking small producers to dynamic markets (e.g. too costly in terms of time and financial resources with limited benefits); and a general uncertainty about the benefits that small producers can expect from the supermarket channel. Then here again, as Chambers et al. (2005: 3) has highlighted, disincentives to cooperate in the horticultural sub-sector of Honduras derive from the history of mistrust among value chain actors.

Hitherto, we have observed that in Honduras the structure of the procurement system of vegetables is also changing, as is also happening in other countries. This change with no doubt is likely to have significant implications for small producers who currently dominate production.

Procurement of vegetables by supermarkets signing agreements and contracting farmers directly or through specialized suppliers rather than procuring from traditional wholesalers or intermediaries is gaining popularity. As several studies (Reardon et al., 2006: 3-12; Reardon and Berdegúé, 2002: 378-82; Dolan and Humphrey, 2004: 497-502; Goldmark and Barber, 2005: 2-8; Reardon, 2005:

²⁸ Author's compilation.

²⁹ Here collective action is narrowly considered in terms of formal farmer organization.

18-31; Humphrey and Memedovic, 2006: 31-39;) have shown, for retailers this has the advantage of improving traceability and is also oriented to promoting quality products, consistent supply and more variety. Furthermore, from these same studies it can be deduced that under this scheme producers associations (Type II) and medium to large scale producers (Type III) seems to fit better, since marketing their products as if from one grower enjoy economies of scale, as costs like that of transport are shared among them, thereby lowering the unit cost. In addition, this is advantageous to buyers, since coordination and transaction costs are lowered when they deal with a group of producers or a large supplier rather than each small producer at a time. For small individual producers of Type I the picture is different, now they confront new challenges. Those unorganized small producers risk being forced out of the chain, as more costs are expected to arise from crop management practices to ensure adherence to standards, and as well as from improving storage facilities and transport conditions. Additionally supermarkets have the capability to buy from international suppliers without many restrictions, which increases competition for local small producers.

The horticultural sub-sector does not receive the required support to be competitive and to increase the income of stakeholders. For instance, restraining us to one constraint, the provision of sector-specific technical support in production and marketing activities is not regular and is usually dispersed, leaving producers adrift. Here, it is worthy to emphasize the work of Honduran Agricultural Research Foundation (FHIA) and several international cooperation agencies which have contributed with important efforts oriented to overcome these difficulties.

2.2 Value Chain Analysis³⁰

Before entering into the review and discussion of theory of value chain governance, it is essential to introduce other important aspects related to value chains analysis, which in fact have significant implications on chain governance.

Value chain analysis focuses on the chain or organizational network as the unit of analysis, rather than the firm (Gereffi et al., 2001: 2). Different definitions of the term value chain have emerged with regard to diverse connotations conferred to value chain framework (Ibid). Nevertheless, a

³⁰ The steps followed to analyze the value chain in this study are described as part of the theoretical framework (see section 2.7).

value chain is more than a sequence of value adding activities or vertical linkages. There are additional elements around it that shape the way it functions (Figure 2.8).

In this study value chain is defined as a socioeconomic system which consists of a set of interdependent firms (actors) performing a sequence of value adding activities required to bring a product from conception to consumption (based on Kaplinsky, 2000: 4; Gereffi et al., 2001: 4; Schmitz, 2005: 4; The Global Value Chains Initiative³¹, 2006; Altenburg, 2006: 36; and GTZ, 2007: 6). In light of the given definition a value chain includes different elements that constitute its structure which are described in next section.

2.2.1 Structure of the Value Chain

In accordance with the definition of value chain adopted in this study, it becomes important to bring in the elements which constitute it.

Kula et al. (2006: 11-15) describe the structure of the value chain as consisting of the following elements: i) vertical relations; ii) horizontal relations; iii) the enabling environment; iv) the supporting markets; and v) the end market (Kula et al., 2006: 11-15). According to these authors these elements are necessary to assess the performance of the chain. Their enclosure ensures both systematic and systemic analysis of the value chain factors and relationships affecting its competitiveness potential (Kula et al., 2006: 11-15; Roduner, 2007: 4). The schematic view of the structure is set out in Figure 2.8.

2.2.1.1 Vertical Relations

Vertical relations refer to the sequence of value adding activities that constitute the spinal cord of the chain (Figure 2.8). They are defined by the linkages among actors operating in a varied range of functions between raw material supply and final market distribution (Kula et al., 2006: 14) Actors performing different functions in the value chain are vertically linked through buying and selling relationships. Through these vertical relations is transferred knowledge, information, technical, financial and business services from one actor to another along the chain (Choudhary, 2008: 1). Vertical relations highlight the level of cooperation, coordination, trust, interdependency and power along the chain. Powerful actors act as coordinators, they have the capacity to set and impose

³¹ <http://www.globalvaluechains.org/concepts.html> [Accessed 08. 08]

criteria and requirements to regulate transactions in their chains. This explicit form of coordination is known in the value chain terminology as governance³² (Gereffi et al., 2005: 82). Therefore, the nature of vertical relations often determines the distribution of benefits between actors in the chain and influence on the creation of incentives and constrains to innovate in order to increase value added (upgrading) (Humphrey and Schmitz: 2001: 3; Dunn et al., 2006: 14). Furthermore, the competitiveness of the entire industry is affected by the efficiency of the transactions between actors vertically linked³³.

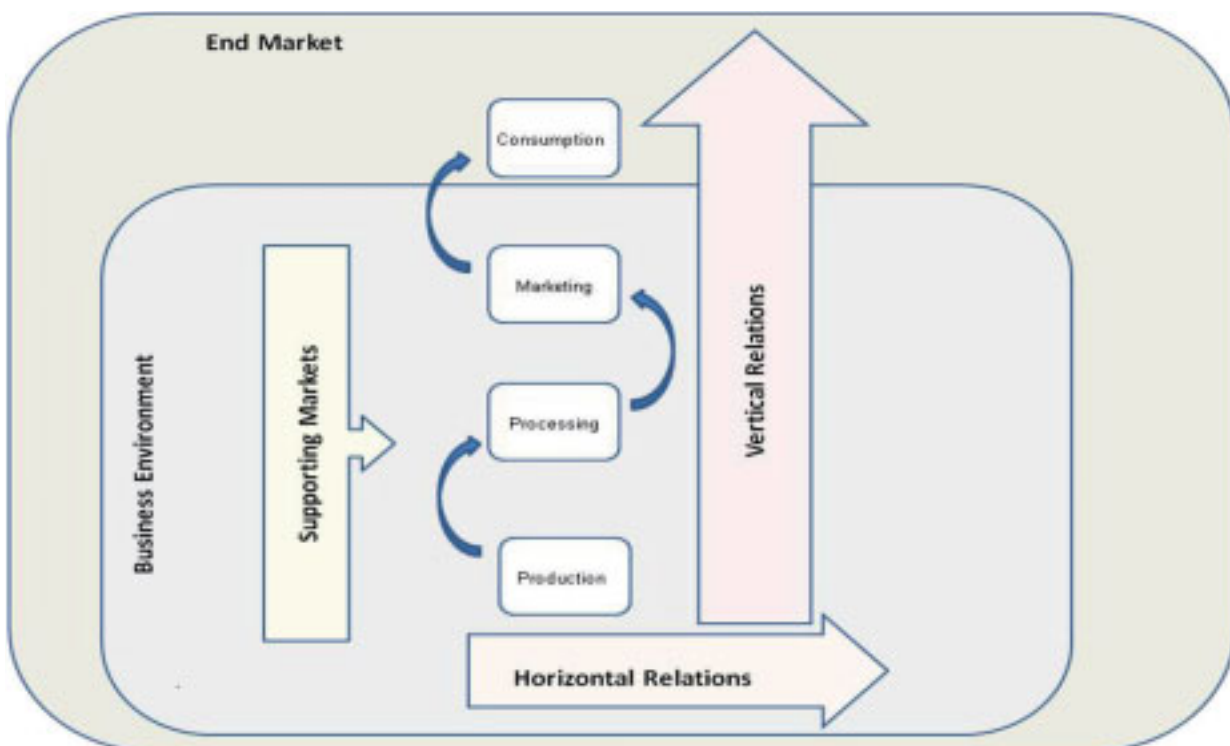


Figure 2.8. Structure of the value chain
Source: Own elaboration based on Kula et al., 2006.

2.2.1.2 Horizontal Relations

Horizontal relations reflect on the balance between cooperation and competition among actors performing the same function in the chain (McCarthy, 2008: 1). Horizontal relations can be formal (cooperatives and associations) or informal (Ibid). Reflection on horizontal relations calls attention

³² This issue is discussed in detail in the section theory of value chain governance (see section 2.3).

³³ USAID:

http://apps.develebridge.net/amap/index.php/Vertical_Linkages#Characteristics_of_Effective_Vertical_Linkages
[Accessed 01. 10]

to the presence or absence of collective action and its effect on the performance of the chain. Consequently, reveals the factors which influence the formation of formal and informal horizontal linkages such as trust, interdependency and institutional aspects. For instance, from the perspective of small producers it enables them to achieve economies of scale and increase bargaining power (Shepherd, 2007: 24; Downing and Campbell, 2007: 2). From the side of the buyer, working through groups can discourage non-compliance of contractual agreements and reduce the transaction costs associated with negotiating contracts, inputs supply and collecting outputs (Ibid). Formal and informal horizontal relations facilitate collective learning and increase the potential of innovating (McCarthy, 2008: 1).

2.2.1.3 Enabling Environment

Organizations do not operate in a vacuum (Lusthaus et al., 2002: 24). The enabling environment is referred as the forces outside the organization that can facilitate or inhibit the adequate performance of the chain (Svedoff, 1998 cited in Lusthaus et al., 2002: 24). It is made up by the institutions of a country, such as its legal and political systems. Institutions as defined by North (1990: 3) are the rules of the game. However, the enabling environment can be at the same time global, national and local (Kula et al., 2006: 11) and consist of the norms, customs, laws, regulations, policies, international trade agreements and infrastructure that influence the production processes in the chain (Downing and Campbell, 2007: 2). In this study it consists of the following elements: i) policy environment; ii) legal and regulatory framework; iii) infrastructure services; and iv) institutional services.

- 1) Policy Environment. It refers to the analysis of how macroeconomic policies, sectoral policies and trade agreements influence the conditions under which the actors in the chain participate (Kula et al., 2006: 11). It focuses on existing taxation, subsidies, tariff and non tariff structures affecting the competitiveness of the value chain actors (Shepherd, 2007:34).
- 2) Legal and Regulatory framework. Underline the impact of the local legal and regulatory system in the competitiveness of the actors in the chain (Downing and Campbell, 2007: 2). The ability to enforce contracts in the competent authority, the land tenure system, the existence of property rights and the food and sanitary laws are tackled (Shepherd, 2007:34).

- 3) Infrastructure Services. Identifies the condition and availability of the most important infrastructure services, such as roads for transport, electric supply and storage and refrigeration facilities and its effect on the performance of the actors (Lusby and Panlibuton, 2007: 13)
- 4) Institutional Services. Draw attention to aspects relating to market information and credit services. Institutional services involve attention to research and development activities, the availability of agricultural extension services, export market promotion and other information services, as well as the institutions responsible to provide them (Shepherd, 2007:35). Increasing importance is given to the possibility of establishing industry associations (Ibid: 36). It also recognizes the accessibility to credit services.

2.2.1.4 Supporting Markets

According to Kula et al. (2006: 13), supporting markets include a broad range of financial and non-financial products and services commercially provided by the private sector to support actors in the chain. These products and services are divided into three main categories: i) financial services such as lending, leasing and capital investment; ii) cross cutting services such as business consulting, legal advice and telecommunications; and iii) sector-specific services including irrigation equipment, handicraft design services and veterinary services (Downing and Campbell, 2007: 3). Supporting markets also include services or products provided by actors in the chain, in this case it is likely that as part of the transaction relationship the service provider provides services or products which are not paid directly by the recipient, although the recipient pays the service indirectly through higher input costs or lower prices received for the product he sells. For instance, export companies, in addition to export services, often provide technical assistance, finance and inputs on credit to their suppliers. The services³⁴ are embedded in the transaction the two parties have with one another (Ibid: 3).

2.2.1.5 End Market

The end market is where the final transaction takes place in a value chain. The end market can be local, regional or international (Kula et al., 2006: 13). It indicates the location of the final

³⁴ In this study these type of services are included as part of sector-specific services.

consumers, represented by the members of society for whom the product or service has been created, and who are not expected to resell that product or service. Analysis of the end market provides information about the segment to which the end user belongs. Determines the characteristics (price, quality, quantity and other attributes that define consumer preferences) of the final product or service (Kula et al., 2006: 13). End market analysis in value chains assesses current and potential opportunities, as well as takes into consideration trends, competitors and other factors (Downing and Campbell, 2007: 2). According to Barber (2008: 1) the development of a value chain should begin and end with the final market, whether is domestic, regional or global. This author affirms that suppliers of a product or service adapt according to the signals received from the demand in order to compete in the markets.

2.2.2 Application of Value Chain Analysis on Agricultural Commodities

Global value chain analysis highlights that access to international markets is achieved through entering into international networks, rather than merely producing or designing new products (Gereffi et al., 2001: 1). Therefore, understanding how value chains operate and are structured has important implications for new entrants, particularly those from developing countries (Ibid).

Value chain analyses are a good way to understand relationships and linkages among buyers, suppliers, and a range of market actors in between (Subramanian et al., 2007: 2). Furthermore, the focus on particular value chains leads the attention to micro-policy issues, such as inadequate sub-sector regulations and lack of specific skills, which otherwise would never be detected by policy makers (Altenburg, 2006: 41).

A variety of international agencies³⁵ (e.g., USAID, GTZ, FAO, and ILO) have generated their own methodologies to analyze value chains in developing countries aimed to further design value chains programs in these countries. According to Altenburg (2006: 33) most tools and guidebooks refer to the pioneering work of Kaplinsky and Morris (2000) and McCormick and Schmitz (2002). In addition, some of these agencies and others like the World Bank, UNIDO and OECD have commissioned value chain analysis to define points for policy interventions (Altenburg, 2006: 33).

³⁵ Merlin (2005) in a work commissioned by GTZ has identified and described a list of more than forty organizations working with the value chain approach in different economic sectors.

Nevertheless, most value chain analyses are not supported by any theory that enables them to justify, support and substantiate their findings.

In recent years value chains have been subject of considerable empirical attention, as result substantial value chain analyses are available that have been carried out in the agri-food sector. Some studies have focused on the two central issues to value chains, which are governance and upgrading, and their effect on the development prospects of a region. For instance, the effect of chain governance structures on the participation of developing countries' small producers in markets (local, regional, and international). Others studies have directed their attention to analyze agricultural commodities or sector state of growth and competitiveness in a particular region. For instance, to identify developing countries' small producers potential opportunities and challenges arising from trade liberalization. However, in general value chain analyses are aimed to uncover the strategic implications of value chain performance for governments, civil society, private sector and development/donor agencies. Following are listed a number of recent studies applying value chain analysis in agricultural commodities:

- **Governance:** Ponte, 2007; Fragata et al., 2007; KIT et al., 2006; Humphrey and Memedovic, 2006; Reardon et al., 2006; Reardon, 2005; Dolan and Humphrey, 2004; Humphrey et al., 2004; Humphrey and Schmitz, 2002.
- **Upgrading:** Pelupessy and Diaz, 2008; Humphrey and Memedovic, 2006; Millard, 2006; Fromm and Dubón, 2006; Pietrobelli and Rabelloti, 2004; Gibbon, 2004; Humphrey and Schmitz, 2002.
- **Competitiveness:** Grygiel, 2007; Jenkins et al., 2007; Subramanian et al., 2007; Derks and Lusby, 2006; Hichaambwa and Tschirley, 2006; Steen et al., 2005; Panlibuton and Meyer, 2004.

2.3 Theory of Value Chain Governance

Broadly, it may be claimed that literature on value chains has laid out a great emphasis upon governance. In fact as Gereffi et al. (2001: 4) stress, governance is a central concept to value chain analysis.

Governance in value chains context involves interaction between firms³⁶ and is usually associated to large firms exercising power, authority and influence over less powerful firms in order to coordinate and control production and sourcing activities in value chains. It refers to institutional mechanisms through which non-market coordination of activities in the chain is achieved (Gereffi et al., 2001: 4; Humphrey and Schmitz, 2001: 5).

Thus, governance implies the establishment and enforcement of particular standards and procedures to be met by suppliers. In other words, it defines what is to be produced (product design and specifications), how is to be produced, (process), how much is to be produced, when it is to be produced, and how it is transported (Humphrey and Schmitz, 2002: 6-7). As consequence, it shapes the incentives that drive chain actors' behavior (Kula et al., 2006: 14), defines markets access and distribution of gains (Schmitz, 2005: 6-7; Ponte and Gibbon, 2005: 3) as well as upgrading prospects across value chains.

According to Gereffi et al. (2001: 5) governance emerges in response to two distinct needs for coordination: Firstly, the involvement of more companies in specifying the products their suppliers have to produce. Secondly, these companies attempt to reduce the risk of suppliers' failure by coordinating the chain.

The importance of inter-firm governance to value chains came to light through the work on global commodity chains carried out by Gereffi and Korzeniewicz. Gereffi (1994) pointed out that the governance structure of global commodity chains is essential to the coordination of transnational systems and defines entry barriers. This researcher identified two polar types of governance called "producer-driven" and "buyer-driven" (Gereffi, 1994:97). Producer-driven commodity chains are characteristic of high-technology and capital-intensive production capabilities. In these chains coordination and control over the production process is exercised by the administrative headquarters of transnational corporations (TNCs) or other large integrated industrial enterprises (Ibid). In buyer-driven commodity chains, barriers to entry in production are low and the specifications are supplied by large retailers which act as the buyers and branded companies that design the goods. Frequently, these businesses do not own any production facilities; they are not manufacturers because they have no factories (Ibid). However, the global commodity chains

³⁶ This has been identified in this study as vertical relations between buyers and suppliers.

framework was criticized of being too simplistic and of being less effective in dealing with value chains lacking strong control exercised by a lead firm and later on was replaced by the global value chain analysis to include a wider variety of products, some of which lack commodity features (Gereffi et al., 2001: 2; Gibbon and Ponte, 2005:77).

Global value chain analysis makes emphasis in that coordination and control of globally dispersed production systems, despite their complexity, can be achieved without direct ownership (Gereffi et al., 2005: 82). Within this framework, Sturgeon (2000: 8-10) took the analysis on governance a further step forward allowing the identification of additional forms of governance. This researcher argued that externalization upstream in the chain not necessary involves low-profit and noncore functions as interpreted according to buyer-driven chains. This and additional observations regarding the insufficiency of the producer and driven dichotomy to explain some features of chain governance, led to the emergence of new classification of governance types (Gibbon and Ponte, 2005:79).

In the vein of new institutional economics and new economic sociology, the theory of global value chains governance attempts to explain why network forms arise instead of markets and hierarchies, but in addition tries to elucidate why it arises one type of network instead of another in dialogue with transaction costs economics (Bair, 2008: 353). Bair (2008: 353) explains that the influence of transaction costs economics is evidenced both by the focus on the dyadic transaction between two particular links (e.g. producer and exporter) and the emphasis on coordination as the substantive content of the governance dimension of global value chains.

2.3.1 Determinants of Value Chain Governance

Grounded in transaction cost economics, production networks and firm-level learning, proponents of global value chains (Gereffi et al., 2005: 84-85) have identified three variables that depending on their value determine how global value chains are governed and change. These variables are: i) complexity of transactions; ii) the ability to codify transactions; and iii) capabilities in the supply base.

Complexity of Transactions. Complexity of inter-firm transactions refers to the complexity of information and knowledge transfer required to sustain a particular transaction, particularly with respect to product and process specifications (Gereffi et al., 2005: 85).

The Ability to Codify Transactions. The extent to which complexity of the information and knowledge to be transferred can be mitigated through codification and, therefore, transmitted efficiently and without transaction-specific investment between the parties to the transaction (Ibid).

Capabilities in the Supply Base. It refers to the extent to which actual and potential suppliers have the capabilities to meet the buyers’ transaction requirements (Gereffi et al., 2005: 85).

Table 2.6 Key determinants of global value chain governance

Governance Type	Complexity of Transactions	Ability to Codify Transactions	Capabilities in the Supply Base	Degree of Explicit Coordination Power Asymmetry
Market	Low	High	High	Low
Modular	High	High	High	↑ ↓
Relational	High	Low	High	
Captive	High	High	Low	↓ ↑
Hierarchy	High	Low	Low	

Source: Gereffi et al., 2005

2.3.2 Value Chain Governance Types

Building on the three key determinants indicated above Gereffi et al. (2005: 86-7) have distinguished five analytical types of value chain governance patterns. These authors argue that in addition to the highest (hierarchy) and lowest (market) levels of explicit coordination and power asymmetry, three forms of network governance arise, namely modular, relational, captive value chains (Dolan and Humphrey, 2004: 493). Each type of chain governance provides a different trade-off between the benefits and risks involved in outsourcing (Gereffi et al., 2005: 87). The five types of value chain governance (see Figure 2.9) found are the following: i) market; ii) modular value chains; iii) relational value chains; iv) captive value chains; and v) hierarchy.

2.3.2.1 Market Governance

This is the simplest form of value chain governance. When product specifications are relative simple to communicate, transactions are easily codified and suppliers have the capability to make the product in question with little input from buyers market governance can be expected (Table

2.6). The central governance mechanism is price. (Gereffi et al., 2005: 86; Dolan and Humphrey, 2004: 493).

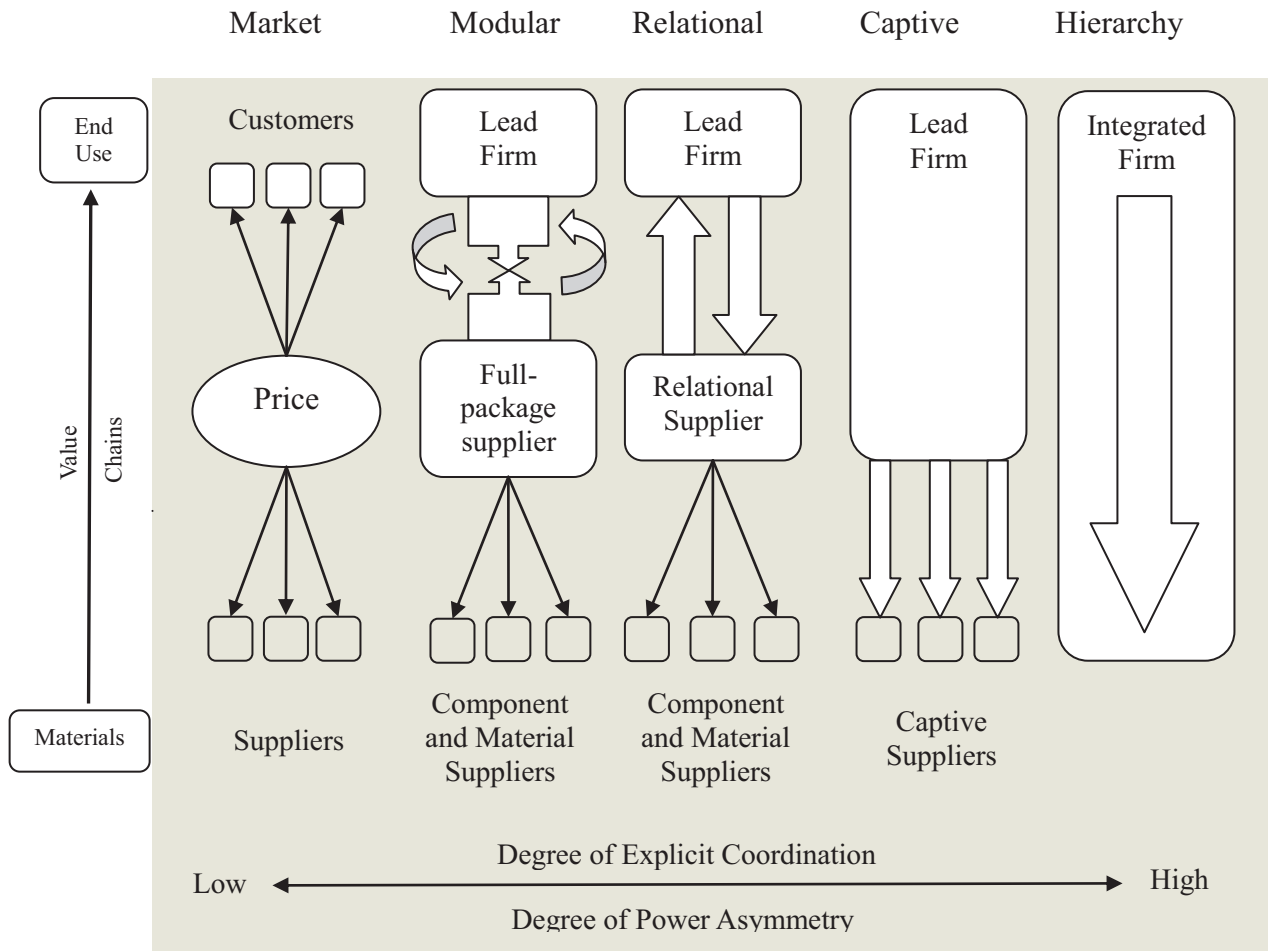


Figure 2.9 Value chain governance types
Source: Gereffi et al., 2005

2.3.2.2 Modular Value Chains

This is the most market-like of three network-style value chains governance patterns (Global Value Chain Initiative, 2006). When suppliers are competent, and information can be codified, then even complex information can be exchanged with little explicit coordination (Table 2.6) (Dolan and Humphrey, 2004: 493). Suppliers in modular value chains provide products to a customer's specifications and tend to take full responsibility for process technology and often use generic machinery that spreads investments across a wide customer base (Gereffi et al., 2005: 84-6). This keeps switching costs low and limits transaction-specific investments, even though buyer-supplier interactions can be very complex. Linkages (or relationships) are more substantial than in simple

markets because of the high volume of information flowing across the inter-firm link, but at the same time, codification schemes can keep interactions between value chain partners from becoming highly complicated and difficult to manage (Global Value Chain Initiative, 2006). According to Humphrey and Schmitz (2008: 264) in agricultural value chains, category management³⁷ is an example of modular linkage.

2.3.2.3 Relational Value Chains

When product specifications cannot be codified, transactions are complex, and supplier capabilities are high, this type of value chain pattern can be expected (Table 2.6) (Gereffi et al., 2005: 86). Interactions between suppliers and buyers are characterized by transfer of information based on mutual dependence regulated through reputation, social and spatial proximity, family and ethnic ties, and the like (Global Value Chain Initiative, 2006). Producers in relational chains are more likely to supply products differentiated in the marketplace as a result of their complexity, quality, origin or other desirable characteristics. As a result, dense interactions and knowledge sharing occurs, but unlike modular networks, this knowledge cannot be codified, easily transmitted or learned. Furthermore, relational linkages take time to build, so the costs and difficulties involved in switching to new partners tend to be high (Microlinks, 2008). The desire to establish relational versus more controlled linkages with suppliers can also be attributed to cultural preferences (Ibid). In agricultural chains relational governance occurs for instance, when supermarkets work directly with a limited number of importers with whom they establish long term relationships involving some element of risk sharing (Dolan and Humphrey, 2004: 500).

2.3.2.4 Captive Value Chains

In these type of chains small suppliers tend to be dependent on a few larger dominant buyers (table 2.6) (Gereffi et al., 2005: 84). This type of chain governance arises when the ability to codify and the complexity of product specifications are both high but supplier capabilities are low (Gereffi et al., 2005: 86). In this case, the buyer needs both to monitor supplier performance closely and possibly to invest in increase supplier capabilities (Dolan and Humphrey, 2004: 493). The

³⁷ Put it simply, category management refers to buyers having greater commitment to fewer suppliers and extending the range of activities performed by those suppliers (Dolan and Humphrey, 2004: 503-4). For instance, retailers manage business on a product category basis (e.g., salads), and within each category the value chain is consolidated, with a large part of its management transferred from the supermarkets to the importers (Ibid).

asymmetric power relationships in captive networks force suppliers to link to their buyer under conditions that are set by, and often specific to, that particular buyer (Microlinks, 2008). In agriculture value chains, outgrowing contracts are the best example of captive suppliers (Humphrey and Schmitz, 2008: 264).

2.3.2.5 Hierarchy

This governance form is characterized by vertical integration. In cases when product specifications cannot be codified, products are complex, and highly competent suppliers cannot be found, then lead firms will be forced to develop and manufacture products in-house (Table 2.6) (Gereffi et al., 2005: 87).

Stamm (2004: 25) asserts that this new range of governance forms provides a better understanding of the complex relations that was previously possible and presents theory-led hypotheses as an explanation of several structured value chains.

2.3.3 Limitations of Theory of Value Chain Governance

Gibbon and Ponte (2005) criticize that this framework developed by Gereffi et al., (2005) doesn't present a clear distinction between immediate forms of coordination and overall forms of governance. According to these authors focusing on a transaction costs or micro level approach to power the large picture is missed (Gibbon and Ponte, 2005: 83-85). In addition, Bair (2005) in agreement with the authors cited above, observes as a weakness of this framework, the lack of acknowledgement of broader institutional frameworks in which lead firms operate as is oriented towards the meso-level of sectorial dynamics and the micro-level of firm upgrading (Bair 2005:154).

Bair (2008: 353 footnote) adds that focusing on one particular link in the chain poses one important challenge for theory of value chain governance. This challenge will be to elaborate what it means to characterize an entire value chain on the basis on the coordination mechanism linking the lead firm to first tier suppliers. For instance, if the agri-food industry is characterized as a relational value chain building on the relation between supermarkets and importers or exporters, how does this coordination mechanism affect the governance structure of the next link in the chain (Bair, 2008: 353 footnote).

2.4 Transaction Costs Economics Theory

Transaction costs economics theory (TCE) is one branch of New Institutional Economics³⁸ (Rindfleisch and Heide, 1997: 31; Kherallah and Kirsten, 2001: 7). TCE is commonly used to understand many of the recent changes in vertical coordination in the agri-food sector of developing countries (Pignali et al., 2005: 9) and developed countries (Hobbs and Young, 2001: 26).

TCE emerged from R. H. Coase's (1937) seminal work on the "The Nature of the Firm" (Williamson, 1979: 233; Dietrich, 1994: 15; Jansson, 1994: 27; Maher, 1997: 147). Coase (1937: 390-4 and 1960: 15-7) introduced the importance of transaction costs on organizing economic activity as he argued that market exchange is not costless. He refers to transaction costs as the cost of discovering the relevant prices, bargaining about prices and fixing them as well as controlling that the prices agreed upon are enforced (Jansson, 1994: 27). Such costs are to be distinguished from production costs, which is the cost category with which neoclassical analysis has been centered (Williamson, 1985: 18). Therefore, transaction costs include the cost of information, negotiation and enforcement incurred to carry out any exchange (Hobbs, 1997: 1083) or to put it more simply the cost of doing business. Coase explains that the particular structure of the firm and the extent to which it will integrate vertically depends on the magnitude of these transaction costs (Coase, 1960: 15-17) (see Figure 2.10). In other words, transaction costs influence the choice and design of institutions (Masten, 1996: 59) that evolve to lower these costs (Bardhan, 1989: 1389).

The insights of Coase's analysis were carried forward by Williamson the most known and successful representative of the TCE theory (Levy, 1985: 438; Kherallah and Kirsten, 2001: 12). Williamson (1979: 233; 1985: 1; and 1995: 27) focuses on transaction as the basic unit of analysis and sustains that institutions such as contracts have the main purpose and effect of economizing on transaction costs. Williamson (1979, 245-6 and 1985:45) assumes that firms are not profit-maximizing entities, but above all, a cost economizing entities (Straub, 2007: 59).

³⁸ The purpose of the New Institutional Economics is both to explain the determinants of institutions and their evolution over time, and to evaluate their impact on economic performance, efficiency and distribution (Nabli and Nugent, 1989: 1335). See also North (1995: 17-26).

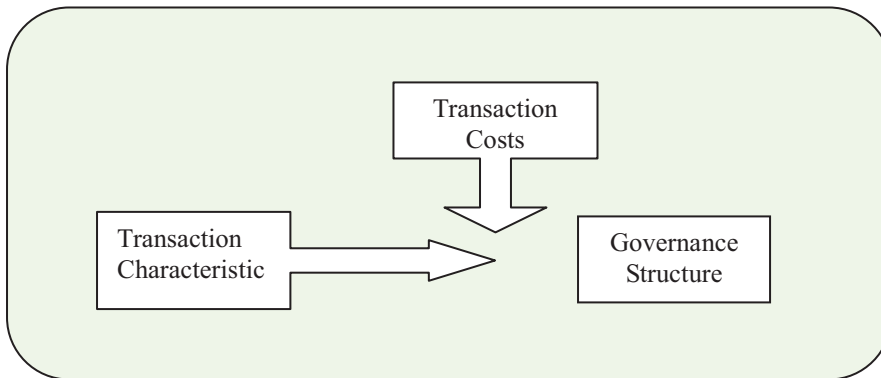


Figure 2.10. Simple Transaction Costs Economics Model
 Source: Own elaboration

2.4.1 TCE Theory Assumptions

Perfect information and costless exchange are key assumptions of perfect competition underlying neo-classical economics (Dorward, 2001: 60). Although it falls within main mainstream economic thinking, distinct to neo-classical economics Williamson (1985: 43-5) makes two behavioral assumptions on which TCE theory relies. These assumptions characterize human nature and they have implications on the cost of carrying out transactions. The first is bounded rationality, which refers to behavior that is intendedly rational but only limitedly so, and the second is opportunism, which refers to self-interest seeking with guile (Williamson, 1985: 44 and 1995: 27-8). These assumptions are constant characteristics embedded in human action and they cannot explain the variation in the organization structure. However, they are important in the sense that if they were not valid, then the arguments about the effects of the characteristics or dimensions that determine whether a firm will integrate vertically or not to lower transaction costs would not be valid.

Bounded rationality exists because individuals have inevitable limits on their abilities to assimilate or use information that is available and it is implausible to accurately foresee every future contingency (Dietrich, 1994: 19). This implies that economic actors are inevitably faced with incomplete information, therefore informational uncertainty exists (Ibid). For instance, producers of Asian vegetables in Honduras may be assumed to be rational, in the sense that they want to maximize their profits, but often they have very limited access to information, which limits their capacity to make a truly rational decision to achieve this end.

Opportunism exists because some individuals may violate the terms of the agreement sometimes when an opportunity (e.g. a situation of asymmetric information) for individual benefit occurs (Bijman, 2008: 11). More generally, opportunism refers to incomplete or distorted disclosure of information, especially to calculated efforts to mislead, distort, disguise, obfuscate, or otherwise confuse (Williamson, 1985: 47). It is responsible for real or contrived conditions of information asymmetry, which vastly complicate problems of economic organization (Ibid). For instance, producers of Asian vegetables may lie on quality to exporters by providing fruit treated with forbidden pesticides. Exporters may expect that some producers will act opportunistically some of the time, but they are not able to know in advance who is and who is not.

2.4.2 The Critical Dimensions of Transactions.

The explanation power of TCE theory comes from the three critical characteristics or dimensions characterizing a transaction identified by Williamson in his 1979 article “Transaction Costs Economics: The Governance of Contractual Relations” in the Journal of Law and Economics. TCE theory focuses on how these characteristics of a transaction affect the cost of handling it through markets or alternative institutional modes (Williamson, 1979: 234). They allow predicting the nature of the institutional arrangements or governance structures that are likely to emerge from different combinations of them (Joskow, 1988: 100). Governance structures lie between two extremes (Figure 2.11). At one end lies the anonymous spot market, which suffices for simple transactions involving standard commodities and at the other end lies the fully integrated firm (vertical integration), where trading parties are under unified ownership and control (Shelanski and Klein, 1995: 337)

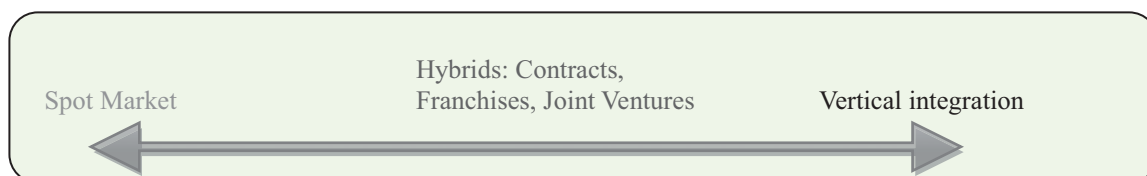


Figure 2.11 Types of governance structure
Source: Klein, 2009

The three critical characteristics with respect to which transactions differ identified by Williamson’s (1979: 246; 1995: 27) innovative analysis on TCE are: i) uncertainty; ii) the frequency with which transactions recur; and iii) asset specificity (this last being a measure of asset

redeployability). Others later added the complexity of the transaction as additional characteristic (Hobbs and Young, 2001: 26).

2.4.2.1 Uncertainty

According to Williamson (1985: 56-7) uncertainty (e.g. affecting quantity, quality or prices) arises because of bounded rationality and can as well be attributable to opportunism. He distinguishes two different and interrelated kinds of uncertainty associated with an economic exchange, namely primary or environmental and behavioral uncertainty (Williamson, 1985: 57-59).

Meuleman et al., (2006: 9) define environmental uncertainty as the uncertainty surrounding the underlying transaction which arises from changing conditions in the economic environment (e.g. changes in consumer preferences) or random acts of nature and will tend to be higher as the number of changes and their unpredictability increases. The same authors state that this kind of uncertainty may cause problems of communication, technological difficulties, coordination problems and, as a consequence, adversely impact in the final execution of transactions (Meuleman et al., 2006: 9).

Williamson (1985: 58) refers to behavioral uncertainty as that of strategic kind and is attributable to opportunism. This kind of uncertainty arises from human action and also from imperfect knowledge about the decision and plans of other actors. As a result, the more likely is it that problems arising from opportunism will emerge. Whereas environmental uncertainty makes it impossible to specify contracts ex ante, behavioral uncertainty refers to the difficulty to verify the performance of transaction partner ex post (Geykens et al., 2006: 520-1).

Even though, influential researchers perceive environmental uncertainty as the main source of economics problems (e.g. Coase, 1937: 638), Williamson concentrates on dealing with behavioral uncertainty which is, in turn, determined by the levels of asset specificity (Roemer, 2004: 24). In this regard he asserts that the interaction effects between uncertainty and asset specificity are important to an understanding of economic organization (Williamson, 1985: 60). Thus, as can be notice in Figure 2.12, uncertainty by itself, however, does not lead to risk of actual financial loss in a transaction: such losses are only incurred if a firm has invested in specific assets or fixed costs which are not recovered if the transaction fails (Williamson, 1985: 79; Masten et al., 1991: 8; Doward, 2001: 61).

		Uncertainty		
		Low	Medium	High
Asset Specificity	Low	Market Transaction	Market Transaction	Market Transaction
	Medium	Contract	Contract or Vertical Integration	Contract or Vertical Integration
	High	Contract	Contract or Vertical Integration	Vertical Integration

Figure 2.12. Relationship between asset specificity, uncertainty and governance structure
Source: Klein, 2009

Therefore, if uncertainty and asset specificity in a particular relationship is sufficiently high, considerable resources must be spend on control and monitoring (Wathne and Heide, 2000: 36). Consequently closer forms of vertical coordination such as long term contracts, strategic alliances or full vertical integration are predicted (Mahoney, 1992: 562).

2.4.2.2 Frequency

For Williamson (1985: 60) frequency of transactions is a relevant dimension. It refers to the frequency of exchange among different trading partners. According to Williamson (1985:60) high levels of transaction frequency provide an incentive for firms to employ hierarchical governance, because for given levels of asset specificity, the greater the volume of transactions, the more likely the benefits of hierarchy exceed the costs. In other words, in situations of low uncertainty, highly frequent transactions tend to be carried out in the spot market because they induce learning and because reputation effects become important, militating against opportunistic behavior (Hobbs and Young, 2001: 40). Put it more simply, a firm won't have an incentive to internalize (vertically integrate) the provision of a service or good that is very rarely used. However, Boudreau et al. (2007: 1127) observes that in the age of internet there are competitive advantages in externalizing high volume transactions that can be executed electronically.

In the agricultural sector for instance, product perishability creates uncertainty for buyers with respect to product quality and for the sellers in finding a buyer as perishable products deteriorate very easy. Therefore transactions tend to occur frequently (Hobbs and Young, 2001: 42).

According to Rindfleisch and Heide, (1997: 31, footnote 2) several studies on TCE have been largely unsuccessful in finding any positive association between transaction frequency and hierarchical governance (e.g. Anderson, 1985; Anderson and Schmittlein, 1984; Maltz, 1993, 1994). Therefore, frequency is very often omitted from detailed discussion in transaction costs analysis (Ibid). Picot, Dietl and Frank (2002: 72) quoted in Roemer, (2004: 24) hold that frequency has a subordinated impact on transaction costs. Carter and Hodgson (2006: 467) focusing on a relative small number of the most influential and highly cited studies applying TCE theory found that none of them tested for transaction frequency. Based on that, these authors argue that the results of these studies are only partly consistent with Williamson's framework (Carter and Hodgson, 2006: 467).

2.4.2.3 Asset Specificity

Williamson (1985: 55) defines asset specificity as “durable investments that are undertaken in support of particular transactions, the opportunity cost of which investments is much lower in best alternative uses or by alternative users should the original transaction be prematurely terminated”. It refers to a condition where the resources invested to support a particular transaction will be of little value outside this relationship.

TCE maintains that asset specificity is the most critical characteristic for determining the preferred governance structure (Williamson, 1985: 30 and 1991: 282; Joskow, 1988: 100; Shelanski and Klein, 1995: 337) and the main variable of interest in the empirical TCE literature (Klein, 2005 quoted in Altman et al., 2007: 1). As investments become more specific to the buyer-seller relationship, Williamson anticipates the cost-minimizing institutional choice will respond by moving between simply anonymous (spot) market contracting (classical contract law), and more complex long-term contractual arrangements with protective provisions (neoclassical contract law), and ultimately to internal organization (vertical integration) (Joskow, 1988: 101). For instance, if a transaction involve assets that are tied to a specific transaction, transaction costs are likely to be lower by vertical integration than in the spot market, particularly when only one party makes the

asset specific investment (Figure 2.13) (Hobbs and Young, 2001:26). Put it differently, in the absence of asset specificity, transactional problems are better resolved through switching partners in the market, because there is no need to combat the threat of opportunism. According to Williamson (1991: 282) asset specificity creates bilateral dependency and poses added contracting hazards. Furthermore, asset specificity increases the transaction costs of all forms of governance (Ibid)

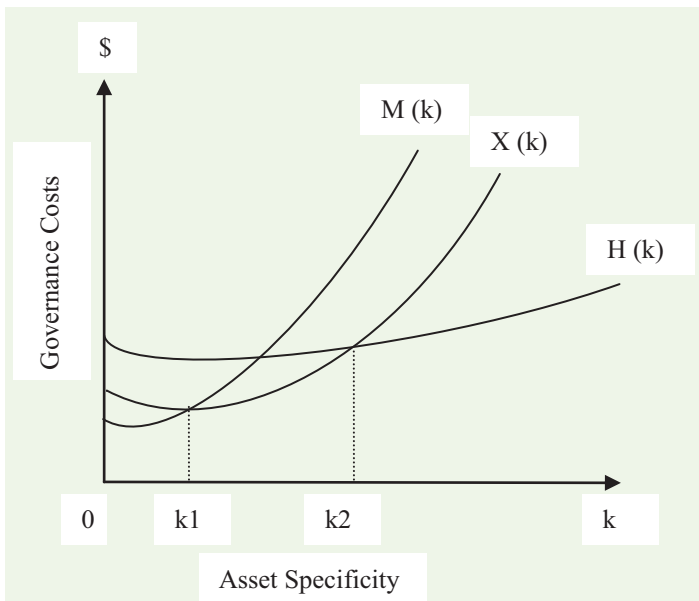


Figure 2.13 Relation between governance costs and assets specificity
Source: Williamson, 1991

Figure 2.13 graphically illustrates the implications indicated previously, when a transaction involves highly specific assets, transaction costs are likely to be lower in a hierarchy than in the market (Williamson, 1991: 283-4). The graphic denotes that for values of asset specificity between 0 and k_1 the spot market $M(k)$ will be most efficient. For values of asset specificity between k_1 and k_2 , hybrids $X(k)$ have the lowest governance costs and will be the most efficient. Finally, hierarchy $H(k)$ will have the lowest cost for values of asset specificity higher than k_2 .

Williamson (1985: 95-6; 1991: 281) has identified six types of asset specificity: i) site specificity; ii) physical asset specificity; iii) human-asset specificity; iv) brand name capital; v) dedicated assets; and vi) temporal specificity.

1) Site specificity. It refers to an investment made in a site that is in close geographical proximity to the exchange partner with the aim to economize on inventory and transportation costs. The

specificity of this type of asset derives from its immobility condition (Williamson, 1985: 95). For instance, the asset in question may meet the technological requirements of other potential transactions, but if would have to be moved to serve other exchange relation the cost of relocation would be very high (Lamminmaki, 2005: 518). In the context of agricultural production, site specificity can arise with respect to the construction of a milk collection center closer to producers in order to create a reliable supply of raw milk. The dairy processor which has invested in the asset is exposed to the possibility of the producers acting opportunistically as they may sell to other processor.

- 2) Physical asset specificity. When one or both parties to the transaction make investment in equipment and machinery that involves design characteristics specific to the transaction and which have lower values in alternative uses (Joskow, 1988: 106). For instance, the acquisition of equipment and machinery that produce a component or input specific to a particular buyer or are specialized to use an input of a particular supplier.
- 3) Human-asset specificity. It refers to the accumulation of knowledge and expertise that is specific to a particular trade partner and arises in learning by doing (Williamson, 1985: 96). It involves close collaboration between the buyer and his supplier. According to Lohtia et al. (1994) quoted in Lamminmaki (2005: 517) human asset specificity is the dimension that has received the most attention conceptually and empirically.
- 4) Brand name capital. Embraces all investments into the company's or product's reputation, which at the same time limit the scope of the transaction partner to pursue different transactions (Wengler, 2006: 109). For instance, a franchisee may invest into a brand name of the franchisor (Roemer, 2004: 22). If the relationship is dissolved, the value of the investment will be lost (Ibid). For this reason, TCE theory holds that an activity will not tend to be outsourced if it results in a supplier being placed in a position enabling it to inflict damage on the reputation of the buyer (Lamminmaki, 2005: 518).
- 5) Dedicated Assets. These are investments in general purpose assets to meet the demand of a specific buyer. The assets are not specific to the buyer, but if the relationship expires, the supplier will have substantial excess capacity (Williamson, 1985: 96). Contracts are therefore symmetrically expanded to attenuate hazard problems (Wengler, 2006: 109).

6) Temporal Specificity. It refers to investments where timing and coordination of activities is critical. In other words, timing and coordination represent the specific asset (Lamminmaki, 2005: 518). For instance, in agriculture, time is a fundamental factor in relation to the perishability and durability of agricultural commodities. It represents an important constraint in relation to the short shelf life of fresh produce which affects its quality.

However, several authors have found evidence that the presence of high asset specificity not always leads to vertical integration (Ruzzier, 2009: 1). Cater and Hodgson (2006: 462) based on their evaluation of most influential and highly cited studies applying TCE theory, argue that the results of testing the role of asset specificity in determining vertical integration are mixed. The same authors add that in particular, measures of human asset specificity fit readily in both a TCE and competence approach (Cater and Hodgson 2006: 473).

2.4.3 Limitations of TCE Theory in the Context of Value Chain Analysis

Although it provides a framework for predicting, as well as showing that contractual relations are the basis for an alternative governance form between markets and hierarchies (Jones et al., 1997: 912), transaction costs economics theory doesn't provide an explanation that covers all aspects.

This theory has been criticized by its emphasis on costs minimization and neglecting the effects of power asymmetries and the role of trust on relational contracting (Granovetter, 1985; Dietrich, 1994:10; Harris-White: 1995:100; Nooteboom, 1996:988; Dorward, 2001:60). In Granovetter's critical view of transaction costs theory, economic behavior is at least in part, influenced by the social context in which it is embedded (networks). This author revealed through his analysis the role of inter-personal and inter-organizational relations in reducing the threat of opportunism or generation of truth between transacting parts (Granovetter, 1985: 487-490). In his discussion Granovetter also noted that power in market relations and social connections between firms cannot be neglected as there are firms which enjoy dominant power position with respect to their partners (Granovetter, 1985: 501-2).

In addition, transaction costs theory rarely defines chain governance and studies most often focus on exchange dyads without reference to the nature of connections with other actors and their effect on their relations. Therefore it cannot illustrate how the whole chain structure influences exchanges

among different actors (Jones et al., 1997: 912). Furthermore, transaction costs, by their nature are difficult to measure (Hobbs, 1997: 19094).

2.5 Resource Dependence Theory

Resource dependence theory (RDT) is based on use of power (control of resources) to create and/or avoid dependence. The notion of power as the expression of dependence can be traced to the works of Emerson (1962) and Blau (1964) (Ulrich and Barney, 1984: 472; Johnson, 1995: 2).

Emerson (1962: 32) in his seminal paper “Power-Dependence Relations” argues that power and dependence are the key variables that define exchange relationships. In short, this author suggests that power is the property of a relation in question and not of an actor, because power resides implicitly in the other’s dependency (Emerson 1962: 32). In other words, the more dependent actor B is on actor A, the more power actor A has over actor B.

Power from this perspective means the ability to of one partner to influence others’ behavior by inducing the latter to accede to his wishes by rewarding them for doing so (Whitmeyer, 2005: 594; Blau, 1964: 117). Dependence refers to the degree to which a particular exchange partner has control over the supply to its partner of its partner’s likes and dislikes (Whitmeyer, 2005: 594-5). Emerson (1962: 32) emphasizes two sources of dependence: i) the importance to actor A of what actor B can provide; and ii) the availability to actor A of alternative sources of what actor B provides. Dependence is greater the more what B provides is valued and the less alternative sources are available (Whitmeyer, 2005: 595).

Under this condition of social relations defined by power and dependence it is likely that imbalance will be present. Imbalance in relationships occurs when one party has unequal access to or power to control resources; balance occurs when both parties have equal access to resources (Emerson, 1962: 33-4). In his analysis, Emerson presented four ways for individuals to avoid becoming involved in a power-dependence relationship. When one needs a service another has to offer, one can (a) supply him with another service; (b) obtain the service elsewhere; (c) force him to provide the service; or (d) renounce the original demand. If the former is not able to choose any of the four alternatives, he has to become dependent on the latter and accept the latter's power (Emerson 1962, 35–41; Blau, 1964: 118-9).

Blau (1964: 118–24) reformulated Emerson's schema and employ it further to indicate the conditions of social independence, the requirements of power, the issues in power conflicts and their structural implications. Blau (1964: 118-24) suggests that the conditions of independence include strategic resources (like money) for starting an exchange relationship, the available ways to escape the other's power, coercive force to compel others, and self-reduction of demands. Being complementary to the conditions of independence, the basic strategies to attain and sustain power are indifference to what others offer, monopoly over what others need, law and order, and support of a value system (Yan, 1995: 218).

Johnson (1995: 3) affirms that the analysis carried out by Emerson and Blau were primarily at the individual level, however the logic and rationale associated with their work have been used by resource dependence theorist to explain behavior at the organizational level. The same author adds that Thompson (1967) represents one of the earliest attempts to analyze the flow of externally-based resources into organization and the implications of the uncertainty surrounding this flow for organizational level action and behavior (Johnson (1995: 3).

2.5.1 Focus of RDT

Since Pfeffer and Salancik's (1978) influential work, "The External Control of Organizations: A Resource Dependence Perspective", RDT has become one of the most influential theories in organizational theory and strategic management (Hillman et al., 2009: 1404).

RDT employs power (dependence) as the most important mechanism to explain behavior, structure and change of organizations derived from the influence of the external environmental context (Figure 2.12) (Nienhüser, 2008: 17). RDT argues that organizations act as if they are seeking to manage dependence, without necessarily some conscious, overarching purpose (Pfeffer, 1987: 28). Its central proposition is that organizational survival relies on the ability to procure critical resources from the external environment (Casciaro and Piskorski, 2005: 167). That is to say that the external environment is the source of critical resources and the organization is dependent on it for survival. The lack of control over these resources therefore acts to create uncertainty for organizations operating in that environment. Organizations must develop strategies to exploit these resources, which are also being sought by other firms, in order to ensure their own survival (figure 2.14). In this way, RDT helps to predict inter-organizational linkage activities among organizations

(Cheng and Bozeman, 1993: 255). For instance, in the particular case of the agricultural sector, access to information about markets is a major resource constraint to producers which makes them dependent on other agents. Therefore, to survive they seek to establish linkages with those actors who possess this strategic resource.

According to RDT power maximization based on the control of strategic resources defines organizational success (Ulrich and Barney, 1984: 474). A major criterion of RDT theory is that power (not just rationality or efficiency) is important for understanding internal and external actions of organizations (Nienhüser, 2008: 17; Davis and Cobb, 2009: 5). It has to be noted then that RDT also applies inside the organization. The resources provided by certain organizational members are more important than the resources provided by other members (Donaldson, 1995: 129). According to Pfeffer and Salancik (2003: 236) the internal control over resources give some organizational members more power over the organization than other members (Donaldson, 1995: 129; Nienhüser, 2008: 16). This point for instance, is visualized in Figure 2.14 through the selection and removal of executives.

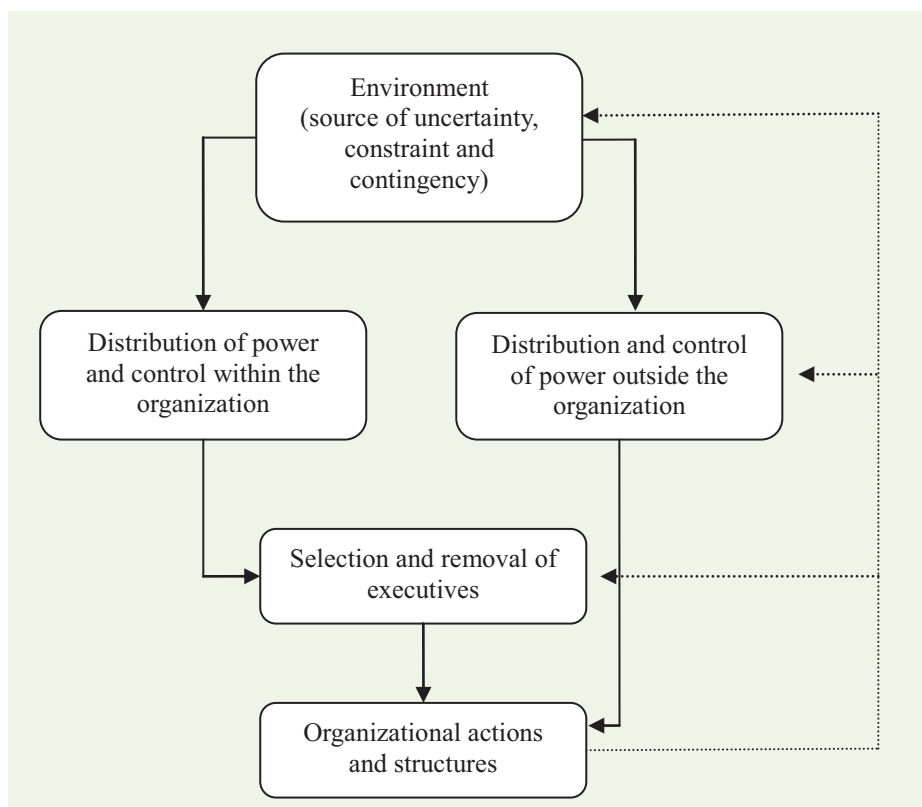


Figure 2.14. Relation between environment, organization and organizational decision
Source: Nienhüser, 2008

The emphasis on power, and a careful articulation of the clear range of tactics available to organizations, is a characteristic of resource dependence theory that distinguishes it from other theories, such as transaction costs economics (Davis and Cobb, 2009: 5). Here again, whereas for TCE the unit of analysis is the transaction (Williamson 1985: 1), RDT focuses on the organization and its relation to the larger environment (Pfeffer, 1987: 26; Ulrich and Barney, 1984: 475).

2.5.2 RDT Theoretical Assumptions

A major implication of RDT is the identification of dependence and uncertainty as the key antecedent variables underlying the formation of interfirm relationships (Heide, 1994: 72). According to Ulrich and Barney (1984: 476) RDT rest on the following three assumptions:

Organizations Comprised of Coalitions. RDT assumes that organizations are comprised of internal and external coalitions which emerge from social exchange that are formed to influence and control behavior. RDT defines organizations as settings “in which groups and individuals with varying interests and preferences come together and engage in exchanges (Pfeffer, 1987: 26). Therefore, organizations are coalitions of interest and markets in which influence and control are transacted (Pfeffer and Salancik, 2003: 259). This theory sees organizations as elemental or fundamental building blocks of social structure. Individuals and their interests are largely controlled by and encompassed in formal organizations (Pfeffer, 1987: 28).

Environment’s Valued and Scarce Resources. RDT assumes that the environment contain resources³⁹ of various kind, which are essential for the continued survival and success of an organization (Johnson, 1995: 4). The environment is there, somewhere outside the organization (Pfeffer and Salancik, 2003: 257). Because individual organizations seldom possess or control all the resources needed for survival, they must interact with other organizations which control those resources. In that sense they depend on their environment (Pfeffer and Salancik, 2003: 258). As consequence, resource acquisition may be problematic and uncertain (Ibid).

³⁹ According to Galaskiewicz and Marsden (1978: 90 footnote) organizational resources can take different forms, e.g., information, money, raw material, capital, personnel, equipment, etc.

Organization's Source of Power. According to RDT organizations are assumed to make efforts to reach two goals as means to influence the exchange between organizations and therefore affecting the distribution of power (Ulrich and Barney, 1984: 476). These goals are:

- 1) To acquire control over resources in order to minimize their dependence on other organizations.
- 2) To acquire control over resources in order to maximize the dependence of other organizations on them.

2.5.3 Factors Determining Organizational Dependence

RDT puts forward three factors as critical in determining the dependence of one organization upon another and therefore their relative power (Pfeffer and Salancik, 1978: 45; Medcof, 2001: 1002):

Resource Importance. The more important the resources controlled by an organization, the more other organizations will be dependent upon it, and the greater will be the power of that organization (Heide and John, 1988: 23; Medcof, 2001: 1002).

Alternatives. The fewer the alternative sources there are for a resource controlled by an organization, the more other organizations will be dependent upon it for the resource, and the greater will be the power of that organization (Heide and John, 1988: 23; Ganesen, 1994: 4; Medcof, 2001: 1002).

Discretion. The greater the degree of unfettered discretion that an organization has in the deployment of a resource, the greater will be others' dependence on it, and the greater will be its power (Heide and John, 1988: 23; Medcof, 2001: 1002).

Consequently, maximum dependence and therefore maximum power occur when one organization has unfettered discretion over a resource of high importance to another organization, and there are no alternative sources (Medcof, 2001: 1003).

2.5.4 Strategies to Secure Resources: Inter-organizational Linkages

The RDT predicts several strategies as mechanisms for organizations to secure resources and minimize dependence and uncertainty from their external environment in order to enable their survival.

Hillman et al. (2009: 1405) have structured based on Pfeffer and Salancik's (1978) five tactics⁴⁰ that firms take to minimize environmental dependences: i) merges or vertical integration; ii) joint ventures and other inter-organizational relationships (e.g. strategic alliances, research and development agreements, research consortia, joint-marketing agreements and buyer-supplier relationships); iii) boards of directors; iv) political action; and v) executive succession.

In summary, according to Pfeffer (1987: 26-7) the basic argument of RDT is: i) the fundamental units for understanding inter-corporate relations and society are organizations; ii) these organizations are not autonomous, but rather are constrained by a network of interdependencies with other organizations; iii) interdependence, when coupled with uncertainty about what the actions will be of those with which the organization is interdependent, leads to a situation in which survival and continued success are uncertain; therefore, iv) organizations take actions to manage external interdependencies, although such actions are inevitable never completely successful and produce new patterns of dependence and interdependence; and v) these patterns of dependence produce inter-organizational as well as intra-organizational power, where such power has some effect on organizational behavior.

2.5.5 Limitations of RDT in the Context of Value Chain Analysis

Some authors argue that while the theoretical basis of RDT is convincing, empirical testing has been relatively limited (Pfeffer and Salancik, 2003: xvi; Mudambi and Pedersen, 2007: 3; Casciaro and Piskorski, 2005: 167).

Johnson (1995; 16) asserts that a significant limitation of RDT is its assumption that organizational behavior and structures are shaped primarily by materialistic forces. Therefore, it neglects the role of cultural, ideological and institutional factors and considerations. In the same line of thought, a cited limitation of resource dependence theory is about its difficulties examining the effects of trust in long-term exchange relationships (de Wulf and Odekerken-Schröder, 2001: 94). According to Morgan and Hunt (1994: 22) and de Wulf and Odekerken-Schröder (2001: 94) parties involved in an exchange relation can rely on cooperation, collaboration and coordination instead of power, influence and control.

⁴⁰ Providing a detailed review of all this tactics is beyond the scope of this study. However, for more detail see Pfeffer and Salancik's (1978), Pfeffer and Salancik's (2003), and Hillman et al. (2009).

Donaldson (1995: 152) argues that other theories which focus on efficiency rather than power may explain organization behavior better than RDT. Similarly, according to Williamson (1995: 32-5) the influence of power is not significant and efficiency plays a large role in the study of contractual relations where the parties can do contract in a relatively farsighted way. In this sense, from TCE perspective dependence is a foreseeable condition and when incurred is supported with safeguards (Williamson, 1995: 35)

Varadarajan and Cunningham (1995:287) note that given the overlapping nature of TCE and RDT, it may be more appropriate to view them as complementing explanations rather than as competing explanations.

2.6 Social Capital Theory

Social capital theory is considered as one branch of New Institutional Economics (Kherallah and Kirsten, 2001: 7). Although there is basic consensus that social capital is derived from social relations, considerable divergence and contradiction exist concerning the specific aspects of social relations that create social capital (Adler and Kwon, 2002: 23; Dika and Singh, 2002: 31; Valentinov, 2003: 12). In spite of such a problem it is difficult to ignore social capital, as it remains an intuitively useful concept (Hean et al., 2003: 1061-2). In this regard, the literature on social capital, in its broadest sense, represents a first approximation to assess the vices, virtues and difficulties of the social dimension as it concerns to the wealth and poverty of countries (Woolcock and Narayan, 2000: 228).

As theory, social capital describes the process by which resources embedded in social networks are captured and reproduced for returns (Lin, 2005: 3). It has been applied to the study of families, youth behavior problems, education, public health, community life, democracy and governance, economic development and general problems of collective action (Adler and Kwon, 2002: 17). However, a theory that satisfactorily identifies mechanisms of creation, preservation and growth of social capital is still missing (Pantoja, 1999: 18).

Three authors have been commonly credited with introducing the concept of social capital to the theoretical debate: Pierre Bourdieu, James Coleman and Robert Putnam (Portes, 1998: 1; Woolcock, 1998: 155; Schuller et al., 2000: 1; O'Brien and Fathaigh, 2005: 3). Additionally, Francis Fukuyama (1995) is recognized for integrating social capital and trust and from working

within an economic framework, rather than a sociological one like Coleman or a political science perspective like Putnam (Harper, 2001: 8).

The explanation of social capital as access to institutional resources draws from the work of Pierre Bourdieu (Dika and Singh, 2002: 33). Portes (1998: 2) affirms that the first contemporary analysis of social capital was carried out by Pierre Bourdieu (1980) in his publication “Actes de la Recherche en Sciences Sociales”. The same author argues that Bourdieu’s analysis is arguably the most theoretically refined among those that introduced the term in contemporary sociological discourse (Portes, 1998: 2).

Bourdieu states that three forms of capital (economic, cultural and social) are the core factors defining positions and possibilities of the various actors in any field (Siisiäinen, 2000: 10). Social capital in the view of Bourdieu’s includes obligation, the advantages of connections or social position, and trust (Smart, 1993: 392). For him, social capital is not reducible to other forms of capital, nor is it independent of them, acting as a multiplier for the other forms (e.g. economic and cultural capital), while being created and maintained by the conversion of economic and cultural capital in the unceasing effort of sociability (Schuller et al., 2000: 5).

However, according to Ihlen, (2005: 492) there are two problems with Bourdieu’s use of social capital. First, he made few attempts to construct an operational definition, and second he largely ignored organizations. In the same line of thinking, Schuller et al. (2000: 5) stress that Bourdieu’s treatment of social capital was definitely superficial.

James Coleman’s interpretation of the concept is most frequently cited in the educational literature (O’Brien and Fathaigh, 2005: 3). Coleman focuses on the role of social capital in the creation of human capital (Dika and Singh, 2002: 32). According to Coleman (1988: S101) social capital is a resource and its value depends on social organization. Forms of social capital include: i) obligations and expectations which depends on the trustworthiness of the social environment; ii) information channels which provide a basis for action; and iii) norms accompanied with effective sanctions to forgo self interest and act in the interests of the collectivity (Coleman, 1988: S102-4).

Like Bourdieu, Coleman also highlights the importance of social networks (Dika and Singh, 2002: 34). Dika and Singh (2002: 34) observe two main differences between the definitions of social

capital by Bourdieu and Coleman. First, Bourdieu makes explicit the distinction of resources from the ability to obtain them in the social structure, but it is confusing in Coleman's analysis (Portes, 1998: 5-6). Second, Bourdieu sees social capital as a tool of reproduction for the dominant class, whereas Coleman sees social capital as (positive) social control (Dika and Singh, 2002: 34)

Nevertheless, Coleman contribution has been influential and significant (Portes, 1998: 6) by subjecting the concept to empirical scrutiny and develop ways of operationalizing it for research purposes (Schuller et al., 2000: 8).

There seems to be a general agreement that currently social capital theory is most commonly associated with the work of Robert Putnam who successfully brought the topic to wide attention (Cooper et al., 1999: 4; Schuller et al., 2000: 8; Pretty and Ward, 2001: 211) and introduced the concept into economic literature (Ballet et al., 2007: 359). Putnam's (1993) famous study comparing different Italian regions, called "Making Democracy Work" lead to the conclusion that regions with high levels of social capital as measured by horizontal integration and high levels of trust are economically more successful (Halpern, 2005:8).

For Putnam (1993a: 167) social capital refers to the features of social organization, such as trust, norms and networks, that can improve the efficiency of society by facilitating coordinated actions. Thus, a social group with a high level of social capital is likely to be cohesive and have well developed networks of communication and mutual support (Cooper et al., 1999: 4). He stresses that high level of social capital lead to strong economic performance (Putnam, 1993a: 174).

Putnam theory of social capital it is influenced by notions of pluralism and communitarianism (O'Brien and Fathaigh 2005: 4). Siisiäinen, (2000: 21) observes that Putnam's work preserves many of the ideas of the sociology of integration. The same author adds that Putnam's concept of social capital and trust are related to issues regarding the integration of values of society, solidarity and togetherness, and the creation of consensus and sustain the stable development of society (Siisiäinen, 2000: 21).

According to Schuller et al. (2000: 10) Putnam, like Coleman, has been criticized for functionalism and for failing to address issues of power and conflict. Likewise, Siisiäinen (2000: 21) notes that

whereas Bourdieu's theoretical interest was the examination of social conflicts, it is difficult to deal with conflicts or opposing interests using Putnam's approach.

2.6.1 Implications of Applying the Term "Capital"

Valentinov (2003: 9) highlights that the term social capital implies analyzing social relations from the perspective of benefits and costs.

Resources referred to as social capital are called "social" because they inhere between particular social relationships (Collier, 1998: 4; Smart, 1993: 393; Valentinov, 2003: 8). Collier (1998: 2-4) asserts that these resources will be underprovided, since social interaction involves an externality, as many of the benefits accrue to non-participants, and because even those benefits which accrue to participants are likely to be unrecognized. For instance, the externality of mutual trust among members generated by the repeated social interaction for other purposes; and the externality conferred on non-members by a generalization of trust (Collier, 1998: 3). Fukuyama (2000: 4) adds that perhaps the reason that social capital seems less obviously a social good than physical or human capital is that it tends to produce more in the way of negative externalities than either of the other two forms. He argues this is so, because group solidarity in communities is purchased at the price of hostility toward out-group members (Fukuyama, 2000: 4).

According to Coleman (1988: S98 and S101) these resources are characterized as capital, because like physical capital and human capital, social capital is productive, making possible the achievement of certain objectives that in its absence would not be possible. Adler and Kwon (2002: 21) observe that like all other forms of capital, social capital is an enduring asset into which other resources can be invested, with the prospect of a future (albeit uncertain) flow of benefits. In the case of individuals investing in building their network of external relations, these benefits are in the form of better access to information, power and solidarity (Ibid). By investing in the development of their internal relations, collective actors can strengthen their collective identity and improve their capacity for collective action (Ibid).

Like other forms of capital (physical), social capital can be used for different purposes (can be appropriable) such as to obtain information (Coleman, 1988: S108-9). Similarly, Ostrom and Ahn (2001: 13) affirm that social capital like other forms of capital opens up some opportunities and closes down others. In addition, social capital can be converted to other forms of capital (is

convertible) (Smart, 1993: 393). For instance, the advantages conferred by one's position in a social network may be converted to economic or other advantage (Adler and Kwon, 2002: 21).

Ostrom and Ahn (2001: 13-14) distinguish four differences between social and physical capital: i) social capital does not wear out with use but rather with disuse; ii) social capital is not easy to see and measure; iii) social capital is hard to construct through external interventions; iv) national, regional and local governmental institutions strongly affect the level and type of social capital available to individuals to pursue long-term development efforts.

Finally, social capital is generally considered an attribute to communities (is a public good) (Putnam, 1993b: 5), whereas human capital (skills, knowledge, qualifications) is considered an attribute of individuals.

2.6.2 Determinants of Social Capital

Many determinants have been offered by several authors to explain the different dimensions and levels of social capital (Figure 2.15). Despite these efforts, there is a lack of consensus and a lack of evidence to support the propositions (Claridge, 2004). Nevertheless, history, culture, family, education and institutional framework are among the most common determinants cited in the literature. For instance, some of the most influential studies (e.g. Putnam, 1993, 1995 and Fukuyama, 1995) suggest that roots of social capital are on history, cultural evolution and family (Brown and Ashman, 1996: 1477; Putzel, 1997: 945)

Aldridge et al. (2002: 39-47) provide a broad set of determinants and explain⁴¹ their impact on social capital based on the findings of several researches. These determinants are the following: i) history and culture; ii) social structures and hierarchy; iii) economic inequalities and social class; iv) labour market trends; v) the size and nature of the welfare state; vi) civil society; vii) individual values; viii) the scale of social organizations; ix) ethnic and social heterogeneity; x) transport and urban design; xi) mobility; xii) media (mainly television); xiii) the family; and xiv) education.

⁴¹ For more detail see Aldridge et al. (2002: 39-47). See also Pantoja (1999: 26) for a different classification of social capital determinants.

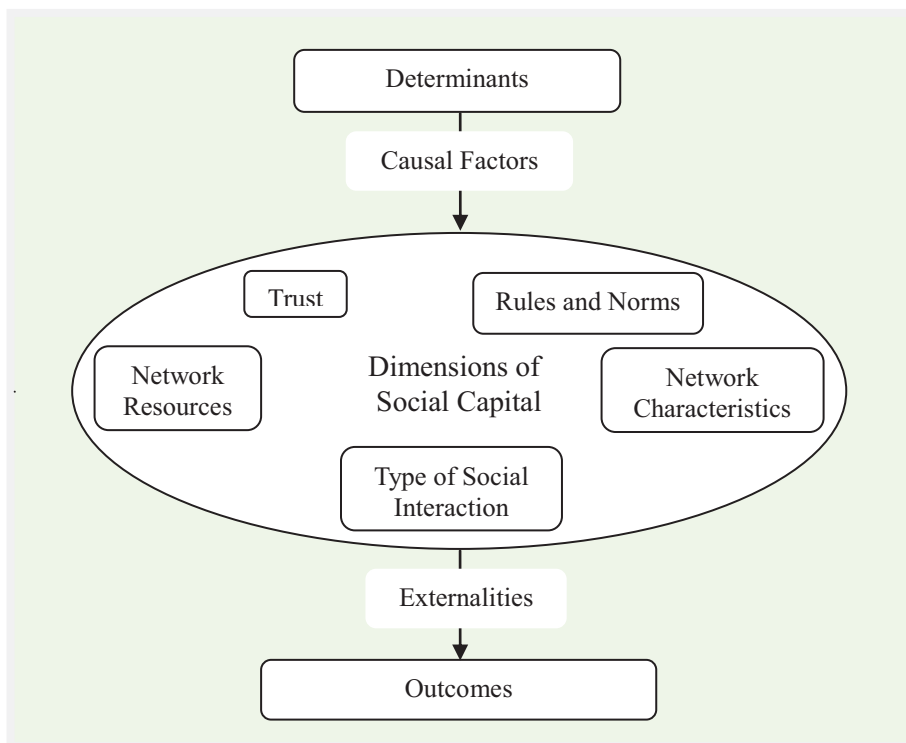


Figure 2.15. Simplified framework of social capital theory
 Source: Own elaboration based on Narayan and Cassidy, 2001; Claridge, 2004.

Pantoja (1999: 26) reflects on the possible connection among determinants and their lack of clear boundaries. The same author stresses that many of these determinants are in fact, inputs for or outputs of other determinants of social capital (Pantoja, 1999: 26).

2.6.3 Dimensions of Social Capital

As in the case of determinants, there is as well not absolute consensus among social capital theorist in relation to the determination of how social capital is developed and maintained within the society. In the opinion of several authors (Hean et al., 2003: 1062; Snijders, 1999: 38) social capital is a multidimensional concept, each dimension contributing to the meaning of social capital although each alone is not able to capture fully the concept in its entirety. Hean et al. (2003: 1062) suggest that the most commonly seen dimensions (Figure 2.15) and their exponents are the following:

- Trust (Coleman, 1988; Collier, 1998; Cox, 1997; Kawachi et al., 1999; Kilpatrick, 2000; Leana and Van Buren III, 1999; Lemmel, 2001; Putnam, 1993; Putnam et al., 1993; Snijders, 1999; Welsh and Pringle, 2001).

- Rules and norms governing social action (Coleman, 1988; Collier, 1998; Fukuyama, 2001; Portes and Sensenbrenner, 1993).
- Types of social interaction (Collier, 1998; Snijders, 1999).
- Network resources (ABS, 2002; Kilpatrick, 2000; Snijders, 1999).
- Other network characteristics (Burt, 1997; Hawe and Shielle, 2000; Kilpatrick, 2000; Putnam, 1995) adapted from (Hean et al., 2003: 1062).

Pretty and Ward (2001: 211) have identified very similar dimensions of social capital. These include: i) relations of trust, which reduces transaction costs; ii) reciprocity and exchange, which increases trust; iii) common norms, rules and sanctions, that give individuals the confidence to invest in collective activities; and iv) connectedness, networks and groups, which are a vital aspect of social capital and facilitate trading of goods, exchange of information and mutual help.

Other authors such as Narayan and Cassidy (2001: 67) provide evidence on the problems of defining and conceptualizing social capital. They have identified different dimensions of social capital. These include: i) group characteristics; ii) generalized norms; iii) togetherness; iv) everyday sociability; v) neighborhood connections; vi) volunteerism; and vii) trust.

2.6.4 Outcomes of Social Capital

First, it is important to note that social capital can yield positive and negative effects or positive and negative externalities (Pantoja, 1999: 56; Ostrom and Ahn, 2001: 13; Aldridge et al., 2002: 73; Hean et al., 2003: 1066).

The premise of this theory is that levels of social capital in a community have an important effect on members' well-being (Morrow, 2003: 162). Putnam (1993b: 3) proclaims that a society that relies on generalized reciprocity is more efficient than a distrustful society. Ballet et al. (2007: 359) highlight that Putnam following a neo-institutional approach attempts to predict why some "good" institutions make possible the achievement of certain goals that would have been reached neither by individuals acting individually nor by markets and governments. In this sense, social capital allows recognizing how the nature and extent of social interactions between communities and institutions shape economic performance (Woolcock and Narayan, 2000: 242; Aldridge et al. 2002:

73). Therefore, it has important implications for development policy, which has traditionally focused on an economic dimension (Putnam, 1993b: 5; Woolcock and Narayan, 2000: 242).

Fukuyama (2000: 6) asserts that social capital's economic function is to lead to the reduction of the transaction costs associated with formal coordination mechanism like contracts hierarchies and bureaucratic rules. Thus, it may facilitate exchange and coordination between agents (Pantoja, 1999: 57) and speed information and innovation (Putnam, 1993b: 5).

However, as Putzel (1997: 943) stresses the mere existence of networks and norms that facilitate economic exchange says little about whether such networks will have a participatory and not exclusivist outcome. Narayan and Cassidy (2001: 60) observe that while social capital is relational, its influence is most profound when relationships are among heterogeneous groups. These authors for instance, note that in Latin America, communities with high concentrations of indigenous people remain poor if they have few connections to the powerful within and outside the community (Narayan and Cassidy, 2001: 60). Putnam (1993b: 11) recognizes that norms and networks that serve some groups may obstruct others, particularly if the norms are discriminatory or the networks socially segregated. Furthermore, investments in social capital like investments in physical capital, are costly, therefore unbalanced investment in social capital can transform a potentially productive asset into a constraint and liability (Adler and Kwon, 2002: 28; Ballet et al., 2007: 365).

2.6.5 Limitations of Social Capital Theory in the Context of Value Chain Analysis

The literature largely regrets that measurement of social capital remains as a critical challenge (Aldridge et al., 2002: 53; Harper, 2002: 13; Foley and Edwards, 1999; Dika and Singh, 2002: 44-5; Hean et al., 2003: 1062). Consequently, it is difficult to measure and define concepts such as trust and reciprocity (Morrow, 2003:163). These difficulties make to some extent the application of social capital theory not operational as an analytical tool (Øyen, 2002: 11). So far, the most commonly used measures of social capital are civic participation (e.g. membership of community organizations), and social trust, both of which are measured in national surveys in the U.S. (Cooper et al., 1999: 4).

Morrow (2003: 177) stress that elements of social capital may be experienced differently depending on gender, age and cultural, religious, or ethnic background. Therefore, social capital needs to be able to accommodate a range of different social identities (Morrow, 2003: 177).

2.7 Theoretical Framework of the Study

Building on the critically reviewed literature, combined with the researcher's own insights a theoretical framework for the design and conduct of this study has been developed (Figure 2.16). This framework is aimed to focus and shape the research process, informing the methodological design and influencing the data-collection instruments used.

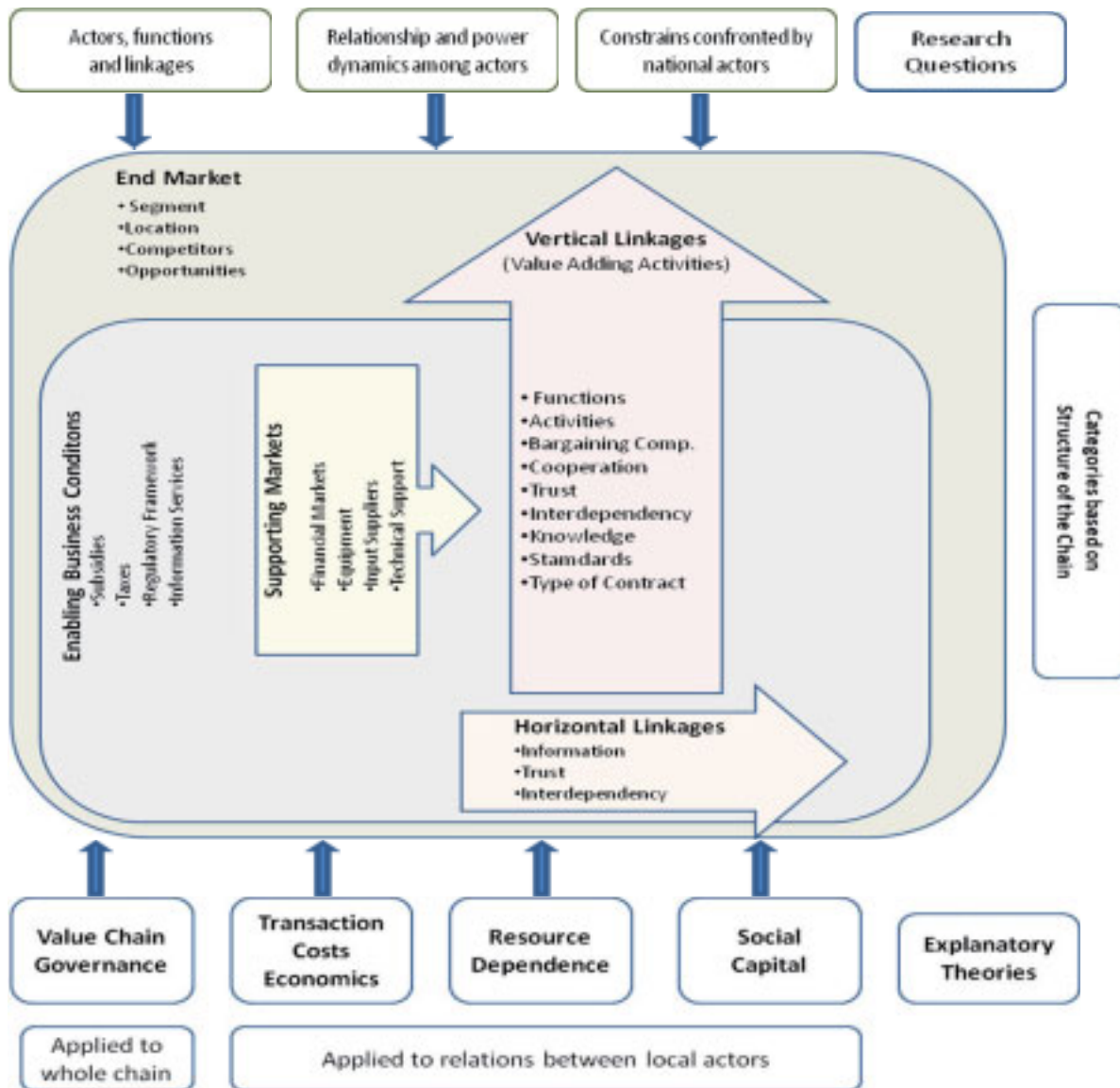


Figure 2.16. Schematic view of theoretical framework
Source: Own elaboration

The idea of the theoretical framework is to explain the key factors, concepts and variables to be studied and the presumed relationships among them (Miles and Huberman, 1994 quoted in Maxwell, 1998: 77).

The different categories of this theoretical framework (Figure 2.16) were derived from the study's research questions formulated in section 1.3 and according to the chain structure described in section 2.2.1. These categories provide an organizing structure both for reporting the findings as well as the analysis and interpretation of these findings. In these sense, these categories provided the basis to develop the coding scheme used to analyze the collected data. To explain each of the categories, the researcher drew on the literature and his own informed presumptions about potential responses to the research questions, which resulted in several descriptors under each category (see Table 2.7). As the theoretical framework was continually revised and refined, during the course of data collection and analysis, some descriptors were added and others deleted.

Table 2.7 Conceptual framework (categories and descriptors)

Category	1. Vertical Relations	2. Horizontal Relations	3. Enabling Environment
Sub-category →	Actors ▪ Functions ▪ Activities	• Information exchanged • Share of resources • Trust • Interdependency	Specific Policies • Subsidies • Taxes
Sub-category →	Relations ▪ Bargaining ▪ Trust ▪ Cooperation ▪ Interdependency ▪ Flow of knowledge ▪ Standards ▪ Type of contracts ▪ Contractual conditions	Sub-category →	Institutional Setting • Regulatory framework • Information services • Technical support • Credit services
		Sub-category →	Public Infrastructure • Roads • Storage facilities
Category	4. Supporting Markets	5. End Markets	6. Production/Exports of A. V.
	▪ Financial markets ▪ Telecommunications ▪ Equipment ▪ Inputs suppliers ▪ Technical support	• Segment • Location • Competitors • Opportunities	• Motivation to produce/export • Asian veg. produced/exported • Area of production/vol export • Season of the year • Use of labor • Price of the product

Source: Own elaboration

2.8 Application of Value Chain Analysis Methodology

There is no definite manner to carry out value chain analysis. Methodologies differ in their perspectives and purposes. Therefore, their application and usefulness vary depending on the circumstances and focus of the analysis (see for instance, Kaplinsky and Morris, 2000; McCormick and Schmitz, 2001; Kula et al., 2006; Subramanian et al., 2007 (World Bank/FIAS, 2007); and GTZ, 2007).

Nevertheless, following the theoretical framework depicted in Figure 2.16, the elements of the chain structure described in section 2.2.1, as well as the methodologies previously cited, the analysis of the value chain proposed in this study is divided in seven major steps, which are presented in Table 2.8.

Table 2.8 Steps followed to analyze the value chain of Asian vegetables

No.	Step and Activities followed to analyze the chain
1.	Map of the Chain <ul style="list-style-type: none"> • Identification of actors • Descriptions of functions carried out for each actor • Description of connections between actors • Identification of flow of product and value in the chain
2.	Description of the Business Environment <ul style="list-style-type: none"> • Description of the policy environment affecting the chain • Description of the legal and regulatory framework affecting the chain • Infrastructure services available to local actors • Institutional services available to local actors
3.	Description of the Supporting Markets <ul style="list-style-type: none"> • Access to financial services • Crosscutting services available to local actors • Sector specific services available to local actors
4.	Description of Vertical Relations in the Chain⁴² <ul style="list-style-type: none"> • Power relations between producers and exporters, as well as between exporters and importers • Flow of knowledge between producers and exporters, as well as between exporters and importers • Trust between producers and exporters, as well between exporters and importers • Distribution of economics gains in the chain
5.	Description of the Horizontal Relations in the Chain⁴³ <ul style="list-style-type: none"> • Description of existing relations (associations) • Exchange of information among producers and among exporters • Share of other resources among producers and among exporters • Trust among producers and among exporters
6.	Description of the End Market <ul style="list-style-type: none"> • Location of the end market • Description of end consumers population segment • Identification of main competitors • Market situation
7.	Description of Strategies followed by local actors to overcome constrains⁴⁴

Source: Own elaboration

⁴² Emphasis is given to local actors.

⁴³ Emphasis is given to producers, but information about exporters is also included.

⁴⁴ Emphasis is given to producers and is included as part of the discussion.

3. METHODOLOGY AND RESEARCH APPROACH

This chapter describes the study's research methodology and includes discussions about the following issues: i) rationale for research approach; ii) research strategy; iii) data-collection methods; iv) data analysis and syntheses; v) limitations of the study; and vi) study areas.

3.1 Rationale for Qualitative Research Design

A qualitative research design was chosen to conduct this study. The decision about using this kind of research design is grounded on the focus and purpose (research problem) of the study. The focus of this study is a value chain. As has been previously defined⁴⁵, in this study a value chain involves a socioeconomic system which consists of different interrelated actors. The purpose is then to describe the relations among these actors, the context within which they act and how these factors influence their actions. Hence, we attempt to study a social setting building on the meanings of the actors comprising it. Figure 3.1 shows an overview of the steps used to carry out this study.

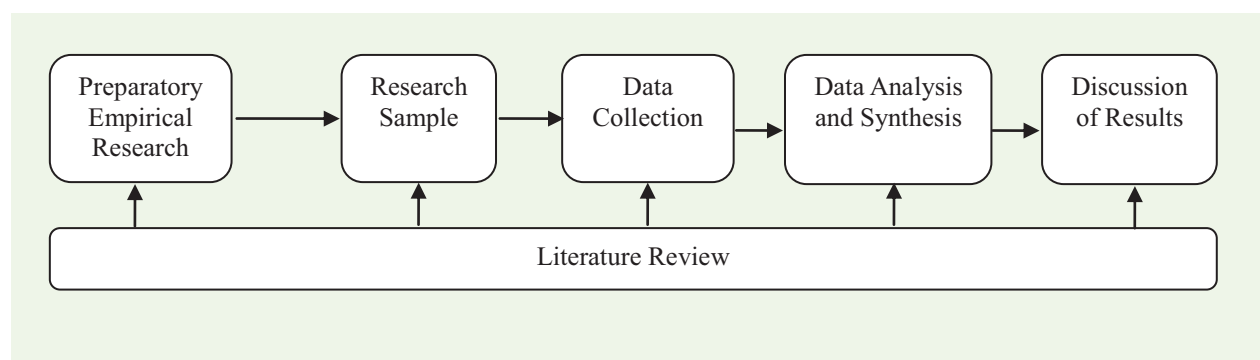


Figure 3.1 Outline of the research process

Source: Own elaboration

Qualitative research is distinguished by describing persons, places and events (Janesick, 1994: 216). Proponents of qualitative research assert that this type of research stresses the socially constructed nature of reality (Denzin and Lincoln, 1994a: 4). In this sense, qualitative research is a means for exploring and understanding the meaning individuals or groups ascribe to a social situation, in a particular context at a particular point of time (Denzin and Lincoln, 1994a: 4; Creswell, 2009: 4 and 195; Bloomberg and Volpe 2008: 80) and not necessarily on making predictions about that social setting (Janesick, 1994: 212). Thus, qualitative research is essentially

⁴⁵ See section 2.2 Value Chain Analysis.

guided by constructivist (knowledge is socially constructed) philosophical assumptions (Bloomberg and Volpe 2008: 80; Maxwell, 1998: 77; Creswell, 2009: 16).

Qualitative research looks at the larger picture; it is aimed to achieve a holistic rather than a reductionist understanding (Janesick, 1994: 212; Bloomberg and Volpe 2008: 80). Through qualitative studies are often studied only a small number of individuals or sites using theoretical or purposeful rather than probability sampling, and rarely generalizations of its accounts are made (Maxwell, 1998: 95; Okely, 1994: 19; Mason, 1994: 102). The generalizability of qualitative studies is usually based on the development of a theory that can be extended to other cases (Ibid). For this reason, Guba and Lincoln (1989) prefer to talk of “transferability rather than “generalizability” in qualitative research (Bloomberg and Volpe 2008: 87-8), in the extent that the implications of the study can be extended to the immediate arena (Rubin and Rubin, 1995: 53).

In the case of this study no theory has been developed and the approach used is a more structured one. The idea behind a qualitative structured approach is to ensure the comparability of data across sources and thus answer questions that deal with differences between things and the explanation for these differences (Maxwell, 1998: 85).

In contrast, the quantitative research approach seeks the measurement, testing or verifying of hypothesis to establish facts, and analysis of causal relationships between variables (not processes) applying statistical procedures (Denzin and Lincoln, 1994a: 4; Creswell, 2009: 4; Bloomberg and Volpe 2008: 80). Quantitative studies are comfortable with aggregating large numbers of people (Janesick, 1994: 210) but may miss contextual details. Qualitative researchers argue that quantitative researchers seldom are able to capture the subject’s perspective because they have to rely on more remote, inferential empirical materials (Denzin and Lincoln, 1994a: 5)

3.2 Research Strategy

Within the framework of qualitative research design, the study was most suited for a case study design. Therefore, it has been employed a comparative case study of two regions⁴⁶: Comayagua and Olancho where Asian vegetables sourced from Honduras are planted.

⁴⁶ Detailed description of these regions is provided in section 3.6 Study Areas.

According to Stake (1994: 236) case study is a choice of object to be studied; rather than a methodological choice. A case study can be defined as a depth description and analysis of a phenomenon, social unit, or system bounded by time, activity or place (Bloomberg and Volpe 2008: 80; Stake, 1994: 236; Creswell, 2009: 12). The value of a case study is its uniqueness (Janesick, 1994: 217). Furthermore, insights derived from case studies can directly influence policy, practice and future research (Merriam, 1998: 19 quoted in Bloomberg and Volpe 2008: 80).

The present study fit well with Stake's (1994) category of "intrinsic case study", wherein the main purpose is not theory building or refinement as it is in what he calls "instrumental case study" category (Stake, 1994: 237). Instead, this study has been primarily undertaken to better understand the particularities of the value chain of Asian vegetables produced in Honduras and its implications to local actors, in particular producers. However, the same author stresses that there is no line distinguishing intrinsic case study from instrumental as they are separated by a zone of combined purposes (Stake, 1994: 237). This is important to mention as the researcher's immediate, however not ultimate, interest and purpose in this study is intrinsic.

3.2.1 Preparatory Empirical Research

Before devoting to the empirical research, time was spent contacting government officials and reviewing available documents to facilitate the process of collecting information in the field. In fact, communication with government officials related to the value chain of Asian vegetables was established to elaborate the study's research proposal and was constant even after the empirical research phase took place. Information about the areas where Asian vegetables are planted and general aspects about the local direct and indirect actors, as well as the location of the final market was gathered through email and telephone conversations held with the leader of the National Horticultural Chain Committee (CNCH) at the Ministry of agriculture and the head of the Communication Section of FHIA. They provided valuable information and advice that assisted the researcher to uncover some insight into the shape of the study that previously was not apparent. They were the links which enabled the researcher to get in contact with the different sources of primary information.

3.2.2 Research Sample

The sample of informants was deliberately selected according to the needs of the study. Patton (2002: 230) refers to this procedure as purposeful sampling. Purposeful sampling focuses on strategically selecting an information-rich sample that yields insights and in-depth understanding about issues of central importance to the purpose of the research (Patton, 2002: 230).

According to Bloomberg and Volpe (2008: 80) qualitative researchers applying a case study strategy usually employ purposeful sampling to ensure most information about a phenomenon under study.

Selected informants were those who are knowledgeable and experienced about Asian vegetables produced and sourced from Honduras. That is to say persons designated as experts because they have accumulated relevant and detailed knowledge of certain segments and facts regarding the value chain of Asian vegetables. The designation of the expert status was made by the researcher grounded on the expert's specific knowledge about the issues of interest (Meuser and Nagel, 1991: 443). The expert's knowledge was captured through interviews and interpreted by the researcher in order to construct reality.

The purposeful sample was carried out in the two locations under study and Tegucigalpa the country's capital city where some institutions working in the regions of interest are located. The research sample selected to conduct this study is presented in Table 3.1. The sample was comprised by 59 respondents.

Table 3.1 Research sample of the study

Respondent	Location			
	Comayagua	Olancho	Tegucigalpa	U.S.
Producers	20	20	-	-
Producer-owned Company	1	-	-	-
Exporters	3	-	-	-
Government Agencies	1	3	2	-
Research Agencies	2	1	-	-
Cooperation Agencies	-	-	1	-
Input Suppliers	1	1	-	-
NGO's	-	-	1	-
Importers	-	-	-	2

Source: Own elaboration

3.2.2.1 Selection of Producers

The research sample included 40 producers, 20 from Comayagua and 20 from Olancho. In fact, 23 producers were interviewed in Comayagua and 22 in Olancho. Despite of conducting and completing, as well as subjecting to analysis the 45 interviews, only 40 were included in the results, because 5 of them didn't meet the criteria established for selection of producers (in the 5 cases producers had less than 3 years producing Asian vegetables). However, their plantations were observed and became a significant input to the analysis. The criteria for selection of producers were:

- All producers were enrolled in production of Asian vegetables for at least 3 years.
- All producers had Asian vegetables production as their main source of income.
- All producers were located in the main production areas of Comayagua and Olancho.

A delimiting time frame of three years was decided on by the researcher to ensure adequate experience in participating in the value chain in order to capture the main changes and events the sector has witnessed. Producers' characteristics including years producing Asian vegetables, location, and type of vegetables planted are summarized as Appendix A.

Producers in Comayagua were identified, contacted and interviewed with the support of technicians working with FHIA. In Olancho this was done through a consultant working with the Asian vegetables Chain Sub-committee of the Ministry of Agriculture.

In addition, a member of the board of directors of the recently created producer-owned company established in Comayagua was interviewed in order to obtain detailed information about this company. In Olancho there is no such a type of Producers' Company.

3.2.2.2 Selection of Exporters

The research sample included the owners, general managers and packing plant managers of three out of four exporting companies of Asian vegetables established in Honduras. All exporters have their packing plants located in Comayagua and only one collects fruit from Olancho. Among the selected companies are the largest exporting company in terms of volume (it is the one which

collects fruit from Olancho) and the eldest-born exporting company of Asian vegetables sourced from Honduras (one of the owners introduced Asian vegetables in Honduras).

Although several attempts were carried out, it was not possible to interview the executives of the fourth exporting company. Nevertheless, this company is relatively new in the business of Asian vegetables, it started operations in 2006. Because of the low number of exporting companies no criteria for selection was elaborated. These companies were contacted with the support of technicians working with FHIA.

Appendix A summarizes information related to the time these companies have been in the business of Asian vegetables, the type of Asian vegetables they export and the different persons interviewed at each company.

3.2.2.3 Selection of Government Officials and Other Local Respondents

As previously indicated some government officials were contacted earlier in order to elaborate the research proposal for this study. Though, the researcher sought to locate additional respondents who are not direct actors, but that have influence on the performance of the chain and therefore constitute important sources of information. These actors not only include government agencies, but also other institutions, such as research agencies, Non-governmental organizations (NGOs), development cooperation agencies and inputs suppliers, which hold information necessary to obtain a deeper and more objective understanding of the relations in the chain.

As suggested by Patton (2002: 237) a snowball or chain sampling approach was employed to locate these additional key informants. Snowball sampling approach suggests to ask well informed people who else to interview and the snowball gets bigger and bigger as new information-rich sources get accumulated (Patton, 2002: 237). Thus, through snowball sampling government officials and then producers, as well as exporters were successively asked to refer to other actors they recommend as valuable in providing information regarding the value chain.

Table 3.2 presents additional local respondents interviewed in each research location. Appendix A contains information regarding the position of the interviewed official and detailed information on these institutions and organizations is presented as part of the results.

Table 3.2 Additional local respondents

Respondent	Location		
	Comayagua	Olancho	Tegucigalpa
Governments Agencies	<ul style="list-style-type: none"> • SENASA 	<ul style="list-style-type: none"> ▪ SENASA (UTVO) ▪ DICTA ▪ CNCH 	<ul style="list-style-type: none"> ▪ CNCH ▪ BANADESA
Research Agencies	<ul style="list-style-type: none"> • FHIA • MTTH 	<ul style="list-style-type: none"> ▪ MTTH 	
Cooperation Agencies			<ul style="list-style-type: none"> • EDA
Input Suppliers	<ul style="list-style-type: none"> • Agrochemical Store 	<ul style="list-style-type: none"> ▪ Agrochemical Store 	
NGO's			<ul style="list-style-type: none"> ▪ TECHNOSERVE

Source: Own elaboration

3.2.2.4 Selection of Importers

Snowball sampling was employed, whereby local actors, particularly exporters were asked to provide information about importers of Asian vegetables produced in Honduras. However, only one exporter explicitly provided information about his main buyer, the rest of them were not too open in this sense. They merely referred to their buyers in an anonymous way, no name or address was provided. Research agencies and a NGO facilitated useful information about possible U.S. importers of Asian vegetables produced in Honduras. Finally, the information collected through interviews was complemented with an extensive internet search, documents review and with photographs of boxes containing the logo of importers taken during the visits to exporters' packing plants and producers' plantations. As a result of this search around 8 importers of Asian vegetables exported from Honduras were identified. Following the identification of the potential importers to be interviewed, 6 were contacted, but only 2 agreed to give an interview. Appendix A presents information about the importers.

3.3 Data-Collection Methods

Qualitative researchers suggest several procedures to collect data in case studies. These procedures include interviews, direct observation, document analysis and visual materials (Denzin and Lincoln, 1994b: 202; Patton, 2002: 248; Creswell, 2009: 178). In this study, the methods previously indicated were employed for collecting empirical data. In addition, informal

conversations and open dialogues were frequently sustained with some actors, including government officials, exporting companies' technicians, producers, research agencies and NGO.

The combination of these different data sources is an attempt to overcome the intrinsic biases derived from using a single source and to explain more fully as well as to give a more balanced picture of the case under study. In qualitative research this principle is called "data triangulation" and is considered a powerful means to provide rigor and corroborative evidence of the data collected (Denzin, 1978 quoted in Morse, 1994: 224; Janesick, 1994: 214; Stake, 1994: 241; Patton, 2002: 248; Creswell, 2009: 199; Bloomberg and Volpe 2008: 82).

3.3.1 Interviews

The interview was chosen as the main method for collecting data in this study. The researcher's reasons for conducting interviews are because they provide a means to obtain information and learn about the events actors in the chain have experienced and how these events influence their actions.

According to Denzin and Lincoln (1994c: 353) the interview is the preferred methodological tool of qualitative researchers. It is considered one of the most powerful methods to understand human beings (Fontana and Frey, 1994: 361). Qualitative interviewing allows the researcher to explore the world of fellow humans to discover what is going on, why they act the way they do, and how they understand their world (Rubin and Rubin, 1995: 5). It is both an academic and a practical tool, and with the knowledge it generates may help to solve problems (Ibid). In addition, the interview provides the researcher an opportunity to clarify statements and search for additional information (Bloomberg and Volpe 2008: 82).

However, according to the literature some problems associated to interviews include: i) the researcher's lack of skill to conduct and guide the interview, therefore losing focus on the subject of interest; ii) the context in which the interview take place and the interaction between the interviewer and the interviewee may have negative effects on neutrality of data gathered; and iii) people differ in their perceptive capacities and willingness to cooperate (Fontana and Frey, 1994: 364; Rubin and Rubin, 1995: 7; Bloomberg and Volpe 2008: 82).

3.3.1.1 Interview Design

Interviews were focused on seeking out explanations, descriptions and detailed factual information that would allow answering the research questions of the study. The themes comprising the interviews of local respondents revolved around the categories of the study's theoretical framework, they included: i) vertical relations between actors; ii) horizontal relations; iii) the enabling business environment affecting local actors, iv) supporting markets available to local actors; v) end market; and vi) general aspects of local actors. This facilitated validation of some sets of data through cross verification. For instance, producers, exporters and other local respondents were all asked about the effect of the infrastructure condition (which is an element of the enabling environment) on the value chain.

Thus, a list of interview questions for each class of respondents (e.g., producers, exporters, importers, etc.) was elaborated. Two doctoral colleagues were asked to review and provide feedback to the researcher. Their comments were incorporated, and then the researcher resubmitted the list of interviews questions to his advisor. With advisor's approval the result was a semi-structured interview. According to Rubin and Rubin (1995: 5) when researchers want more specific information, they use a semi-structured (also called focused) interview. The final interview schedule for each class of respondent is included as Appendix B. However, in the course of the process of data-collection some modifications of the interview took effect in order to capture more and better information.

3.3.1.2 Interview Process

The field research and therefore the interviews took place between September and November 2008. Once in Honduras, the researcher approached the director of the National Horticultural Chain Committee at the Ministry of Agriculture and the head of the Communication Section of FHIA in order to set the agenda for collecting data.

The first respondent was the director of the National Horticultural Chain Committee located in Tegucigalpa. Interview and a constant open dialogue with this official served as fundamental guide to the study, as well to obtain knowledge on the governmental efforts to promote production of Asian vegetables.

In Comayagua the researcher conducted the interviews between September and October 2008 and in Olancho between October and November of the same year. In the case of Tegucigalpa, interviews were conducted between September and November 2008. With exception of two producers from Gualaco, Olancho, the request for interview to producers was in all cases on-site visits. In the case of government agencies, cooperation agencies, research agencies, input suppliers and most exporters the request for interview was made through telephone. In the case of importers the request was first made by telephone and then simultaneously by e-mail and fax. All interviews were conducted by the researcher and before the interviewed commenced the researcher described to interviewees the purpose of the study and offered them anonymity. Interviews with local actors were conducted in Spanish. With importers in one case the interview was conducted in English and in the other in Spanish. All interviews were digitally recorded in their entirety, except in the case of those conducted telephonically, which were written down by the researcher. On completion of the interview, the audio archive was transcribed verbatim and stored in well labeled computer files.

In both locations producers were first class of respondents approached. In Comayagua all producers were identified and contacted through technicians working with FHIA and in Olancho through a consultant working with National Horticultural Chain Committee in that region. In both locations semi-structured interviews were conducted with the selected producers mainly on their plantations, and in a few cases, in their homes or in a previously agreed place as it was the case of two producers from Gualaco, Olancho. All selected and contacted producers accepted to take part in the study. All interviews with producers were individual and face to face verbal interchange. Interviews lasted between 55 and 65 minutes.

All exporting companies are located in Comayagua. Interviews were conducted in the company manager's or owner's bureau. The 3 exporting companies contacted accepted to be interviewed. In the case of two exporting companies the owners and the packing plant managers were interviewed and each provided information about his area of responsibility. For the third company only the general manager was interviewed. All interviews were individual and face to face verbal interchange. Interviews lasted between 60 and 135 minutes. Interviews with two exporters were divided in two parts of approximately 60 minutes each, because of respondents work load.

Interviews with other local respondents including research agencies, input suppliers and government agencies were conducted in their bureau. They were conducted in Comayagua, Olancho and Tegucigalpa. All interviews were individual, and with two exceptions all were a face to face verbal interchange. In the case of the NGO and the producers-owned association member, the interviews were conducted telephonically in January 2009. Interviews with all these respondents lasted between 35 and 50 minutes. In addition, informal conversations were frequently held with some government agencies' officials, the NGO and the member of the producer-owned company even after the empirical research phase. Informal conversations were also held during field research with some exporting companies' technicians, research agencies' technicians, producers, input suppliers and machinery services providers.

All importers invited to take part in the interview are located in Miami, U.S. From 8 identified importers 2 were simply impossible to reach. Only two out of six contacted importers accepted to be interviewed, the rest of them declined the interview. At least two claimed that the questions posed through the interview demanded sensible information which could damage their relationship with suppliers in Honduras. The others argued lack of time to answer the questions. The interviews with the two importers which agreed on participating were conducted telephonically in January 2009. Although one interview had to be completed via fax, most information was collected telephonically. Interviews with importers lasted between 60 and 120 minutes.

3.3.2 Direct Observations

Observation is a complement of interviewing that qualitative researchers employ and its essence is captured, although oversimplified, in the phrase being there (Wolcott, 1995: 95). However, the same author adds, that being there is a self-conscious role which makes the researcher different from anyone else's (Wolcott, 1995: 95).

Research based on observation can vary considerably depending on the stage of a research project, on the setting, and on the relationship with of researchers to their subjects (Adler and Adler, 1994: 379, Creswell, 2009: 181). For instance, in ethnography studies researchers may become converted to genuine membership of the subject group during the course of their research (Adler and Adler, 1994: 380).

Important advantages of collecting data through observational research include: i) allows the researcher to become aware of unusual aspects; ii) the ability to record information as it occurs; and iii) exploring topics that maybe uncomfortable for interviewees to discuss (Creswell, 2009: 179).

One of the main problems with observational research is that researchers may rely entirely on their own perceptions. Therefore, they are susceptible to bias from their subjective interpretations of situations (Adler and Adler, 1994: 381). Other problems are researcher lack of observing skills and the researcher perceived as intrusive (Creswell, 2009: 179).

3.3.2.1 Observational Design and Process

An observations guide was prepared to gather regularly and repeatedly impressions about the environmental context in which the different actors interact, being careful about not disturbing the natural flow of events. Building on a list of aspects the researcher took descriptive field notes to record in a semi-structured way the activities of producers and exporters at the research site. The major observed aspects include: i) location of vegetables production areas and packing plants; ii) working environment and activities; iii) conditions of the available infrastructure (roads and storage facilities); and iv) characteristics of production assets (land, machinery, and equipment.). The complete lists of observational aspects are presented as Appendix B.

The observational role the researcher took in the setting is characterized by Gold, 1958 quoted in Adler and Adler (1994: 379) as “observer as participant”. In this type of role the researcher observes subjects (producers and exporters) with whom he is unfamiliar and in unknown locations (plantations, packing plants, roads) during brief periods of time. Thus, the researcher interacted only casually with subjects and his identity remained strongly research oriented without committing into close relations with them (Adler and Adler, 1994: 380).

In general the process of observation was uncomplicated. In Comayagua the researcher was allowed to visit the packing plants of two exporters. Therefore, he was able to observe their condition, the equipment as well as the process of fruit reception, sorting, packing and storage. In both locations Comayagua and Olancho, the researcher had the opportunity to visit different plantations to observe the condition of the equipment producers use and crop management practices they follow, as well as fruit harvesting and sorting activities. In addition, points were

exporters collect fruit were visited and observations were made. In Olancho the researcher was able to observe a meeting involving producers of Asian vegetables and government officials. Research agencies were also visited in both locations. The researcher could observe and learn about the activities carried out to produce seedlings at the research agencies' green houses.

3.3.3 Documents

Analysis of documents is invaluable to qualitative researchers (Denzin and Lincoln, 1994c: 355). Documents contain texts and images that have been recorded without a researcher's intervention and have served mostly as complement of other data-collection techniques (Bowen, 2009: 27-9).

Documents that may be used for data-collection as part of a study take a variety of forms. They include advertisements; agendas, attendance registers, and minutes of meetings; manuals; background papers; books and brochures; diaries and journals; event programs (e.g., printed outlines); letters and memoranda; maps and charts; newspapers (clippings/articles); press releases; program proposals, application forms and summaries; radio and television program scripts; organizational or institutional reports; survey data; and various public records (Bowen, 2009: 27; Creswell, 2009: 180).

Document analysis has the following advantages: i) it is less time consuming as involves data selection, instead of collection; ii) provides to the researcher the language and words of the studied subjects; iii) are more accessible, many documents are in the public domain; iv) documents are unobtrusive and non-reactive, that is, they are unaffected by the research process; and v) document analysis is less costly than other data-collection techniques (Bowen, 2009: 31; Creswell, 2009: 180).

However, this data-collection technique has also limitations. For instance, i) they may provide insufficient detail to answer a particular research question; ii) protected documents may difficult public access; iii) It may be hard to find; and iv) documents may lack authenticity (Bowen, 2009: 32; Creswell, 2009: 180).

3.3.3.1 Documents Collection Process

Although no local (in Honduras) library catalogues and archives were browsed for documents to be analyzed, important information and insights were derived from documents collected during the

empirical research. Documents were obtained by asking directly to government officials, research agencies, cooperation agencies, exporters and producers. In addition, useful documents were gathered through search on the Internet.

Public documents collected during the empirical research include those provided by different units of the Ministry of Agriculture. Among these are: i) statistical reports on Asian vegetables exported from Honduras; ii) regulations to produce and export Asian vegetables; iii) manual of proceedings to export agricultural commodities; iv) socio-economic and demographic information of locations where Asian vegetables are planted; v) the strategic plan of Asian vegetables Chain Sub-committee; and vi) minutes of meetings with producers and exporters.

Private documents include those provided mainly by producers, exporters, research agencies and cooperation agencies. Among these are: i) copy of written contracts between producers and exporters; ii) copy of other agreements between producers and exporters; iii) copy of seasonal prices pay to producers; iv) payment invoices; v) international wholesaler price reports; and vi) manuals of production.

3.3.4 Visual Data

Qualitative researchers employ visual materials as means of recording and documenting social life (Denzin and Lincoln, 1994c: 355). Photography is often called the mirror with a memory; it takes the researcher into the subjects' world (ibid). Data collected through visual materials take the form of photographs, videotapes and art objects (Creswell, 2009: 181).

According to Grady (2008: 4) Photographic data provides a more direct record of the actual events being studied than any of the other major forms of data collection used by qualitative researchers. Photographs also capture the immediacy of the moment as it appears to the observer (Grady, 2008: 4)

Visual data produced through the use of digital visual technologies offers several advantages. Some of them are: i) miniaturization; ii) low cost; iii) storage capacity; and iv) easy transmission of photographs (Knoblauch et al., 2008: 1).

Disadvantages associated with the use of visual data include: i) the difficulties to interpret it; ii) the presence of the photographer may be disruptive; and iii) may not be accessible publicly or privately (Creswell, 2009: 180).

3.3.4.1 Visual Data Collection

Visual data was collected with a digital camera that produced instant photos and that supports files in different digital formats.

Although an exhaustive photo-collection and photo-analysis based on rigorous methodological principles were beyond the scope of this study and the researcher capabilities, photographs provided very useful information. The images captured through photographs along with direct observations facilitated the description of several issues. For instance, the conditions of roads and equipment in the locations where Asian vegetables are produced.

In this study photographs also allowed recording information that otherwise it would have been difficult to obtain. For instance, some contracts were photographed due to the impossibility to obtain a copy of them. Moreover, some information about importers was captured through photographing boxes with their logo.

3.4 Data Analysis and Synthesis

Data analysis and synthesis as well as data collection was major contest. It was an extremely time consuming process that demanded a great deal of reflection and time. The procedure followed in this study to analyze and synthesize data makes use of some concepts of grounded theory and is based on Huberman and Miles (1998); Bloomberg and Volpe (2008); and Creswell (2009), see Figure 3.2.

According to Huberman and Miles (1998: 180) data analysis is an ongoing procedure which takes place all through the entire research process.

The approach used in this study for data analysis is a manual one; no computer-aided qualitative data analysis software program was used. The selection of the manual over the computer-aided method was a matter of the researcher's personal preference.

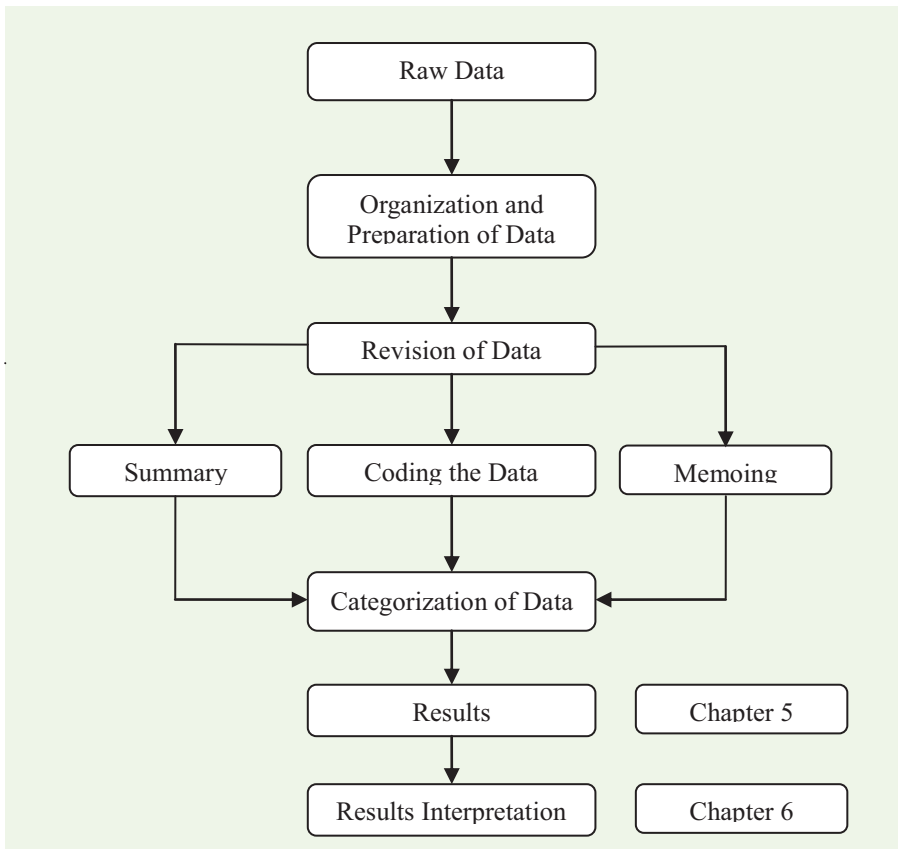


Figure 3.2. Procedure of data analysis

Source: Own elaboration based on Bloomberg and Volpe (2008); and Creswell (2009)

3.4.1 Organization and Preparation of Data

The first step was to transcribe verbatim all the 59 conducted interviews in Honduras. Transcriptions were done manually using a computer and by the researcher himself. Labeled field observation notes and visual data were included along with transcriptions. Transcriptions were sorted and arranged depending on the respondents' class or group (e.g., producers, exporters, importers, etc.). Copies of all the material were done and data was store securely in labeled computer files to honor confidentiality of respondents.

3.4.2 Revision of Data

Transcribed interviews, field observations notes, collected documents and visual data were carefully read over to gain a general sense of the information they contain and to reflect on its overall meaning. Additionally, as the researcher read the transcriptions, he made notes of relevant words and phrases that he though capture important aspects of the data, as well as he verified how

data was linked to the relevant literature. The aim was then trying to integrate what the different respondents said and to extract the important ideas or themes emerging from the information collected.

3.4.3 Coding the Data

In this phase the researcher worked on making the data more readily accessible and understandable. The large arrangement of words, sentences and paragraphs were reduced to what is of most importance and interest and then was transformed to draw out themes and patterns. Huberman and Miles (1998: 180) call this process “data reduction”.

Thus, key codes (coding scheme) derived from conceptual framework and research questions were generated. The idea was then to use these codes as descriptors of data patterns, remaining flexible as the data analysis process proceeds, that is, to classify the data and place sections of material into categories. According to Bloomberg and Volpe (2008: 102) coding works as system of classification, whereby data segments containing important information are labeled to facilitate the analysis.

In the final coding scheme each category was abbreviated and its descriptors were codified. During the process some descriptors were deleted and sometimes new ones emerged. The codes assigned to each descriptor were written next to the appropriate segments of the text. Simultaneously, summary charts of each category were elaborated and memos (memoing) were written to supplement the coding process.

The categories and the underneath category’s descriptors developed in this study are displayed in Table 2.11 (Conceptual framework) included in section 2.7 theoretical framework.

3.4.4 Sort and Categorization of Data

After the material was coded quotations were assembled in the analytical category they belonged to. In this study the researcher used the method of electronic flip charts suggested in Bloomberg and Volpe (2008: 105). These electronic flip charts are Microsoft word documents, wherein quotes from the transcriptions were copied and pasted electronically. The researcher created a separate flip chart for each category. On each flip chart was listed a category name and its descriptors.

Once going through all transcriptions was finished, they were re-examined, particularly those which didn't fit any of the existing descriptors or was unclear under which category they should fall. As result two additional categories were created, namely miscellaneous and dates (this two categories were not displayed in Table 3.1 "Conceptual Framework" included in Chapter 3 Theoretical Framework). The next step was to report findings, which are presented in the next chapter.

3.5 Limitations of the Study

Qualitative studies in general are limited by researcher subjectivity; there is no bias-free qualitative design (Janesick, 1994: 212; Bloomberg and Volpe, 2008: 87). Additionally, interviewing was a new experience for the researcher. In this sense a limitation of this study is the potential bias concerning the researcher's own perception, prejudgments and assumptions about the relationship between local actors (producers and exporters) and how the institutional context shapes this relationship. To overcome this limitation the researcher acknowledged his assumptions and made a conscious effort to collect, extract, analyze and interpret the empirical data in an honest and transparent manner. Discussions with doctoral colleagues and advisor provided a rich space for reflecting about the nature of this study and to remain flexible and objective during the analysis.

Because of limited economic resources, a very important limitation of this study is the lack of first hand information on all actors participating in links located in the U.S. Value chain analysis ultimately rests on the ability to grasp the complex nature of the whole chain and this entails capturing the experiences of each actor. Although the focus of this study is on local actors, attempts were made to interview more importers and to contact wholesalers and Asian supermarkets in U.S., but unfortunately these efforts were unfruitful. To overcome this limitation, local actors and importers were asked to provide information regarding this issue. Local actors, including exporters, producer-owned company, cooperation agencies and the interviewed NGO provided useful insights. Moreover, an extensive revision of documents and other secondary sources was carried out to collect information about U.S. actors.

In addition to data triangulation, measures were taken to ensure internal validity. However, in the case of importers this was problematic. The researcher was not able to establish an ongoing dialogue regarding his interpretations of importers' meanings. In contrast, an open dialogue was

established with local actors, particularly with members of the producers-owned association, the interviewed NGO and officials working with some government agencies.

Due to the restricted research sample a critique of this research might be the limited possibility of generalizing results to other value chains or cases. However, generalizability was not the intended goal of this study. Furthermore, by means of a rich description and detailed information concerning the context of the study, the knowledge generated may be assessed for its applicability in other cases.

3.6 Study Areas

Honduras is the second largest country of Central America, it has a surface area of 112, 492 km² and, in 2008, had an estimated population of 7.7 million people (BCH, 2009: 1). Honduras is bounded on the north and east by the Caribbean Sea, on the south by Nicaragua on the south west by the Pacific Ocean and El Salvador, and on the west by Guatemala (Figure 3.3). The capital city is Tegucigalpa the country's largest city with an estimated population, in 2008, of 967,200 people (Figure 3.3) (BCH, 2009: 1).



Figure 3.3. Departments of Honduras

Source: Own elaboration

Honduras territorial organization consists of 18 departments (departamentos) (Figure 3.3). Departments are roughly equivalent to a Bundesländer, state, or province. These 18 departments are divided into 298 municipalities (municipalidades). The municipalities are further subdivided into aldeas and those into caserios. This study was conducted in the departments of Comayagua and Olancho where production of Asian vegetables is concentrated (Figure 3.3).

3.6.1 Department of Comayagua

Comayagua is one of the 18 departments into which Honduras is divided and is located in the central western part of the country (Figure 3.3). The seat of government in department of Comayagua is Comayagua city situated at 86 km northwest of Tegucigalpa (Figure 3.4). The department covers a total surface area of 5,124 km² and, in 2005, had an estimated population of 388,460 people (UNDP, 2006: 236).

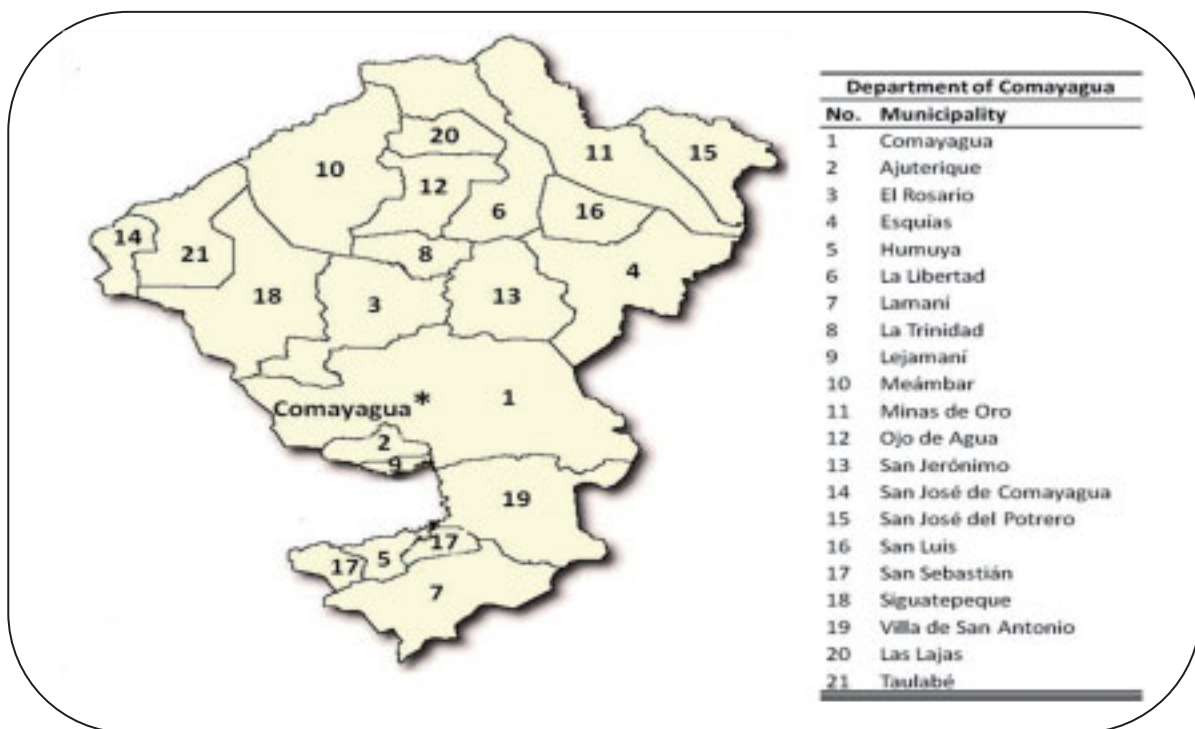


Figure 3.4. Department of Comayagua
Source: Own elaboration based on PNUD, 2006

The southern part of Comayagua Valley concentrates the production of Asian vegetables and production spreads north towards municipalities of San Jeronimo and La Libertad (Figure 3.4). Comayagua Valley is located in the southern part of the department at 150 km from the Atlantic Coast. The valley covers 2 municipalities in department of La Paz and at least 10 in Comayagua

including: Comayagua, Ajuterique, Humuya, Lamani, Lejamaní, San Sebastián, and Villa de San Antonio among others (Figure 3.4) (SERNA, 2000: 81; Doryan and Flores, 1999: 17). The borders of the valley are delineated by Comayagua’s hillsides and Montecillos Mountains (Doryan and Flores, 1999: 17). The valley is positioned in an axis that stretches from north down to south around 35 km long and from 10 to 15 km wide (Ibid). It covers a surface area of 37,250 has and is a relatively flat area at an average elevation of 626 meters (SERNA, 2000: 81). The valley is surrounded by Humuya River which serves as border with department of La Paz and is fed by many tributaries (Doryan and Flores, 1999: 17). The Basin of Humuya River is a very important source of water not only for Comayagua, but also for other regions in the country. To optimize the water use in the Valley the government has promoted the creation of irrigation districts which are administered by the beneficiaries with support from different government agencies (SERNA, 2000: 81).

The visited areas to collect information for this study include plantations and packing houses located in several aldeas in the municipalities of Comayagua, Ajuterique, Lejamaní, San Jeronimo and El Rosario (Figure 3.4).

3.6.1.1 Climate and Soils

Valley of Comayagua has a sub-tropical climate and rain intensity is relatively low. The average annual temperature, relative humidity, precipitation and evaporation during the last 35 years is displayed in Table 3.3

Table 3.3 Main meteorological variables (Playitas Station)

Location	Temperature (°c)	Precipitation (mm)	Relative Humidity (%)	Evaporation (mm)
Comayagua	25.18	827.2	68.25	5.4

Source: Own calculation based on SERNA, 2009⁴⁷.

The rainy season known locally as winter, usually begins in May and last until October and is characterized by three periods: i) the first half of the rainy season (primera) begins in early May and ends in early July; ii) the second half of the rainy season (postrera) begins in late July or early

⁴⁷ http://www.serna.gob.hn/centro_de_informacion/est_conv/Paginas/default.aspx [Accessed 02. 10]

August and ends in early November; and iii) the dry period (canícula) between the two rainy seasons lasts from two to six weeks.

According to Doryan and Flores (1999: 20) the soil textures found in Valley of Comayagua are claim loam and silty clay loam, with high pH value (7 to 8) and moderate fertility. However, these soils are suitable to grow a broad range of crops. The same authors assert that according to a soil study the best soils are concentrated in the North and Central parts of the valley (Doryan and Flores, 1999: 20).

3.6.1.2 Main Socioeconomic Facts

The main economic activities of the department are linked to the agricultural sector. Comayagua has become the horticultural production center of Honduras. The area under production with exports crops covers approximately 10,000 has. The main economic activities include: production of tomatoes, cucumbers, cabbage, onions, peppers, water melons, mangoes, papaya, sugar cane, coffee, rice, maize, timber and livestock (Doryan and Flores, 1999: 24; SERNA, 2000: 82; PNUD, 2006: 236). This department is the main producer of Asian vegetables, which together with cucumbers and mangoes have turned into the major exporting activities in the region. In addition, in recent years Comayagua has become one of the most important tourist attractions in Honduras.

The Human Development Index (HDI) in 2004 for Comayagua was of 0.629, which is below the national average (see Table 3.4). Although it has increased progressively over the years the exhibited HDI and its dimensions highlight the existing gaps in well-being and life chances in the region.

Table 3.4 Honduras's human development index 2004

Location	Life Expectancy at birth (Years)	Adult Literacy Rate	Gross Enrolment Ratio	GDP per Capita (PPP US\$)	HDI Value
Comayagua	67.8	0.755	0.675	1993	0.629
Olancho	67.2	0.730	0.649	1686	0.608
Honduras	68.6	0.810	0.717	2665	0.664

Source: PNUD, 2006

3.6.2 Department of Olancho

Olancho is located in the northeastern part of the country (Figure 3.3). It is the largest of all Honduras's departments. It covers a surface area of 24,905 km² and, in 2005, had an estimated population of 495, 816 people (PNUD, 2006: 248). The seat of government in Olancho is the city of Juticalpa situated at 170 km East of Tegucigalpa (Figure 3.5). Catacamas is the second city of department and is located 40 km further (Figure 3.5).

The valleys of Olancho constitute important agricultural production zones. Asian vegetables are planted in some of these valleys. The most important valleys include Guayape, Lepaguare, Catacamas, Agalta and Patuca. The visited areas to collect information for this study include plantations located in several aldeas in the municipalities⁴⁸ of Catacamas, Juticalpa, Campamento, and Guayape (Figure 3.5).

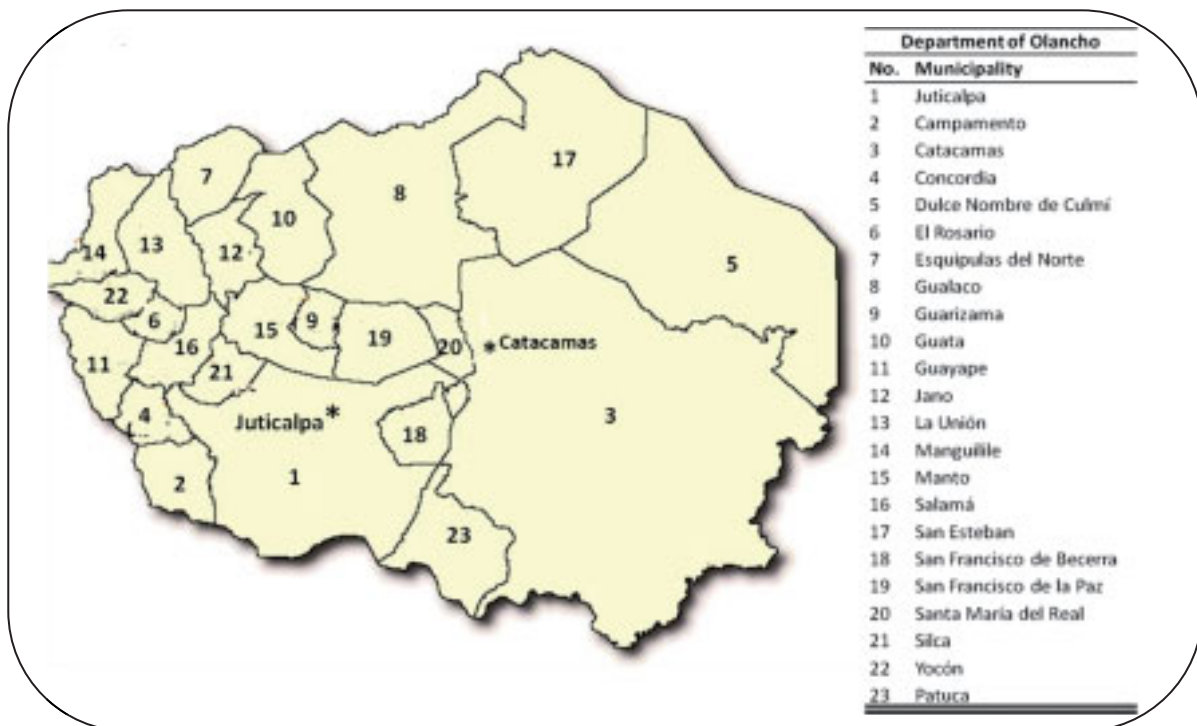


Figure 3.5 Department of Olancho
Source: Own elaboration based on PNUD, 2006

According to SERNA (2000: 45) the zone of valley Guayape and Lepaguare is located in the central part of the department at approximately 160 km from Tegucigalpa. The valley covers a

⁴⁸ The municipality of Gualaco was not visited but information was collected through interviews with producers in that region.

surface area of approximately 90,000 ha which represents only around 8.6 percent of the total surface of 4 municipalities. These municipalities are Juticalpa, Catacamas, Santa María del Real and San Francisco de Becerra (Figure 3.5). Nevertheless, 11,000 ha out this 90,000 ha are not suitable for agricultural production; instead they are better apt for uses related to forestry (Martinez, 1990: 27). The Valley belongs to Patuca River Basin and Guayape River Sub-basin (SERNA, 2000: 46). Guayape Valley is the main staple crops production zone in Olancho and probably in Honduras (Martinez, 1990: 1).

Agalta Valley lies between the municipalities of Gualaco and San Esteban where production of Asian vegetables is also carried out (Figure 3.5). This valley is the second after Guayape in terms of agricultural production in Olancho. Agalta Valley is a relative remote area located in the eastern part of the department at 270 km from Tegucigaloa. It has a length of 60 km and covers a surface area of 60,000 ha (Torres, 2008: 418). It is separated from Catacamas Valley by a chain of mountains named Sierra de Agalta. This valley is irrigated by several rivers; the most important are Tonjagua River and Grande de Agalta River.

Olancho is one of the departments with higher rates of deforestation. This problem may be attributed to the existing culture of slash and burn to create fields for agriculture or pasture for extensive livestock production (SERNA, 2000: 64).

3.6.2.1 Climate and Soils

In general, the climate of Olancho may be defined as sub-tropical with low rain intensity. The average annual temperature, relative humidity, precipitation and evaporation during the last 35 years are displayed in Table 3.5.

Table 3.5 Main meteorological variables (Station of Guayabillas)

Location	Temperature (°c)	Precipitation (mm)	Relative Humidity (%)	Evaporation (mm)
Olancho	25.43	1198.2	81.6	4.4

Source: Own calculation based on SERNA, 2009.

As in the case of Comayagua the rainy season known locally as winter, usually begins in May and last until October and is characterized by the three periods which have already been described for Comayagua.

According to Martinez (1990: 27) Guayape Valley soils present clay loam texture with low pH (5 to 6) and tend to have good drainage. However, during the rainy season they may remain with water excess. Most of the valley surface is flat with slopes between 0 and 4 percent (Martinez, 1990: 27). On the other hand, Agalta Valley possesses highly fertile soils with texture between loam and clay loam, and pH moderately neutral (Torres, 2008: 418).

3.6.2.2 Main Socioeconomic Facts

Olancho's economy is based on agriculture and cattle ranching, and a good part of the dairy products, meat and grains grown in Honduras originate there. This department used to be considered the breadbasket of Honduras. Despite of its touristic appeal Olancho has remained out of foreign visitors' path.

The main economic activities in Olancho are: production of maize, sugar cane, coffee, sorghum (maicillo), bean, rice, bananas, timber and livestock (SERNA, 2000: 82; PNUD, 2006: 248). In recent years Olancho has increased its participation in the production of horticultural crops. In some regions of the department Asian vegetables, water melons and other non traditional crops are being produced.

The HDI in 2004 for Olancho was of 0.608, which is slightly lower than in Comayagua and below the national average (see Table 3.4). The same comment made for Comayagua applies for Olancho. The region has improved during recent years, but still there exists a long way before satisfying the existing gaps in well-being and life chances in the region.

4. PRESENTATION OF RESULTS

This chapter presents the key findings derived from the empirical research carried out mainly in Comayagua and Olancho the regions where Asian vegetables are produced, but also in Tegucigalpa where some government and cooperation agencies are located. These findings were obtained from interviews conducted to different actors related to the value chain and from observations in the locations where Asian vegetables are planted and packed, as well as from documents review and visual materials. Various findings emerged from this study.

The chapter is organized by the following sections: i) introduction of Asian vegetables in the study areas; ii) actors in the value chain of Comayagua and Olancho; iii) function and linkages of actors in both locations; iv) distinctive aspects of producers in both locations; v) business environment in the value chain; vi) supporting markets to the value chain; vii) vertical relations in the value chain; viii) horizontal relations in the value chain; ix) the end market; and x) summary of results.

4.1 Introduction of Asian vegetables to Department of Comayagua

Asian vegetables in Honduras were first produced in Comayagua. They were introduced in 1990 by a Japanese entrepreneur established in Dominican Republic as exporter. Pest problems in the former, forced him to transfer the production to Honduras with the purpose to continue exporting Asian vegetables to the U.S. He brought the genetic material and the knowledge to producers in Comayagua. Simultaneously, in Comayagua the tomato industry had recently collapsed; emerging Asian vegetables as a promissory alternative for local producers. On the other hand, the government's policy strategy during this period is characterized by the encouragement of non-traditional exports, as a means of economic growth. In December 1990 was exported to the U.S. the first shipment of Chinese eggplant, fuzzy melon and long squash produced in Honduras. The following are some statements provided by the person who introduced the Asian vegetables to Honduras, an exporter and a government official.

I began to export from Dominican Republic to the U.S. in 1979. Over there, they export since 1974. In 1988 the USFDA detected the use of illegal pesticides in Dominican Republic and they threatened with automatic detention⁴⁹ was issued in 1989, and at

⁴⁹ Today referred as "Detention without Physical Examination (DWPE)". Is an administrative act of detaining an entry without physical examination, solely on the basis of information regarding past violative history and/or other information which indicates the appearance of a violation (U.S. FDA, 2009: 9-19). www.fda.gov/ICECI/ComplianceManuals/RegulatoryProceduresManual/default.htm#_top [Accessed 04. 09].

the beginning of 1990 USDA banned imports of Asian vegetables from Dominican Republic. After that, I went out to look where to plant. I visited Guatemala two times and Cuba too. Then I remembered Mr. Waki, in those days he worked in Comayagua, he was brought there from Dominican Republic by a processing food company. I knew him since 1956; we arrived to Dominican Republic from Japan in the same boat. Mr. Waki told me: come here, in Comayagua you can plant everything. In December 1990, we exported to the U.S. the first shipment of Chinese eggplant, fuzzy squash, and long squash. When I came to Comayagua people didn't even know the names, I brought with me a Dominican Agronomist named Rafael Rodriguez to teach about the production of Asian vegetables. I brought the seed that is why the names used in Honduras are the same used in Dominican Republic (Yoshiyuki Tateyama)⁵⁰.

“There was a juncture in Comayagua valley at the end of the 80's and beginning of the 90's. Comayagua valley is a horticultural region by nature and the predominant crop was tomato, but due to problems with Whitefly, the tomato industry practically collapsed. This coincided with serious problems of Thrips palmi in Dominican Republic, the excessive use of pesticides to control that pest resulted in a problem of pesticide residues in Asian vegetables exported to U.S. That situation induced two Japanese entrepreneurs resident in Dominican Republic to come here, to bring their knowledge and to search for local partners with resources. That is basically the way the business was initiated (EXPC3)”.

In 1989 and 1990 due to whitefly attacks, almost all plantations of tomato in Comayagua were lost. Therefore, producers emigrated to other regions, also coincided with pest problems in Dominican Republic, which affected its exports of Asian vegetables. The introduction of Asian vegetables was done by two Japanese gentlemen and one agronomist from Dominican Republic; they introduced six different Asian vegetables crops and planted them in a place called El Quebracho. That is how production of Asian vegetables in Comayagua began (SENC).

4.2 Introduction of Asian vegetables to Department of Olancho

In Olancho Asian vegetables were introduced in 2000 by the government with the objective to diversify production in the region, which traditionally has been oriented to supply staple grains⁵¹. Within the framework of Department of Olancho's Diversification Program, the government with the cooperation of an exporting company established in Comayagua, initiated the conditions to stimulate producers to produce Asian vegetables as means to diversify production and improve the socio-economic conditions in the region. The first plantations were located in four different locations: i) La Colonia Agrícola; ii) San Marcos de Jutiquile; iii) La Lima Campamento; and iv)

⁵⁰ Names cited with permission of the interviewed person.

⁵¹ Maize and beans.

Silca. This information was collected from different government officials in Olancho. Some of them said:

Sowing Asian vegetables in Olancho began in August 2000, they were planted in four places, La Colonia Agricola; San Marcos de Jutiquire; La Lima, Campamento; and Silca. It was done through the Olancho's Diversification Program, which objective was to diversify production in Olancho, wherein we had the option to look for a crop and at the same time to search its market, in order to incentive producers to plant it and to secure a promissory future for that kind of crop, especially since the Department of Olancho has been traditionally a producer of basic grains. That is the way we initiated production of Asian vegetables. We investigated in Comayagua, wherein an agro-export company opened its doors to us. We signed up an agreement with this company and they established a packing plant in the city of Juticalpa, Olancho, thereby the producers could deliver their product (UTVOO).

Here in Olancho, production of Asian vegetables is more recent than in Comayagua. We are involved in the production of Asian vegetables since the moment they were introduced and that was eight to ten years ago (1998-2000) (MTTHO).

In Olancho Asian vegetables are planted since about eight years ago (2000). Several companies have come here to produce Asian vegetables. We look for producers with experience in the production of vegetables; it is easier to ask them to apply certain pesticides or to follow the management practices (DICTO).

4.3 Actors in the Value Chain of Comayagua

Here, are understand as actors those whom transform or/and become owners of the product in question, in this case Asian vegetables. The identified actors involved in the value chain of Asian vegetables produced and sourced from Comayagua are shown in Figure 4.1. These actors include two research institutions, four exporters, about 500 producers, a producer-owned company aimed to export, and several exports intermediaries.

The initial information about the different actors in the chain was gathered from interviews with governmental officials at the Ministry of Agriculture (SAG) in Tegucigalpa and Comayagua. From them only a general description of local actors participating in the chain was captured and they couldn't provide much details about actors located in the U.S. Some of them expressed the following:

Participants in the chain of Asian vegetables are producers, input suppliers, exporters and some support institutions, like government dependencies and cooperation agencies. Currently we are working in an Asian vegetables producer's census. There are four exporters, all of them in Comayagua (SCVO).

Here in the Department of Comayagua, there are at least 500 producers of Asian vegetables distributed in different sectors: El Sifón, Playitas, Ajuterique, Lamani, La Paz, Lejamani, San Sebastián, Humuya and almost in all 21 municipalities of Comayagua and part of Department of La Paz. They are small and medium size producers ranging from ½ to 6 mz. The linkages in the chain of Asian vegetables include producer, exporter and broker. (SENC).

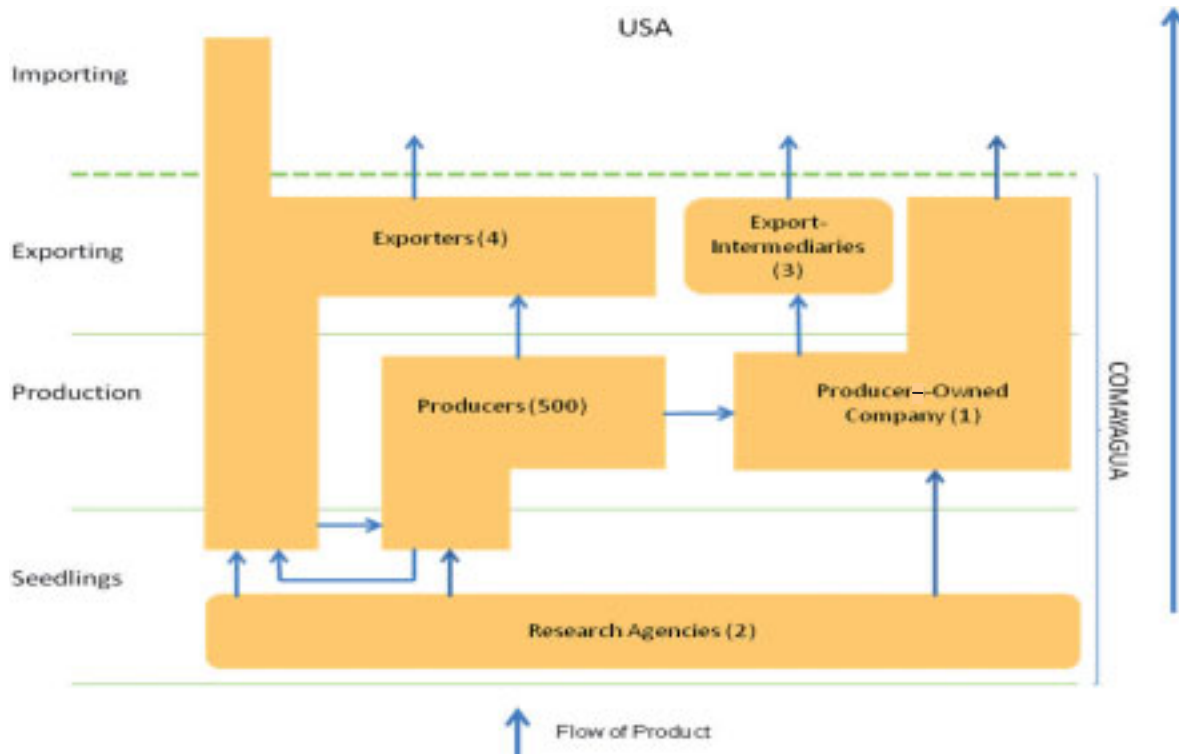


Figure 4.1. Actors in the value chain of Asian vegetables produced in Comayagua

Note: Figures within brackets represent the number of participants performing a function.

Source: Own elaboration.

The information provided by government institutions, was then complemented through interviews with direct actors. It follows the inclusion at local level, of two research institutions, a recently formed producer-owned company and several exports intermediaries companies. In relation to the participation of research institutions in the chain, an exporter and a technician of FHIA made the following statements:

We buy the seedlings in the Taiwanese Technical Cooperation and then sell them to the producer. We work together with this Cooperation Agency; we have tested different crop seeds with it (EXPC2).

The seedlings to plant Asian vegetables are sold by the exporter to the producers. FHIA and Taiwanese Technical Cooperation also produce and sell seedlings to the producer (FHIA).

Regarding the involvement of the recently created producer-owned company, we've got the next assertions from a member of the company and an institution providing it support:

Now a producer-owned company is in function, it includes 47 producers of Comayagua; which operates since November 3, 2008. They have exported to the U.S., but unfortunately had a problem with the intermediaries (TECH).

We have come together with the aim to export. We are convinced that the business is to export rather than to produce. We have mainly exported through intermediaries, who take care of the whole export procedure until the fruit reaches the destiny port. (POCC).

As to the actors in the U.S., it was possible to identify importers, Asian wholesalers, Asian supermarkets, restaurants and consumers mainly of Asian origin. In this regard, we include what some exporters have said:

The chain of Asian vegetables includes input suppliers, agricultural mechanisation services, transporters, exporters, shipping companies, importers, wholesalers and retailers (EXPC3).

Commercialization of Asian vegetables is different compared to those vegetables oriented to the Caucasian-consumer. We sell our product to a broker or importer. The broker sells to the wholesaler. The wholesalers are mostly Asians; there are some Americans and some Latinos. The wholesaler supplies small Asian specialized supermarket and some restaurants (EXPC1).

4.4 Actors in the Value Chain of Olancho

In Olancho identified direct local actors, participating in the chain, are shown in Figure 4.2. It includes one research agency which produces planting material, approximately 200 small producers and only one exporter⁵². The exporter is installed in Comayagua; he travels to the region to collect the fruit and then transports it to his packing plant in Comayagua, from where it is exported to the U.S.

As in the case of Comayagua, government officials at SAG in Tegucigalpa provided a first glance about which actors participate in the production of Asian vegetables in Olancho. In addition, this information was complemented in Comayagua by the exporter which goes there to pick up the fruit. They said the following:

In the last years, I think since 2003, production of Asian vegetables has reached Olancho. There, only one exporter goes to pick up fruit from small producers (SCVO).

⁵² It is not the same exporter that helped the government to establish the production of Asian vegetables in Olancho.

Our suppliers are small and medium size producers, 70% of the producers are in Comayagua and 30 % are in Olancho. We go to Olancho and pick up fruit from producers located over there and then export it from Comayagua (EXPC3).

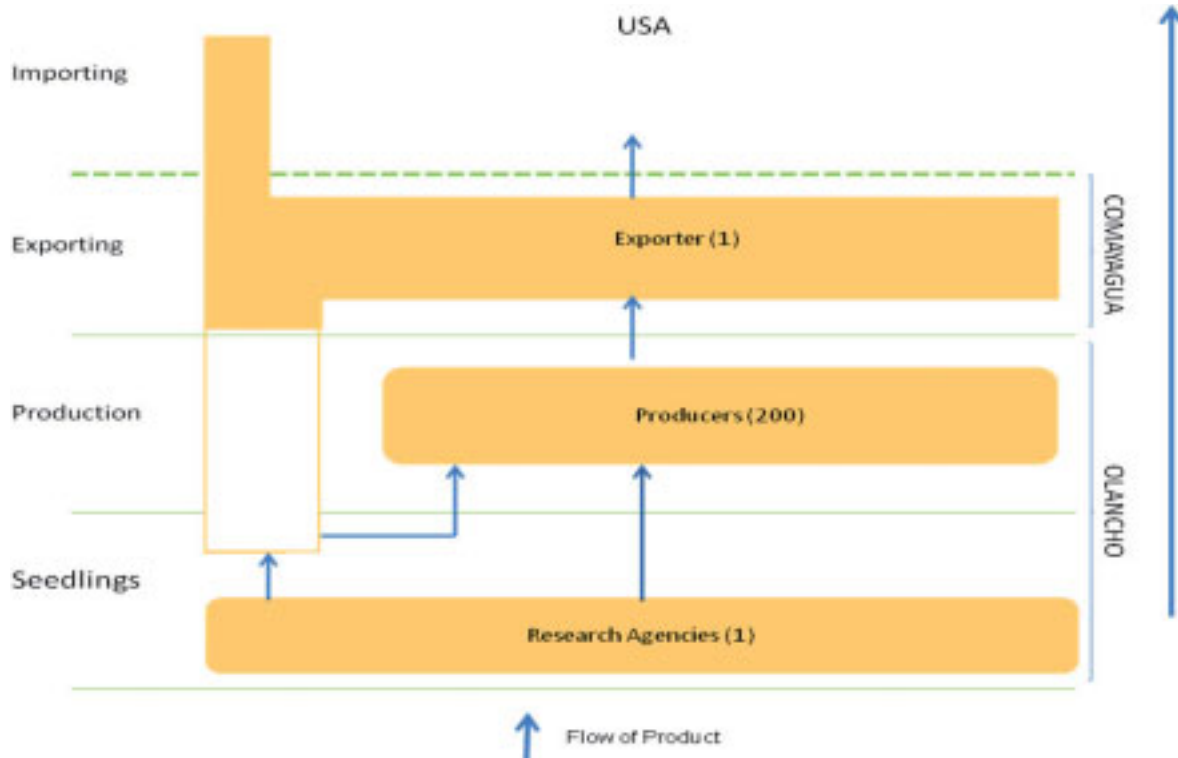


Figure 4.2. Actors in the value chain of Asian vegetables produced in Olancho

Note: Figures within brackets represent the number of participants performing a function.

Source: Own elaboration

Detailed information about the actors was then obtained in our visit to Olancho. There, we could interview the producers and officials from different dependencies of SAG and cooperation agencies providing assistance in the production of Asian vegetables in the zone.

Taiwanese Cooperation in Olancho produce the seedling for the producers, it has the capacity to supply producers in the whole region. We work together with it; we assist from 190 to 230 producers. What takes place is that the exporter makes an order of seedlings to Taiwanese Cooperation based on the area they need to plant with Asian vegetables and then we give them to the producer (DICTO).

Here in “Conce”, there is located an experimental centre for Asian vegetables in the region. We produce seedlings in greenhouses to supply the producers of Olancho. We do it with the purpose to avoid bringing the seedlings from Comayagua. First, the pests found in Comayagua are not present here; second, the cost for the producer is lower; and third, the stress that seedlings suffer during transport, increases loss. The objective is to distribute seedlings to producers in Campamento, La Lima (Campamento), Lepaguare, La Colonia Agrícola, San Esteban, Gualaco (MTTHO).

Regarding international actors, in Olancho there is no direct link with them. Therefore, no information is included here; because, as indicated before, the fruit produced in Olancho is taken by the exporter to Comayagua where the definitive sorting and packing is done, and then is taken to the shipment port. In other words, the information about international actors is the same corresponding to Comayagua.

4.5 Functions and Linkages of Actors in Comayagua

Due to the fact that this study is particularly concerned on local actors, emphasis is made on the description of their functions, particularly in the case of individual producers. In addition, it was not possible to collect enough primary information regarding the functions of all international actors participating in the chain. No interviews were held with Asian supermarkets and restaurants; information about them was obtained from interviews with exporters, importers/wholesalers and documents review.

Here, we understand as a function, each value adding activity or productive process that the product sequentially undergoes, from being a raw material to reaching the end consumer.

The functions fulfilled by the actors in the value chain of Asian vegetables in Comayagua vary. Some actors perform only one function, whereas others perform two or more. For that reason, in some cases several actors appear to perform the same function.

The sequence of functions performed by the different actors in Comayagua and their linkages are visualized in Figure 4.3.

4.5.1 Seeds and Seedlings Supply

Supply of seeds and seedlings entails their production and the evaluation of new materials to produce Asian vegetables varieties adapted to the region. Two main actors involved in seeds and seedling production and distribution can be distinguished in Comayagua, these are research agencies and exporters. Nevertheless, recently some producers have been involved in the production of seeds.

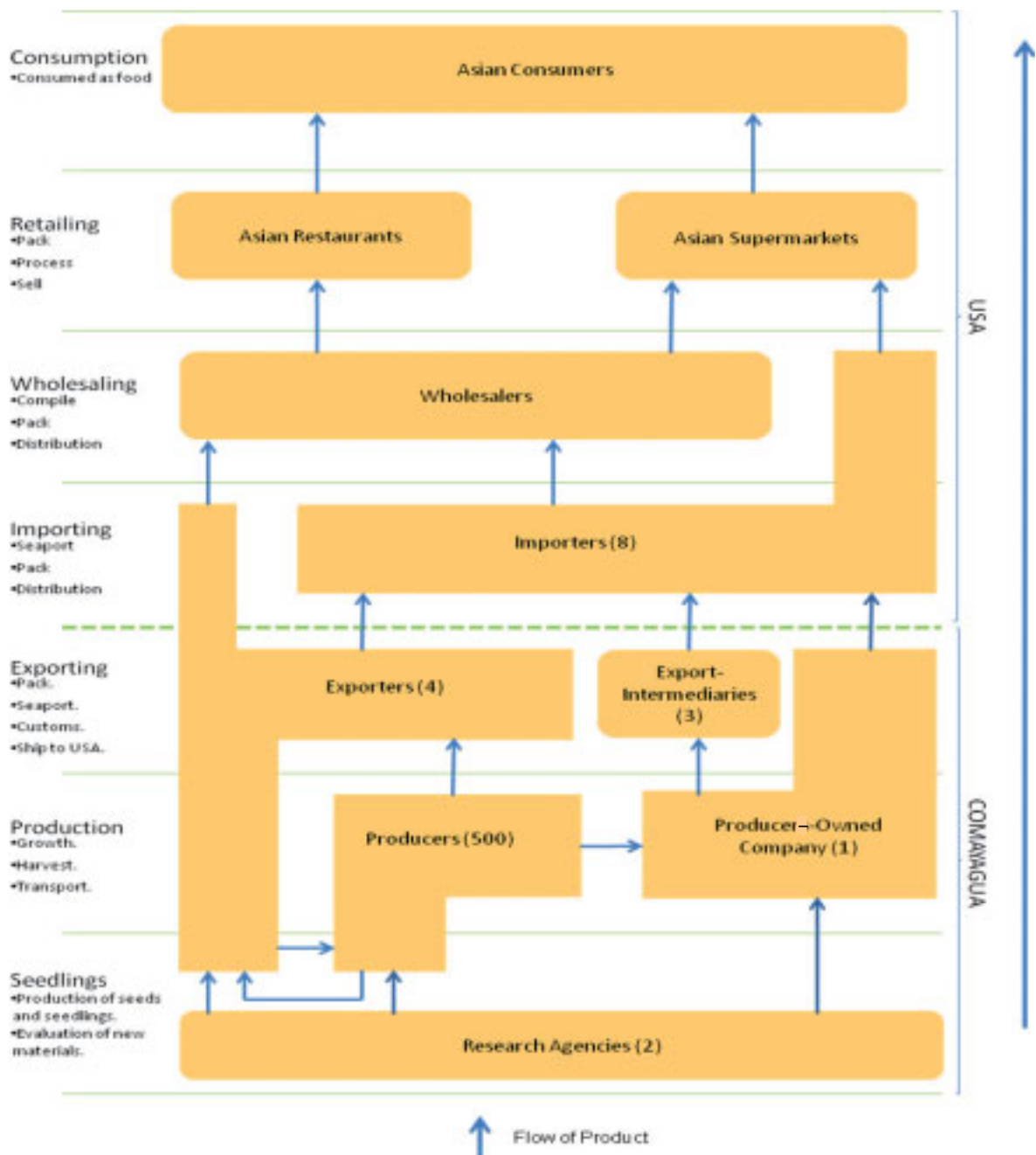


Figure 4.3 Functions of actors in the value chain of Asian vegetables (Comayagua)

Note: Figures within brackets represent the number of participants performing a function.

Source: Own elaboration

4.5.1.1 Research Agencies

Production of seeds and seedlings is done by two research agencies present in the region which are FHIA and MTTH. They germinate seeds in their greenhouses and grow the seedlings during approximately 30 days. Next, these seedlings are then purchased by some exporters which are unable to produce by themselves or directly by some producers, including those which are

members of the producer-owned company. Research agencies also take significant actions in the evaluation of new varieties of Asian vegetables suitable to the region, which are later validated by producers with the support of DICTA Comayagua. These research activities involve exporters, producers and government sections, related to the production of Asian vegetables.

4.5.1.2 Producers

Some producers are also involved in the production of seeds which are used to establish their own new plantations, or to supply some exporters as raw material to the production of seedlings. Some producers save hybrid seed that have adapted to local conditions over time for use from year to year as a mean to reduce cost and dependence from exporters. However, it appears that producers don't have the capacity to ensure that desired characteristics are retained in their varieties. Problems of seed contamination and degeneration due to inappropriate management of Asian cucurbits and Indian eggplant seed plantations were reported in 2007.

4.5.1.3 Exporters

Two exporters have the capacity to produce seedlings. They have their own greenhouses and the technicians required to complete this process. What they have done is to reproduce the genetic material obtained from FHIA and MTTH. Based on that, they grow their own seedlings and then supply producers on credit. However, these exporters recently have been turning to the producers as their source of seeds. They go to the fields and select producers' plantations they catalogue as optimum for the production of seed. The producer is paid for the seeds and these are taken to the exporter's greenhouses. There, takes place the production of the seedlings, which are subsequently provided on credit to other producers. In this regard some actors, including technicians of MTTH in Comayagua, FHIA and an exporter expressed the following statements:

Most of the genetic materials used by the exporters were developed by the Agricultural Mission of Taiwan (MTTH); even those used by FHIA were produced by us. We have practically preserved their genetic material. We donated the material to FHIA and to the exporters we sold it (MTTHC).

The exporters have their own technicians to solve their problems. Nevertheless some of them have turn to us for the production of seedling, especially when they work with high volumes, in those cases we produce the seedlings they need. Research is varied, at the beginning several variety trials for different vegetables crops were carried out, like bitter melon and winter melon. However, nowadays our research continues, not so much in variety trials, rather to provide an answer to current problems. For instance, problems with soils infected

with pests and diseases, we are searching the way to generate new resistant varieties and to promote improved practices such as different systems of staking to reduce fruits rejection (FHIA).

We work together with the Agricultural Mission of Taiwan; we have done trials of hybrid seeds for several crops, such as long squash, Chinese eggplant, and other cucurbits. We have tested whether they grow well in the region and if this is the case, we do cold resistance tests at harvest (EXPC2).

4.5.2 Production Activities

Three different actors participate in production activities in Comayagua. Production of Asian vegetables is done by individual producers, two exporters and a recently formed producer-owned company. The main production activities include growing the plantation, harvesting, sorting, and in some cases depending to which exporter they supply, the fruit is taken to the exporters' packing plants.

4.5.2.1 Exporters

Two exporters out of four established exporters manage their own plantations. These plantations are at a relatively large scale and technologically well endowed in comparison to the majority of producers in this region. Exporters do it for several grounds; the main appears to be quality reasons. Although it seems that these exporters have good performance in their own production of Asian vegetables, they still rely very much on the producers' production in order to achieve the export volume demanded by their buyers in USA, especially during the high season. On the contrary, other exporters decided to abandon this activity in order to focus on their core competency, which is exporting. Exporters in Comayagua provided the following comments:

In our company, we produce, export and then the other owner, which works as broker distributes the product to the different clients we have in U.S. (EXPC3).

Previously, our company used to have its own plantations of Asian vegetables, but we thought it was better to buy from producers. It was too complicated for the company to manage both activities (EXPC1).

Our company is just starting a project of planting 17 mz, with the aim to secure quality. We have realized that producers have to use as reflect what the company does, that is, to allow them to observe the quality our company pursues. At the same time it serves to the company to evaluate itself and to understand better the position of producers, above all in relation to rejections of product (EXPC2).

4.5.2.2 Producer-owned Company.

Productos Vegetales del Valle Sociedad Anónima (PROVEVSA) is an Asian vegetable trading firm owned and controlled by 47 producers members located in Comayagua. This company was created in July 2008 and it's fundamentally based upon production of the associated members for exports to the U.S. It initiated operations in October 2008. Producers integrated in this company are mostly small in operation and size, but well equipped. However, they have achieved a significant level of expertise and recognition for the quality of their product and rectitude. The company does not take ownership or possession of members' production. Members grow their plantations and retain ownership until the fruit reaches the packing plant where is taken by an export intermediary. With regard to this, some producers' members of this company made the following accounts:

I am a member of an association, its name is PROVEVSA. We produce to export. We have started procedures to export directly, the exporters keep us down, and we hope to export soon (PRC6).

Yes I take part in an association of producers, we want to export. I haven't plant yet, that might mean I am not part of the association, but I do. I will plant soon to export. I think there are about 47 producers in the association. We want to produce to export (PRC17).

This company was established in July (2008) this is a limited liability company trading company. Our objective is to export directly in order to earn a higher profit. We are 47 members; all are small producers planting between 1 to 5 mz with Asian vegetables. Most of us, 90 percent have only primary education and only 5 percent has a university degree. However, we are technified; we all have drip irrigation systems and follow a fertilization program, also some fertigation. We implement a crop management plan, superior to the rest of producers (POCC).

4.5.2.3 Individual Producers

We present additional results related to individual producers' activities in section 4.7. However, here it is worth stressing that production of Asian vegetables in Comayagua is concentrated on small size individual producers, in less extent there are also medium and large size producers. Most of individual producers grow under semi-technified systems of production, following basic cultural management practices for Asian vegetable production such as: cultivar selection; transplanting; pruning of leaves; staking; soil, water, weed management; pest and disease control. Producers sort the fruit, place it in boxes and depending on the exporter they have to transport it to the packing

plant. Based on contractual agreements, producers supply with their produce to any of the four exporting companies in the region.

In general, what you have to do to produce Asian vegetables is to have good soil preparation, plant a good seed and follow all cultural practices. You have to be careful not letting any cultural activity behind, when possible you do it one day before. In my case I have to transport the fruit (PRC2).

The main activities we do to produce Asian vegetables are: a good soil preparation, and the transportation of the seedlings. You have to do the staking and prune the leaves to enhance production. Fertilization and application of pesticides in the right moment is important. Then comes the harvest time, we have to collect the fruit, put it into boxes and transport it (PRC3).

In total we have 200 suppliers in Comayagua. Our suppliers are mostly those who plant small areas ranging from ¼ to 1 mz. Those who plant more than 3 mz are considered medium size producers. The large producer plants 6 mz or more and needs an initial investment of Lps. 60,000/mz, that is to say Lps. 360,000 to plant 6 mz. There are producers that plant 3 mz with Lps. 50,000, but I really don't have any idea of how they do it (EXP2).

4.5.3 Exports Activities

Traditionally, exports activities have been performed by exporting companies. However, recently the sector has witnessed the emergence of a group of producers striving to export on their own. Exporters, some of them and in some cases, collect the fruit from the producers' plots and take it to their packing plants. In the packing plant they wash, rinse, sort and grade the fruit, after that is packaged and stored. They undertake the customs clearance procedures and ship the fruit to the port of destiny in the U.S.

4.5.3.1 Exporting companies

Since the introduction of Asian vegetables in the region, over the years several companies have arrived. Currently, there are four⁵³ exporting companies regularly operating, which its main activity is to export Asian vegetables to the U.S., so far the only market for Honduras' direct⁵⁴ exports of Asian vegetables. All exporters of Asian vegetables are concentrated in Comayagua. Their suppliers are individual local producers, which as indicated before, sell their product based on contractual agreements. The exporters sell the product to importers and/or wholesalers located in different parts of USA including New York, Las Vegas, and Chicago but primarily to Miami. It

⁵³ It doesn't include the Producer-owned Company.

⁵⁴ Some Asian vegetables produced in Honduras reach Canada, but through distributors located in USA.

takes to exporters around three days from receiving the fruit at the packing plant until reaches the shipment port (Puerto Cortés). From Puerto Cortés containers are delivered daily and from there the fruit reaches the U.S. market after approximately three days.

Here, in the packing plant the product is received, sprayed, and then taken to the packing area where it is submerged in a water container with chlorine and phosphoric acid, after that is selected in the conveyor belt. Some products such as bitter melon and fuzzy squash are packed in the cold room because they are too sensible. After that the boxes are placed in a refrigerated container contracted by the company (EXPC2).

We have a well planned packing plant, which has so far met our expectations. There we receive, select and pack the product bought from the producers. We have our cold chain where the shelf life of the product is ensured. The product is transported in refrigerated in containers to the port (EXP3).

We contract individual producers to supply us with the product we need. The number of producers we contract varies according to the season, but usually is high. During the high season we can contract up to 200 producers. The producers have to take care of the transport of the product to our packing plant. Once they bring it here, we pay them. We contract a shipping company to send the product to the port in USA (EXP1).

4.5.3.2 Producer-owned Company

This company is based upon production of the associated members and their objective is to avoid transactions with the exporters and to export directly to the U.S. in order to have higher profit. Currently, the members receive one cent of a dollar more per pound, compared to what some exporters offer. Although the associations' important accumulation of human capital and experience is valuable, it remains unknown in the importing market and economically dependent, putting greater reliance upon export intermediaries to overcome these difficulties related to exports activities. The company still doesn't have the necessary resources to take care of logistic aspects related to exports and haven't connected with a reliable buyer to whom deliver directly and continuously the fruit in the U.S. They have contracted with export intermediaries who take care of the fruit from the packing plant until reaches the port in the final market. However, the outcome wasn't profitable. Furthermore, in an attempt to establish a direct relation with buyers in U.S they have exported once without intermediation and the outcome wasn't satisfactory either.

At the moment the fruit arrives to the packing plant and is picked up by the exports intermediary who takes care of it until it reaches the port of destiny in U.S. They charge us with 10% to 15% of commission. For us this reduces risks, especially considering that we don't have working capital, and we don't have the capacity to send somebody to the

destination port. We don't have the capacity to search directly for buyers in the U.S. either. For those reasons it is advantageous for us to sell the fruit in the packing plant and us as producers members receive 0.01 US\$ more per pound than with the exporter. We have tried to export directly once but the experience was negative (POCC).

We can't send directly to the U.S., because we don't have enough capital. However, we are trying to negotiate directly with the importer. We are going to sell the fruit at packing plant price, and then he is responsible for it. To the member producers we will pay the cost of the package, he has to pay the box and transport to the packing plant (PRC1).

4.5.4 Import Activities

Importers carry a large assortment of Asian vegetables from different countries in Latin America. Importers provide to exporters boxes with their logo. They compile the fruit and sell it generally to wholesalers, but in some cases they also supply some local Asian supermarkets and restaurants. Some importers are also wholesalers and get involved in distributions activities in several states of U.S. and Canada. During our attempts to interview importers who buy from Honduras, we could ascertain that they are mainly of Asian and some of Latin American origin and buy vegetables from different Latin American countries in order to spread risk. We have knowledge of at least approximately six to eight importers buying regularly produce from Honduras, including one exporter which sells the product directly to wholesalers. Importers of Asian vegetables produced in Honduras are located, the most important in Miami, some in New York, and in a less extent in Las Vegas and Chicago.

We have only one buyer. He is an importer of Asian origin and is located in Miami. Through the importer our product sometimes reaches Canada. He sells mainly to the wholesalers, in fact our company doesn't have any contact with the wholesalers (EXPC1).

Our broker is one of the owners of the company, there is nobody in between. He concentrates all in Miami and then distributes it all to our four or five clients in mainly in the East coast of the U.S.; I mean Florida and New York. (EXPC3).

Exporters of Asian vegetables from Honduras sell mainly in Miami, but also in New York, Las Vegas and Chicago. Most of the importers are in Miami, but importers in New York pay the highest price. The product that reaches Canada is shipped from North Carolina and is transported by train (TECH).

4.5.5 Wholesale Activities

Wholesalers purchase the product from importers, or in the case when they also operate as importers, they do it directly from the exporters in Honduras. They manage large assortment of tropical fruits and vegetables. Wholesalers participate first of all in supply of Asian supermarkets and restaurants, but through deliveries to other wholesalers they also contribute to the distribution of the product across the U.S. and some cities in Canada. Wholesalers dealing with Asian vegetables produced in Honduras are of Asian origin and mostly are in cities located in the East Coast of U.S., such as Miami, New York, New Jersey but also in Chicago.

We are importers and wholesalers. Our buyers are most of them Asian supermarkets, not restaurants, because they buy from other small local wholesalers. Our buyers are located in Florida and Chicago. We are getting in contact with a group of producers trying to export (IMP2).

We are dedicated to import fresh tropical and Asian vegetables from several countries, one of them is Honduras. Our buyers are Asian wholesalers, Asian supermarkets, Asian vegetable shops and also some restaurants (IMP1).

Most importers are located in Miami and they sell the product to wholesalers. Wholesalers distribute the product all over the U.S., for instance to Seattle, New York, New Jersey and Canada (EXPC1).

4.5.6 Retail Activities

Retailers of Asian vegetables mainly source supply from Asian wholesalers and importers. They are Asian citizens or are Asian descendents. From our interviews we could ascertain that some retailers arrange the transport to collect the fruit from the wholesaler. They go in small cars to the wholesaler place to pick up their vegetables supplies. The major retailers of Asian vegetables can be divided in two groups. First, Asian supermarkets and specialty Asian vegetable shops, which offer to the consumer the vegetables in fresh condition; and second, restaurants, specialized in Asian food or/and vegetarian food, which offer dishes prepared with Asian vegetables. Although some traditional supermarkets and other types of restaurants buy Asian vegetables, they do it in much lower volumes compared to Asian food specialized stores.

The amount we sale to this Asian buyers is not too big, so they come with their little truck or van and take the product. Some restaurants just need a few boxes and they usually don't have transport to pick up the boxes, so they buy from local wholesalers (IMP2).

We have four buyers, they are importers at least two of them are in Miami and one is in Canada, but this last is currently inactive. We have a main client, who buys our product since we are in business and he sales the product mainly to Asian supermarkets and wholesalers (EXP2).

4.5.7 Consumer of Asian Vegetables⁵⁵

Asian vegetables are mainly consumed by Asian individuals and to a lesser extent by other consumer groups with higher income searching for variety in their menu. Asian consumers buy mainly from Asian supermarkets and specialty Asian vegetables shops. Other consumers groups go mostly to restaurants. Asian vegetables are consumed all over the U.S.

This food is consumed by Asian people at home or in restaurants of Asian and vegetarian food, and not in fast food restaurants. It seems that Asian people in the U.S. are transferring their customs to the rest of the population; it is possible that the market won't decrease. However, it doesn't have the same peak like other Anglo-Saxon products (EXP1).

The consumers are mostly Asians. However, you can find Asian vegetables everywhere. They are consumed in Texas, California, Florida, Chicago, etc. Asian vegetables are consumed all over the U.S.; (IMP2).

4.6 Functions and Linkages of Actors in Olancho

In view of the fact that international actors in the chain are the same for both Olancho and Comayagua, to avoid duplication, in this section we only include information regarding local actors. Local actors as indicated before are one research agency, approximately 200 producers and one agro-export company. The sequence of functions performed by the different actors in Olancho and their linkages can be visualized in Figure 4.4.

4.6.1 Seeds and Seedlings Supply

Seeds and seedlings in Olancho are essentially produced by one research agency. MTTH produces the seedling and besides makes collaborative efforts with DICTA Olancho to develop and evaluate of new varieties of some Asian vegetables for the region. In contrast with Comayagua, there are no producers involved in the production of seeds. Production of seeds and seedlings by the exporter to supply producers in Olancho appears to be something fortuitous. Producers appreciate the production of seedling in Olancho by MTTH, because seedlings produced by the exporter are

⁵⁵ Additional information is provided in section 4.13 End Market.

subject to damage during the transport from Comayagua, increasing the risk of defective plantations. In addition, pests' differences between Comayagua and Olancho are taken into consideration in the production of seedlings. Based on its needs the exporting company possesses specific orders of seedlings to the MTTH and then supplies producers on credit. The MTTH produce the seedlings and make them available to the producers. Despite that producers have the option to buy seedlings directly from MITTH, but they rarely do it; and prefer to do it through the exporter to take advantage of the credit he provides.

To produce grafted seedlings we sow in trays, thereafter we have to wait one month and then we graft. There are some producers that prefer "Friegaplantos" others prefer "Taiwanese", that is a matter of taste, but they both work the same. We put in the inputs and labour and then the exporter pays us for the seedlings. The exporter makes orders based on the area he needs to plant in Olancho. We send the bill to the exporter in Comayagua and then we receive the payment. The producers come here to load them and the exporter deducts it from the producers' production. Producers can buy directly from us, but just those who are solvent do it, because they have to pay immediately. The exporter produces seedlings in Comayagua; also MTCH and FHIA in Comayagua do it. This year producers bought seedlings produced in Comayagua by the exporter, but normally they do it from us (MTTHO).

This year we couldn't buy seedlings from MTTH here in Olancho, because they didn't produce them, but we prefer to supply from them for two reasons. First, they are here in Olancho; and second the quality is better, they have guaranty. The disadvantage is that there is no credit; you have to pay right in the moment you get the seedlings (PRO1)."

The exporter buys seedlings in the MTTH and then supplies us on credit. I have bought directly from MTTH; in the case of eggplants I like more the graft of 'Friegaplantos' (PRO3).

4.6.2 Production Activities

In Olancho production activities are only carried out by individual producers. Additional results and detailed information related to producers are presented in section 4.8.

The main production activities are similar to those executed in Comayagua and in general, include growing the plantation, harvesting and sorting the fruit. Producers transport the fruit to an agreed place of collection in the main road, where is picked up by the exporter at an agreed time. Producers in Olancho are basically small in terms of size and operation; and as their counterparts in Comayagua they hold semi-technified systems of production and follow the basic cultural management practices for vegetable production. Based on contractual agreements producers supply

the only exporter that procures production from the region. Some producers expressed the following:

In short, in the case of eggplant we first prepare the land; after the land is ready, we bring the seedlings and transplant them in the field. Then, one has to follow all the cultural practices. You know, like pruning the leaves, staking, fertilizing, pest control and irrigating. When the fruit is harvested we put it into boxes and take it to the road (PRO7).

I plant eggplant and to do it well I have to transplant the seedlings when the land is prepared. I make sure that the crop has all what it needs in time, but sometimes is difficult to get the inputs to fertilize and control pests. I grow the plantation and then the harvested product I put it into boxes and take it to the point of collection (PRO8).

When you plant Asian vegetables you have to plant in a good land. You have to stake the plantation and make the prune. You fertilize and use no residual pesticides to avoid getting banned. The fruit you harvest is placed in boxes and taken to the edge of the main road by truck or oxen (PRO16).

4.6.3 Export Activities

Only one exporting company procures fruits from producers in Olancho, but has no packing plant there. Therefore, the producers have to transport the fruit to a previously agreed point, located in the main road (Catacamas-Tegucigalpa) from where the exporter collects it and transport it to his packing plant in Comayagua. In Comayagua the fruit is sorted, graded and then taken to the shipment port (Puerto Cortés).

Since the introduction of Asian vegetables in Olancho several exporters have gone there to gain from its production, but only one has remained active. According to the information we have gathered through interviews three exporters including one from Guatemala have procured Asian vegetables from producers located in Olancho. They withdrew from the activity due to excessive economic losses. Even the exporter presently operating, temporally ceased activities in the region and later on came back after his competitor declared bankruptcy. In this regard some actors provided the following comments:

In Olancho we began operations in 2002, then we withdrew and another company came to the region, but this company gave up working there and then went back. We collect fruit from producers in Olancho (EXPC3).

Originally there was a company which supported the government to introduce Asian vegetables, then entered the company which is currently buying, and after came a company from Guatemala which was here two years ago. The company that remains in the region

began operations in 2002. The company from Guatemala entered in 2005, but it had problem of rejection in U.S. with eggplant produced in Comayagua, it had several problems with pests and that contributed to its bankruptcy (UTVOO).

We, the producers have to take the fruit to a place where the truck of the company can pick it up; I do transport it with my ox cart to the paved road (PRO2).

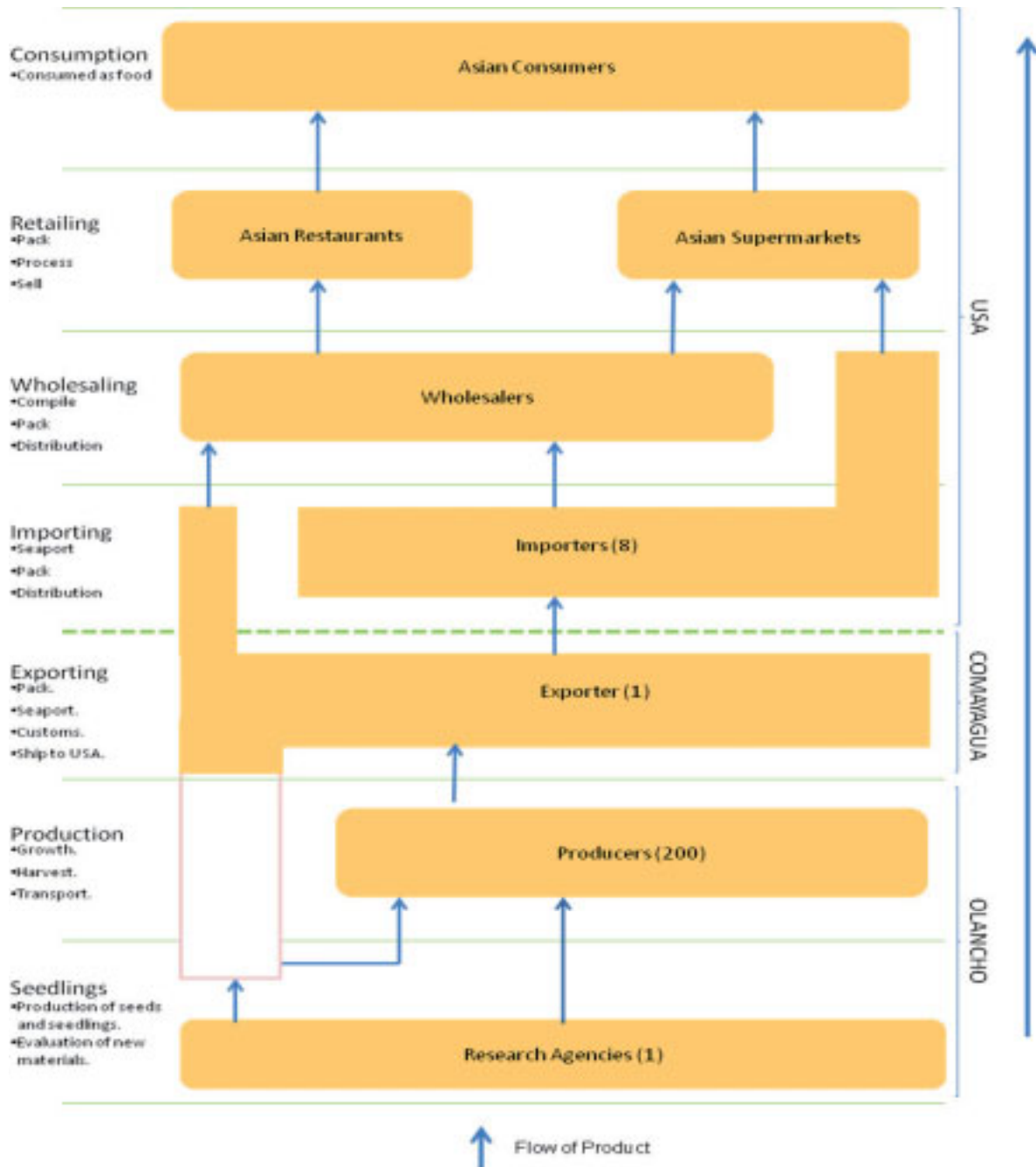


Figure 4.4 Functions of actors in the value chain of Asian vegetables (Olancho)

Note: Figures within brackets represent the number of participants performing a function.

Source: Own elaboration

4.7 Distinctive Aspects of Producers in Comayagua.

This section presents several features that characterize producers of Asian vegetables in Comayagua. It includes the motivations they have to plant Asian vegetables and the main characteristics of their production systems.

4.7.1 Motivations of producers to plan Asian vegetables.

Motivations for the producers to engage in the production of Asian vegetables in Comayagua are several (see table 4.1).

In terms of the number of producers interviewed in Comayagua (20), the primary reason for producers to undertake the production of Asian vegetables is to earn a stable income in a relatively short term (approx. 50 days) after the investment is done. There appeared that production of Asian vegetables offers a way to reduce the uncertainties related to price and commercialization risks attached to staple crops and other vegetables produced in the region (Table 4.1). Producers expressed that in the following ways:

We have observed that with Asian vegetables there is already a fixed price, while with the rest of vegetables is to venture. The good thing with these Asian vegetables is the possibility of being sure of having food and with them there we go, with a good production there is a good profit (PRC4).

The traditional crops we used to plant compete in markets and one sells them to the price the coyotes (intermediaries) offer and with the export companies' one get a stable price (PRC17). The main reason is that traditional crops in the region don't have a fixed market and here Asian vegetables come with a fix price. Therefore, since the first pound we produce, we already know how much we are going to earn and with traditional crops this is not possible, because their price depends on the market (PRC20).

Table 4.1 Motivations of producers to plant Asian vegetables in Comayagua

Motivation	Number of Producers ¹	% of Total
1. Stable income	13	65
2. Improve income	10	50
3. Unique Alternative	3	15
4. Financing and inputs ²	2	10

¹ In total twenty producers were interviewed. Some producers pointed out several motivations, that 's why the sum doesn't equal to twenty. ²Financing and inputs provided by exporting companies.

Source: Own elaboration

There were producers who spoke more poignantly about the opportunity to raise their income. The production of Asian vegetables is associated, by some producers, with the possibility to get higher

profits compare to staple crops and other vegetables cultivated in the region (Table 4.1). The producers recalled:

Several producers were having good results in terms of production and benefits, based on that I started. My objective is to get the best possible economic level; the reality is that in Comayagua, there are no crops that allow earning more money along the whole year than Asian vegetables (PRC1).

We used to plant maize, rice and beans but, because there was a lot of competition these crops weren't profitable. Then, a cooperation agency came, they supported us to work with Asian vegetables, they provided us technical support and after we realized these crops were more profitable than maize and other crops. My wife and I did an experiment, here in this land, we planted 10 tareas (aprox. 0.4 has) with eggplant and the rest (aprox. 0.2 has) with maize. In the case of maize we didn't get even corncocob, we got only Lps.3,000 and from the eggplant we got Lps. 66,000. We did everything well detailed (PRC6).

On the subject of improving income by means of producing Asian vegetables an exporter added the following comment:

I, as a producer of Long squash invest Lps. 60,000. My plantation starts producing fruit and it needs about 15 days to stabilize its production. Once production stabilizes, I may pick 60 boxes 3 times a week; this means I may get 180 boxes per week, which turn into 720 boxes during two months. Now, suppose that from those 720 boxes the exporter pack (takes) 600 and he pays me Lps. 100 for each box. So, in two months I have recovered my investment, even though we are talking about low numbers. In average, the harvest season lasts from 3.5 to 4 months for all Asian vegetables, as a result in the remaining 1.5 or 2 months after paying the investment, I as a producer have money to spend in something else. I as a producer was able to get 85 boxes per pick, which means approximately Lps.25000 weekly. I had to reinvest at most Lps.2000 in payroll and Lps.4000 in inputs (EXP2).

Other producers described production of Asian vegetables as the only productive alternative in the region. Nonetheless, they provide some insights into the limitations of producing these vegetable crops, such as increasing pest problems and rising costs of inputs (Table 4.1).

This valley is the only option that helps a little more, I have planted other crops and the results are never as good as when you plant Asian vegetables. Today it is not as good as before, Asian vegetables are not perfect, we have problems with them too, pests, higher input costs, but even though they are the best thing to plant (PRC16).

A few producers reflected on the supply of inputs (seeds, fertilizers and pesticides) and the provision of credit finance by the agro-export companies which assist them to meet production and export requirements (Table 4.1).

We get financing and here we have nothing else to produce. We hope that continues being profitable, although the land is wearing away after every harvest and the fruit comes out degenerated (PRC11).

I principally plant these crops because the exporter provides us some facilities and services, such as financial support to buy the inputs we need to produce and for the reason that Asian vegetables are more profitable crops in this region (PRC13).

4.7.2 Characteristics of Producers

Here is described the size of area planted with Asian vegetables and technology producers employ to produce Asian vegetables in Comayagua.

4.7.2.1 Type of Producers according to the Land Area Cultivated

As exhibited in Table 4.2, in Comayagua the majority of interviewed producers who plant Asian vegetables as main source of income do it in small areas which in average have 1.1 has per year.

Table 4.2 Type of producers according to land area cultivated (Comayagua)

Type of Producer	Average ha/year	Number	% of Total
Small Producer	1.1	11	55
Medium Producer	2.6	7	35
Large Producer	5.6	2	10
TOTAL	2.1	20	100

Source: Own elaboration

The type of producers is defined in terms of the area planted with Asian vegetables: Large producers are those who plant 4.2 has or more; medium size producers plant between 2.1 has and 4.1 has; and small producers plant 2.0 has or less. This categorization of producers is based on the classification provided by an exporter⁵⁶. Most producers plant small areas due to the high investment and costs involved in the production of these vegetables. A technician of MTTH in Comayagua was very explicit in this regard; he provided some insights about the size of the plots with Asian vegetables:

To manage areas larger than 10 mz (7 has) planted with Asian vegetables, besides high budgets (because the costs are all very high), it is required a higher amount of labor, more than the available equipment and you need a truck. It is not possible to expand area. Some producers are economically stronger and can think about buying a truck to transport the fruit, while the majority has to hire transport or if they own a car they have to drive several times to the packing plant (MTTHC).

⁵⁶ See 4.5.2.3 Individual Producers.

Additional evidence supporting this result has been presented before in this study⁵⁷. However, FHIA (2008: 1), reports that in Honduras there are active approximately 600 producers of Asian vegetables distributed in the regions of Olancho and Comayagua, which in average cultivate 1.5 has per year.

4.7.2.2 Technological level of Producers

Higher technological level was observed on large producers compared to those producers planting medium and small areas.

Certainly, from the information collected in this study it is not possible to provide a complete and detailed picture in relation to the technological level of producers. The information presented here is based on the type and condition of producer's irrigation systems. That is the reason why it is difficult to ascertain any direct relation between the area planted and the technological level of producers.

However, this study found that in Comayagua there are small ($0.7 \text{ ha} \leq 2.0 \text{ ha}$) and medium size producers ($2.1 \text{ ha} \leq 4.1 \text{ ha}$), which don't operate drip irrigation system and instead they work with gravity fed systems (Table 4.3). It seems that for these producers, the investment needed to implement drip irrigation system turns out to be too high. According to some interviewed actors this is the case for the majority of producers in the region.

There are producers who have land, but they are not able to install drip irrigation system due to economic reasons. I would say that economic factors are the main constrain for producers to have drip irrigation system. The majority of producers don't have drip irrigation systems. Drip irrigation was introduced in the region in 2005, through a cooperation program named FINTRAC supported by USAID and also the government has done some effort to implement more efficient irrigation systems (EXP1).

In the case of Asian vegetables 60 percent of the producers in Comayagua don't have drip irrigation systems, but three years ago (2005) there were only 10% of them with that type of irrigation system. The majority of producers have gravity fed irrigation systems (POCC).

⁵⁷ See 2.1.1 Structure of the Vegetables Sub-sector.

Table 4.3 Type of irrigation system and condition of accessories used by producers in Comayagua

Type	Number	Irrigation System		Accessories ¹		Other ¹	
		Drip System	Gravity fed	New	Used/ Incomplete	Fertigation	Plastic Mulch
Small Producer	11	6 (55%)	5 (45%)	0 (0%)	6 (100%)	0 (0%)	0 (0%)
Medium Prod.	7	5 (71%)	2 (29%)	0 (0%)	5 (100%)	1(14%)	0 (0%)
Large Producer	2	2 (100%)	0 (0%)	2 (100%)	0 (0%)	1 (50%)	1 (50%)
TOTAL	20	13 (65%)	7 (35%)	2	11	2	1

¹ It refers to drip irrigation systems only.

Source: Own elaboration

Additionally, it was observed that some medium size producers (2.1 ha ≤ 4.1 ha) and some small size producers (0.7 ha ≤ 2.0 ha) have drip irrigation systems (Table 4.3). They differentiate in relation to the large producers as most of them operate drip irrigation systems with an incomplete or used set of accessories. Some of them apply fertigation. Several small and medium size producers have obtained their equipment through the support of different governmental institutions or cooperation agencies. These types of producers regret the lack of filters in their systems due to their high costs and for convenience they utilize second hand drip hose, bought from the exporter or other agricultural companies in the region. Generally, they are not able to regularly provide to their system the required maintenance.

I operate a drip irrigation system; you have to buy the water pump with your resources. Sometimes I get the hose from the exporter, it is not new, but it is in good condition. If we are lucky we can even get plastic cover from the exporter (PRC3).

I bought with my money the irrigation equipment I have, but I need sand filters. I still haven't change the old ones, I am not able to do it at appropriate moment because they are too expensive, we need them to avoid obstruction in the emitters (PRC5).

The irrigation system I have is a drip system. Which I bought myself, the hose I make use of is a used one. Actually is almost new. I would say it is new. It was installed in the field but not used because they didn't plant. A friend of mine got it from a cucumbers agro-export company and sold it to me (PRC17).

Conversely, the researcher observed that producers who plant large areas (4.2 ha ≤ X ha) are better equipped (Table 4.3). They operate drip irrigation systems with complete set of accessories, such as sand filters and some of them even follow a fertigation program (Table 4.3). They have the capacity to provide their equipment the necessary maintenance management, like changing the filters as needed, cleaning periodically the drip hose system and to replace it by a new one when is not anymore usable. They use of plastic mulch to control weeds. Among large producers is at least one

cucumber company, which sometimes during the out of season cucumber’s production period plants Asian vegetables. This company is positioned to ideally accommodate itself to the requirements associated with the production of Asian vegetables, therefore has the capability to achieve high yields.

The researcher could observe that in general the use of agricultural machinery by producers of Asian vegetables in Comayagua is limited to soil cultivation activities (Table 4.4). Large producers use plastic mulch layer during cultivating season. However, producers prepare the soil for planting with different farm implements pulled by tractor and the rest of activities such as planting; fertilizing and pest control as well as harvesting are done by hand. The most used implement by producers of Asian vegetables is the plow. Depending on the needs, different types of plows are used for initial cultivation of soil in preparation for planting and killing weeds. Producers also use harrows to follow the rough finish left by ploughing operations in order to provide the soil a finer finish that make it suitable for seeding and planting operations. Finally, producers use seedbed preparation machines before planting.

Producers have no refrigerated storage facilities; instead they improvise provisional storage structures near to harvesting places in a simple and inexpensive way using rests of plastic bags or sacks, without following any equipment requirement. In these structures producers gather together the harvested fruit to protect it against the inclemency of weather conditions and then take it to the exporter packing plant (Picture 4.1).

Table 4.4. Comayagua’s producers use of agricultural machinery and storage facilities

Type of Producer	Soil Cultivation	Other	Storage Facilities
Small Producer	11 (100%)	0	0
Medium Producer	7 (100%)	0	0
Large Producer	2 (100%)	Plastic Mulch Layer	0
TOTAL	20	20	0

Source: Own elaboration

In addition, all interviewed producers have their own compression and/or motorized backpack sprayers to apply chemicals to plantations. They explained that motorized sprayers are preferred to use when the crop is taller and the other during the establishment of the plantation.



Picture 4.1 Producer sorting fruit in an improvised storage structure (Comayagua)
Source: Own elaboration

4.8 Distinctive Aspects of Producers in Olancho.

This section presents several features that characterize producers of Asian vegetables in Olancho. It includes the motivations they have to plant Asian vegetables and some characteristic of their production systems.

4.8.1 Motivations of producers to plant Asian vegetables.

Motivations for the producers to engage in the production of Asian vegetables in Olancho are diverse (see Table 4.5).

Table 4.5 Motivations of producers to plant Asian vegetables in Olancho

Motivation	Number of Producers¹	% of Total
1. Higher income	12	60
2. Stable income	7	35
3. Unique Alternative	3	15
4. Help other people	3	15
5. Possibility to Export	2	10
6. Inputs ²	1	5

¹In total twenty producers were interviewed. Some producers pointed out several motivations, that's why the sum doesn't equal to twenty. ²Inputs provided by exporting companies.

Source: Own elaboration

Based on the total number of producers interviewed (20), the main reason for them to plant Asian vegetables is concerned with the prospect to raise their income.

The production of Asian vegetables is associated, by the majority of producers with the possibility to get higher profits compared to staple crops and other vegetables cultivated in the region (Table 4.5). The producers recalled:

The opportunity to work with non-traditional crops appeared and as you know maize and beans are not feasible, one as peasant or farmer searches for something that helps to sustain family, we look for the income to reach our aspirations and dreams of having a decent life (PRO1).

You get more money compared to maize and beans. It is a secure market and every Saturday you get money (el billetillo), besides that you have to hire labor and that is a good thing because you help other people too (PRO4).

Maize, beans and watermelons don't leave enough money. Through eggplants we have obtain a little bit more money than with watermelon (PRO19).

There were producers who appreciated the opportunity to earn a stable income through the production of Asian vegetables. These types of crops represent a mean to reduce the uncertainties related to price and commercialization risks attached to staple crops and other vegetables produced in the region (Table 4.5). Producers expressed that in the following ways:

Asian vegetables provide a safe and steady market. I used to be a famous tomatoes grower, but the market's instability discouraged me. I realized that Asian vegetables were worthwhile and also have a stable market, therefore I decided to plant them (PRO18).

Fellow producers said that these products are worthwhile and we have proved it. Additionally, we are able to get money weekly, almost just the milkman. Through Asian vegetables you don't become rich, but you manage it during the season (PRO20).

Other producers described production of Asian vegetables as the only productive alternative in the region (Table 4.5).

I saw my brother and other producers told me about it and then I liked it. Also, I do it because there is nothing better to do than producing these crops (PRO15).

Some producers indicated that they plant Asian vegetables, because it helps other people too (Table 4.15).

Compared to pepper and tomato which is it like a raffle, you don't know whether you are going to win or lose, suddenly comes a bad weather and you lost, while with Asian vegetables it is different one always gets some money and helps other people. I have hired up to 14

workers and that is motivating and in addition to helping yourself you help other people (PRO8).

A few producers reflected on the possibility of connecting with exports markets through the production of Asian vegetables (Table 4.15).

When the market was opened and we noticed that it was possible to export and to get paid in dollars, it was a very good motivation for us, it is very important, because is a direct aid against poverty (PRO7).

Only 1 of the 20 producers indicated in some way that he plants Asian vegetables due to the fact that the exporting company supplies him with inputs (seeds, fertilizers and pesticides) and provides credit finance to meet production and export requirements.

We used to plant maize and beans, but we noticed that when planting Asian vegetables we got boxes from the agro-export company and the price we get for the vegetables was good (PRO11).

As a final point, in relation to the motivations of producers from Olancho to plant Asian vegetables, a technician of the Ministry of Agricultural in the region added that this is definitely the best economic activity available to producers. He made the following comment:

It is true that with the increase in the costs of inputs the utility margins of producers can be null or presents tendency to lose, however, the salary a producer obtains as day laborer in the field doesn't reach the level of what he receives through Asian vegetable production, to support his family and in addition these crops involve family labor. This is money that remains in the family; therefore they have a better economic status than those who are dedicated to plant maize and beans. Also those producers who plant Asian vegetables get income in a weekly basis during 6 to 8 months (UTVOO).

4.8.2 Characteristics of Producers

Here is described the size of area planted with Asian vegetables and technology producers employ to produce Asian vegetables in Olancho.

4.8.2.1 Type of Producers according to the Land Area Cultivated

In Olancho the overwhelming majority of interviewed producers who plant Asian vegetables as main source of income do it in small areas of 0.8 has in average (1.1 mz.) per year, see Table 4.6.

Table 4.6 Type of producers according to land area cultivated (Olancho)

Type of Producer	Average ha/year	Number	% of Total
Small Producer	0.8	18	90
Medium Producer	2.1	2	20
Large Producer	0.0	0	0
TOTAL	0.9	20	100

Source: Own elaboration

The type of producer is according to the characterization indicated in page 114, and additional evidence supporting these results has been presented in this study⁵⁸. In this regard, the official in charge of the Ministry of Agriculture's Technical Unit of Asian vegetables in Olancho provided the following comment:

The average area planted with Asian vegetables in Olancho is approximately 1 mz (0.7 ha). Currently, we have 121 active producers in the region, I would say that practically all of them are small producers, and there are no large producers in Olancho (UTVOO).

4.8.2.2 Technological level of Producers

Here, we remark the same vindication presented in the case of Comayagua, that with the information collected in this study is not possible to provide a complete and detailed picture in relation to the technological level of producers.

In Olancho some small size producers ($0.7 \text{ ha} \leq 2.0 \text{ ha}$), said they don't operate drip irrigation systems and instead they work with gravity fed systems (Table 4.7). Although, some of these producers have part of the required equipment such as pumps, they lack the necessary capital to buy the accessories to implement drip irrigation systems. Nonetheless, the majority of small (78 percent) and the two medium size producers ($2.1 \text{ ha} \leq 4.1 \text{ ha}$) interviewed operate drip systems. Most of them operate drip irrigation systems with an incomplete or used set of accessories (Table 4.7). Some small producers apply fertigation. These producers are disappointed due to the lack of sand filters in their systems; they cannot afford them and as substitute they make use of second hand drip hose bought from the exporter or other agricultural companies in the region. Several producers have been supported by cooperation agencies which assist them with some brand new equipment. These produce are in general, not in a position to regularly provide to their system the

⁵⁸ See 2.1.1 Structure of the Vegetables Sub-sector.

required maintenance. According to some interviewed actors, this is the case for the majority of producers in the region. Following are comments of producers' regarding the irrigation systems:

You know, I have the motor to impel the water; my problem is that I don't have the required technology neither enough resources to buy all the accessories to install a drip irrigation system. Therefore I use a gravity fed system. But now I am struggling to get a drip system (PRO1).

I have installed a drip irrigation system with my own effort. In the past we used to irrigate the crops even with buckets. This pump I bought it three years ago, the hose I bought is used; it is not the best, but still works very well. I still haven't used fertigation; I know it is not difficult to install it (PRO11).

I have my drip irrigation system and it is working with fertigation. My equipment is provisional, it is incomplete, I need some additional accessories to complete it, the hose system is second hand. I got it from a nearby plantain company; I hope to install a new one in the short term (PRO17).

Table 4.7 Type of irrigation system and condition of accessories used by producers in Olancho

Type	Number	Irrigation System		Accessories ¹		Other ¹	
		Drip System	Gravity fed	New	Used/ Incomplete	Fertigation	Plastic Mulch
Small Producer	18	14 (78%)	4 (22%)	1 (7%)	13 (93%)	3 (17%)	0 (0%)
Medium Prod.	2	2 (100%)	0 (0%)	0 (0%)	2 (100%)	0 (0%)	0 (0%)
TOTAL	20	16 (80%)	4 (20%)	1 (6%)	15 (93%)	3(18%)	0 (0%)

¹ It refers to drip irrigation systems only.

Source: Own elaboration

In Olancho as in Comayagua the use of agricultural machinery by producers of Asian vegetables is limited to soil cultivation activities (Table 4.8). They prepare the soil for planting with different farm implements pulled by tractor and the rest of activities such as planting; fertilizing and pest control as well as harvesting are done by hand. The most used implement by producers of Asian vegetables is the plow. Depending on the needs, different types of plow are used for initial cultivation of soil in preparation for planting and killing weeds. Producers also use harrows to follow the rough finish left by ploughing operations in order to provide the soil a finer finish that make it suitable for seeding and planting operations. Finally, producers use seedbed preparation machines before planting.

They have no storage refrigerated facilities and the distance with respect to the packing plant of the exporter leave producers in a very sensible position. Producers can only improvise provisional storage structures near to harvesting places in a simple and inexpensive way using rests of plastic

bags or sacks, without following any equipment requirement. In these structures producers gather together the harvested fruit to protect it against the inclemency of weather conditions before is taken to the main road where the exporter picks the fruit up. The problem is when for any reason the fruit cannot be collected by the exporter and has to be kept for a longer time in these structures.

Table 4.8. Olancho’s producers use of agricultural machinery and storage facilities

Type of Producer	Soil Cultivation	Other	Storage Facilities
Small Producer	18 (100%)	0(0%)	0(0%)
Medium Producer	2 (100%)	0(0%)	0(0%)
TOTAL	20(100%)	20(100%)	0(0%)

Source: Own elaboration

As in Comayagua, all producers interviewed in Olancho have their own compression and/or motorized backpack sprayers to apply chemicals to plantations. They explained that motorized sprayers are preferred to use when the crop is taller and the other during the establishment of the plantation.

4.9 Business Environment in the Value Chain.

It is concerned with the local and international institutional setting affecting the performance of the local actors in the value chain, such as producers and exporters in both regions Comayagua and Olancho.

4.9.1 Policy Environment

As indicated before, in the last decades Honduras has adopted policies focussed on encouraging exports and improvements in the international competitiveness of producing sectors, with the aim to promote conditions for sustainable growth and to reduce poverty.

4.9.1.1 Macroeconomic Policies

In Honduras economic policy has been framed by the agreements signed with the International Monetary Fund concerned with the objective of maintaining macroeconomic stability. In the last three years (2005 to 2008) low interests rates, stable exchange rate and relative low inflation levels have been an expression of favourable macroeconomic conditions (CEPAL, 2009: 5). However, as stressed before the contribution of the agricultural sector to the Gross Domestic Product in recent years has decreased.

According to the information collected from the interviews conducted with producers in Olancho and Comayagua (Table 4.9), the orientations of macroeconomic policy in Honduras hasn't included: Putting in place specifically targeted subsidies and neither the imposition of any direct tax regime affecting the production of Asian vegetables.

Table 4.9 Subsidies and taxes on production of Asian vegetables in both locations

Location	Subsidies	Tax on Production	% of Total
Producers in Comayagua	No (20)	No (20)	100%
Producers in Olancho	No (20)	No (20)	100%
TOTAL	40	40	100%

Source: Own elaboration

In this respect some producers in Comayagua expressed the following comments:

I have never received subsidies from the government to produce Asian vegetables. I only pay taxes when I buy any equipment, material or input to produce, but there are no taxes on production of Asian vegetables (PRC1).

We don't get any subsidy from the government. There are no taxes on agricultural production I went to the Executive Direction of Revenue (Dirección Ejecutiva de Ingresos) and they told me that we are exempt to pay any tax on production of Asian vegetables (PRC2).

We the producers don't get subsidies from nobody, we have never received anything. As poor people we pay little taxes, but regarding the production of Asian vegetables we don't pay any direct tax (PRC17).

In this respect some producers in Olancho expressed the following comments:

We don't receive subsidies for producing Asian vegetables, although we have technical assistance from the government. We don't have to pay taxes for producing Asian vegetables, just for buying fertilizer or pesticides (PRO2).

No, we have never received any type of subsidy from the government, neither have we been asked to pay anything to produce Asian vegetables (PRO17).

So far and according to my experience we have never get any subsidy from the government. We don't have to pay taxes for the production of Asian vegetables (PRO20).

4.9.1.2 Sectorial Policies

In the context of the Poverty Reduction Strategy, the State Policy for the Agri-food Sector and Rural Area 2004-2021 (Política de Estado para el Sector Agroalimentario y el Medio Rural 2004-2021) was formulated. This policy was based on the contribution of members involved in the Mesa

Agrícola Hondureña⁵⁹ (MAH) and has two strategic axes: i) the productive transformation of the agri-food sector, in order to make the most of the export potential of the country and to strengthen domestic production competing with imports. For the purposes of achieving these objectives, the emphasis is in improving competitiveness and promoting the integration of value chains (SAG, 2004: 41-2); and ii) the reduction of rural poverty, in order to improve welfare in rural areas through actions articulating other sectors such as education, health and housing; by supporting peasant agriculture; and via fostering gender equity (Ibid: 42-3).

An important element derived from this policy framework was the organization of the sector through the integration of value chains in subsectors identified as of higher priority. The National Program of Agri-food Development (Programa Nacional de Desarrollo Agroalimentario, PRONAGRO) was created to coordinate this process. As a result, the Committee of the Horticultural Chain was established in 2004, gathering together different public and private actors of the chain with the intention to provide a space of dialog and agreement that helps to find a focus for policies, programs and projects in the subsector.

In 2007 the Asian Vegetables Chain National Sub-committee (Sub-Comite Nacional de la Cadena de Vegetales Orientales) was established. On October 30th of the same year, in the city of Comayagua the first meeting took place, and participants included producers, exporters, research agencies, cooperation agencies and several government dependencies⁶⁰. The Technical Secretary of the Chain, who is the government official coordinating actions of the chain, offered some insights:

The value chain of Asian vegetables was initiated in 2007. The value chain committee emerged to promote harmony relations among actors in the chain. Our function is to serve as an instance of dialogue especially among exporters and producers. There is a committee, which is not constituted as a board of directors; rather it is to have a participative approach. It is more of a dialogue table chaired by the Minister of Agriculture. Producers are represented as well as each exporter; both are represented in order to watch for their interests. There are also some inputs suppliers, cooperation agencies and government institutions. All of them take part in the committee but without any hierarchy. Other important functions of the committee are the socialization of ministerial agreements and policies, as well as contracting experts through other government dependencies (SCVO).

⁵⁹ Mesa Agrícola Hondureña was a project executed by the Ministry of Agriculture and included the participation of different civil society organizations, and personalities; as well as government institutions with the objective to evaluate and define the short, medium and long term policies required by the Agricultural sector (MAH, 2002: 1) .

⁶⁰ Asian Vegetables Chain National Sub-committee, Aide Mémoire.

More recently, the current government has put into practice the Agri-food Sector Strategic Plan 2006-2010 (Plan Estratégico Operativo del Sector Agroalimentario 2006-2010) circumscribed on the guidelines established by the State Policy for the Agrifood Sector and Rural Area 2004-2021, which is aimed to consolidate a modern, efficient, competitive, environmentally sustainable agri-food sector, that encourages value adding processes, poverty reduction and food security (SAG, 2006: 9). From the perspective of the horticultural sector, this plan is focused to increase the area of non-traditional vegetables from 1750 ha in 2005, to 2454 in 2009. In the case of traditional vegetables the objective is to increase from 6851 ha in 2005, to 8963 in 2009 (SAG, 2006: 96).

4.9.1.3 Trade Policies

In Honduras several measures to incite investment and employment creation, by means of exports has been implemented. Apparently, according to the information derived from conducted interviews, the exporting companies involved in the exports of Asian vegetables depending on their corporate legal constitution qualify differently to these incentives and therefore, the effects are not similar. Some exporters enjoy benefits as those companies in Free Zones and other just benefit of the Temporary Import law. Smaller exporting companies have complained about the accessibility of these benefits. There are no non-tariff barriers affecting the sector, the customs process seem to be efficient. However, administrative procedures to obtain some permits such as the sanitary and environmental license take long time.

The most important measures affecting exporters of Asian vegetables are the following⁶¹:

- a) Investment Law (Ley de Inversiones). Its purpose is to promote and guarantee national investment, foreign direct investment and joint-ventures to stimulate economic growth and social development of the country. All private enterprises in Honduras will be treated equally, with no distinction between Honduran and foreign capital. It includes several guarantees for investors such as access to foreign currency in the Banking System; payment of dividends and repatriation of capital; freedom to engage in the production and marketing of goods and services in all areas; and others.

⁶¹ For more information see FIDE, http://www.hondurasinfo.hn/inversion/es_04b.asp [Accessed 09. 09].

- b) Export Processing Zone Law (Ley de Zonas de Procesamiento para Exportación). Private Export Processing Zones can be established anywhere in the country. Export companies establish in these zones enjoy the same benefits as those in the Free Zones, including the exemption of all taxes as well as exemption from all customs charges on import or export of materials, equipment, office supplies and others required for the factory.
- c) Temporary Import Law (Régimen de Importación Temporal). Applicable to companies operating outside the Export Processing Zones. Qualifying companies can import duty free all equipment and materials required to manufacture their goods. However, income and city taxes and a customs broker fee must be paid. Special approval must be obtained to operate under the Temporary Import Law.

In relation to these different policies implemented to promote exports, the exporters of Asian vegetables made the following comments:

We know, we have the right to be exempted of paying duties when importing some raw materials, like boxes and other materials that are necessary for export. Actually is more related to exemptions rather than benefits. I have no knowledge about the exemption of income tax for exports of Asian vegetables, I haven't heard about it. But it takes too much time to enjoy all these benefits, so far we haven't got them (POCC).

When we initiated operations in 1993, we were exempted to pay income taxes during ten years. At the beginning when we established this company there were some customs duty benefits to import machinery, small equipment such as conveyor belt and cold storage. Currently we are exempted from all customs charges on import of boxes and packing material, all exporters are exempted of this charge. We just pay 1% duty customs when the fruit is shipped. We pay domestic taxes as those companies which produce other goods. There is no non-tariff barriers, the activities to export through Puerto Cortés are very fast; we have no problems in this sense. In general is not difficult to export, but some permits take too much time, for instance the sanitary and environmental license put back any project in Honduras and it is demanded by the government of Honduras. (EXPC1).

The government doesn't provide any subsidy. The government has implemented policies with favouritism to exports companies; but above all, consolidated and well established exports companies, have no problems with paperwork. While small or family-owned companies have many obstacles. We don't have to pay any kind of tax or tariff for exporting Asian vegetables, except to those related to the shipping companies; I mean transport of the fruit to the final market. We don't have to deal with non-tariff barriers at the customs the process is very fast, the customs is modern and workers are qualified. One doesn't require much paperwork, it is easy and fast. This is in interests of the U.S. To them it is better when things are done in a fast way (EXPC2).

In relation to non-tariff barriers, the official in charge of the Regional Office of SENASA in Comayagua expressed the next comment:

We, SENASA, through OIRSA, have an office named CENTREX where a phytosanitary certificate is issued. This certificate has to be presented in the port and the customs officer carries out the procedure to ship the fruit by sea, they are always well informed about the day the ships arrive and depart, so the exporters send their containers the date the ship will leave. This process is fast, it takes approximately 8 hours (SENC).

4.9.1.4 Trade Agreements

Especial attention is paid to the DR-CAFTA⁶² the trade agreement signed with the U.S., which currently represents the market of Asian vegetables produced in Honduras. An overview of trade agreements with other countries has been provided before in this document⁶³.

As has been stated, through the DR-CAFTA, non-traditional crops such as Asian vegetables are eligible for duty-free treatment. Many analysts remain skeptical about the benefits of the DR-CAFTA, in particular for reducing protection against subsidized exports from the United States of certain commodities like beans, corn and rice, which have remarkable importance to small producers and the poor. However, this doesn't seem to be the case for Asian vegetables which tariffs are eliminated and in addition these are not products in which the U.S. imports compete with local production. Some exporters of Asian vegetables have provided with enthusiasm optimistic assessments in relation to the exports opportunities derived from the DR-CAFTA.

Nevertheless, despite of the continuation of market access conditions, the effect and implications of the DR-CAFTA in the production of Asian vegetables and the horticultural sub-sector in general, it remains to be seen. We have to be aware that in general producers lack enough knowledge and understanding to be able to take advantage of DR-CAFTA.

4.9.2 Legal and Regulatory Framework

Production of Asian vegetables destined to the U.S. market has to satisfy a series of stringent quality and safety public control mechanisms. Both the Honduran and the U.S. legislation impose several requirements to be complied by the local actors participating in the value chain of Asian vegetables. Producers, exporters and government officials agreed that since recent years (2006)

⁶² For additional information see: 2.1 Development Strategies and their Effect on Horticultural Production.

⁶³ For additional information see: 2.1 Development Strategies and their Effect on Horticultural Production.

public regulations, regarding phytosanitary and quality requirements affecting the production and exports of Asian vegetables from Honduras to the U.S. have turned stricter.

4.9.2.1 Regulations by Local Public Entities

Compliance of food safety and environmental protection standards associated to the production and exports of Asian vegetables in Honduras are mainly regulated by the Ministry of Agriculture and Livestock through the National Service of Agricultural Health with the support of the International Regional Organization for Plant and Animal Health (OIRSA⁶⁴).

SENASA is an agency of the Honduran Ministry of Agriculture and Livestock responsible for the design, direction, coordination and execution of animal and plant health programs; enacting the norms to orient public and private actions in this matter. With that purpose is responsible for the application of sanitary norms and procedures to export and import agricultural products, including diagnostic and epidemiological surveillance of pests and diseases, quarantine control of export and import products, the coordination of programs and phytosanitary campaigns, and the coordination of different activities related to agricultural health⁶⁵.

Within the framework of the “Diagnose Surveillance and Phytosanitary Campaigns Regulations (Reglamento de Diagnóstico, Vigilancia y Campañas Fitosanitarias)”, in accordance with the Article 012-07, it was issued in January 2007, the “Phytosanitary Guide of Compulsory Compliance for Producers and Exporters of Fruits and Vegetables (Guía Fitosanitaria de Cumplimiento Obligatorio para Productores y Exportadores de Frutas y Vegetales)”.

The general objective of the Phytosanitary Guide is to control and regulate the production, harvest, transport and package of fruits and vegetables in Honduras. The main aspects considered in the Phytosanitary Guide include: i) to register before the Ministry of Agriculture and Livestock all farms dedicated to the production of fruit and vegetables as well as packing plants; ii) the establishment of Good Agricultural Practices Program (GAP) and Integrated Pest Management in all farms dedicated to the production of fruits and vegetables; iii) the establishment of Good

⁶⁴ OIRSA is an institution specializing in the areas of animal health, plant health and quarantine services whose objective is to develop and coordinate programmes for the prevention, control and eradication of diseases and pests in its member countries: Belize, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama (For more information see <http://www.oirsa.org/>) [Accessed 09. 09].

⁶⁵ <http://www.senasa-sag.gob.hn/index> [Accessed 09. 09].

Manufacturing Practices (GMP) in all farms and packing plants of fruits and vegetables; iv) information and training; and v) phytosanitary surveillance in the production of fruits and vegetables. These practices have been established according to the requirements of several U.S. agencies, including FDA, APHIS and EPA⁶⁶.

GAP demanded to producers of Asian vegetables to include: i) the establishment of Integrated Pest Management Program in all farms; ii) to restrict the application of pesticides to those registered at the Ministry of Agriculture and Livestock; iii) the calibration of the water pH used in the aspersion of agrochemicals; iv) to guarantee the exclusion of domestic animals in production plots; and v) to provide the required protection equipment to the personnel involved in the application of phytosanitary products.

GMP include: i) one toilette for every twenty five people of the same gender; ii) one washbowl for every twenty five people including disinfectant solution; iii) recollection centre for empty chemical containers; iv) mixing centre of pesticides; and v) agrochemicals warehouse.

These regulations affect producers and exporters in both Comayagua and Olancho, and are a requisite to establish plantations of Asian vegetables and to export to the U.S. market (Table 4.10). According to SENASA, exporters agreed to demand these regulations to their suppliers. In Comayagua SENASA additionally charges producers every two years with Lps. 500.00 for farm supervision. No matter its size, for every plot planted with Asian vegetables in Comayagua the producers have to pay SENASA the amount of money indicated, in order to obtain a production permit. SENASA has inspectors in all exporters' packinghouses to monitor and verify the adequate use of pesticides and the presence of pests in the fruits.

Table 4.10 Compliance of regulations by producers and exporters in both locations

Location	GAP	GMP	Payment to SENASA
Producers in Comayagua	Yes (20)	Yes (20)	Yes (20)
Producers in Olancho	Yes (20)	Yes (20)	No (20)
Exporters	Yes (3)	Yes (3)	No (3)
TOTAL	43 (100%)	43(100%)	20 (46%)

Source: Own elaboration

⁶⁶ Additional information regarding these agencies is included in: 4.9.2.2 Regulations by External Public Entities (U.S. Government Regulations).

The official in charge of the Regional Office of SENASA in Comayagua provided the next insights:

We, as SENASA, specifically take care of the adequate use of pesticides for the control of pests and diseases. We are trying to implement the Phytosanitary Guide of Compulsory Compliance, which basically consists on GAP and GMP. There is already a signed document with the condition that exporters will demand GAP and GMP to their producers or suppliers and they will also apply them in their packing plants. The GMP and GAP are based on the requirements of the U.S and Europe markets; especially through Global GAP and the U.S. Food and Drug Administration (FDA). We do not provide technical assistance, we take care of the regulation and that is a mandate from the National Congress of the Republic through the Diagnose Surveillance and Phytosanitary Campaigns Regulations (Reglamento de Diagnóstico, Vigilancia y Campañas Fitosanitarias), that defines our responsibilities as government dependency for the agricultural sector (SENC).

In addition, the official in charge of the Technical Unit of Asian vegetables production at SENASA in Olancho provided the next comment:

The producers in Olancho follow their activities based on the methodology of GAP in order to guarantee food safety and adequate Phytosanitary management, otherwise they are not certified to plant Asian vegetables and these are conditions we are imposing because of their benefit. The agro-export company might ask them to plant, but if the producers don't follow these practices and the people of the FDA and USDA/APHIS (Animal and Plant Health Inspection Service) come they might be sanctioned and we cannot come off badly in the presence of these institutions. Concluding I can tell you we are applying GAP, according to the requirements of FDA and EPA (UTVOO).

In this regard some exporters expressed the following:

Our plantation is certified with Global GAP and this year (2008) we just begun a program to implement good agricultural practices based on Global GAP and the Phytosanitary Guide of Compulsory Compliance established by the Ministry of Agriculture, in order to achieve that our suppliers follow GAP in their productive unit. This is not an easy process, but we believe that the next year (2009) will be implemented, then our producers will have to follow integrated pest management, rational use of pesticides and everything what involves a GAP Program. This type of regulation is imposed by the market and we define them, we put them as a requirement (EXPC3).

There is permanently an inspector of SENASA in all exporters' packinghouses, but they are mainly focused on pests' problems prevention. They try to protect the country's reputation by preventing the proliferation of pests. This is thanks to the financial support that the government gets from OIRSA, this support has allowed the government to implement measures of prevention and control, but certainly is a process that just started and that we suppose will continue (EXPC1).

Some producers in Comayagua described the regulation adopted by the government through SENASA as follows:

SENASA is regulating the application of pesticides. They ask for a registry of the applied pesticides. Since 2007, they are now asking for things they didn't ask before. They have been visiting us and demanding the construction of latrines in the farms. They also demand the adequate use of pesticides to avoid the contamination of water. They are asking for Lps. 500.00. I am not sure for what they want this money, but we have to pay it otherwise we cannot plant Asian vegetables. We have to pay that money for every plot we plan. So if I plant 0.5 mz here I have to pay and if I plan another 0.5 mz somewhere else I also have to pay (PRC9).

SENASA ask us to adequately manage pesticides. We have to keep control of the pesticides we apply to the plantation, the amount and the date. The packages have to be collected and we should have a place to fill up the pesticides pump and we should have a latrine in the field. I had to pay Lps. 500.00 to SENASA, it seems that was valid for two years, they said correspond to the registration of the farm and give us the right to sell to the exporter (PRC10).

The technicians of SENASA told us that we must have latrines, a well to fill the barrel and the pumps to apply pesticides; we must have a warehouse for the fertilizers and pesticides and we also have to collect all the packages. They don't come very often to my plantation. We pay Lps. 500.00 to SENASA every two years; I don't really know for what it is. They said it is to pay the salaries of their staff (PRC15).

Producers in Olancho offered the following descriptions:

We have to handle pesticides with caution; it is a mandate from SENASA. They have demanded the adequate use of agrochemicals; they are concerned with the disposal of toxic waste in the farms. We have to eliminate everything that might affect the environment and our health. So far as I know we don't have to pay, I haven't done it (PRO4).

The technicians from SENASA are always very close, they try to help us improving our production systems, but they concentrate a lot on the use of pesticides. They ask for burning the empty containers and to avoid as much as possible pollution. They call it system of good agricultural practices. Here in Olancho they don't charge the producers with any kind of tariff (PRO5).

The government through SENASA controls that we the producers in the region apply pesticides in an appropriate way. We have to pick up all waste and destroy it, they ask for the use of equipment for protection when we apply pesticides, we have to wear gloves and mask. I even have taken part in training they gave regarding these practices. They don't come very often to visit us, but they have been here a couple of times (PRO13).

Additional regulations put into operation by SENASA affecting the production and exports of Asian vegetables include the following:

- a) Agricultural Quarantine Regulations (Reglamento de Cuarentena Agropecuaria). The purpose of this regulation is to establish the technical, administrative and legal resolutions to preserve the

country's agricultural health through actions preventing the introduction, establishment and dispersion of pests and diseases of economic and social importance which threaten human, animal and plant health in the country.

- b) Regulations on the Registration, Use and Control of Pesticides and Related Substances (Reglamento sobre el Registro, Uso y Control de Pesticidas y Sustancias Afines). The objective of this regulation is to establish the technical, administrative and legal resolutions framed by the Phytosanitary Law (Ley Fitosanitaria) concerning the registration, import, fabrication, formulation, repackaging, transport, storage, sell, use, handle and export of agrochemicals and related substances.
- c) Regulations to the Inspection and Safety of Fruits, Vegetables, Fresh and Processed (Reglamento para la Inspección e Inocuidad de Frutas, Vegetales, Frescos y Procesados). The objective of this regulation is to establish the mechanisms that guarantee the correct application and compliance of the Law in everything related to the procedures of hygienic-sanitary inspection in the fields where they are produced. The means through which they are transported and the places where they are commercialized. Fruits, fresh and processed vegetables produced for domestic consumption, import or export.

Other institutions engaged in food safety and environmental protection affecting local actors in the value chain of Asian vegetables, especially to exporters are: The Ministry of Health (Secretaría de Salud), the Ministry of Natural Resources and Environment (Secretaría de Recursos Naturales y Ambiente, SERNA) and the municipalities. They interfere through the following regulations:

- a) Environment Law (Ley de Medio Ambiente). Issued in 1993, this law promotes agricultural, cattle, forest and industrial activities, toward practices that are compatible with the conservation and sound and sustainable use of natural resources, and the protection of the environment as a whole.
- b) Framework Law of the Water and Sewerage Sector (Ley Marco del Sector Agua Potable y Saneamiento). This law confers to municipalities the responsibility of providing and regulating the service of water and sewerage.

Related to this some exporters provided the next description:

“The Ministry of Health, the Ministry of Natural Resources and Environment and the municipality of Comayagua, monitor our export facilities. As well as the inputs we employ such as the quality of water we use and the sewerage system we have. They have done several water analyses in order to check the presence of sediments or heavy metals. They don’t do it frequently; however they have done it, so far we have not had any problem, and have everything under control (EXP2).”

“In the case of fresh vegetables most of the regulations come from SENASA and the regulations are not so drastic, although the government is now getting stricter and other dependencies are participating in regulating our activities. However, other government dependencies get more involved in the case of processed fruits and vegetable. For instance, for those products is required the sanitary registry demanded by the Ministry of Health (EXPC1).”

4.9.2.2 Regulations by External Public Entities (U.S. Government Regulations)

As indicated repeatedly, emphasis is put in the U.S. market, so far it is the main market of Asian vegetables produced and exported from Honduras. Imported food products such as Asian vegetables into the U.S. are subject to compliance of legal requirements dictated by several federal agencies, responsible for ensuring that the products are safe, sanitary and labeled according to the U.S. requirements.

The Food and Drug Administration (FDA) is part of the Department of Health and Human Services (DHHS), and the Public Health Service (PHS). The U.S. FDA is the regulatory agency responsible for the safety of almost all foods in the U.S.

Laws provided by the FDA regulating imports of Asian vegetables include:

- a) Fair Packaging and Labeling Act⁶⁷. According to this law, a food label must contain specified information displayed conspicuously. In terms that the ordinary consumer is likely to read and understand under ordinary conditions of purchase and use. In general this Act requires that food product be safe, clean and wholesome and the labeling to be honest and informative.

⁶⁷ For additional information see: <http://www.fas.usda.gov/itp/ofsts/us.html> [Accessed 09. 09].

- b) GMP. FDA requires processors to impose GMP concerning personnel, buildings and facilities, equipment and product process controls. This may give manufacturers assurances that their food is safe and sanitary. These regulations establish a minimum level of safety performance, which apply to all businesses. Such protection includes extermination and exclusion of rodents, inspection and sorting of raw materials, quick handling and proper storage, use of clean equipment, and supervision of personnel.
- c) Hazard Analysis & Critical Control Points (HACCP). HACCP is a management system in which food safety is addressed through the analysis and control of biological, chemical, and physical hazards from raw material production, procurement and handling, to manufacturing, distribution and consumption of the finished product.
- d) The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Bioterrorism Act). Requires that the FDA receives prior notice for food imported or offered for import into the United States. It also states that if an article of food arrives at the port of arrival with inadequate prior notice (e.g., no prior notice, inaccurate prior notice, or untimely prior notice), the food is subject to refusal of admission and may not be delivered to the importer, owner, or consignee. The Bioterrorism Act also requires that domestic and foreign facilities that manufacture, process, pack, or hold food for human or animal consumption in the United States to register with the FDA.

The Animal and Plant Health Inspection Service (APHIS) of the U.S. Department of Agriculture (USDA). APHIS is responsible for enforcing regulations governing the import and export of plants. It issues regulations and conducts control programs to protect and improve animal and plant health for the benefit of people and their environment.

APHIS import requirements depend on both the product and the country of origin. Plants and plant materials must be accompanied by a phytosanitary certificate issued by an official of the exporting country.

Regulations issued by APHIS pertaining to Asian vegetables include:

a) Plant Protection Act (PPA)⁶⁸. The PPA consolidates all or part of 10 existing USDA plant health laws into one comprehensive law, including the authority to regulate plants, plant products, certain biological control organisms, noxious weeds, and plant pests. The Plant Quarantine Act, the Federal Pest Act, and the Federal Noxious Weed Act are among the ten statutes the new Act replaces. The PPA gives the Secretary of Agriculture, and through delegated authority, USDA's APHIS, the ability to prohibit or restrict the importation, exportation, and the interstate movement of plants, plant products, certain biological control organisms, noxious weeds, and plant pests.

The Agricultural Marketing Service (AMS)⁶⁹ of the USDA. AMS carries out a wide range of programs are aimed to facilitate the marketing of agricultural products, assuring consumers of a quality food supply, and assuring fair trading practices. AMS offers voluntary grading service to provide the industry with an impartial, third-party certification of quality and condition of any fresh or processed product. This certification can help to provide a basis for assuring a quality product, verify compliance with contract terms as an aid to selling, and/or help settle claims for damage incurred in transit or storage.

The following services provided by AMS affect imports of Asian vegetables:

- a) Quality Standards: In cooperation with industry, AMS develops and maintains quality standards for fresh fruits, vegetables, and specialty crops, processed fruits and vegetables, milk and other dairy products, cattle, hogs, and sheep, poultry and eggs, cotton, tobacco, organic products.
- b) Grading and Certification: Quality grading (a user-fee service) based on the standards developed for each product. Grading services are often operated cooperatively with state departments of agriculture.

⁶⁸ For additional information see: http://www.aphis.usda.gov/lpa/pubs/fsheet_faq_notice/fs_phproact.html [Accessed 09. 09].

⁶⁹ For additional information see: <http://www.fas.usda.gov/itp/ofsts/us.html> [Accessed 09. 09].

U.S. Environmental Protection Agency (EPA). EPA⁷⁰ coordinates governmental action on behalf of the environment through integrating research, monitoring, standard setting, and enforcement activities. Among its many duties, EPA regulates pesticides.

EPA regulates the use of pesticides under the authority of two federal statutes:

- a) The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Provides the basis for regulation, sale, distribution and use of pesticides in the U.S. FIFRA authorizes EPA to review and register pesticides for specified uses. EPA also has the authority to suspend or cancel the registration of a pesticide if subsequent information shows that continued use would pose unreasonable risks.
- b) The Federal Food, Drug, and Cosmetic Act (FFDCA). Authorizes EPA to set maximum residue levels, or tolerances, for pesticides used in or on foods or animal feed. Producers must use only those chemicals which are registered for use on a specific commodity or group of specifically indicated commodities and only according to the direction on the package. The U.S. Food and Drug Administration will test products entering the United States for compliance with EPA regulations for pesticide, fungicide, and herbicide residues. The FDA monitors for unsafe pesticide levels in food, and researches and develops standards on the composition, quality, nutrition and safety of food and color additives.

With respect to the regulations imposed by the different agencies from the U.S. government to the imports of Asian vegetables from Honduras the exporters provided the following comments:

It is costly to export, because you need to have the adequate facilities, good quality inputs, qualified personnel, and to fulfill the requirements of the FDA in the U.S. The packing plant needs to be certified by the Honduran government and the APHIS from the U.S. government. APHIS is the agency from the U.S. government which most interacts with the exporters from Honduras. The rules are based on the protocol of the FDA and the USDA. They carry out agrochemical analysis in the U.S. and if they find toxic residues of non-registered pesticides or any pest in the vegetables we export, the company is fined and banned, not the producer. For this reason we are trying to get certified from EPA in applying GAP, and we are working together with producer. We provide them support in this sense, so they don't apply any forbidden product or in inadequate levels (EXPC2).

⁷⁰ For additional information see: <http://www.epa.gov/pesticides/regulating/laws.htm> [Accessed 09. 09].

The U.S. government demands our buyers to import the product adequately labelled. Therefore, we must package the vegetables in boxes with clear identification, including weight, quality, and the registry code of where it was packaged, in order to monitor and track any problem. Now with the Bio security law we are forced to file during eighteen months the product history, so is traceable. This Bio security law was enacted after the terrorist attacked the World Trade Center in New York, and covers a series of dispositions to avoid attacks with explosives and poisoning or intoxication to the U.S. people through food consumption. It is not only the analysis of explosives and drugs, it also includes avoiding biological contamination. The regulations are stricter today and the people of the FDA are extremely severe in the enforcement of these regulations (EXPC1).

4.9.3 Infrastructure Services

In Comayagua producers and exporters gave special consideration to the condition of roads, while producers in Olancho, in addition to the condition of roads, also focus in the necessity of storage facilities, to trade off the problem of distance between their production sites and the packinghouse of their buyer which is located in Comayagua. Information regarding the availability of electrical energy in both locations is included.

4.9.3.1 Road Network in Comayagua and Olancho

In Comayagua and Olancho, dilapidated roads are blamed for lowering the margins of producers and exporters. Abrupt motion and longer time necessary to load displacement from plantations to the exporters' packinghouses or points of collection are the causes of damage suffered by the fruits (Table 4.11). In addition, the costly routine maintenance of vehicle raises their operation and transaction costs.

In Comayagua, estimations of some exporters attribute at least 15 percent of fruit loss, due to the poor condition of secondary, local and minor earth roads. Roads conditions also influence on the selection of producers done by some exporters; producers located in plots with bad access because of the precarious condition of minor earth roads might be rejected in order to reduce the risks of poor quality. It appears that routine and quality of maintenance activities of secondary and local roads are not in accordance with the traffic volume and the type of vehicles they have to withstand.

In Olancho, apparently the problem is less traumatizing than in Comayagua, because producers have to transit shorter distances to the point where the fruit is collected by the exporter, and secondary and local roads are in fair condition. The condition of minor earth roads to access the

farms ranges from fair to bad, depending on the season of the year. However, the journey to transport the fruit from Olancho to Comayagua is an aspect which is critically seen as a disadvantage from the perspective of producers. Estimations of government officials assign 10 percent of fruit loss in consequence of bad roads.

In both regions, only those producers whose plantations are located to closer distance or next to paved roads, don't have to confront with problems associated to poor condition of roads.

Table 4.11 Conditions of roads affecting producers and exporters in both locations

Location	Good	Bad	Total
Producers in Comayagua	2(10%)	18(90%)	20(100%)
Producers in Olancho	7(35%)	13(65%)	20(100%)
Exporters ¹	0(0%)	3(100%)	3(100%)

¹It refers to roads in Comayagua

Source: Own elaboration

Honduras has a road network comprising 14,044 km of official roads, administered by the Roads Fund (Fondo Vial) of the Ministry of Public Works, Transport and Housing (Secretaria de Obras Publicas, Transporte y Vivienda/SOPTRAVI). In addition, there is a rough estimation of 7,000 km to 12,000 km of unclassified roads which have been developed by several public and private institutions; therefore their maintenance is not the responsibility of the Road Fund (Fondo Vial)⁷¹. However, only 21 percent (2,976 km) of the official roads are paved and the remaining 79 percent is not.

According to SOPTRAVI (2009: 2) official roads are categorized in the following way:

- a) Network of Primary Roads. These are 3,275 km of roads that belong to the main structure of the national road network. These are primary roads linking cities and regions of national importance; they can be paved or not, but they must be in conditions to be transited the whole year. In this category are included roads of integration with other Central American countries and with the Pan-American System of Roads. These roads receive maintenance annually in the summer season.

⁷¹ See: http://www.fondovial.gob.hn/que_es_fondo_vial.htm [Accessed 10. 09].

b) Network of Secondary Roads. These are 2,554 km of roads that link cities and towns to the network of primary roads, or that link cities with towns and have intra-departmental importance. These roads link three departments in the country, and can be paved or not, and should have at least a cover of selected material.

c) Network of Local Roads (Carreteras Vecinales). These are 8,214 km of roads that link towns and villages to the primary and secondary networks, and they have exclusively departmental or municipal importance. These are unpaved roads; and some are covered with selected material or are earth roads. They should have the conditions to be transited during agricultural harvest time.

An additional category that plays an extremely important role in rural areas, and is not part of the official roads network is made up by Tracks of Penetration.

d) Tracks of Penetration. Includes 7,000 km to 12,000 km of minor earth roads which can only be transited temporarily. They have been constructed by different public⁷² or private institutions, to accomplish specific objectives following minimal geometric rules. SOPTRAVI is not responsible to provide maintenance service to these roads.

A. Primary Roads in Comayagua and Olancho

SOPTRAVI (2009: 7) estimates that the Department of Comayagua has 750.18 km and the Department of Olancho 1,710.01 km of official roads. In both departments most are unpaved local roads. In Comayagua local roads represent 60 percent of the total and in Olancho 58 percent (Table 4.12).

Table 4.12 Length (km) and categorization of road network in both locations

Location	Primary Roads	Secondary Roads	Local Roads	Total
Comayagua	132.47	164.83	452.88	750.18
Olancho	416.06	293.76	1,000.19	1,710.01

Source: SOPTRAVI, 2009

Referring to primary roads in Comayagua, but also in Olancho, of particular importance for the production of Asian vegetables is Highway CA-5 Norte, the main communication corridor of the

⁷² Among of them is the Ministry of Agriculture

country (see Figure 4.5). CA-5 Norte is part of the Atlantic Corridor of the international road network of Plan Puebla-Panama, a regional integration initiative sponsored by Central American countries and Mexico. Highway CA-5 Norte links the capital city, Tegucigalpa with the production centers in Comayagua and the former with Puerto Cortes in the Caribbean coast.

Because of its proximity to the U.S. seaports in the Gulf of Mexico, and on the East Coast; as well as its outstanding seaport infrastructure, Puerto Cortes is the main sea port of Honduras and Central America. All the containers of Asian vegetables, produced in Honduras, destined to the U.S. are exported from Puerto Cortes.

After 30 years in service, Highway CA-5 Norte needs substantial improvements. On some stretches, service levels have drastically declined, due to a daily traffic volume average between 4,500 and 6,500 vehicles, of which 35 percent are heavy vehicles (Roa et al., 2005a: 2). Nevertheless, in general is in fair condition due to periodic maintenance.

In the individual case of Olancho, Route 39 Telica-San Francisco de La Paz-Gualaco-San Esteban, is the primary road linking the inner locations where Asian vegetables are produced, with Route 15 Tegucigalpa-Juticalpa-Telica-Catacamas, the main primary road in the department (Figure 4.5).

Route 15 is part of the agricultural corridor and connects Catacamas (the largest municipality) and Juticalpa (the capital of the department) with the country's capital city Tegucigalpa, in the central corridor. Highway CA-5 connects Tegucigalpa with Comayagua, where the exporter packing plant is located (Figure 4.5).

Route 39 has a length of 159.68 km and its condition changes quickly over time. Some stretches require heavy maintenance including regravelling and rehabilitation especially after the rainy season, while other parts are in fair condition (Figure 4.5). However, according to information provided by producers and government technicians in the region, the pavement of this road is underway. Route 15 is a paved road which extends from Catacamas to Tegucigalpa with a distance of 209.48 km and in some stretches it requires rehabilitation, whereas others are in relative good condition.

Route 41 Limones-Pozo Zarco is a primary road which links producers in Salama with the Route 15. It has a length of 28.34 km and is unpaved (Figure 4.5).

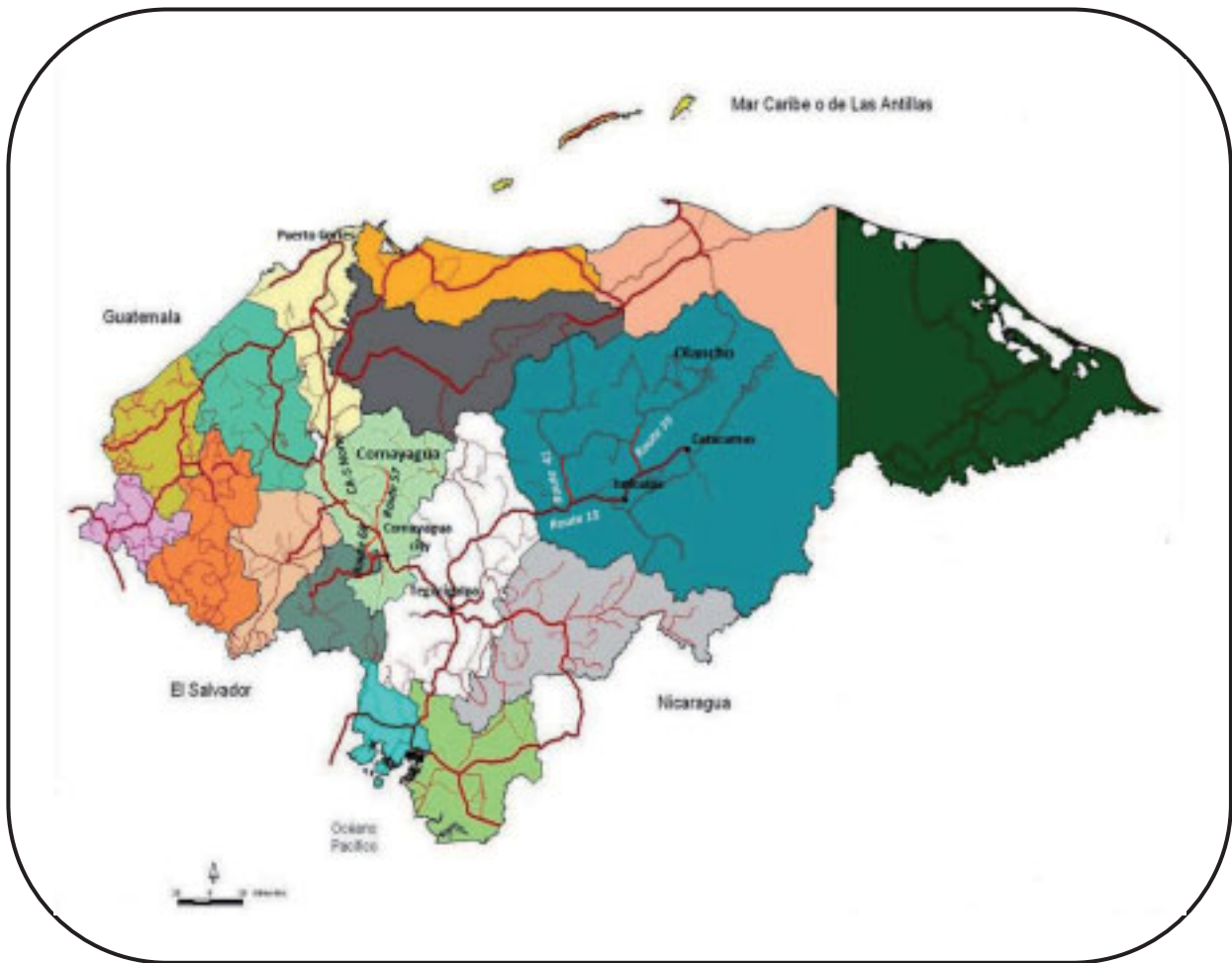


Figure 4.5. Honduras primary and secondary roads network map
 Source: Own elaboration based on SOPTRAVI, 2009 and SERNA, 2009.

In this regard the official in charge of the Technical Unit of Asian vegetables production at SENASA in Olancho states:

The road Telica-San Esteban-Gualaco is being paved until San Francisco de La Paz and then it is supposed to be paved from San Francisco de La Paz to Gualaco. The pavement from Gualaco to San Esteban will be put out to tender. The secondary route that goes from Catacamas to Culmí is also being paved (UTVOO).

An official of DICTA providing technical support to producers of Asian vegetables in Olancho provided the next comment:

In the way from Olancho to Comayagua the fruit suffers different kinds of damages because of various reasons. We know that part of the damage is caused by the bad conditions of the roads. There is a lot of heavy traffic in that road and that affects its condition (DICO).

B. Secondary and Local Roads in Comayagua and Olancho

In Comayagua more than 90 percent of secondary roads and all local roads fall in the category of unpaved. Almost 85 percent of the former are covered with a layer of selected material or gravel material and the remaining 15 percent are earth roads (Figure 4.6). There is no reliable official information about minor earth roads (tracks of penetration), which are the main feature of Comayagua, playing a crucial function in communicating producers' plantations with secondary and local roads; therefore having a significant impact in the quality of the fruit.

Route 68 Comayagua-Ajuterique-La Paz is the most important intradepartmental road for actors in the value chain of Asian vegetables produced in Comayagua (Figure, 4.5). Most of producers in Comayagua (50 to 60 percent) and all exporters are connected through this road. This secondary road is unpaved and in Comayagua it has a span of 15.82 km. Its deteriorated condition has been identified as a major constrain to ensure the quality of the fruits (Picture 4.2). However, local authorities and active citizens including actors of the value chain of Asian vegetable organized a Highway Pro-paving Committee and with the funding of MCA-Honduras⁷³, paving of this road is now under way and is expected to be ready at the beginning of 2010.

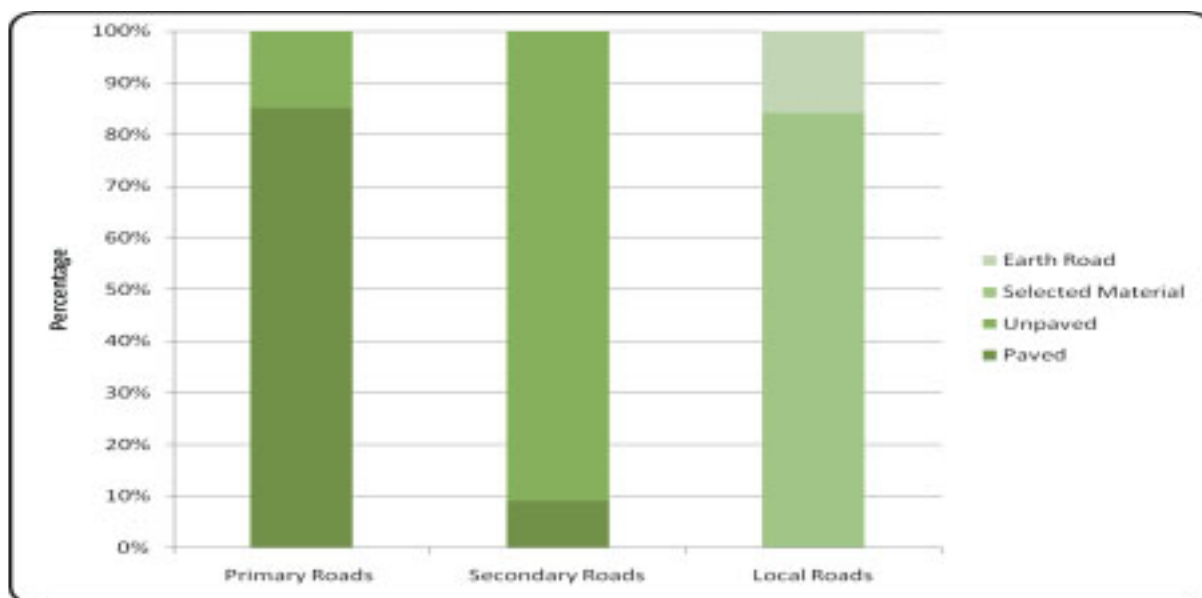


Figure 4.6. Categorization of roads in Comayagua according to type of surface
Source: Own elaboration based on SOPTRAVI, 2009

⁷³ The Millennium Challenge Account (MCA) is a development program funded exclusively by the U.S Congress. Its objective is to promote accelerated and inclusive economic growth, supporting the goal of the Poverty Reduction Strategy (PRS) of Honduras.

Another important secondary road is Route 57 Comayagua-Libertad (Figure 4.5). This road has a length of 42.95 km. Only of 8.47 km are paved and correspond to the segment of Comayagua-INCEHSA which is in very good condition, the rest is covered with selected material and is in fair condition. Producers in San Jeronimo, Comayagua and surroundings get linked to the exporters through this road.



Picture 4.2 Route 68 Comayagua-Ajuterique-La Paz

Source: Own elaboration

Exporters in Comayagua provided the following descriptions in relation to the condition of secondary and local roads available to transport the fruits:

The bad condition of minor roads that gives access to the farms of producers and to the packinghouses of the exporters damages the fruit. It reduces the quality of the vegetables as a consequence of bruises; the quality is deteriorated at post-harvest. We have gone through many steps and the road Comayagua-La Paz is going to be paved soon. To a large extent it is the result of our effort, because we have contributed with the topographical works, we gave a lot of money to do that. Specially, we have been requesting the paving of the stretch from Las Liconas to La Paz; which is actually the segment of the road Comayagua-La Paz where most of the export vegetables transit. We have asked for support from the Millennium Challenge Account (EXPC3).

There is some infrastructure which is incongruous to the productivity of this valley. The great problem is the inadequate condition of roads. Most of the producers, I think more than 50 percent, must use the road of Comayagua-Ajuterique-Lejamaní-La Paz, which is in bad

condition most of the time, Resulting in an estimated loss of 15 percent of the fruit, affecting negatively both the producers and the exporters. We have joined efforts; the whole community has taken part. A study has been done showing the producers affected. We have presented a request to pave two times and apparently has been approved (EXPC2).

First of all roads... practically we have no roads, producers have many problems on account of that and probably this has a repercussion in the international market, because damage is done to the fruits; owing to the fact that vehicles move abruptly on their way from the farms to the packinghouse. We are not able to detect the damage in the right moment. I mean it is not immediately visible, therefore when the fruit arrives to the U.S. it is rotten or decayed. The percentage of loss is large. Between the producer and the packinghouse loss is around 30 percent and has to do with pests which are the main reason, and also mechanical damage in the roads, which is huge. This company has even declined to buy from producers located in some places where the condition of the road is dreadful. In the road that leads from Comayagua to La Paz, 60 percent of the production of Asian vegetables is concentrated, in the Comayagua valley. For years the government has been promising its pave, supposedly there is already a project to do it, but there is always something missing (EXP1).

In Olancho the conditions of secondary and local roads is slightly different with respect to Comayagua. All secondary roads and all local roads, fall in the category of unpaved. However, as will be indicated later, some of them are in process of being paved. Most of local roads (83 percent) are covered with selected material or gravel material, and the remaining (17 percent) are earth roads (Figure 4.7). Here again, as in Comayagua, there is no reliable official information about minor earth roads (tracks of penetration), which are the main feature, playing a crucial function in communicating farms with secondary and local roads; therefore having a significant impact in the quality of the fruit.

Route 110 Pozo Zarco-Salama is an important secondary road which links producers in Salama with Route 41 Limones-Pozo Zarco where the detour to Tegucigalpa in Route 15 is located. Route 110 has a length of 3.96 km, and is unpaved.

Other important secondary roads are Route 109 Salama-Sabana Larga which connects producers in Silca with Route 41 and Route 83 ENA-Dulce Nombre de Culmí. Road 109 has a length of 18.54 km and Road 83 has 48.26 km, as all secondary roads in Olancho they are unpaved.

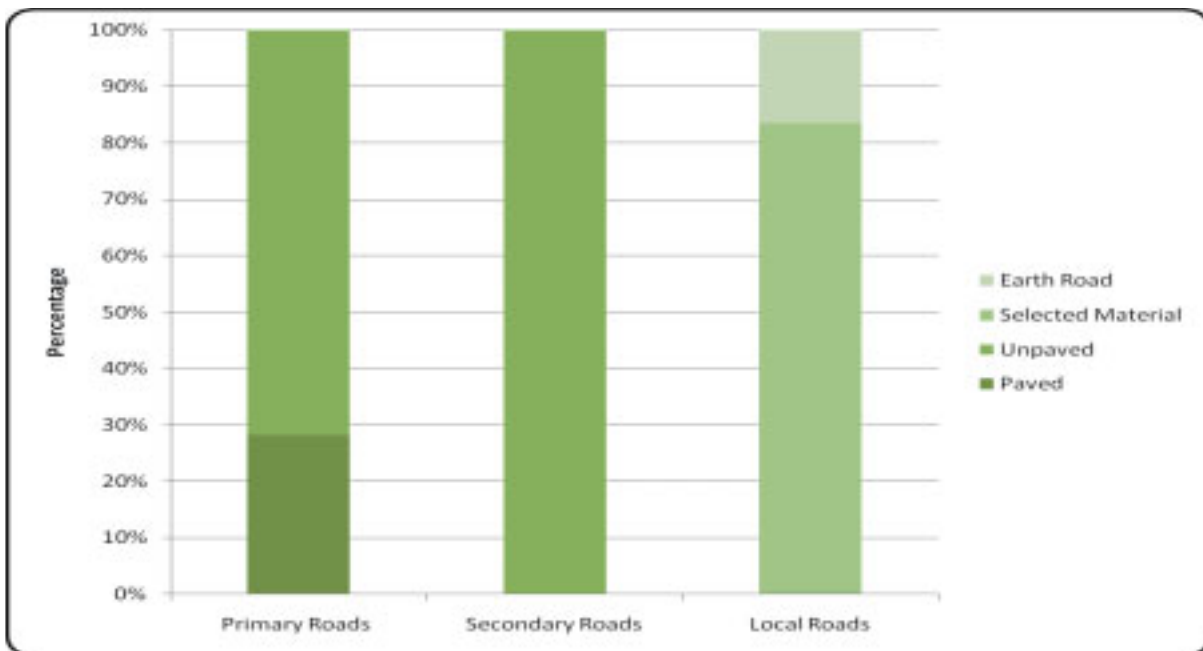


Figure 4.7. Categorization of roads in Olancho according to type of Surface
 Source: Own elaboration based on SOPTRAVI, 2009

These secondary roads present typical features of this type of roads as its condition changes quickly over time demanding maintenance frequently. As in the case of most roads in Honduras, some stretches require rehabilitation and others are in a relatively good condition. An official of the Technical Unit of Asian Vegetables at SENASA in Olancho provided the following descriptions in relation to the condition of secondary and local roads available to transport the fruits:

Talking about the condition of secondary, local and earth roads (access to the farms), yes, the secondary roads are in fair condition as they don't receive maintenance routinely. In the case of the roads to access the farms where producers plant Asian vegetables these are in fair or bad condition depending on the season of the year (UTVOO).

C. Minor Earth Roads in Comayagua and Olancho

To deliver the fruit from their farms, the majority of producers in Comayagua and Olancho have to transit minor earth roads that come out onto the primary roads which connect them to exporters' packinghouses. In most cases these earth roads are basically widened paths with the in-situ earth compacted by the transit of vehicles but with minimal grading and no surfacing. Most of such roads become impassable during the rainy season and very dusty in the dry season. They tend to progressively deform under increasing vehicles weights. In contrast, they demand continuous maintenance that is rarely available. In fact, this is not surprising considering that the government

(SOPTRAVI) is not responsible for it. In this regard a technician of MTTH in Comayagua expressed the following comment:

The roads to access the farms are 4th or 5th quality; this is one of the main problems affecting producers. In some cases the paved road is just 1 km or less away from the farm, but for the majority of producers their plots or farms are up to 9 to 10 km away from the packinghouses, and they have to transit earth roads which don't get any maintenance reducing enormously the quality of the fruit owing to the brush and the vibration (MTTHC).

Some producers reported the next comments in relation to the situation of the roads in Comayagua:

I have no problems with the road; my plot is located next to the paved road which comes from La Libertad and goes to Comayagua. I just need to put the fruit into the boxes, load them in my truck carefully and then take it to the packinghouse (PRC6).

The road to get out of here and to reach the paved road is horrible. The fruit gets damaged and the car too. A car without four wheel drive gets stuck, if you try to go through with a car loaded with fruits, you run the risk of not getting out. Nobody does anything to improve the condition of this road (PRC8).

The roads we have are useless; practically we have no way out. The cars don't resist, the shock absorbers and other parts get damaged very fast. To repair them we incur losses, in addition to the fruit that is lost. We have talked to politicians, they only make promises and do not do more than to scrape the road. When the next harvest season comes it is again in bad condition (PRC15).

With respect to the effect of the condition of roads in the activities related to Asian vegetables in Olancho a consultant working in the region for the Asian Vegetables Chain Sub-committee expressed the following:

In relation to roads in Olancho, these are divided in primary, secondary and local roads. Primary roads have maintenance every year in the dry season; treatment for secondary and local is less frequent. On the other hand, I estimate that losses resulting from roads in bad conditions are not significant, because in most cases distances to the point of collection are short (SCCO).

Some producers in Olancho made the following remarks regarding the condition of roads they transit to transport Asian vegetables:

The roads here are awful, and the exporter collects the fruit in the paved road. The ago-exporter asks us to drive over there very fast but the cars are heavily loaded and the roads are in bad conditions, so it is impossible to run. The problem is that the fruit gets damaged and in addition it then has to be transported to Comayagua (PRO6).

We have problems with the roads, because this is a very fragile product and when we transport it where the exporter collects it, it gets damaged. However, this also depends on the

producer; we should avoid as much as possible damage in the fruit, but sometimes it is definitely impossible (PRO8).

I, for instance, have a plot where it is impossible to access by car, when the harvest season comes I have to get there by ox driven cart in order to take the fruit to the paved road where the exporter collects it. The thing is that these vegetables are very sensitive and gets damaged very easily. There are some producers which are lucky to have their plots next to the paved road and don't have to deal with this problem (PRO9).

4.9.3.2 Storage Facilities in Olancho and Comayagua

Given the highly perishable nature of Asian vegetables, emphasis was placed on the availability to producers of post-harvest infrastructure such as cold storage. In both regions Comayagua and Olancho, producers do not have cold storage facilities in their farms to provide vegetables the required temperature, relative humidity and air movement necessary to ensure high quality products demanded in export markets (Table 4.13).

The cold storage and other preservation facilities are concentrated by the exporters and around the food consuming markets of urban areas in Comayagua and Olancho. It is estimated that between producers and the exporters' packinghouses loss is about 30 percent. There is a gap in the cold chain and exporters attribute it to producers post harvest management. This situation has led to conflicts between both parties owing to the amount of rejected fruit. To reduce quality loss producers are forced to transport the fruit to exporters' packinghouses or collection points a few hours after it was harvested.

Table 4.13 Cold storage facilities available to producers in Comayagua and Olancho

Location	Yes	No
Producers in Comayagua	0(0%)	20(100%)
Producers in Olancho	0(0%)	20(100%)
TOTAL	0(0%)	40(100%)

Source: Own elaboration

Here, we copy verbatim what has been indicated before in this study. Most of producers in Comayagua and Olancho improvise provisional storage structures near to harvesting places, in a simple and inexpensive way using rests of plastic bags, sacks or tree branches, without following any equipment requirement and when possible they place the harvested fruits in the shadows of the trees. In these structures producers gather together the harvested fruit to protect it against the inclemency of weather conditions before it is taken to the packinghouse or to the point of collection

where the exporter picks the fruit up. Therefore, the risk of deterioration is very high, taken mainly into consideration the prevailing environmental conditions in these regions. Producers in Comayagua stated:

Lack of cool storage facilities is a big disadvantage for us. We have to harvest the fruit at morning and to avoid reduction of the quality we take it immediately to the packinghouses of the exporter. We have to be ready to take the fruit to the exporter after harvesting and sometimes, it is difficult (PRC4).

I use the shadow of a Guanacaste tree. Under this tree we gather together all the fruit we harvested in a working day, and then we take it to the point in the road where it is collected by the exporter (PRC12).

We need cold storage infrastructure, because these vegetables get damaged very easy and we have to take care of that, otherwise we have many losses. We have to use the materials we have in the farm to protect the fruit and their quality is not good, but that is what we have (PRC19).

The exporters provided the next statements:

The percentage of loss is large. Between the producer and the packinghouse loss is around 30 percent (EXPC1).

We have conflicts, because the product arrives to our packinghouse in bad condition. The problem is the cold chain, producers here don't have a cold room in the field where they can storage the fruit after is harvested. The producer cuts the fruit at 7:00 am but it is out in the sun until 10:00 am, then takes it to the packinghouse in the truck and arrives here damaged due to the transport and when is unloaded gets more damage, finally when we storage it in our cold room is already spoiled (EXPC2).

In Olancho, the problem of storage is more prevalent, because the exporter doesn't have packinghouse in the region. The closest cold storage facility available to producers of Asian vegetables in Olancho is located in Comayagua, which is almost four hours away from the collection point. To preserve quality as good as possible producers harvest the fruit on a previously agreed day and time with the exporter prior to take it to the collection point.

This situation leads to two probable scenarios: i) it can be that the fruit is ready to harvest much before (one day) of the agreed day or time; or ii) it happens that the exporter is unable to pick the fruit on the agreed day or time. Under the first scenario, the producers are force to store the fruit in inadequate conditions for a longer period of time until it can be taken to the collection point. The second scenario is even worse, because they have to expose again the fruit to precarious transport conditions in order to take the fruit back to their plantations where they might store it in the

conditions indicated above. What is more, the time to reach the cold room in Comayagua has to be added.

As can be noted, producers in Olancho face more problems to maintain the edible quality characteristics required for export fresh vegetables; consequently they are confronted with higher risk of incurring in losses. An official of DICTA⁷⁴ providing technical support to producers of Asian vegetables in Olancho, remarks:

Few producers here, and as well in Comayagua, have a table with shed to avoid place the fruit direct on the floor and to expose it to the sun. The greatest weakness in Olancho is the lack of packinghouse for the production of Asian vegetables. The exporter has offered the establishment of one here, which actually will function as a pre-pack before to the final packing in Comayagua. We understand that the cost of packinghouse including cold storage, water containers and other equipment is not cheap. Most of losses are post-harvest this could be reduced if we had a packinghouse here (DICO).

The producers in Olancho expressed:

Here in Olancho we need a cold room. That is a serious problem we have. This affects us all, for instance, once we harvested the fruit one day in the afternoon and then we had to wait the container to pick it until the next day, so most of the fruit got deteriorated very easily (PRO2).

I would like to have cold storage; the exporters want to open a packinghouse with cold room because we lose too much fruit. Just imagine that we harvest at 2:00 pm, then we have to place the fruits in the boxes and sometimes I have been forced to dispatch my product until 8:00 am of the next day, and arrives to Comayagua in the afternoon, for that reason when the exporter checks the fruits they are already damaged (PRO6).

We are not in a good situation, because we don't have storage facilities. Sometimes we have problems with the weather. I have harvested and suddenly while we are in the road transporting the fruit, it starts raining and the boxes get wet. The problem is that we have to wait for the container of the company in the road with our fruit wet and then it has to be taken to Comayagua. That is too much time (PRC20).

The storage problem, particularly maintaining the cool chain is a general problem in the entire country. Despite that one of the goals of the current government in its Plan of Agricultural Development, was the creation of 30 storage centers for vegetables and fruits⁷⁵, so far in Honduras few farming communities producing vegetables and fruits have at their disposal cold storage

⁷⁴ Science and Technology General Direction, Ministry of Agriculture/Dirección General de Ciencia y Tecnología, Secretaría de Agricultura y Ganadería.

⁷⁵ Government Plan (2006-2010). Vision of the Civic Power to transform Honduras/Plan de Gobierno (2006-2010). Visión del Poder Ciudadano para Transformar Honduras (2006).

facilities or companies and organizations offering the service. Some exceptions include the construction through the Program Agropyme⁷⁶ of a storage center in a vegetables producer's cooperative located in Siguatepeque the neighbor Municipality of Comayagua; and most recently the inauguration of a storage center in the Municipality of Marcala, in the neighbor Department of Comayagua⁷⁷.

4.9.3.3 Electricity Supply in Comayagua and Olancho

Supply of electricity still has not been made available in most farming communities that involve the production of Asian vegetables in Comayagua and Olancho. The use of electricity in connection with production of Asian vegetables has not attained important dimensions at least in the case of producers. The use of electricity in farms of Asian vegetables seems to be something unusual. In fact, producers give modest attention to it as they have gained little experience in this matter. The chief applications of electricity could be to pump water and to run cold rooms. However, producers use gas engine to lift the water to their farms and as mentioned they don't operate cold rooms.

Conversely, in the case of exporters electrical energy is used widely. The principal reason for this is the fact that under other conditions the efficiency of their packinghouses activities would be seriously hampered or basically, wouldn't be operational at all. Some exporter's packinghouses are located in places where electricity supply is easily available through existing energy lines or power plants, while others have the capacity to extend the supply of electricity to their location. In the case of producers the extension of electricity supply to cultivated areas is thus a matter of local authorities or government commitment.

According to estimations of The National Company of Electrical Energy/Empresa Nacional de Energía Eléctrica (ENEE) the coverage of electrical energy supply in the Department of Comayagua is of almost 70 percent and in the Department of Olancho a little more than 43 percent (ENEE, 2006). In other departments such as Francisco Morazán, where the capital city is located, the coverage is of 90 percent and in Department of Cortes, where Puerto Cortés is located, reaches

⁷⁶ The Program Agropyme (Developing the Competitiveness of small and medium agricultural enterprises through non-financial services) is financed by the Swiss Cooperation Agency and implemented by a consortium formed by the Swiss development organization Swisscontact and Helvetas and diverse local partners.

⁷⁷ For additional information see: <http://www.sag.gob.hn/index>. [Accessed 10. 09].

99 percent. This makes clear the concentration of electrical supply on the centers of major economic activity, which are the metropolitan region of Tegucigalpa and San Pedro Sula (Roa et al., 2005b:2). The national coverage is of 69 percent. The overall rate of access to electricity in Honduras is among the lowest in Latin America and the second lowest in Central America (World Bank, 2007: 42).

The poor coverage of electrical energy supply in rural areas of the country, it is widely recognized. In rural areas the coverage rate is notably low, compared with the average coverage in urban areas. In rural areas the coverage is of 45 percent compared to 94 percent in urban areas (World Bank, 2007: 42). There are 298 municipalities in Honduras from which 119 (39.9 percent) have coverage lower than 30 percent, and 23 municipalities (7.7 percent) have no access at all (Ibid: 45). In this regard a technician of MTCH in Comayagua expressed the following comment:

The majority of planted areas with Asian vegetables in Comayagua do not have electrical power or potable water (MTTHC).

Some producers in Comayagua mentioned:

To produce Asian vegetables, electrical energy is not really necessary; we use gasoline or diesel engines to pump the water we use to irrigate out plantations (PRC3).

I have electrical energy in my plot and potable water. I had to pay for it and also got some help through donations from different agencies. Here in my plot it is easy to install these things because is located next to the pave road (PRC6).

In Olancho the consultant working there for the National Horticultural Chain Committee stated the following:

I would say that in both Olancho and Comayagua, almost all producers of Asian vegetables don't have electricity at their farms; therefore they use diesel or gasoline engines to feed their irrigation systems (SCCO).

4.9.3.4 Irrigation Infrastructure in Comayagua and Olancho

After the Atlantic coast in the North part of the country, Comayagua concentrates the largest irrigated area in Honduras. In the valley there are three irrigation districts in operation, covering an estimated area of more than 5,700 ha. The districts of Selguapa (2,400 ha), San Sebastián (350 ha) and Flores (3,000 ha) were originally managed by the government, and supported as a mean to assist peasant farmers. Since the 1990s there is an ongoing privatization process that involves the transfer of irrigation systems to users. Irrigators Association was formed to manage, operate and

administrate the system under the guidance from the Directorate of Irrigation and Drainage of the Ministry of Agriculture. A large number of producers of Asian vegetables operating gravity fed irrigation systems in Comayagua are part of any of these districts. Producers have to pay a fee to use the water. Some producers provided the next comments:

We have to pay a fee to the irrigation district to use the water. It is charged to give maintenance to the infrastructure. My land is located in the district of Selguapa wich comprises Ajuterique, Lejamani, and part of La Paz (PRC5).

I have a gravity fed irrigation system; I get the water from the irrigation district. To use it we pay Lps. 25(PRC13).

Currently the Watering Modernization Project for Micro Watersheds in the Western Zone in the Valley of Comayagua/Proyecto de Modernización del Riego en Micro Cuencas del Oeste del valle de Comayagua (PROMORCO)⁷⁸, is underway. PROMORCO is funded with resources from the Central American Bank of Economic Integration (BCIE). Its execution was initiated in 2003 and is expected to be finished at the end of 2009. Through the construction of about 38 km of primary and secondary pipelines, the project will benefit 1,222 families, planting less than 42 ha and will affect approximately 3,700 ha of land. The project extends over several regions where Asian vegetables are planted, and several producers have benefited from it. Besides the construction of the irrigation systems, the project is aimed to provide training, technical support and equipment, as well as to promote marketing and environmental development. Some producers of Asian vegetables have received irrigation equipment from the project. They provided the next comments:

Part of the irrigation equipment was received through an Institution of the government named PROMORCO, they gave us hose according to the planted area, and taught us how to operate the water pump. Thereafter, we bought additional hose from a cucumber company, which sold it to us after it was used during one cycle in the production of cucumbers; it is used but still is in good condition (PRC4).

I have a drip irrigation system. Some of the equipment I got it from PROMORCO, the rest I bought it. PROMORCO gave the equipment, even the water pump. We just have to present documents of land and topography, but a lot of people didn't believe on that; and therefore, they didn't receive any benefit (PRC19).

In Olancho actions taken by the government to develop irrigation infrastructure have been disperse. There are no large areas irrigated with infrastructure promoted by the government. The government

⁷⁸ See: http://www.undp.un.hn/RP_PROMORCO.htm [Accessed 10. 09].

through the Directorate of Irrigation and Drainage is currently trying to obtain financial support from different international sources to execute the construction of irrigation infrastructure in 4,000 ha in Valley of Guayape. In addition, financial support from the government of Japan for the construction of the infrastructure to irrigate 50 ha in La Lima, Campamento, has been obtained. The Canadian-funded Proyecto Guayape aimed to diversify crops, has provided support to producers of watermelon to install drip irrigation systems. Some of these producers are today planting Asian vegetables. A government official expressed the following:

In Olancho there are initiatives to develop irrigation projects like Colonia Agrícola in Catacamas and in La Lima, Campamento. These two communities have moved forward in diligences to execute projects. For instance, Catacamas already has a topographic survey, but it still needs the design. In La Lima, Campamento, they already have the project, and it is expected to be financed by the Japanese government (CCHO).

4.9.4 Institutional Services in Comayagua and Olancho

In this study, institutional services available to local actors involved in the production of Asian vegetables are divided in different components; namely, i) technical assistance services; and ii) market information services. Emphasis was given to producers.

There are several institutions providing technical assistance and market information services in order to encourage more sustainable farm operations and to help achieve compliance with market quality requirements and regulations. It is visible that in both regions these services are mainly provided by private organizations or institutions and international development cooperation agencies, in collaboration with different government agencies. Accordingly, provision of these services takes, in most cases, a form of mixed public-private approach. Among the most active private suppliers of these services are the exporters, research agencies and projects financed by international cooperation agencies that work closely with the ministry of agriculture dependencies. In general, for both regions producers regret the lack of regular provision of technical support, either from the exporters or the government through the Ministry of Agriculture. In the particular case of exporters, producers are disappointed with some technicians which lack experience leading to unreliable recommendations. As will be described, in spite of the reduced technical support received from the government, the Asian Vegetables Chain Sub-committee has provided an important space to concertize certain differences between producers and exporters. It also has

encouraged the formation of producers' formal organizations with more-or-less convincing results, which seem to be more positively visible in Olancho.

In Comayagua the exporters, FHIA, MTTH with the contribution of EDA seems to play the leading role in providing technical assistance to producers and exporters. FUNDER has supported an exporter. Therefore, in that region most producers and exporters don't associate effusively the government to the provision of this service and tend to discredit its involvement. In spite of this, exporters appreciate what the government does promoting exports activities, which according to them gives an incentive to producers and other actors.

However, in Olancho the picture is different, FHIA doesn't provide services and it seems that SENASA, through the Technical Unit of Asian Vegetables, has taken a very active position complemented by MTTH and DICTA, with the involvement of EDA and in to a less extent by the exporter. Note that SENASA responsibilities concentrate on regulation, rather than training or extension, though in Olancho producers turn to it when necessary.

Market information services are basically provided by FHIA and EDA. An important service provided by FHIA is the periodical provision of information concerning prices of Asian vegetable in different U.S. wholesaler markets. EDA and preceding U.S. cooperation programs have facilitated liaisons of exporters with buyers located in international markets. In addition, actors in the chain can seek price data from USDA's AMS. AMS reports daily on prices and shipment sizes at the U.S. biggest metropolitan centers. All major markets detail the wholesale prices on the most common produce.

4.9.4.1 FHIA

The Honduran Agricultural Research Foundation/Fundación Hondureña de Investigación Agrícola (FHIA). FHIA was established in 1984, and is a private organization offering several services to producers, exporters and any other interested individual or organization. Services offered by FHIA include, research and training programs, technical consulting, laboratories services and agricultural marketing services⁷⁹. It is important to mention that the services of FHIA don't span to Olancho.

⁷⁹ See: <http://www.fhia.org.hn/direccion.htm> [Accessed 10. 09].

Since the introduction of Asian vegetables in Comayagua, FHIA has been participating actively in research activities. Initially, it was focused on the development and evaluation of new varieties of Asian vegetables adapted to the region. From October 2007 to August 2008 with financial support of FIDE⁸⁰, FHIA-Comayagua carried out the “Project Training and Technical Assistance to Improve the Competitiveness of Small and Medium Producers of Asian Vegetables and Mango in the Comayagua Valley” (Proyecto de Capacitación y Asistencia Técnica para el Mejoramiento de la Competitividad de los Pequeños y Medianos Productores de Vegetales Orientales y Mango en el Valle de Comayagua). The general objective was to develop a program of training and technical assistance to transfer adequate cultivation, business management and marketing techniques, to contribute to the improvement of competitiveness of small and medium producers of Asian vegetables and mango in Comayagua Valley. Ninety (90) producers of Asian vegetables benefited from this project. Significant progress in GAP implementation was obtained and the yields, as well as income, were higher compared to the prior year. An additional outcome was the elaboration of the Production Guides for Chinese Eggplant and Asian Cucurbits (Fuzzy melon, Long squash and Bitter melon), which were distributed among participants and are now available to any individual.

Currently, FHIA doesn't have social projection directly related to Asian vegetables production. It doesn't provide in-situ technical assistance free of charge, as in the above mentioned project, anymore. However, its technical staff is open to hear the queries of producers and exporters that visit its experimental station in Comayagua and support them as much as possible. Other services including provision of seed or seedlings, soil and water analysis are charged with a fee. The foundation is now oriented to help solving current problems related to crop management practices and post-harvest management, rather than development and evaluation of new varieties as in the past. Concerning technical assistance to production of Asian vegetables the leader of FHIA's experimental station in Comayagua and some producers asserted the following:

Short time ago we used to have a project with FIDE, directly related to provide technical assistance to producers of mango and Asian vegetables. In this project producers received orientation about crop selection according to the international market, pests and diseases. A lot of training and courses were offered in the farms of the producers as well as through organized events in different point of Comayagua valley. At present the only assistance we

⁸⁰ Investment and Exports Development Foundation/Fundación para la Inversión y Desarrollo de las Exportaciones (FIDE). Is a private non-profit organization created in 1984 to promote investment in Honduras, support export development and work closely with the government and other private organizations to promote and design new legislation aimed at improving the country's business climate.

are providing is here in our station, if any producer has a problem and comes to tell us about it, we might help him, but we have no social projection in terms of agricultural extension. Formerly, during the project, there was no charge to the producers; the objective was to increase productivity of producers in the valley, to increase foreign currency reserves, it was a donation. Now that the project has finished, the service is generally free of charge when somebody request only information, if we have to travel to the farm there might be a charge, for other services such as seedlings production, soil and water analysis and seed there will be a charge. When Asian vegetables came to Comayagua we were focused on varietal analysis, but today we are concentrated on providing answer to several current problems (FHIAC).

I have never received technical support from the government, just from some private institutions. Here in Comayagua we have received training from FHIA, MTTH and EDA. They are mostly private initiatives that sometimes collaborate with the government (PRC2)."

The government doesn't provide direct technical support; it does it through other institutions. For instance, FHIA about crop management; and recently I have been in some soil sampling training provided by EDA (PRC14).

4.9.4.2 MTTH

Taiwan Technical Mission in Honduras/Misión Técnica de Taiwan en Honduras (MTTH). MTTH is financially supported by the International Cooperation Development Found (ICDF) of the Republic of China (Taiwan), with the objective to contribute to reduction of poverty in Honduras through agricultural development. MITTH cooperates and coordinates efforts with SAG through DICTA⁸¹ and DIGEPESCA⁸² to provide technical assistance to small and medium agricultural producers, in order to improve their lives and contribute to promote economic development in rural areas of Honduras. MITTH-DICTA has experimental stations in several regions of the country. These experimental stations are involved in activities oriented to different agricultural production subsectors, including pork production, fish farming, exotic fruits and Asian vegetables production.

In the particular case of Asian vegetables, MTTH and DICTA coordinate Centers for Enhancement and Propagation of Plants located in Comayagua and Olancho. In these experimental stations "The

⁸¹ Direction of Agricultural Science and Technology/Dirección de Ciencia y Tecnología Agropecuaria (DICTA). DICTA is ascribed to SAG and is responsible to design, coordinate and regulate the programs of generation and transference of agricultural technology in the agricultural sector of the country. See: <http://www.sag.gob.hn/files/DICTA/DICTA>. [Accessed 10. 09].

⁸² General Direction of Fishing and Aquaculture/Dirección General de Pesca y Acuicultura (DIGEPESCA). In general terms, it is the government dependency in charge of conducting issues related to fishing, farming, and protection of hydro biological species. See: <http://www.sag.gob.hn/index>. [Accessed 10. 09].

Project of Non-traditional Vegetables” is underway. This project is part of actions taken by the government in terms of diversification and promotion of non-traditional exports in regions with high productive potential. The activities implemented include: i) quality enhancement of Asian vegetables seed; ii) production of enhanced seedlings from enhanced seed; iii) production of Asian vegetables grafts using rootstock resistant to pests and diseases affecting the region; and iv) introduction, generation, validation and transference of technology to small and medium agricultural producers.

To a large extent the genetic materials available for the production of Asian vegetables in Honduras have been produced, evaluated and disseminated by MTTH-DICTA. They donated part of his material to FHIA and sold it to some exporters, which have reproduced it. Certainly, MITTH has performed an important function through its contribution to the preservation of this genetic material. Next, are some comments stated by technicians of MTTH-DICTA in Comayagua and Olancho and some producers with respect to the activities of MTTH-DICTA in these regions:

MTTH and also FHIA develop in their experimental stations techniques and materials and then search producers to evaluate them as producers' plots, I mean the producer itself has to manage it and that is the way we have evaluate eggplants, long squash and bitter melon. We have evaluated the genetic materials of exporters and FHIA to check if they are appropriate to the region, because we cannot let the producer to embark in something which is not good for him (MTTHC).

Here in Olancho, besides the production of seedlings and grafts with resistant rootstocks for the producers and exporters, we provide technical assistance to producers which is a free of charge support to the exporter, because these producers are their suppliers and also it has its own staff of technicians. DICTA and SENASA have their staff and neither do they get anything from the exporter. However, we work together and cooperate to solve problems (MTTHO).

Here in Olancho, MTTH established a trial to test a new rootstock resistant to pests affecting plantations in this region; in which I have participated (PRO1).

Yes here in La Concepción, Olancho, we get technical support from MTTH-DICTA and also from SENASA. The exporter technician also provides technical support, which should come every 15 days. Well I have already planted and he still doesn't appear, so I have to ask the technicians of SENASA (PRO6).

4.9.4.3 EDA

Farming Training and Development/Entrenamiento y Desarrollo de Agricultores (EDA). EDA is a program of the Millennium Challenge Account of Honduras (MCA-Honduras) with funds provided by the Millennium Challenge Corporation (MCC) of the United States⁸³. The program is being implemented by Fintrac Inc., a U.S. based agribusiness firm, and has a life span of five years; it started in 2006 and will finish in 2011. At the end of this period of time, EDA expects to have increased the incomes of 8,255 farmers through expanded production and increased productivity of high value horticultural products.

EDA's focus on direct technical assistance and training for producers participating in the program follows a market-led production methodology. Technical assistance is provided directly to individual producers, who receive regular extension visits on their farms from the program's agronomists. To be able to accomplish its objective, EDA is selecting 1,250 farmers to be lead farmers, and another 7,005 as beneficiary farmers. Lead farmers' farms serve as demonstration, training and dissemination sites, and are responsible for identifying, organizing, and coordinating the participation of the selected beneficiary farmers.

Since 2006 EDA is providing technical assistance to selected producers of Asian vegetables located in Comayagua and Olancho. These producers have received technical assistance through regular visits on their farms, in order to implement basic technified and updated production practices to increase productivity, minimize costs and reduce risks. Some producers have also benefited with the installation of drip irrigation systems or its accessories donated by MCA-Honduras.

Additionally, USAID-RED⁸⁴ was a project implemented from 2005 to 2008 also led by Fintrac Inc. and financially supported by USAID that provided support to some producers and exporters of Asian vegetables in Olancho and Comayagua. The program assessed the line flow, cold room and containers of an exporter in Comayagua, and also provided liaison with a Canadian buyer of Asian

⁸³ For more information see: <http://www.fintrac.com> [Accessed 10. 09].

⁸⁴ The Rural Economic Diversification Program (USAID-RED) was a 3½-year initiative of the United States Agency for International Development (USAID) with a primary goal of increasing incomes and employment opportunities in rural Honduran communities. The program targeted the agribusiness sector and promoted private sector investments in higher-value and value added agricultural products (see <http://www.usaid-red.org>). [Accessed 10. 09].

vegetables. Some training activities involving producers of Asian vegetables included basic practices and irrigation systems installation, maintenance and fertigation. In relation to Asian vegetables the following comment was provided by an official of EDA:

With producers of Asian vegetables we are working exclusively on production. EDA has additional components like marketing, monitoring and financing, but with producers of Asian vegetables we work on production, on basic practices. I don't have any exact number, but we assist producers in Comayagua and Olancho since two years ago (2006). Our attention to producers is individual, because the problems vary from producer to producer; it is difficult to recommend a global package for all farms you have to go farm by farm. We divide the producer in leaders and beneficiaries. The technicians select the leaders and these have to work with 7 beneficiaries, our goal is to assist 8,255 producers. The service is free of charge and our technical support and training are punctual. Some producers have been benefited with donations of drip irrigation systems, filters or other accessories. EDA started two years ago (2006) and will finish in 2011, then we don't know what will happen. Fintrac Inc., has another two projects, such as US RED probably will come another project and maybe Fintrac will implement it, but this depend very much on international aid (EDA).

In relation to the support offered by EDA and U.S. cooperation programs some local actors asserted the following statement:

I have technical support, mainly from the exporter. EDA provides technical support, but just to some producers, I for instance don't get support from them. EDA donates drip irrigation systems to some producers but they have to manage it the way EDA says. They ask us to write down which pesticides we applied, how much we applied and the cost, but I don't have time to do it (PRC8).

USAID through its projects in the region provides a manual of good agricultural practices and good manufacturing practices, and socializes them with us. From the government nothing regarding getting support to obtain a new packing technology or maybe some training. The government promises too much and doesn't do too much (EXPC2).

We have been in several events promoted by EDA, and they have also been in my plantation providing technical assistance. SENASA and DICTA have visited my plantation too (PRO7).

4.9.4.4 FUNDER

Rural Business Development Foundation/Fundación para el Desarrollo Empresarial Rural (FUNDER). FUNDER⁸⁵ was created in 1997, is a private non-profit organization which promotes participative process of business development through training services and technical assistance in organization, marketing, financing and strengthening of rural banks, micro-business and business

⁸⁵ For additional information see: <http://www.funder.hn/main.swf> [Accessed 10. 09].

initiatives with small and medium producers. FUNDER is integrated by government authorities, representatives of civil society (rural social organizations), and members of international cooperation agencies oriented to contribute to the improvement life condition of the most vulnerable families in rural areas.

FUNDER has broad experience in executing projects through institutional agreements with government institutions and international cooperation agencies. Regarding Asian vegetables, it is currently implementing a project with USDA, IICA and SAG. The general objective of this project is, with participation of producers and exporters, to develop a sustainable business model to manage the Exports Plant of Fruits and Vegetables in Comayagua Valley/Planta Exportadora de Frutas y Vegetales del Valle de Comayagua (HONDUFRESH).

HONDUFRESH is a treatment and packing plant, constructed with the financial support of the USDA; with the objective to accomplish the phytosanitary requirements imposed to exports of fruits and vegetables by the U.S. market. This initiative is theoretically a consortium of three companies involved in production and marketing of fruit and vegetables, including among them an exporter of Asian vegetables which make use of this facility to export its product to the U.S. market. In addition, some producers in Comayagua have been initiated in the production of Asian vegetables through technical assistance provided by FUNDER. Despite of its presence in Olancho, apparently FUNDER hasn't had any relation with production of Asian vegetables in that region, so far. The following comments illustrate what has been indicated before:

This company is an association between several companies. It is something like a forced association promoted by the U.S. FUNDER and the U.S government which promoted the formation of an organization or company including other companies. Certainly it is only the name, because every company carries out its activities and matters individually and separately; but everything has been our own initiative; the government hasn't promoted much directly. It has been the initiative of producers and exporters (EXPC2).

I used to plant staple maize, rice and beans, but it wasn't a good business; then came a foreign institution in those days named PROCORA, today its name is FUNDER and they supported us to work with Asian vegetables, and that is the way we begun to do this (PRC6).

4.9.4.5 Other Institutions

Other organizations providing support in Comayagua are the Netherlands Development Organization (SNV-Honduras), TechnoServe Inc., and the Program Agropyme cited above. SNV-

Honduras has provided technical assistance to the most recently established Asian vegetable exporter. SNV-Honduras has funded for this exporting company a market study to assess the possibility to export Asian vegetables produced in Honduras to European markets. TechnoServe Inc., a non-profit organization, which offers entrepreneurship development and training programs in developing countries, has provided support to producer-owned company. TechnoServe-Honduras has a three years support agreement with the producer-owned company. It has helped them to establish links with importers in the U.S. and has also provided packing material such as boxes.

4.10 Supporting Markets to the Value Chain Actors.

As expressed, supporting market refers to a broad range of financial and non-financial products and services, commercially provided by the private sector to support the actors in the chain. In spite of this, for practical reasons some public actors providing these services are included in this classification. In the study supporting markets are divided into three main categories: i) financial services; ii) cross cutting services, such as business consulting, legal advice and telecommunications; and iii) sector-specific services including: irrigation equipment, handicraft design services and veterinary services.

4.10.1 Financial Services in Comayagua and Olancho

Credit services are sourced by formal and informal institutions. In the formal sector there are several private and public institutions, willing to service producers and exporters in Olancho and Comayagua. Such institutions range from commercial banks, cooperatives and BANADESA. On the other hand, the informal sector basically embraces exporting companies, relatives and close friends. The following are the major formal sources of credit for local actors in the value chain of Asian vegetables.

According to data of the National Banking and Insurance Commission (Comisión Nacional de Bancos y Seguros) the banking system in Honduras⁸⁶ currently comprises 17 commercial banks, including financial intermediaries, brokerages, credit operators, foreign exchange houses and security exchange. Very often it has been stated that the local banking system is conservative and extends limited amounts of credit, and this is particularly applicable to the agricultural sector.

⁸⁶ For additional information see: <http://www.cnbs.gov.hn/web/index.htm> [Accessed 11. 09].

However, there are several commercial banks that emphasize lending to agriculture. These banks are large enough to cover major geographical areas of the country including Comayagua and Olancho. Other commercial banks can only afford to devote a modest share of its portfolio to agricultural lending. Loans from commercial banks tend to be established at short term with substantial collateral and/or guarantee requirements, and interest rates for agricultural sector loans have been high, hovering around 20 percent. In general, these commercial banks usually lend to progressive medium and large scale farmers in the non-traditional agricultural sector.

Based upon the figures of the Central Bank in 2008, it is possible to assert that the cooperative movement in Honduras tends to be oriented to the agricultural sector. Agriculture cooperatives represent 67 percent of production cooperatives, and 29 percent of all active cooperatives. However, most members are found in service cooperatives, particularly credit and savings cooperatives, which have played an important function in serving the financial needs of rural population. From data collected it is unrealistic to assert the number of cooperatives affecting the production of Asian vegetables in Comayagua and Olancho. Nevertheless, the eligibility criteria varies among cooperatives, some require to have a savings account with certain amount of money or a low minimum balance, and lend money at a relatively high interest rate (around 20 percent); while others require a security interest as collateral and lend money at low interest rate (around 4 percent).

National Agricultural Development Bank/Banco Nacional de Desarrollo Agrícola (BANADESA)⁸⁷. BANADESA is a government-owned bank that provides credit, savings facilities (savings, and current accounts) and administers trust funds. The main objective of the bank is to channel financial resources to develop production and productivity in agriculture, livestock, fishing, poultry farming, apiculture, forestry and activities related with the primary processing of that production including its marketing. The main sources of funds include deposits from the general public, equity and concessionary trust funds. In Comayagua BANADESA has two agencies located in the municipalities of Comayagua and Minas de Oro. Olancho has five agencies located in the municipalities of Catacamas, Juticalpa, Salamá, San Esteban and Dulce Nombre de Culmí.

⁸⁷ For additional information see: <http://www.banadesa.hn/> [Accessed 11. 09].

The most important eligibility criteria for producers to qualify for funds of BANADESA include i) being a producer; ii) borrower's repayment record at the risk management central of the bank, which means not having pending debts with other banks; iii) to sign an irrevocable letter; iv) to pledge property (collateral) to secure the loan; and v) to present an investment plan. The credit scheme for Asian vegetables is incorporated in the scheme for vegetable crops. When financing from equity, as it is the case of Olancho and Comayagua, the interest rate is 12 percent; for amounts up to Lps. 300,000 the bank requires borrowers a security interest as collateral, if it is more than that amount, then it requires a mortgage security. The loan can be payable in six, nine or twelve months, depending on the length of the crop cycle, the repayment of debt obligation has to be effective when the plantation begins to bear fruit.

4.10.1.1 Financial Services in Comayagua

It appears that for producers in Comayagua the main source of financial services are the exporters (Table 4.14). Some exporters provide credit to producers as part of input supply including seedlings, others lend capital to purchase inputs and provide seedlings on credit. This credit is provided under seasonal contract farming agreements, thus it is tied to subsequent sale of produce to reduce the risk associated to agricultural lending. The amount lend by exporters varies among each other and depends on the producer too, as well as on the crop, subsequently producers don't receive all the same amount. Some exporters lend capital to purchase inputs including seedlings, which covers between 10 to 35 percent of the investment required to make the plantation bear fruit. Other exporters provide inputs plus seedlings that accounts for about 18 to 21 percent of the total required investment (approximately US\$ 2200/ha).

According to producers in Comayagua, credit from exporters has become insufficient to respond the increasingly costs of production, or it is not delivered out in time. Therefore, they have to supplement it with their own resources. Despite that, most producers prefer credit supplied from exporters because future production serves as collateral, and don't have to bear with the cost of lending rates. In addition, they avoid dealing with the procedures, eligibility criteria, and related issues necessary for accessing the funds of BANADESA and commercial banks.

Producers have experienced difficulty to access, slow transaction, and untimely delivery of credit from BANADESA. They claim that approval of loan disbursement from BANADESA takes too

long, and they don't get it on time. Furthermore, they have to satisfy highly demanding collateral requirements. For them it would be quicker to get money from a commercial bank, but the interest rate is higher and often they don't satisfy its eligibility criteria.

The majority of producers interviewed have accessed to production finance through exporters (Table 4.14). The remaining has done it without the exporter and has resorted to other sources such as relatives, BANADESA and, in a less extent, cooperatives and private banks. However, even these producers buy seedlings on credit from the exporters. A few producers spoke about complementing the credit supplied by exporters with the additional financial alternatives already indicated (Table 4.14).

Table 4.14 Number of producers per source of credit in Comayagua

Source of Credit	Number of Producers	% of Total
Exporters	15	75
BANADESA	3	15
Relatives	3	15
Commercial Banks	1	5
Cooperatives	1	5
Own Resources	1	5

Source: Own elaboration

Following are some actors' comments regarding credit services in Comayagua:

I get credit from several private banks and the exporter. BANADESA asks for too much collateral and takes a long time to approve a loan. One has a date to plant, because the exporters already have programmed when they will harvest. With private banks you receive the credit in three days. In the case of the exporters, the one I work with gave me cash, because he says he doesn't want to waste time fighting with producers and its technicians supervisors to see if we are spending the money on the plantation; if we aren't, the next week we don't get credit. In the case of some private banks depending on the amount of money you want to borrow you might be asked for relatively low collateral, but in a few days you know whether or not you get the loan. Regarding the payment the exporters deduct from the fruit you give them, some of them take 20 percent, other 30 percent and the most criminal up to 50 percent of the production (PRC1).

The exporter provides credit, but it is not enough they gave me approximately Lps. 10,000, even though they offered me Lps. 24,000. I have never asked for credit from BANADESA because it requires unattained collateral and takes too long to get the credit (PRC12).

The financing of producer works in the following way: A producer comes to us and says he wants to plant. We ask him what does he want to plant and how much. We have set an amount to lend money for eggplants and another for cucurbits. For instance if a producer brings to the packinghouse 50 boxes and 40 are taken, then 20 pay the debt and the other 20 are for

him. The producer signs a contract which indicates the amount he borrowed and he takes the responsibility to deliver his whole production to our packinghouse. The most difficult time for the producer is at the beginning. We give them Lps. 15,000 plus the seedlings to plant (EXPC2).

An official in one of BANADESA's agencies in Comayagua gave the following comment:

Producers of Asian vegetables that borrow from this BANADESA agency in Comayagua are not much and they are long-standing clients. I don't know exactly how many there are, but they are few, and the number hasn't changed considerably (BNDC).

It appears that exporters access financial services provided by commercial banks. They seek working capital to finance short-term export sales. However, some exporters expressed having difficulties to access these services. Consequently, they prefer commercial banks that emphasize lending to the agricultural sector. Predominantly, during establishment of its operations, some exporters expressed that commercial banks facilities have been sought to finance export sales, until the payment of the buyer is received. According to exporters assistance from the public sector is not available. One exporter applied for funds from BANADESA and it was not approved. It comes into view that there are no government agencies with the primary purpose of offering or facilitating specific programs to assist exporters of Asian vegetables with their financial needs. In addition, buyers are a source of financing for some exporters. Some importers of Asian vegetables, depending on the relation with the exporter have been willing to provide financing based on product purchase transactions.

In the case of the producers-own company, when exporting through export intermediaries, they have eliminated the need for financing. Export intermediaries purchase the vegetables directly from the producers, thus eliminating not only the risk associated with the export transaction, but also the need for financing. One exporter was very explicit in explaining the availability of credit services for its activity:

When we started this company we were hoping to get credit support from the government. If we could reach a certain amount of exported containers, they would offered support, but so far we haven't received anything. Two commercial banks have opened their doors to support our activities. But it hasn't been easy, especially with one bank; we have been more relaxed with a commercial bank which is oriented to the agricultural sector. Basically they require an investment plan to show that the activity is feasible, you need to have collateral and to be registered as a company. We asked for credit at the beginning of our operations to pay labor, because the broker didn't pay us on time. In one project we received financial support from the buyer, and paid with product (EXPC2).

In this regard the executive interviewed at BANADESA's central office made the next comment:

The exporters request loans from private commercial banks; where they have their saving accounts. During the year 2000 one exporter asked for financial support from BANADESA but it was not approved. The rest of exporters have never requested (BND).

4.10.1.2 Financial Services in Olancho

In Olancho the exporter provides credit to producers only as part of input supply including seedlings. Nevertheless, as in Comayagua, the credit from the exporter is not enough for producers to respond the increasingly costs of production and very often is not deliver on time. Therefore, they inevitably have to supplement the cost of production with their resources. Though the exporter offers to lend 30 percent of the investment required to make the plantation bear fruit, he often provides no more than about 20 percent, as inputs and seedlings.

With respect to BANADESA, the same assertions made in Comayagua apply to Olancho and prior to 2007, no one of the producers interviewed accessed credit from it. Instead, they turned to cooperatives and in to a less extent, to commercial banks which seem to be the last alternative as they require higher interest rate and more demanding eligibility criteria. Notwithstanding, in 2007 BANADESA, in cooperation with the exporter and the Technical Unit of Asian Vegetables of SENASA, implemented a different credit scheme compared to Comayagua. This scheme was a mechanism based in a Tripartite Agreement which consisted on providing financial support to producers with funds of BANADESA, the technical supervision of UTVO and endorsed by the exporting company, who ensured marketing of the product. The fund consisted on Lps. 1.5 million (around US\$ 80,000) from the bank's equity to initially finance 50 producers of Asian vegetables in Olancho. In this way, credit was made available to a group of approximately 30 selected producers of Asian vegetables; otherwise they would be neglected as a result of the lack of collateral. The amount borrowed by producers was between Lps. 15,000 to Lps. 30,000 (US\$ 800 and US\$ 1600). The conditions were those required to the horticultural sector.

According to BANADESA, this experiment failed to meet the bank's expectations. At the time when the interview was conducted (1 production cycle or 8 months after the funds were lent to producers) the institution had not been able to recover all of the loans granted. The interviewed executive said that bad loans were about 50 percent of the total, and held producers responsible.

Though, the bank had conviction on exporter's persuasive faculties over producers to accelerate the recovery of loans. For those producers who honored their debt, some were automatically granted with a new loan, for others it is in process, because the bank is now apprehensive about the consequences. A producer provided the following comment:

I borrowed Lps. 30,000 from BANADESA, all my colleagues got money from it, some of them have paid back their loan and others haven't. I haven't paid it back, because I used to lease the land and I had to give it back on harvest time. That is why I am now paying. The lending rate was 10 percent and it was backed by the exporter (PRO11).

Cooperatives appear to be an important source of credit for producers in Olancho. As mentioned, the eligibility criteria varies among cooperatives, some require to have a savings account with a certain amount, and lend money at a relatively high interest rate; while others require from borrowers a security interest as collateral and lend money at low interest rate.

In Olancho, producers are moving to higher levels of self-sufficiency, they are creating rural banks with the support of the Asian Vegetables Chain Sub-committee of the Ministry of Agriculture. The objective is to create microfinance institutions that provide producers credit in the amounts and terms that meet their needs. However, in the meantime most of them are limited in financial terms and their potential to succeed remains to be seen. The level of commitment to self-sufficiency and to market oriented operation may vary affecting the capacity of the group to achieve its objective.

Almost all producers interviewed rely on credit provided by the exporter (Table 4.15). The majority of producers interviewed have improved access to credit from BANADESA, within the framework of the Tripartite Agreement signed with the exporter and SENASA (Table 4.15). This condition momentarily allowed producers to come off from the exporter supply. Some producers have accessed credit from cooperatives, and only one expressed to use credit provided by commercial banks (Table 4.15).

Table 4.15 Number of producers per source of credit in Olancho

Source of Credit	Number of Producers	% of Total
Exporters	19	95
BANADESA	13	65
Cooperatives	5	25
Commercial Banks	1	5
Rural Bank	1	5

Source: Own elaboration

4.10.2 Cross Cutting Services in Comayagua and Olancho

Cross cutting services include business consulting, legal advice and telecommunications available in both regions. Emphasis was given to producers.

4.10.2.1 Telecommunication Services

For producers, mobile telephones are the main mean of communication. The majority of producers of Asian vegetables in Comayagua and Olancho are placed in direct and instantaneous communication with exporters, other producers, inputs suppliers, government agencies or any other institution; through cell phones services. Cell phones have enabled producers to afford a channel of conversation, which greatly relieves the problem of long distance mobilization through poor quality roads in the rural areas of Comayagua and Olancho. In both departments the service is offered by three private companies and reaches locations where Asian vegetables are planted and marketed; and has proved to be of great value as a time saver.

In less isolated rural areas of Comayagua and Olancho some producers are covered by the National Telecommunication Company/Empresa Hondureña de Telecomunicaciones (HONDUTEL). HONDUTEL is owned by the Honduran government; in addition to traditional landline service for fixed phones, it also has recently launched mobile services in major municipalities of Comayagua and Olancho. In this regard a technician of MTTTH in Comayagua stated:

In the majority of plots there are no fixed telephones lines, however all producers use cell phones to get in contact (MTTHC).

In Olancho the government officials expressed the next comment in relation to the use of this service:

In Olancho communication in rural areas is through mobile phone service. Fixed telephones lines are available only in major municipalities as Juticalpa and Catacamas, and in some villages as La Concepción and La Puzunga (SCCO).

Communication is essential, because these are very expensive crops and in two days they might be lost. Therefore, we are in direct communication with producers, if they have any phytosanitary problem they communicate with us through mobile phones (DICTO).

A few producers have access to internet in Comayagua. In Olancho no information was collected regarding this type of service.

In the case of exporters, they all have access to the services indicated above. Some exporters even have designed their own webpage containing information about the services and products they offer.

4.10.2.2 Consultancy Services

A range of consultancy services are available to provide advice and guide in a number of technical and business areas depending on the requirements of the local actors. The most common include financial, accounting, design, legal, management, and marketing services. Other important services are customs, transport, logistics, and human resources training. Some of these services are provided either by local or international consulting firms.

Given the expertise and knowledge associated to this kind of services, their cost is, in most cases, high. As a result, the execution of these services is demanded only by exporters. In both regions, Comayagua and Olancho, none of the interviewed producers indicated to procure any of these services. On the other hand, exporters procure different services, although needs don't differ substantially among them. In relation to exports services, they contract customs clearance services to avoid problems related to accomplishment of customs procedures and regulations required to introduce agricultural products to the U.S. market. They make use of road transport services to deliver containers with the fruit to the shipment port in Cortés, and sea transport services to deliver them from there to the different entry ports in the U.S. As part of their efforts to ensure high quality products, and to enhance efficiency they target customized services to improve the performance of their packing houses, and design of their packages.

In all instances they carry out external audits to supervise the accounts of the company, and when required, they hire legal services, often to deal with special permits rather than for pursuit of specific claims against other actors. The following are illustrations provided by exporters:

We contract ground and sea transport. Consulting services for package design and to modify or improve process in the packing plant. We also contract consultancy in vegetal nutrition for our fertilization programs. We are strengthening our food safety department; in fact, continuous improvement is a crosscutting theme in our company (EXPC3).

We contract external consultancies to check the accounts of the company, I mean audits. We also have an external legal advisor. We also contract a customs broker to take care of custom procedures and clearance. People come here very often and from everywhere to offer

services, like internet services, telephones, furniture, etc. When we started this company the service providers just came when they wanted (EXPC2)

We had to spend a lot of money hiring lawyers to apply and/or renew several work permits and licenses demanded by the government. (EXPC1).

4.10.3 Sector Specific Services in Comayagua and Olancho

Sector-specific services include irrigation, equipment and inputs available to local actors in the chain. For practical reasons, as probably noticed, provision of technical assistance and finance were included separately in other sub-chapters. Emphasis is given to producers.

4.10.3.1 Irrigation Systems Suppliers

There are several manufacturers, distributors and service companies dedicated to design, sell and install various types of modern irrigation systems. They provide a range of products including equipment, applications and accessories.

However, not all producers in Comayagua and Olancho can afford to buy directly from these companies, especially some applications and accessories. According to producers most of these companies don't charge for designing and installing the irrigation systems, instead they benefit from purchase of equipment, materials and accessories made by producers. Most of these companies don't provide technical support in relation to the operation and maintenance of the systems. During installation of drip irrigation systems they provide a brief and basic introduction on operation and maintenance of the equipment. Most producers know how to operate and maintain these systems by experience. In fact, in Comayagua the overwhelming majority of producers (12 out of 13) underestimated the technical support provided by the irrigation companies. They expressed they learned to operate the equipment by themselves, or with the support from other producers and institutions. Some producers (23 percent) have learned via training from different international cooperation agencies' projects, or the Ministry of Agriculture. However, they all expressed their willingness to receive training regarding this matter.

Table 4.16 Sources of irrigation equipment of producers in Comayagua

Source	Equipment	
	Water Pump	Accessories (hose)
Irrigation Supply Co.	12	2
Exporter	0	5
Projects	1	2
Other Vegetables Co.	0	4
Total	13	13

Note: It is important to bear in mind that from the 20 producers interviewed in Comayagua, 13 operate drip irrigation systems and the remaining gravity fed systems.

Source: Own elaboration

As Table 4.16 illustrates, almost all producers purchased water pumps from irrigation equipment companies, only one producer did not; he obtained it as a donation from a project. Initially, when the system is to be installed, producers generally buy the equipment and accessories from irrigations companies. Some producers have obtained the whole or part of the equipment and accessories through projects, such as PROMORCO and EDA in Comayagua or through financing from some organizations, such as FUNDER. However, when time to replace equipment comes, particularly in the case of hose, the majority (85 percent) indicated they turn to additional sources instead of the irrigation equipment companies. As indicated before, the majority of producers pursue to get used hose from some exporters of Asian vegetables, or other companies in the vegetable production business. Other accessories such as sand filters often are overused or not used at all.

Producers in Comayagua provided the following comments:

I have bought the equipment from an irrigation company. The companies of irrigation provide some technical support during installation, but not much. In general we learn by ourselves how to operate and to give maintenance to our equipment. The government helps a little bit in operation of the systems. The business of these companies is to sell equipment and material; they don't get much from installation (PRC2).

I bought the irrigation pump with my own money, but the hose we get are used and given by the exporter, if he has any. During the installation the seller explained how to operate it, thereafter we do it alone. We repair the equipment, but we need sand filters, they are too expensive and we need them because the emitters get blocked very often (PRC7).

The irrigation system is easy to operate. I have learned to operate it by myself. I bought this drip irrigation system, I only paid for the pipe line and valves, and the company has installed it. I change the hose by myself (PRC17).

In Olancho the pattern is similar to Comayagua. The overwhelming majority of producers (12 out of 13) took too lightly the technical support provided by the irrigation companies. They expressed

they have learned to operate the equipment by themselves, or with the support from other producers, relatives and institutions. Some producers (18 percent) have learned via training from different international cooperation agencies' projects, or the Ministry of Agriculture. However, they all as their peers in Comayagua expressed their willingness to receive training regarding this matter.

As Table 4.17 displays, the majority of producers purchased water pumps from irrigation equipment companies, two producers did it on credit through projects. Initially, when the system is to be installed, producers generally buy the equipment and accessories from irrigations companies. Some producers have obtained the whole or part of the equipment and accessories through projects such as Guayape and EDA in Olancho, in case of the former they got in on credit and in the latter as donation. However, when time to replace it comes, particularly in the case of hose, the majority (80 percent) indicated they turn to additional sources instead of the irrigation equipment companies. As mentioned, the majority of producers pursue to get used hose from the exporter of Asian vegetables or other companies in the vegetable production business. As in Comayagua other accessories such as sand filters often are overused or not used.

Table 4.17 Sources of irrigation equipment of producers in Olancho

Source	Equipment	
	Water Pump	Accessories (hose)
Irrigation Supply Co.	14	0
Exporter	0	6
Projects	2	3
Other Vegetables Co.	0	7
Total	16	16

Note: It is important to bear in mind that from the 20 producers interviewed in Olancho, 16 operate drip irrigation systems and the remaining gravity fed systems.

Source: Own elaboration

Producers in Olancho provided the following comments:

I bought equipment for drip irrigation, in Tegucigalpa, with my own resources. When they installed the irrigation equipment, they explained me how to turn it on and turn it off. It was mostly through my experience I learned how to operate it, practically I did it alone (PRO6).

I have a drip irrigation system, it is not first class; it uses a second hand hose, which the exporter traded for fruit. I bought the water pump from an irrigation company. I learned to operate the irrigation equipment with support from DICTA, SENASA and EDA. They have taken us to visit other producers with drip irrigation systems, and that is how I learned (PRO8).

I have a water pump which I bought with my own resources and use it for drip irrigation, I also have fertigation. This equipment is provisional, it is not complete, it is second hand, and I got it from a plantain company. I have learned to use it gradually, as I use it. I would like to have training; since I never had any to use the equipment. One never stops learning (PRO18).

4.10.3.2 Agricultural Machinery and Other Equipment

As aforementioned producers make use of different farm implements pulled by tractor, the most used are plow, harrow and seed bed preparation implements.

The great majority of producers in Comayagua and Olancho don't own agricultural machinery and implements, since they can't afford it, they lease machinery and implements from different suppliers. The most demanded supplier of machinery are small entrepreneurs serving in the areas where producers plant (Table 4.18). The suppliers of machinery and implements have nothing to do with exporters of Asian vegetables. Exporting companies of Asian vegetables have their own machinery, but don't lease it, rather they use it in their own activities.

One producer in Comayagua has leased machinery and implements from FHIA and MTTH. However, the former doesn't provide the service anymore. In Olancho, some producers lease machinery from the National University of Agriculture (UNA) and/or peasant enterprises.

Table 4.18 Number of producers per source of machinery in Comayagua and Olancho

Source	Supplier of Machinery Services		
	Local Entrepreneur	Other	Total
Producers Comayagua	19	1	20
Producers Olancho	15	5	20

Source: Own elaboration

Some producers in Comayagua affirmed the following:

I lease the machinery from a neighbor who has a tractor and the implements. I hire out the plow and harrow, to prepare my soil before planting. The price is fair; I think it is not expensive. I am satisfied with the quality of the work. I have my own sprayers to apply pesticides to the plantation. I have motorized and handheld sprayers (PRC10).

I have to lease the machinery to prepare the soil to plant. There is machinery in this area, and people who offer the service; we have no problem with that. For me the price is still affordable. I use sprayers too; I bought them in agrochemical store. (PRC14).

Some producers in Olancho presented the next comments:

Here there is a fellow producer who has machinery and we pay him to use it when is time to prepare the land. I lease a plow and two passing with harrow. It is not too expensive. I have backpack sprayers to apply pesticides; we bought them at the agrochemical store (PRO2). A friend of mine has machinery, a tractor and implements, and I lease them from him. One passing with plow and two with harrow costs Lps.1500. I lease the seedbed implement from UNA, I have to pay Lps.300 for using it. I have a compression and motorized backpack sprayer (PRO6).

According to producers in Comayagua and Olancho, the price of hiring machinery is fair. In despite of the increasing cost of fuel and spare parts of machinery, the terms of leasing are favorable and accessible. It appears that the majority of producers are satisfied with the service. Some asserted that the service is better compared to past years. However in both, Comayagua and Olancho, the quality and the availability of the service vary depending on the place where the plantation is located. Therefore, not all producers are totally satisfied.

In Comayagua, some producers (15 percent) regretted the lack of skill of the operator, the lack of the adequate implements or the absence of machinery in the required moment. In Olancho, the situation is less encouraging, 7 producers (35 percent) expressed their dissatisfaction with the services. The arguments are those mentioned above. It seems that these producers incur in higher transaction costs in order to establish their plantations. Some producers in Comayagua commented the following:

I have to lease machinery, even though the service is dreadful, the leaser do what he wants. Here, there is just one person from Ajuterique who provides the service. The machines are good, but the operator is not. Other things, like sprayers I bought them in agrochemical stores (PRC6).

We have to hire the machinery to prepare the soil before planting. But, the service we have available is not good. They don't have the necessary implements, and we have to search everywhere to get them. I have handheld and motorized sprayers; I bought them in Comayagua (PRC18).

Some producers in Olancho presented the next comments:

I have an ox therefore I must rent machinery to prepare the soil to plant. I am not happy with the service, I don't like the way the leaser works. The price is not expensive, but sometimes he doesn't work well, yet he is the only provider. I have equipment to apply pesticides; I have sprayers (PRO1).

I lease the machinery for soil preparation. The preparation they do is bad, the problem is that they don't have enough experience and it is even worse, because there are no other providers. I have sprayers; I bought with the money I got from a tomato plantation. Sprayers are obtained in agrochemical stores or some distributors (PRO7).

In relation to other agricultural equipment, such as compression or motorized backpack sprayers to apply chemicals to plantations, producers in Comayagua and Olancho, purchase them from agrochemical stores, manufacturers, distributors and agricultural service companies.

4.10.3.3 Input Suppliers

In this section inputs refer to fertilizers, chemicals, specific materials and seed available to producers of Asian vegetables in Comayagua and Olancho. Inputs such as land, labor, farm machinery and equipment are not included.

There are many commercial inputs companies that supply primary agriculture in both regions. Input suppliers comprise some multinational firms producing a great variety of chemical products and equipment, although most are local agrochemical stores, cooperatives, small local businesses, next door neighbors and input hawkers selling fertilizer and pesticides. In addition, research agencies such as FHIA and MTTH supply seedlings.

Based on the information obtained in this study, it seems that commercial suppliers of agricultural inputs to producers of Asian vegetables don't play a major role in providing technical information. Transfer of knowledge and information from input suppliers to producers is weak and limited. In most cases the interaction is restricted to the purchase transactions of products. The only exception is when inputs suppliers promote a new product through field demonstrations to evaluate their profitability.

The most important input supply channel for producers of Asian vegetables is the exporter and agrochemical stores. In Comayagua and in Olancho, the majority of producers make use of the credit provided by exporters to procure inputs. This preference is based on the convenience of buying inputs on seasonal credit using expected harvest as collateral. Some exporters provide inputs such as fertilizer, pesticides and seedlings, while others give producers cash to buy fertilizers and pesticides, and additionally, provide seedlings. Also, exporters sell to producers new or used cardboard boxes to transport the fruit. However, these flexibilities on payments are in some cases minimized, owing to the fact that inputs are not timely delivered, not available in sufficient quantities or the amount of money lent to buy inputs is not enough. Furthermore, some producers

don't like the fertilizers offered by some exporters. Therefore, commercial input companies are an indispensable complement for producers (Table 4.19).

Table 4.19 Number of producers per source of inputs and conditions of payment in Comayagua and Olancho

Terms of Transaction	Source of Inputs						
	Exporter	Agrochemical Store		Cooperative		Inputs Hawker /Local Seller	
	Credit	Credit	Cash	Credit	Cash	Credit	Cash
Producers Comayagua	16	5	13	3	10	12	0
Producers Olancho	17	6	14	0	2	2	0

Source: Own elaboration

Producers expressed their satisfaction with the quality of the products sold by commercial inputs suppliers, and to be able to find there almost always what they need. In fact, the main restriction for producers to obtain an input is lack of liquidity. Hence, to select among these companies and the products they offer, price and financing are key considerations for producers. In both locations the majority of producers tend to procure inputs from agrochemical stores. In Comayagua cooperatives, local small sellers and input hawkers are also important sources of inputs (Table 4.19). Nevertheless, in the case of local small sellers and input hawkers variety and quantity are very often reduced. Depending on the relation with the buyer some agrochemical stores might provide pesticides on credit, and cooperatives provide credit only to their members. However, in both cases the majority of producers argued they have to pay in cash (Table 4.19). Some producers in Comayagua made the following comments:

The exporters provide credit to buy inputs, but I don't make use of it. I buy inputs from two cooperatives and from some agrochemical companies that visit my plantation. I buy fertilizers, pesticides and any input I need. I paid cash for it; however, we always need credit. The quality is good; actually I don't know how to measure it. Yet, they don't provide technical assistance (PRC2).

The exporter gives us cash to buy inputs. We as producers look always for the cheapest alternative. I go to agrochemical stores and compare which has the lowest price. I have to pay in cash, which is the way it is. The products are effective; I have no complaint in this matter. They don't provide technical support, they do trials but only when they want to sell a product, though it is not frequent (PRC9).

Producer in Olancho stated the next remarks:

I buy pesticides in agrochemical stores and from an inputs hawker. In the agrochemical store I have to pay in cash, but the hawker sells me on credit. The products have good quality, but they don't provide technical support, they just sell the products. I have always found what I

need, if I don't find it in Juticalpa I go to Talanga. The costs have increased a lot, now one must have money to buy them (PRO6).

The exporter offers Lps. 9,000 on inputs, but that's a lie, they only send a couple of sacks. So, I buy inputs at the agrochemical stores, I have to pay in cash, I used to have credit in one store but I had a problem and thereafter I decided not to use it anymore. Sometimes there are problems to get the inputs, but one manages to solve the problem, it is more due to lack of money rather than lack of inputs (PRO11).

According to producers in the recent years (2006 to 2008) the cost of fertilizers have increased considerably, affecting their capacity to acquire and apply them on the appropriate amount and required moment. Consequently, producers strive to obtain fertilizer from exporter or buy it from other sources on credit. On the other hand, interviewed input suppliers expressed that while they provide technical support to their buyers, the majority of inputs companies don't do so. Although it wasn't the case of Asian vegetables, interviewed input suppliers commonly carry out trials to test new products in producers' plots, and when required provide some general indications about the products they sell.

Input suppliers that don't provide credit to producers argued their reluctantly based on the higher risk associated to agricultural activities which producers have to face and negative experiences in the past. Particularly, in the case of fertilizers, input companies don't supply them on credit, because their profitability is lower compared to other inputs. However, they stressed the fundamental importance of fertilizers in an inputs supply business. Following are comments provided by the input suppliers interviewed in Comayagua and Olancho:

I have a small business of inputs. There is no problem with the availability and the quality of products is good. If I don't have something, I have the phone number of distributors to ask for it. I sell fertilizers, insecticides and fungicides. I give credit to some producers, because the products they buy are expensive and they can pay me after one week. Most of producers know the products, so I don't have to explain them very much, but if necessary I do it (INPSC).

Last year (2007), producers lost a lot of money with tomato and passed the losses to us, because we give them inputs on credit. It is risky to provide inputs on credit, because there is a lot of uncertainty in agriculture. For instance, nobody gives fertilizer on credit; some companies have almost gone into bankruptcy for that. However, we provide credit to some producers. We provide technical support, but it is rare that inputs suppliers do it. Producers of Asian vegetables are important buyers; they buy expensive products like acaricides and other insecticides (INPSO).

Although they don't represent their main segment, input suppliers recognized producers of Asian vegetables as important customers. Producers of Asian vegetables purchase expensive inputs which are used in relatively small doses, such as acaricides or miticides and other insecticides. This type of products, according to input suppliers have higher profit margin.

4.11 Vertical Relations in the Chain

Here are highlighted the relations among several actors performing different functions in the value chain, which are vertically linked through buying and selling transactions of Asian vegetables. Emphasis is given to the relations between producers and exporters. However, information on the relations between exporters and importers is also included.

4.11.1 Relations between Producers and Exporters in Comayagua and Olancho

In Olancho and Comayagua producers and exporters, in the overwhelming majority of cases hold contractual relationships. The producers interviewed indicated they have contractual relations with exporters (Table 4.20). These relations are typically based on written contractual arrangements, which define supply of products and resources access. Contracts are seasonal and a different one is signed for each vegetable. Contracts allow exporters to achieve the coordination needed to ensure quality, quantity, time delivery and a factor which has become more serious in recent years, as it is safety/health in food production. Producers might plant Asian vegetables without signing a contract, but at the risk of their product not being taken by any exporter.

Table 4.20 Formality of Transactions between Producers and Exporters

Location	Formal (contractual)	% of Total
Comayagua	20	100
Olancho	20	100

Source: Own elaboration

Derived from orders placed by its buyers, exporters elaborate an estimated crop planning, where upon they estimate the required area to be planted each season. Depending on the season either the producer can approach the exporter or vice versa, the exporter approaches the producer. When exporters initiated operations they looked for producers to invite them to be their suppliers.

In Comayagua, producers select an exporter based on considerations, such as transparency in sort and grading of product, price, distance to the packing house, provision of certain inputs (boxes),

possibility to supply product at any time (specially in low season), and payment punctuality. The most important seems to be transparency in sort and grading of product in packinghouses, the second most important appears to be the distance to packinghouses and the possibility to supply product in the low season, during which some exporters tend to buy from preferred producers (Table 4.21). In Olancho, producers have no choices, since only one exporter procures fruit from the region.

Table 4.21 Producers' main criteria to select among exporters in Comayagua

Criteria	Comayagua	
	Number	Percentage
Transparency in sort and grading	13	65
Distance to packinghouse	4	20
Receive product in low season	4	20
Price offered	3	15
Provision of boxes	2	10
Payment punctuality	2	10

Source: Own elaboration

Some producers in Comayagua expressed the following comments:

I sell to this company because it is responsible. However, this season I am also producing for another exporter; I want to try with this company because it is closer to my plantation. I just have to take the fruit to the paved road, while with the other company I have to take it to its packinghouse. The problem is that I like the credit I get from the company to which I have traditionally sold the fruit, but I will check how it goes with the classification in the company I am selling for the first time (PRC7).

I like to sell my whole production to this exporter because he always takes anyone that wants to plant; other companies already have their producers. Moreover, with another two exporters I had problems with the payment; while with this exporter everything has worked out well (PRC3).

Some producers in Olancho expressed the following comments:

I sell to this company, because it is the only one that buys Asian vegetables in this region. Before I sold to a different company; actually, it was very good and did things conscientiously, but it left since 2006 and now we just have one option (PRO4).

I sell to this company, as it is the only one that comes here, there was another before, but it doesn't come anymore. I know this company because its people came here to ask me if I wanted to plant vegetables for it (PRO10)

The first time a producer expresses his interest to plant Asian vegetables, the exporter assesses several eligibility factors prior to the establishment of any formal relation. The most important factors comprise, previous experience planting vegetables, sensitivity to flooding, access to the

plot, and land ownership. Afterwards, based on these factors, the crop planning, and on the leanings of producer, the exporter defines the vegetable and the area to be planted. Finally, a written contract is signed and the producer can withdraw inputs or cash to initiate the plantation.

The first time a producer displays interest in planting Asian vegetables, we assign him a code. Then our technicians visit the place where he plans to plant in order to verify that his land is not sensible to flooding. In addition, we check landownership to reduce some risks, and we ask him about his previous experience with vegetables. After that we assess whether or not he qualifies to be our supplier. If he does, he comes to our office and is officially registered as our supplier. Based on our crop plan that derives from orders we receive twice a year we assign him a vegetable and size of area to be planted. Although, we first ask what he wants to plant, and if it is available he can do it, otherwise we offer him a different option (EXPC3).

Producers, themselves, select an export company, if they like the price it offers and the way it classifies the product. I mean, if from 50 boxes you take 40. We elaborate a crop plan depending on the demand; we know how many containers we need to deliver every month and every week, based on that we know how much area we need to plant. Producers come to us to express their interest in planting Asian vegetables, and depending on the needs of the company we define which crop and how much they should plant. After that, the contract is signed and we ask MTHH for seedlings (EXPC2).

Subsequent contracts in following seasons are marked by previous experiences. As a consequence, exporters have created their categorization of producers, while producers have done the same in relation to exporters.

Conditions contained in contracts don't vary considerably by exporter and vegetable. In general, on the part of producers they include the following commitment: i) to sell exclusively to contractor the entire production with the required quality; ii) to offer plantations as collateral for the received financing from the contractor; iii) to transport the product from the plantation to the contractor's packinghouse or agreed place; iv) repayment of advance disbursements with certain percentage of production; v) to carry out the Phytosanitary Exports Crop Plan set by SENASA; and vi) certain amount of money on deposit for elimination of stubble. Commitment on the part of the exporter include: i) to purchase on agreed price the entire production; ii) provision of some inputs to the producer; iii) to buy production of contractee during the agreed period; and iv), time and frequency of payment to the producer. Provision of technical assistance is not included.

4.11.1.1 Power Relations

According to producers and some government officials' contractual arrangements with exporters are characterized by an unbalanced power relationship. However, the nature of the relation varies depending on the particularities of the exporter and the producer.

In general, exporters exert their power by setting the conditions of the contract, including the price of the product, transmitting and monitoring the quality requirements based on the importing market demands. The definition of production schedules including what crop is to be produced, also how much and when is mutually agreed. Quality standards are set by the market, and the importer passes them to the exporter and this is turn to producers. There is no price variation or price premium according to quality grading scales. Other rules such as food safety, pesticide regulation and environmental protection are defined by the exporter based on U.S. government stipulations. To verify the accomplishment of standards, exporters carry out random sampling of the fruit at their packinghouses and do not necessarily visit producers' plantations.

The identification of pests such as *Thrips palmi* Karny (Thysanoptera: Thripidae), *Neoleucinodes elegantalis* (Lepidoptera: Pyralidae) and most recently *Succinea costaricana* (Stylommatophora: Succineidae), have intensified the subordinated role played by producers. In 2006, in the U.S ports, the presence of *N. elegantalis* larvae lodged in several shipments of eggplant produced in Comayagua, was detected. *N. elegantalis* is a fruit borer considered a quarantined pest in the U.S. As a result, these shipments were detained upon entrance to the U.S. Although low population levels (less than 1 percent) were detected in the exporters' packing plants, production of eggplant in the affected areas of Comayagua was banned. Accordingly, exporters and government have assumed a stricter position in relation to food safety and pest management practices of producers in Comayagua and in a lesser extent in Olancho. The following comments illustrate reflections of some producers and an exporter in Comayagua:

The exporter establishes the standards; we have to apply EPA pesticides. They inform about the color and size at harvest time, however as they provide us the seedlings these factors are ensured. The technician of the company comes to supervise that we use EPA pesticides and that we don't sell the fruit to another exporter. Here, with this problem of elegantalis it is not possible to plant eggplants. The government and the exporter demand more controls. The price is set by the exporter, when there is a lot of production the price goes down, and when there is little the price goes up (PRC5).

We have to follow some standards such as quality, size, no mechanical or insects damage. The exporter establishes these standards. Now they are demanding more things, like traps and barriers. This means an increase in costs, but it is better for us as producers, I see it as an investment. The technicians come to check if one follows the good practices. Due to elegantalis, is not possible to plant eggplants in this region. In San Jeronimo there are plantations, but here in El Sifón, I mean Ajuterique, because El Sifón and Playitas belong to Ajuterique, even in Lejamani it is not allowed to plant eggplants. The price is defined by the exporter, in winter it increases and in summer it decreases. (PRC3).

Quality is defined by the market, if the market wants eggplants more or less purple it transmits that information to us. The quality requirements for Asian vegetables haven't changed; they have been always the same depending on the market. However, today food safety requirements are more rigorous, now it is very important to follow GAP (EXPC3).

Some producers in Olancho remarked the following:

The fruit cannot be deformed, damaged, green, overripe, small, or larger than 12 inches. This is not in the contracts, they explained it the first time you plant a crop, and then with the practice we don't forget it. The exporter establishes the rules, there is a technician to monitor what we do, but he doesn't know, we know more than him. The exporter gives us the price, it changes in November, when he has orders, he offers seeds to everybody, but when he does not, he only takes quality (PRO14).

Yes, the company gives emphasis in the use of EPA's pesticides, but also on the quality of the vegetables. The company set the standards, but the technicians don't come often. They come only to tell us which pesticide to apply. The company set the prices, but this season we decided to act collectively and we could negotiate it, although at the end we had to give up the undertaking. Normally, the price increases in the high season (PRO19).

It appears that, standards don't extend beyond food safety, pesticide use regulation and environmental protection established by the importing country regulations. This suggests the absence of private and external standards, as well as independent certification set by retailers or other actors, in order to define product and process parameters to be met along the value chain of Asian vegetables.

It seems apparent that bargaining position of producers tends to be weak in most cases. This imbalance may be highlighted on the shortcoming in contracts offered by exporters to producers with a non-negotiable price. However, in 2008 for the first time, a price negotiation between producers from both locations and all exporters took place and a relative modest price enhancement was possible; although as the researcher could confirm, through this "Price Agreement" producers reached some improvement in prices to be effective during the period from November 2008 to June 2009, the final pact didn't meet their expectations entirely. Notwithstanding, further significant

aspects where included in the agreement. These aspects were focalized on the exporter collecting fruit in Olancho and his suppliers over there. Noteworthy is the pledge to establish a fruit collection center to carry out a pre-selection of the fruit, the provision on credit of Lps. 20,000 (around US\$ 1000) of inputs; and the provision on credit of baskets to harvest and transport the fruit⁸⁸.

In 2008 price negotiations emerged within the Horticultural Chain Committee at the Ministry of Agriculture. There was an action plan but it didn't have continuity, everything was blocked after the negotiation under exporters' pressure. We reached an agreement; the exporters increased the price a little and they were going to have a price for the high season and another price during the low season. However, this just lasted two months (POCC).

The last meeting we had (July 2008) was to talk about prices, which it was very difficult to handle. We could set a "Price Agreement", by the way, it was not very advantageous to producers. The Ministry of Agriculture (SAG) did a revision of the costs of eggplant and it was observed that they have increased considerably. In the case of Olancho the level of productivity was low (SCVO).

The price was increased thanks to the support of Horticultural Chain Committee. In the case of eggplant it was increased from US\$ 0.13 to US\$ 0.17, we were looking for a price between US\$ 0.20 to 0.21, but the exporters didn't accept it. Probably, in winter they will pay us the same price, but rejection will be higher. They will play some dirty trick on us (PRO1)."

Nonetheless, large producers have enough power to bargain with exporters. In Comayagua, a producer planting a significant area with chive indicated that he has reached an agreement with the exporter, on the inclusion of a clause that allows him to negotiate the price according to the market fluctuations.

When I was going to plant this chive, I said to the exporter that I was going to plant a large area and then he told me that he was interested and would buy it. But I have negotiated the price; in my case we have included a clause in the contract that allows me to negotiate the price according to the market (PRC2).

Producers might posse claims to some exporters for their lack of consistency on provision of what they have offered, however the latter don't compensate equitably and tend to default on contract terms. For instance, the untimely provision and/or low quality inputs, which result in declining yields of producers. Producers argue that they pay immediately with the harvested fruit for the inputs they didn't receive on time. In both locations, with higher emphasis in Olancho, producers complained about the low quality of seedlings supplied by the exporter, and its negative effects on the yields and quality of the final product. Although recently some exporters' contracts recognize a

⁸⁸ Source: Price Agreement Document. August, 2008.

compensation of 50 percent of the losses producers incur due to defective seedlings, the bureaucratic process involved to pursue compensation, is a limitation that prevents most producers from obtaining any type of reimbursement. Another example, cited in Olancho, occurs when the exporter doesn't pick the fruit upon the agreed time, and the producers cover the cost of the entire losses. These are expressions provided by some producers and an exporter in Comayagua:

With the exporters it is like that, they never lose, just us the producers..., it is unfair. We have to do everything they ask in the contracts, we have to follow their rules, but when we ask our rights they simply make up excuses (PRC13).

I have had problems with the seedlings and the exporter didn't face his responsibility. I had to pay the consequences because the quality of the harvested product wasn't very good and the company didn't recognize anything (PRC19).

Some agro-export companies don't have compromise with producers, but we do. If the producer has problems with seedlings or any problem derived from the supervision of our technicians, we pay the producers (EXPC1).

In Olancho some actors, including government officials and producers made the next observations:

If seedlings are in bad condition they charge us, and we have to pay for them. Right now I lost 1000 plants, they just threw them and went away, and later they didn't come here, that is why they don't know what is happening. We pay Lps. 2.30 per seedling and they recognized nothing. I asked for more seedlings to replant which they didn't want to give (PRO6).

We are arriving at a point where we have to change the relation with the exporter. We need to change the way things are being handled, because the company ask too much but they don't fulfill their responsibilities, just we as producers (PRO20).

There is a war with the seedlings and seeds; this is because these contracts are unconscionable. Everything is in favor of the exporter and not oriented to protect the producers or treat them justly. That is one of the points producers have been fighting here in Olancho. In the case of eggplant seedlings, this season (2008) the exporter handed seedlings out of season, I could observe them, they were already 10 to 12 days old when producers got them. Therefore the producer has to incur in additional costs of staking out the plantation (UTVOO).

Some exporters, especially during low season, tend to request magnified plantation areas to producers in order to secure supply. To prevent any unforeseen event and because not all product supplied by producers has export quality, the amount exporters demand might exceed what their buyers require. According to a government official and other institutions, when demand decreases they punish producers exerting stricter quality control parameters, resulting in high rates of rejection. In some cases the rate of rejection can reach up to 50 percent of the total amount a

producer brings to the packinghouse. The producer is only paid for the product that satisfies quality requirements, that is to say, what is “packed” by the exporter. Important to notice here, as the researcher could observe in the fields, is that producers do not have scales to assess whether they are packing the right quantity and sorting the fruit with the required quality.

The exporters trying to ensure supply, request producers to plant certain area, but when the low season comes the demand decreases, and their reaction is to punish the producers with stricter quality standards (TECH).

Agro-export companies try to secure more fruit than what buyers in the U.S. demand, so they increase the area of plantation. They ask for 25 to 30 percent more, because they are awarded that not all producers will supply excellent fruit. The point is when the price in the importing market goes down; there the producers have more limitations, because exporters take less fruit (MTTHC).

There is no shared production and price risk between producer and exporter. The researcher could observe in some contracts, a clause that states in case of natural disaster or any problem affecting the plantation, that the producer will be responsible to cover the costs and to honor any contracted debt with the exporter.

There was a season when I lost my plantation. There was a floodwater and floods which caused a lot of damage in the plantation; I lost everything, the money I have invested, time and my work. The agro-export didn't recognize anything (PRO2).

In Olancho, producers have been struggling for the establishment of a packinghouse in the region, so far without any tangible result. According to a government official, there used to be a packinghouse in the region established by the first exporter procuring from there, but it was dismantled as he left the market. Also, the current buyer used to have in San Esteban what is called a pre-packinghouse but he couldn't afford the cost of operations.

We have suggested the agro-export company to establish a packinghouse here in Olancho, to reduce the risk we face. Here, in Gualaco it might take from two to three days to transport the fruit to Comayagua, and it is sure that we lose some fruit in that period. What we want is for the fruit to be packed the same day we harvest it, because that is where we lose (PRO8).

We have been fighting for a packinghouse, because Lepaguare is a very productive area, but neither the company nor the government has done it, they are much interested in politics, which is what commands them (PRO12).

The weakness of Olancho is the lack of a packing plant; the exporter has offered to establish a pre-packing plant, maybe in November. There have already been talks between producers and the exporter. When the company came here, was installing a packing house, it brought the cold room, slop sink, classification tables, the band, they even brought women from

Comayagua to classify the fruit; but they went away. This company which is now buying, used to operate a pre-packing plant in San Esteban, but the costs of operation were too high (DICO).

4.11.1.2 Flow of Knowledge

Producers in Olancho and Comayagua need a signed contract to obtain technical support from exporters.

Exporters don't budget for research or development activities and neither have they had a program, nor a person specifically dedicated to these issues. However, together with FHIA and MTTH-DICTA they carry out some field trials in Comayagua to test the adaptation of seeds that later on might be provided to producers. Some exporters mentioned that they are or will be certified by HACCP and GAP, and they plan to extend it to their suppliers in the short term. In this regard some exporters provided the following comments:

The technicians pay a visit to the farmers' land before planting to assess which crops are suitable and give them advice regarding crop management practices. We don't budget for research activities. But, we have carried out some activities together with FHIA. Partly, from experience we know what crops can grow on the different areas (EXPC1).

As I just mentioned before, we have been certified by GAP and we are trying to create a scheme to finance in the medium term the producers supplying us with Asian vegetables, so they can have access to the minimum infrastructure required to implement GAP. We have a food safety department which will be in charge of it (EXPC3).

When growing for export is a new experience, producers receive technical assistance from exporters that aids them in meeting export quality standards. In 2007, approximately 20 producers from Olancho visited Comayagua invited by the exporter. They received information on classification of fruits according to export quality standards.

Each exporter has an average of three technicians to attend up to 200 producers during the high season. It seems that they don't have the capacity to provide technical assistance on a regular basis to all producers, particularly to those producers located in remote areas. Some exporters concentrate on leader-producers that can generate an exponential effect. Hence, they frequently confine their support to common or general problems rather than punctual or specific problems. In addition, it is perceived that exporters rely to a large extent on producers' experience. In this regard, some exporters and one producer in Olancho made the following statements:

The company has two field technicians, they supervise all our producers. These technicians the whole year follow a weekly rotation. We provide technical assistance; we train leader-producers, who later create a multiplicative effect. In addition, the assistant manager visits the fields to collect their claims and suggestions related to the fruit selection we do and also provides technical advice to producers. We don't have any research program or person concentrated in such activities, but we devote sometime to these activities together with research institutions in the region (EXPC2).

We provide free of charge technical support to our providers. Especially when they plant Asian vegetables for the first time, we explain them what to produce, which are the standards and verify their compliance. We have three technicians and they give orientation to producers in relation to the use of agro-chemicals. We indicate producers which pesticides can be applied to the plantation, if we detect the use of banned pesticides, the vegetables are rejected (EXPC1).

Technical support should be provided in the moment somebody needs it, but the exporter doesn't have enough technicians to provide it at that moment. Exporters can't cope with that (PRO10).

Traditionally, technical support in situ has been oriented to conform to public regulations of the importing market. Therefore, more attention has been devoted to pest management practices, including recommendations regarding use of pesticides certified by EPA, use of personal protective equipment, and crop rotations. In this regard, the elegantalis outbreak in some regions of Comayagua has forced SENASA to pursue collaborative efforts with exporters in order to provide additional support to producers, on the matters indicated above. One example, is the issue by SENASA of the Phytosanitary Guide of Compulsory Compliance for Producers and Exporters of Fruits and Vegetables (Guía Fitosanitaria de Cumplimiento Obligatorio para Productores y Exportadores de Frutas y Vegetales), which attached importance to the contribution of exporters on its transmission to producers. Producers in Comayagua expressed this tendency as follows:

Yes, the exporter's technicians tell me what pesticide to apply; there is a technician in charge of Playitas. I communicate him in case I have a problem with pests and he tells me what to do. Because, if for instance, I apply Lannate or Tamaron a day before harvest the company throws away all my fruit. They have laboratories to check concentration of pesticides in the fruits; all exporters do it. Now they are stricter than before (PRC10).

The company sends its technicians here to supervise the plantation. They observe the plantation and if there is a pest problem they tell us what to do, which product should we apply and how should we do it. But, they come here just when they remember (PRC11).

Producers in Olancho expressed it in the following ways:

They come and tell us which pesticides we can apply to the plantation to control pests and diseases. Recently, they have come often; I am satisfied with the way I have done things, my product has been always good, so far I haven't had any problem (PRO17).

Look, basically the technical support they provide to producers is to tell us which products we can apply to the crops. They said that we must apply pesticides accepted by EPA, otherwise they don't take any vegetable (PRO19).

Several producers in both regions criticized expertise provided by some exporters. They argued that some exporters to provide technical assistance contract technicians holding a high school diploma oriented to agricultural sciences that act as trainees using the plantations as labs rather than to provide technical advice. The following comments illustrate it:

All exporting companies hire field-technicians to supervise plantations. Our technicians hold a high school diploma oriented to agricultural sciences and they are hired to supervise the plantations and the crop management practices of producers. This operates as control and helps the company which is currently trying to be certified on GAP to EPA. We have to walk together with the producers, that is why we provide them technical support to control pests and diseases and the company cover the costs (EXPC2).

The exporting company has its technicians and sometimes they come to visit my plantation. Yes, some technicians have experience, are good and provide assistance, but there are others that are beginners and instead they learn from us (Laughs) (PRC4).

The technicians rarely come here; we have the disadvantage of living in a remote area, so we communicate with them mostly via mobile phone. Anyway, when they have come, we have had problems, because they gave us wrong instructions. One time, they told us to pull the leaves of a long squash plantation, but it was too severe and we had considerable loses. They pay more attention to the application of allowed pesticides and that we deliver the adequate quality fruit (PRO7).

Neither exporters, nor producers referred to the flow of information related to harvest and post harvest practices. They were all concentrated on achieving the required quality characteristics through the implementation of adequate production practices. However, technical support regarding these issues has been provided by other organizations, including cooperation agencies and government through the National Horticultural Chain Committee.

Support and training from exporters on the implementation of new technologies seems to be limited or practically inexistent. As has been indicated before, the majority of producers have learned the operation of equipment such as drip irrigation systems based, on their experience. It gives the impression that exporters don't provide sufficient information to producers concerning

the end market. The majority of interviewed producers only know the country where the final consumer is located. Most of them don't receive information about the population segment nor the price pay by other actors in the chain, or neighbor countries exporting Asian vegetables to U.S. The mentioned condition is far more noticeable in Olancho, where producers seem to be less informed (Table 4.22). An exception to this situation is the producer-owned company in Comayagua, whose members obtain this information themselves through others sources.

Table 4.22 Producers' information on characteristics of end market

	Location	Segment	Competitors	Prices
Comayagua	20 (100%)	3 (15%)	7 (35%)	8 (40%)
Olancho	20 (100%)	0 (0%)	5 (25%)	0 (0%)

Source: Own elaboration

In Comayagua, some producers asserted the next comments:

*I just know that the exporter takes it to the U.S., but I have no idea of how much he gets for it. During winter in the U.S. the price rises, that is all I know (PRC9).
Information about the end market I don't get, the information about price I have I get it through the exporter and it is the price we receive (PRC14).*

In Olancho, some producers expressed the following comments:

No, I don't get information about the end market, what I know is that the exporter sells the fruit to a company in U.S. (PRO15).

The exporter tells us the price we get, but other price, I don't know. I know that this fruit goes to the U.S., but I don't know to whom the exporter sell it (PRO18).

4.11.1.3 Trust

Trust plays a crucial role in the selection of suppliers and buyers in Comayagua. The level of mistrust seems to be high and mutual, between producers and exporters, in both locations. The fact that in Olancho there is no alternative outlet highlights the high level of mistrust from producers towards the exporter.

Some producers complained with respect to some exporters, that the level of commitment between both parties is unequal and there is lack of transparency. On the other hand, some exporters claimed that some producers are dishonest because they don't honor their responsibilities.

The results of the interviews reflect that very few producers have had problems with payments. Although there are some cases, (though it is very rare) that the exporters don't pay in the agreed time the product supplied which they have sorted in their packinghouses.

Producers in both locations argue that even though contracts state that exporters will take all fruit that meet export quality, during the low season, some of them tend to reject even the fruit meeting these requirements, they said this is so, because the importing market has been oversupplied. In addition, where export quality standards are not met, the rejected produce is not returned to the producers, and the reasons why it was rejected and what happen with it afterward remain unknown. Although some exporters have open packing plants it may take hours for producers to observe the process of sorting, therefore they don't do it. In the case of producers in Olancho, they additionally claim that they take the entire risk involved in the transportation of the fruit to Comayagua. They argued that very often the fruit get damaged due to improper management in the journey from Olancho to Comayagua. During transfer to Comayagua, boxes are mixed or inadequately stowed and transported; therefore some producers might be penalized unjustly. In this respect, some producers in Comayagua provided the following illustrations:

We the producers complain that only we commit and exporters don't do it. They take the fruit we produce, but then it is rejected and not paid. I sell to this exporter because he keeps the price and throws less fruit away; I think he is more honest than the rest. There are some exporters that just promise things but don't keep their word (PRC5).

We signed a written contract, but the exporter doesn't carry out the agreement. The contract states that it is a buying and selling agreement, but if the market is full the exporter takes what he wants and we don't even know what happened with the rejected fruit, especially in the case of some exporters. Sometimes, we deliver fruit that fulfill the required quality, but when the workers of the company take it, they don't follow the appropriate management and care; they place the fruit of 50 to 80 producers together in a crate (PRC6).

A representative of an international NGO supporting producers of Asian vegetables in Comayagua expressed the next comment:

Especially, in the low season, producers are not sure of what happens with the fruit some exporters reject. There is no transparency, because producers are not allowed to visit the exporters' packinghouses during the classification of fruits, something that it is understood, in the sense of the organizational problems this would mean for the exporters (TECH).

In Olancho some producers added the following illustrations:

We need a cold room in Olancho. The people hired by the exporter to transport the fruit from Olancho to Comayagua are irresponsible; sometimes we have had to wait for even two days

until they pick up our fruit. The fruit gets damaged because we place it on the road the day it is requested, yet they come one or two days later (PRO3).

The exporter always rejects some of my fruit, but it is because they don't take enough care during the transport from here to Comayagua. We have requested a cold room to the government and they said that is going to be installed in Catacamas. We have support from the Horticultural Chain Committee, but we have been in this question since one and a half year. The exporting company was supposed to bring a packinghouse somewhere close to Juticalpa, but it is an awful, nobody believes on what he says (PRO4).

Several producers in Comayagua asserted that the assignment of technicians by some exporters is: first, to supervise if the provided inputs are used for what they were requested; and second, to avoid diversion of the produced vegetables to competitors, rather than to provide technical assistance. In Olancho, producers didn't refer to this problem.

The technicians come to my plantation to check if everything is fine, sometimes they provide technical advice, but they come to verify that we don't use the inputs on other crops and that we don't sell the harvested fruit to other companies (PRC1)

They come to visit us but to check that we don't sell the fruit to other company, especially if they haven't paid in time or when other exporters raise the price; in these cases even the managers have come to visit our plantations (PRC9).

The interviewed technician at the MTTH in Comayagua provided the next statement:

What exporters' technicians do in principle is to supervise that the producers use the credit for what has been given. However, when producers are in production they might provide some specific advice, but above all they visit to supervise the amount of production, and if the producer is not is not selling it to other exporters (MTTHC).

It was mentioned in both locations that some exporters offer but don't keep their promises to producers. In some cases these are informal agreements not included in contracts, such as providing additional inputs. In other cases are agreements reached through government's mediation, such as the establishment of a packinghouse in Olancho. In the case of Olancho, this observation was not only made by producers, but also by government officials. In Comayagua, some producers expressed it as follows:

Yes, some exporters tell you what pesticide you should apply, the problem is that they offer it to you, they offer to bring it to you, but actually they don't have it and when they finally have enough, it is too late. I was supplier of an exporter for 8 years and I never got any support from that company, even though they get money from abroad to give it to the producers (PRC6).

One exporter lied to me, he told me about doing a nursery. He said I was going to plant it for him. I prepared the soil time and time again, but he never gave me anything, so I decide to do business with a different exporter (PRC8).

In Olancho, some producers and a government official asserted the following comments:

The company said that for the season starting in November (2008) it will establish a packinghouse, we will see if they really do it. It offered Lps. 9,000 on inputs but it has not even given us Lps. 2,000. At the end we have to accommodate ourselves to what the company said (PRO10).

The exporter offers Lps. 9,000 on inputs, but he gives them just when he is sure that will recover that money, and that is at the beginning of harvest. This year most producers were unwilling to plant, that is why the exporter offered Lps. 20,000 on inputs, but we have just received the seedlings and a couple of sacks with fertilizer; and so far nobody from the company has returned here with more inputs. The exporter doesn't fulfill his obligations (PRO13).

This year the exporter has offered to producers between Lps. 20,000 and Lps. 25,000 on inputs. It has approached our government agency and the national bank to get financial resources to support producers, because it doesn't have the capacity to provide what it has promised in the contracts (UTVOO).

The general impression is that exporters manage information distrustfully; however the extent of mistrust varies depending on the exporter. In this regard, a government official expressed that exporters are not keen on sharing information on prices they received from their buyers in U.S. Moreover, in an effort of prices and standards' unification only one exporter agreed to provide to the government the quality standards applied to producers. The rest, including the one procuring from producers in Olancho, refused to do it. The official's argument is that the exporters behaved in this way, because they are afraid that this information might be used for producers to back claims for rejections which they are subject in the low season, and/or might opt to export themselves. Based on that, this official asserted that exporters do not trust the government.

The experience of the researcher through conducted interviews was that exporters tend to provide general and rough information when consulted about prices they receive from importers. "General" refers that they only provided information about one vegetable, which was in all cases Chinese eggplant, the main exported vegetable; and "rough" information in the sense that they only provided approximate figures. Regarding information on standards, they released information about several vegetables crops, but always general. They mentioned color, size and appearance as important factors, but didn't extend on specifications about these factors. An exporter mentioned

the company's recent preparation of a GMP Manual, but making clear that it was confidential. Some exporters and a government official provided the next illustrations:

Exporters manage the information on prices in an exclusive way, in a very confidential mode; the government has not access to it. What we know is the wholesale price through the Internet. Just exporter "X" facilitated information related to standards demanded to producers, the rest didn't do it because they fear that producers might claim why their product is rejected during low demand season or might try to export by themselves (SCVO).

For Chinese eggplant a high price fluctuates between US\$ 0.30 to 0.35/Lb., and a low price might be between US\$ 0.18 to 0.20/Lb. The cost per packed pound is around US\$ 0.20 to 0.25; actually it is the same for all exporters (EXPC1).

There is not fixed price, but a minimum price and we get more when we send eggplants. There is a container's price, rather than per box price, which is advantageous for us in the sense that the buyer takes the whole container. The minimum price our company demands is US\$ 11,000/container. The cost of exporting a box of eggplants varies from US\$8 to US\$11 depending on the season. The price we get is from US\$12 to US\$15 at the end our profit is of about US\$3 per box of eggplant. We have just finished preparing a manual on good manufacturing practices, but it is not available for public use (EXPC2).

In Olancho some producers complained about not receiving copy of the contract they signed with the exporter. As the researcher could observe in the Price Agreement Document, this was one of the issues to be amended in order to bring more precision to the relationship. Accordingly, producers and exporting company agreed that each will have a copy of the signed contract.

Also in Olancho, the exporter has been criticized by some producers and government officials for practicing detrimental competition. Apparently, the first exporter procuring from producers in Olancho was driven out of the market by its competitor through disloyal strategies. According to some interviewed actors, the strategy of the unfair competitor consisted into offer higher prices only to the suppliers of the competition, leaving out its own suppliers. At the end, producers' short-sighted approach led to consolidation of one exporter and to bankruptcy of the other. Following are some comments regarding this matter:

Another company used to come here; it came to collect fruit, but just for one year. But (name of the current buyer) pushed it away; he bought the fruit of producers selling to the other company (PRO3).

...Although once a company from Comayagua entered Olancho and the producers who sold it fruit had problems with the company which is now buying (PRO5).

In the case of (name of company) when it was growing in Olancho, by the way at a brisk pace, but disloyal and very selfish competition sought how to lead it to bankruptcy. At the farm gate (name of current buyer) offered higher prices to the producers of (name of company), but only to those producers, to their own suppliers (name of current buyer) didn't offer them (UTVOO).

As mentioned before, exporters have their categorization of producers. According to exporters priority is given to producers with good record. Those producers from whom they don't expect a disappointment have a preferential treatment and producers recognize it. In Comayagua, several producers stated that if trust is high some exporters might increase the supplied amount of inputs or cash credit as it was their case. In addition, but not very often, some exporters might provide financial support to buy and install drip irrigation systems. These producers have a long standing relationship with the exporter and often have the status of permanent suppliers. This means, they are more certain that their fruit will be bought by the exporter in the low season. Furthermore, during that season the exporter is less rigorous with these producers in the selection of fruit at the packinghouse. In this regard producers and an exporter mentioned the following comments:

I sell to this company since 13 years ago; it should give me a prize (laughs). I trust it, because even if I have any setback with the fruit it pays me, not like other companies where if one lost, there is no other option, you lost. I have realized that in this company they take my fruit even when it would be rejected if it was from another producer (PRC10).

I sell to this exporter since 3 years ago, before I used to sell to another one. This company gives to producers Lps. 12,000 cash to buy inputs, but it is necessary to sign a contract. If the company trusts the producer it can give him more than Lps. 12,000, I know some cases of good producers who have got more than that (PRC11).

We have many suppliers but a contract is signed just with some of them. It has happened that producers' supply is very high in times when our buyers' demand is relatively low; in that situation we take mainly fruit of producers which have signed contract, from the rest we have to reject more fruit. We have financed some good producers with irrigation systems, because we have full and total confidence on them. We can't do it with all producers, for instance, a producer requested a loan of Lps. 15,000 to install a drip irrigation system, but from an economic perspective it is not advisable for the company, because it is an investment we won't recover, these are assets left to producers and not to the company (EXPC2)

In contrast, an exporter reported a high rate of compliance failure from producers in Comayagua and his complain was certainly reaffirmed by several producers. This company has approximately 65 percent of unsolved cases wherein producers haven't honored their financial responsibilities. This represents an approximate sum of US\$130,000 which this company doesn't expect to recover.

The company indicated that those producers are not going to be sued, though they won't be contracted by the company anymore.

In relation to the abovementioned issue, some producers have weekly cost overruns; this means that what they earn from the contractor exporter is not enough to cover their expenses. It follows that these producers sell part of the product to other exporter as mean to earn additional money during that particular week. According to the affected exporter, this situation is persistent at the beginning of the school year (February) and Christmas time. Consequently, this exporting company has become more selective to sign contracts with producers. Ironically, according to producers and government officials, this exporter seems to be the more flexible and supportive among all exporters currently operating in Comayagua. Here are the comments of the affected exporter and several producers in Comayagua:

In our company priority is given to producers that follow the rules. We provide credit on cash to our suppliers to finance the cost of inputs, but it is very problematic to recover the money, particularly during Christmas and at the beginning of the school year. We have 65 percent unsolved cases and I think it will be very difficult to recover those Lps. 2.5 millions. Many producers have disappeared and never paid. The only think we can do it is to avoid renovating their contracts, we won't proceed legally against them, because we don't want enemies. (EXPC1).

There are irresponsible producers who in a week spend more money than what they earn. They might not get enough money, from the fruit they sell to the contractor exporter, to pay their debts. To obtain additional income the same week, they sell a load of fruit to a different exporter, but without having signed a contract with him (PRC15).

The problem is that some producers have fled, because of their debts. This is a big problem, and that is why some exporters are more selective and try to procure produce only from those producers they really trust (PRC18).

In Comayagua, some exporters complained that in certain circumstances producers don't fully comply with the regulations set by the government. Various producers when are not able to control pests with the permitted pesticides, use any other product as long as they can eliminate the problem, or even avoid applications at all in order to save money, without taking into consideration the negative consequences this may have on the whole chain. In fact, the researcher could observe that the majority of the visited producers didn't have in their plantations those facilities demanded by SENASA and exporters, specifically, latrines and places for the disposal of waste. In Olancho,

an interviewed producer expressed that he doesn't apply the recommended pesticides because of their high cost.

For instance, with fuzzy melon we have problems, because producers don't give it the appropriate management in the field. Sometimes, they don't apply pesticides to control worms, trips and other bugs, because they expect that we will do it here in our packing plant. The point is that then we have problems to eliminate these insects, since we are not allowed to apply the pesticides used in the fields (EXPC2).

People overlook the rules; here in this region (Playitas, Comayagua) it is rare to find somebody that fulfills all the rules, especially those set by the government. I for instance, don't fulfill them because I rent the land. I don't have latrine or any specific place for the disposal of waste, but I always apply the certified pesticides. I know some producers that don't honor contracts and sell fruit to other companies (PRC17).

Right now, the problem we have is that producers don't want to follow the rules emitted by SENASA. Other problem is when the producer is unable to control a pest through the allowed chemicals uses something else as long as he kills it. Some producers just comply with what they want to and things shouldn't work like that, you know (EXPC1).

Yes, the exporter's technicians sometimes come here to see the plantation and not necessarily when they have to come. These technicians tell us which pesticides we should apply, they give us sheet of paper with the information, but I don't buy them because I think they are too expensive (PRO11).

4.11.1.4 Distribution of Economic Gains

The exchange of information among producers through the recent negotiation on prices held with exporters has increased their awareness on distribution of gains along the chain. As indicated before, only one exporter procures Asian vegetables from producers in Olancho. The prices producers receive in Olancho and in Comayagua by supplying the same exporter are similar. The general perception of producers in both locations is that economic gains are not fairly distributed among the various actors in the value chain, particularly between local actors. In connection with this, some exporters expressed that losses are incriminated to the fruit rejected to producers, since at their packing plants they don't report any.

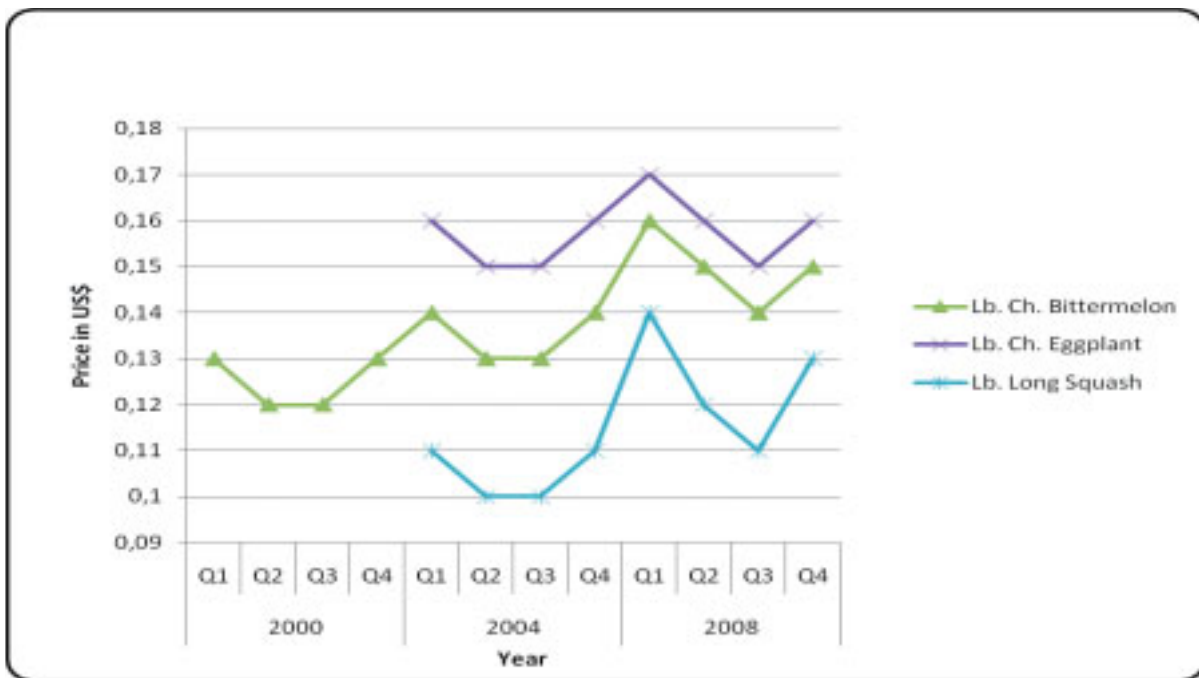


Figure 4.8 Producers' price variations for selected Asian vegetables (2004-2008)

Source: Own elaboration based on courtesy of producers, producer-owned company and exporting companies

Producers in both locations reported that in the last years the prices they have received haven't changed in the same proportion of the increasing costs they have been facing. Therefore, their profit has been depressed. This affirmation was confirmed by some exporters indicating that in the last three years (2005-2008) the price has had a modest slight variation of US\$ 0.03 to US\$ 0.04. However, here is important to stress that prices of Asian vegetables in the importing market have also remained relatively stable. On the other hand, the higher international oil price and raise in demand of inputs from large countries, has increased the cost of fertilizer up to 300 percent more compared to the last year (2007). Based on information provided by producers, the producer-owned company and exporters, Figure 4.8 shows an estimation of producer's price variation of selected Asian vegetables.

Some producers in Comayagua provided the following comments:

We know that people in the U.S. pay a lot of money for these vegetables. A partner member of the producer-owned company we have formed went to Miami and through him we found out that for instance, people over there pay Lps. 60.0/Lb (Approx. US\$ 3.0/Lb.) and the same happens with bitter melon and here we get only Lps. 3.0/Lb. (Approx. US\$ 0.15/Lb.). Now we receive US\$ 0.13/Lb. but we already have information that prices have increased and maybe in November and December will be even higher, but of course exporters will pay us the same price (PRC6).

The system exporters use to fix the price is not adequate, because it doesn't fluctuate according to the market, instead get behind. Some exporters leave the prices constant while others raise it just a little bit. During the high season we know that in the U.S. is possible to get good prices for these vegetables and the exporters could pay us more, but instead they pay us a lower price and that prevent us to improve our situation, you have to be very efficient if you don't want to lose (PRC2).

I have read that in the U.S a box of eggplants cost much higher than the price we get here. When we started the producer-owner association we discovered that in U.S. the consumers pay US\$ 22 per box of eggplants while the investment is of US\$ 18 per box, that means that the exporter obtains US\$ 4/box and we producers receive much less (PRC8).

Some producers in Olancho offered the next statements:

All the costs have gone up, the costs of fertilizers has increased a lot. The price we receive from the export company hasn't change too much, it has kept stable. We needed an enhancement on prices that is why this year we have negotiated prices. The problem is that with these costs is not possible to treat well the plantation and then you don't have enough production (PRO11).

Now, a disadvantage is that inputs prices have skyrocketed and the payment per pound of Asian vegetables we acquire hasn't changed very much, until this year that we have organized ourselves better and negotiated with the exporter. We told him that we were not going to plant this year unless that he increases the prices (PRO9).

It is problematic; it doesn't give as much money as before. Fuel, fertilizers and labor are more expensive, their prices have increased a lot and the exporter pay us practically the same price for the fruit, the price changes in November but just a little (PRO14).

According to some producers in Comayagua, it seems that positive price fluctuations at the importing markets are not fully reflected on the prices they receive, rather tend to fall behind. For instance, if in low season of "X" year a box of 35 Lbs. of bitter melon reaches a wholesale price of US\$30, producers get US\$5.60 per box (see table 4.23). However, in the high season of the same year, the box of bitter melon might reach a wholesale price of US\$35 and the producers get only US\$5.95 per box. These producers claim that they could obtain a higher price per box and would keep alike the profit margins of exporters. In other words, and as an illustration based on this information, whereas the profit margins of exporters rise (in terms of share of total value raises from 26 to 28 percent) in proportion to the increase in market prices, producers extract lower margins (in terms of share of total value drops from 13 to 11 percent) (see Table 4.23). Some exporters argued that in high season they have higher costs, because they hire more labor.

Table 4.23. Variation in share of total value in the chain according to season

Actor of the Chain	Price received US\$		Share of Total Value (%)	
	Box 35 Lbs Bitter melon		Low Season	High Season
	Low Season	High Season		
Wholesaler	30.00	35.00	16	16
Importer	23.24	27.30	14	14
Exporter	17.22	20.22	26	28
Producer	5.60	5.95	13	11

Source: Own elaboration

Although exporters and producers in both locations earn higher prices when they sale chive flower to their buyers (Table 4.25), it appears that they supply in higher quantity Chinese eggplant and other Asian vegetables such as different types of bitter melon, long squash and other varieties of Asian eggplants (Table 4.24). Unfortunately, good and reliable exports data for Asian vegetables produced in Honduras is difficult to come by. Nevertheless, as illustration data for year 2008 is presented in Table 4.24.

Table 4.24 Quantity exported of selected Asian vegetables in 2008

Vegetable	Quantity in Metric Tonnes
	2008
Chinese Eggplant	773.79
Bitter Melon ¹	367.10
Long Squash	124.42
Chive Flower	119.23
Fuzzy Squash	80.26

Note:¹It includes all exported types of bitter melon

Source: Own elaboration based on SENASA

In the importing market chives have the highest price, followed by Chinese eggplant. Table 5.25 depicts the most important Asian vegetables exported from Honduras and the average price paid to producers by exporters in 2008. In Olancho the number of crops planted is less. There, producers plant mainly Chinese eggplant, long squash, fuzzy squash and Thai eggplant. Chive flower and bitter melon are not produced in Olancho.

The price at the importing market varies according to the season. However, some exporters in Comayagua leave it constant the whole year, whereas others raise it modestly in the high season, including the one collecting fruit from Olancho.

Table 4.25 Average price for most important Asian vegetables in 2008

Vegetable	Price US\$/Lb
Chive Flower	0.45
Chinese Eggplant	0.15
Chinese Bitter Melon	0.14
Indian Eggplant	0.14
Indian Bitter Melon	0.14
Japanese Eggplant	0.14
Thai Eggplant	0.13
Thai Bitter Melon	0.13
Long Squash	0.11
Fuzzy Squash	0.11
Thai Okra	0.11
Chinese Okra	0.09

Source: Courtesy of exporting companies

The high season in Honduras extends from November to April, and is determined by the climate conditions in Mexico and USA, countries where Asian vegetables are also grown. Asian vegetables cultivated in Mexico and the USA competing with those cultivated in Honduras, cannot tolerate frost and grow best under sunny weather conditions. Therefore, producers in these two countries start planting in March and the harvest season covers from June to October avoiding the winter time of the year (Table 4.26). They tend to plant short-term varieties to take advantage of the warm season. As a result of the reduction in supply from domestic U.S sources and Mexico during their winter season, the demand and prices of Asian vegetables increase for the period of November to the end of April.

Table 4.26. Life cycle and planting season for selected Asian vegetables in Honduras and USA

Vegetable	Life- cycle	Season of the Year	
		Honduras	USA
Chinese Eggplant	Annual	All year	Fall-spring
Bitter Melon	Annual	All year	Fall-spring
Fuzzy Melon	Annual	All year	Fall-spring
Long Squash	Annual	All year	Fall-spring

Note: Season in USA includes regions of South Florida and San Joaquín Valley, California.

Source: Own elaboration based on interviews, Lambert, M.L (2007) and Molinar et al. (2005)

Following are some comments of some producers and exporters from Comayagua illustrating what has been indicated above:

From November to April the price increases and for the rest of the year it comes down. The price increases because in U.S. and Mexico is winter and producers over there can't produce,

I mean when there is not much production the price goes up and when there is little production the price goes up (PRC13).

The company which I have signed contract used to keep the same prices all year long, but since two or three months ago (June-July, 2008) it has changed them, I don't know for how long. Traditionally, exporters have changed the price based on the season, that is to say, in the high season they raise it and in the low they drop it. (PRC18).

The price changes depending on the supply available during the season. When it is winter time in the North is good for us, particularly in the case of Mexico and California, because they cannot produce these vegetables and the price increases. They plant hybrids which in 15 days produce fruit and in other 15 days are over. If there is low supply from Dominican Republic the price might change too (EXPC2).

On the same subject some producers in Olancho stated the next comments:

The exporter changes the prices depending on the window, I mean in the high season he raises the price, but just a little, they always get more. The exporter even if he gives us a higher price, he is up (PRO12).

Yes, the prices change, in November they increase because in U.S. and Mexico is too cold and production over there stops. Also the packing (sorting) is better because the export company needs more fruit and they take whatever. That is the best time to produce Asian vegetables, because when U.S. produces the prices go down (PRO20).

Data on cost obtained from interviews was not sufficient, particularly in the case of actors located in USA. Therefore, calculation and distribution of the value added along the chain was not undertaken since can only be derived from detailed average cost calculation of the actors concerned. However, based on data collected on the price paid to each actor, the share of value in each stage of the chain has been estimated. Figure 4.9, shows price and thus value distribution in the value chain of Asian vegetables produced in Honduras.

As can be seen in Figure 4.9 high portion of the revenue seems to be concentrating in the hands of the exporters. Exporters capture more than twice (26 to 28 percent) the value producers receive (11 to 13 percent). Apparently, at the local level exporters have the ability to influence the setting of prices and therefore, extract the higher profit margins. The importers capture relative low value (14 percent) compared to exporters and retailers.

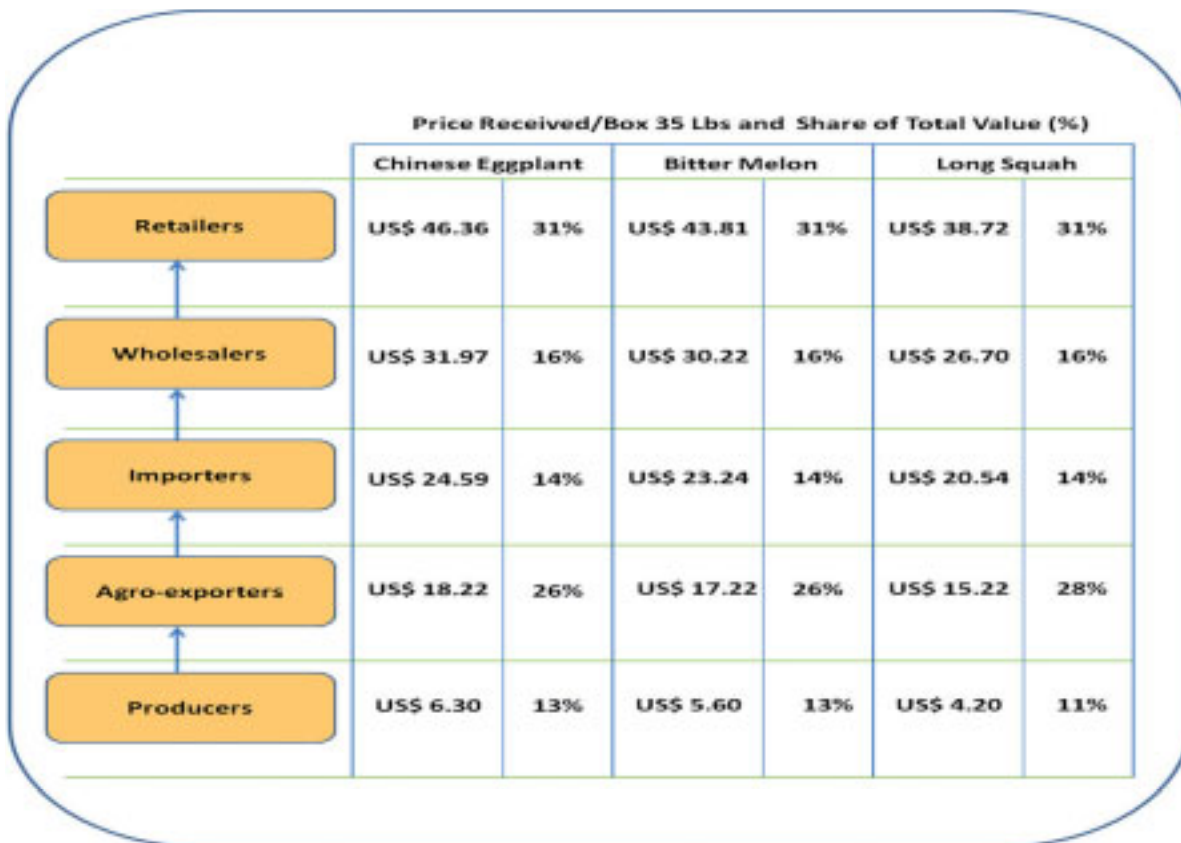


Figure 4.9 Distribution of value in the chain for selected Asian vegetables
 Source: Own elaboration based on information courtesy of Producer-owned Company.

4.11.2 Relations between Exporters and Importers

Important to mention is, as indicated before, that four out of six contacted importers declined our interview. We have pursued to contact the main importers of each exporter; however, we failed.

Three exporters have more than one buyer, one sells exclusively to a unique buyer, other is vertically integrated (perform both exports and imports functions) and the incipient producer-owned company still hasn't established a solid relation with any buyer. Based on this, we have estimated the existence of 6 to 8 importers procuring on a regular basis from exporters in Honduras, the majority located in Florida, which sell the product to wholesalers located in other regions of U.S. such as Chicago, New York and even to Canada. Some exporters described it in this way:

We have a sole buyer. Since the beginning of operations we established a strategic relation with our buyer. The buyer is located in U.S. and he distributes the product all over the country (EXPC1.)

We have three or four buyers, I mean formal buyers, they are importers and at least two of them are located in Miami and one currently inactive is located in Canada (EXPC2).

So far, we haven't found a trustworthy client in U.S., we hope to find one soon, because we have enough production (POCC).

According to exporters the importers define the monthly amount to be supplied based on their annual planning. Exporters sell to importers on a contractual basis. Depending on the relationships these contracts might be seasonal or annual agreements, and it seems that their function is the same as that of domestic contracts between producers and exporters with the exclusion of some clauses such as the provision of certain inputs. In general, the exporter must cope with timely sending the vegetables overseas while ensuring itself that they satisfy the quality and quantity demanded by its buyer. The importer faces the task of covering the cost of marine freight and transportation from the arrival port to the final destination, as well as compensating its supplier with the negotiated free on board (FOB) shipping point⁸⁹ price for the delivered product. Following are the ways some exporters expressed about contractual relations:

Contracts are annual; there is a crop plan which indicates how many boxes of each vegetable have to be monthly delivered to the importer. The importer covers the cost of transport from the loading port in Puerto Cortés to the port in U.S. We sell the product FOB until reaches the port of loading. We use sea freight. (EXPC1).

There is a written agreement; it is a formal contract, annual contracts. The importer sends an order for the whole cycle; we already know what he wants for the whole year. The payments are weekly, for instance if have agreed to send 7 containers per week, but just sent 5 the importer pay us, because of the existence of a formal agreement to send 7 (EXP2).

Interviewed importers indicated that the main criterion to procure Asian vegetables from exporters in Honduras was the possibility to acquire from them the required quality regularly. On the other hand, exporters seek out reliable importers, willing to establish a transparent relationship. Exporting companies deliver the whole year different vegetables in a container; otherwise it would be too expensive, due to the relative low volumes individually demanded. The main exported vegetable crop in terms of value and volume is Chinese eggplant. Other important vegetable crops are long squash, fuzzy squash, chive flower, Chinese bitter melon, Indian bitter melon, Chinese okra, Thai okra and Thai eggplant. In this regard importers provided the following comments:

⁸⁹ The term, FOB Shipping Point, indicates that the sale occurred at the shipping point and the buyer takes responsibility for the cost of transporting the goods.

We buy from exporters in Honduras, we look for quality, but continuous, there has to be consistency on the shipments. Our buyers recognize the fruit; they know the fruit, because they have grown with them. Therefore, the fruit we buy have to be in optimal condition. We import from Honduras Chinese eggplant, Chinese bitter melon, Chinese okra, chive flower, fuzzy squash, Indian bitter melon, Japanese eggplant, long squash (IMP1).

Actually, there was no selection between different exporters from Honduras, but in any case depends on the product. However, quality of the product is the most important factor to buy Asian vegetables from an exporter in Honduras. Price is also very important. The vegetables we import from Honduras are mainly bitter melon, Chinese eggplant and okra (IMP2).

4.11.2.1 Power Relations

In contrast to the skewed power relations between producers and exporters, relations between the latter and importers appear to be balanced. The risk seems to be distributed by mutual agreement.

Regulations imposed by the U.S. government to guarantee safety of imported food products have leaded importers to ensure traceability through the command of labeling and packaging specifications. Importers demand from exporters to deliver the vegetables in boxes displaying information about the origin of the product. Boxes have to exhibit where the product was produced and packed, as well as the name and logo of the exporter and the importer. Importers determine the dimensions and material of the boxes and are also concerned with the appropriate identification of specific features of the product. In this sense, boxes must include information about their content, such as crop variety, weight and size. Importers require the inclusion of their logo in boxes with the intention to connect potential clients. This is illustrated by the comments of some importers and exporters:

The importer defines what has to be included and its characteristics. Dimensions, size and material of boxes, as well as logo depend on the client requirements, we just follow what they want (EXPC1).

We provide logo to the exporter, they pay for these boxes. It is in our interest to provide logo, because people can make business directly with us, it has happen that the client call the grower and buy directly from them (IMP1).

Exporters and importers coincided that quality rules are set by the retailers and subsequently transmitted upstream through the chain. However, these are quality standards based on consumer preferences, and as has already been indicated, they don't entail voluntary private standards or independent certification. In fact, exporters in the course of time have perceived a stricter attitude

from the involved importing government authority than from the actors downstream on the chain. Following are illustrations of some exporters and importers' comments regarding rules:

There are no private standards for Asian vegetables; our suppliers have to fulfill only general export standards. There are no standards set by retailers, only public standards set by the U.S. government and of course quality standards based on the customer (IMP1).

About the standards, strictly talking about quality standards set by our buyers, those haven't change very much. They tell us the standards and we ensure that producers follow them. What has changed is that now the U.S government is stricter; they are concern with food safety. (EXPC3).

Commercialization of Asian vegetables is quite different than products consumed by Caucasians. The buyers are not too severe, but the control agencies in U.S. like FDA are now more rigorous. The supermarkets transmit the rules to the importers and those to the exporters and us to the producers (EXPC1).

It seems that exporters have enough bargaining power to influence the setting of prices with respect to importers and to negotiate in several situations. The agreed price is influenced not only by the quality of the product, but above all by the existing relation between both parties. Some exporters negotiate a minimum price for container. This means that the exporter obtains a price per container (approx. 800 boxes of 35 to 40 Lbs.) rather than per box, thereby reducing the risk involved. An exporter explained that when fruit has been scarce he has been able to persuade the importer to take what is available and give up on its pretentions of specific fruit size. There is balance in the share of risk; both the exporter and the importer have invested resources in the relationship. Some exporters offered the next comments:

There is no fix price, what we get is a minimum price, but we get more profit when we ship eggplants. I mean, we have negotiated with the buyers a price per container and not per box, for us is better because he takes all. If the importer says, look I want fruit of this size, we explain him that right now there is only fruit of a different size, because otherwise we will be forced to throw away the fruit of producers. So, we negotiate and he takes what we have available, especially when fruit is scarce. The advantage of this relation is that the buyer invests with us, so we don't have to bear the whole risk (EXPC2).

The price is determined usually, through a verbal agreement with the importer and the products, almost all reach the importer by consignment. The importer has an idea of the exporter's cost price and depending on the quality of the product and above all on the relation with the exporter. In any case the importer will try to get at least the price of cost (EXPC1).

4.11.2.2 Flow of Knowledge

According to our interviews, importers don't provide technical support to their suppliers in Honduras on a regular basis and they don't get it from their buyers either. However, they provide information related to the characteristics of the product and U.S. government import regulations. Importers briefly expressed the following:

No, neither do we provide technical support to our suppliers of Asian vegetables in Honduras nor do we get from our buyers here in the U.S. (IMP2).

No, we don't provide technical support to our exporters and we don't have it from our buyers either (IMP1).

Except in the case of the company performing exporting and importing functions, which has direct contact with wholesalers, exporters do not have direct relationships with wholesalers or supermarkets. Therefore, they obtain information on the marketplace through their importers. Importers provide to their main suppliers in Honduras information on prices tendencies and consumer preferences.

Communication between exporters and their main buyers appears to be fluent and frequent. Some exporters have representatives in the U.S., who are in constant communication with their buyers; others travel very often from Honduras to hold meetings with their Asian-American partners. Conversely, it seems that importers seldom visit exporters packing plants. Some importers have visited their partners to explain and describe workers at packing plants which are the required characteristics the fruit must have. Some exporters described it in this way:

Our main importer provides support through our representative in U.S, but actually, he doesn't provide truly technical support, and it is something occasional. Our representative comes here two or three times in a year. The importer has visited us once in three years to indicate what we have to improve or what we have to do to avoid mistakes. He gave some indications about selection of the fruit to the workers in the packing plant. Initially, communication wasn't very clear, but now after two years is fluent and transparent, the fact that we have somebody over there makes things easier (EXPC2).

We don't have any direct contact with the wholesalers or end consumer, it is made through our buyer. One of the owners of this company lives in Dominican Republic and he travels constantly to Miami to meet the buyer, the communication with him is very good, there is a very good relationship with the buyer. The information we get about market and prices is through the buyer. The importer has come here to our packinghouse a couple of times (EXPC1).

4.11.2.3 Trust

The level of trust between exporters and their main buyers appears to be high. They have conformed strategic alliances based on long term close relationships. In fact, two out of the four importers that decline to be interviewed argued that they couldn't answer the questions we posed them, because that might put in a precarious situation the win-win relationships they are committed with their partners in Honduras. In addition, the new entrants in the exporting business of Asian vegetables argued that they have found it difficult to settle stable relationships with buyers, partly because most of the trustworthy importers have already their suppliers. This is reflected in the emails received from some of the importers which declined our interview:

*Dear Mr. Napoleon,
(Name of the company) has reviewed your request. We have decided that it would not be in our company's best interest to provide this information to you.
We have taken a number of years to develop strategic alliances with our suppliers, transportation providers, and our customers. It is a commodity systems approach, It is a concept based upon "win, win, win." And it has been precisely that. Providing that information even in a research setting could provide undue advantage to our present and future competitors.
We wish you all of the best in your research.
Sincerely,
(Name).*

*Molina,
Sorry I can't not provide the information you requested, I am sure you can find other importers to help you.
Regards
(Name)*

Exporters mentioned that importers don't consistently monitor the accomplishment of rules, because exists trust between both parts. Interviewed imports companies confirmed this information. They described their relation with their main buyers as loyal and very supportive. An exporter expressed that after 15 years supplying to the same importer, to avoid damaging the relationship, his company has no intention of selling to other importers. In the same line, another company mentioned that he is certain that his main buyer will procure vegetables from them even when the market's demand is low. Some exporters provided the following comments:

We work as a team; there is trust, cooperation and commitment between both parties. We adapt to what our buyer wants because we are a team. We have never considered supplying to another buyer; maybe more products but always to the same buyer; we don't want to

damage our relation. So far as I know, there have never been conflicts in the relation with our buyer, and we haven't hear any complain from them (EXPC1).

In the case of our main buyer, we have got significant support from him; we know that if the market is low he will buy our fruit, he help us the whole year. This is good because the risk is shared. Currently, our relation with the main importer is good, there is trust and cooperation, but I think it can be improved; distance is not an excuse anymore, we have the means to communicate more often (EXPC2).

However, when relations are not so closer there have emerged some conflicts. One of the interviewed importers expressed that his trust on exporters from Honduras has decreased, as they don't follow adequate post-harvest management practices. He regretted that not all exporters from Honduras do pre-cooling⁹⁰ of the fruits. What some exporters do instead, according to this importer, is to place the vegetables in a container with water and then set them in the shipping container with fans. In effect, during the empirical study the researcher could presence in an exporter's packinghouse the process described by this importer. In turn, the exporter transferred the blame to producers, arguing that they break the cool chain. Nevertheless, he recognized the one aspect his company needs to improve is the process of fruits drying at the packinghouse. Here some comments illustrating what has been indicated:

We have visited our Honduran suppliers, but it wasn't packing time. We don't visit our exporters regularly, because we trust them, but in the case of exporters from Honduras we have lower our trust because of what happened, so now we don't trust them very much anymore. We have better relation with our buyers than with the exporters from Honduras. (IMP1).

Currently, we need new fans in the classification section in order to improve the fruit drying. In this way, while the fruit is being sorted gets dry. These fans remove humidity without smashing the fruit (EXC2).

In some cases, initial relations have been characterized by a measure of mistrust and lack of transparency. The recently formed producer-owned company has suffered the informality of some importers and exports-intermediaries, which haven't honor payment agreements. Coincidentally, the producer-owned company pointed at the importer above cited as one of the parties at fault. An analogue experience was described by one exporter who reported significant losses during his

⁹⁰ It is a procedure to extend the shelf life of vegetables. It consists on lowering to 15°F (-9.4°C) the temperature of the vegetables through frost air in order to stop the process of aging.

initial steps in the exporting business, because he couldn't afford to have somebody in the U.S to validate what the importer said about the conditions of the fruit he received.

(Name of Company) is not a good buyer; it doesn't pay off his debts in time. Its obligation is to pay when the fruit reaches the port, but it said that there was not market and didn't pay us in time. It just paid the down payment, he said that the rest depends on how it sells the fruit, but that is not our problem as suppliers. We have done our part, now it has to do its part (POCC).

4.12 Horizontal Relations in the Value Chain

Here, the aim is to reflect the relations among actor performing the same function in the value chain. Emphasis has been given to producers; nevertheless information on the horizontal relations among exporters has been also included.

4.12.1 Relations among Producers

On the subject of relations among producers is worth mentioning that since the introduction of Asian vegetables in Honduras, several producers associations have arisen. Producers are aware of the benefits of acting collectively. It emerges, that producers have joined these associations in order to improve their bargaining position and to have access to national or international financial resources. In Olancho, the role of the government's regional dependencies, acting as catalyst of collaborative efforts among producers is notable.

The first producers' organization to appear in scene was the Exports' Vegetables and Fruits Producers Association/Asociación de Productores de Vegetales y Frutas de Exportación (APROVEFEX). This is a non-profit association representing the interests of Asian vegetables producers in Comayagua and was established in 2001. Its main objectives⁹¹ are: i) to improve the social and economic conditions of its members and the community; ii) to increase the patrimony of the association through the increase in production; iii) to stimulate exports of vegetables and fruits; iv) to get through international and national institutions inputs and agricultural equipment to improve production. It assembles producers from five different sectors or areas of Comayagua, each with their own structure. In retrospect, this association has apparently experienced a

⁹¹ Source: Articles of the Association.

progressive reduction in the number of members. In fact, the association was temporarily deactivated and revived in May 2008.

Olancho's Asian Vegetables Micro-entrepreneurial Producers Association/Asociación Micro-empresarial de Productores de Vegetales Orientales de Olancho (AMPROVOL). This association was formed in 2004 and obtained its legal status in 2005. AMPROVOL is a Honduran agrarian reform enterprise (Empresa Asociativa Campesina), in other words a sort of state-dominated cooperative beneficiary of the Land Reform Law (Ley de Reforma Agraria). Its legal status entitled this peasant association to benefit from government's credits, technical assistance and real state for its operations. Its main purpose⁹² is to storage, classify, preserve, pack, transport and sell in the national and international markets the agricultural products produced by the association or by other beneficiaries of the Land Reform.

Vegetables Products of the Valley Incorporated Company/Productos Vegetales del Valle Sociedad Anónima (PROVEVSA). As indicated before, conformed by 47 members this producer-owned company was founded in Comayagua in mid 2008, with the purpose to export directly to the end market avoiding the traditional relationship with exporters as a mean to pay members a higher price for their product, and in the near future be able to finance the members on their production activities. It differs from the two associations described above on his profit-making motive. Whereas, APROVEFEX and AMPROVOL, act as union-based focused mainly in representation, negotiation and application for loans, technical support or other resources for its members, PROVEVSA exists to earn and re-distribute its surplus funds to owners.

In Olancho, six rural savings banks were legally established in 2008; they are located in: i) Campamento; ii) La Sierra; iii) Colonia Agrícola; iv) San Marcos de Jutiquire; v) Gualaco; and vi) San Esteban. Producers involved in these rural savings banks were draw from the local committees established through the Asian Vegetables Chain Sub-committee and with support of SENASA and DICTA, all three dependencies of the Ministry of Agriculture (SAG). The main objective is to put producers in a better position to tackle their financial difficulties and to deal with major agricultural constrains. This rural savings banks are conformed by producers of Asian vegetables, but its founds

⁹² Source: Legal Status Certificate.

can be destined to other production activities. According to the government's official who has coordinated this project, in Comayagua, it was not possible to accomplish the same results, because of the existence of micro-credit institutions and producers higher liquidity.

In both locations half of the interviewed producers don't belong to any association. In Comayagua, only one producer expressed to be member of both APROVEFEX and PROVEVSA, the rest is almost equally distributed among the two associations. In Olancho, a couple of producers affirmed to be members of both AMPROVOL and a rural savings bank (RSB), but the majority were members of RSB (Table 4.27).

Table 4.27 Participation of interviewed producers in producers' associations

Comayagua			Olancho		
APROVEFEX	PROVEVSA	No	AMPROVOL	RSB	No
6(30%)	5(5%)	10(50%)	4(20%)	8 (40%)	10(50%)

Source: Own elaboration

4.12.1.1 Exchange of Information

Orally communicated experiences appear to be an essential and frequent component among producers in Comayagua and Olancho. It seems to be the clearest sign of collaborative contact in a context marked by failed attempts in developing more organized initiatives among producers.

According to the information collected through interviews, in both locations exchange of information among producers is focused on discussions regarding crop management practices, especially pests and diseases control (Table 4.28).

Table 4.28 Type of information exchanged among producers

Criteria	Location	
	Comayagua	Olancho
Crop Management	14(70%)	18(90%)
Received Prices	8(40%)	5(25%)
Rejection of Fruits	7(35%)	1(5%)
Cost of Inputs	----	2(10%)
Equipment	2(10%)	----
Exporter	2(10%)	----

Source: Own elaboration

In Comayagua, some producers asserted they disclose information about the prices they get from the different exporters to make comparative evaluations. Some producers expressed they contrast

impressions about fruit rejection made by exporters. A few producers affirmed they have discussed about issues related to equipment with peers. Also in Comayagua, a few producers expressed they have met the exporter through other producers. Some producers in Comayagua expressed it in the following way:

The contact I have with other producers is to share experiences and to exchange advice. We talk about pests' problems and rejection of fruit made by the exporters. I am member of APROVEFEX, I don't remember exactly how much producers we are, I think we are about 100 and we have meetings the twentieth of every month. I have joined this association, for instance to negotiate better prices (PRC7).

Yes, we exchange experiences about pests and the pesticides we apply to control them. I participate in APROVEFEX; the idea is to export directly and to buy inputs together. I am also members of the irrigation association of the District of Selguapa. In the district we have to pay a ticket (boleta) to irrigate and in the case of Asian vegetables it is of Lps. 25/mz. (PRC12).

We talk with other producers about how things are going on, we talk about rejection of fruits (empaque), prices of the vegetables and about the pesticides we use to kill pests. I know there is a producer association, but I still haven't get involved, but it is mainly because of lack of interest on my part (PRC19).

As have been showed in Table 4.28, in Olancho exchange of information is mostly on crop management practices. Some producers affirmed they discuss about prices, inputs cost and fruit rejection, but mainly within the producers organization (AMPROVOL). Some producers in Olancho expressed it as follows:

With other producers we ask us about what is good to control diseases. Here, we wanted to form a producers association, but I don't know what it happened. I am part of the savings rural bank which was formed one year ago (2007). This is like a cooperative from which you can borrow money and I have borrowed Lps. 700 to plant (PRO2).

Yes, of course we talk with other producers, we get together and we talk a lot about crop management. I take part in a producers association, but I don't remember its name. I think is good to be part of this association because one gets informed and united we can be better (PRO5).

I am the leader-producer of this region and we get often in contact with the rest of producers. We are workmates, they help me, we exchange experiences and share what we have learned in other places about the management of the crop. We have formed the rural savings bank which is for all purposes, but the members are all producers of Asian vegetables. We have gotten closer and we hope to raise funds to finance our plantations. We meet every month and each gives Lps.25/month and we buy annual shares for Lps. 200 (PRO7).

The price negotiation sustained with the exporters in season 2008 and concerted by the Asian Vegetables Chain Sub-committee of the SAG, it wouldn't have been possible without the cohesive participation of producers from Comayagua and Olancho. This event represents, so far, the more synergic and successful effort of producers to reach a common goal. According to interviews with some government officials, the germ of this collaborative effort was derived from producers in Olancho, who threatened the exporter with a stop planting during the season 2008, unless he increased the paid price for the vegetables they produce. The initiative was first of all forged at Olancho's regional level through AMPROVOL and then spread out to their counterparts in Comayagua where APROVEFEX, at that time recently revived, led the cause. The upshot was a demand raised by producers at the national level, involving not only the exporter collecting fruit produced in Olancho, but also the rest of exporters procuring fruit from producers in Comayagua and with the mediation of the government through the Asian Vegetables Chain Sub-committee of the SAG. Here again, some producers in Olancho have acknowledged the contribution of the Asian Vegetables Technical Unit of SENASA and DICTA on raising their awareness concerning the importance of acting collectively to improve their situation. Some government officials described it in the following way:

Producers in Olancho created a situation never seen before in Comayagua. Producers joined forces in Olancho, as well in Comayagua to demand better prices from the exporters and on the other side, the exporters had to join together in order to confront the demands of producers. All this make you think how far you can go in a negotiation of this type (UTVOO).

At the beginning of this Asian vegetables season (2008), producers of Olancho got organized first through their departmental board and later on at national level together with the producers in Comayagua to demand the exporters an increase in prices and they have got some results. Here in Olancho there are even rural savings banks organized this year (2008), they have around Lps. 200,000 and each has from 14 to 18 producers (DICO).

4.12.1.2 Share of Other Resources

Share of goods among producers of Asian vegetables in Comayagua and Olancho occurs seldom, except in the case of those producers of Comayagua who belong to any of the irrigation districts.

In both locations, the overwhelming majority of interviewed producers do not buy inputs together with other producers (Table 4.29). Traditionally, purchase of inputs has been done individually, and apparently even producers' organized groups haven't been able to raise money to buy inputs for

their commercial plots without having to resort to external sources of credit. Producers argued that they all have different input needs or preferences and that not all have the required amount of money when the inputs have to be purchased. However, in both locations, there were a very few cases of producers who have been able to share economic resources to acquire inputs.

Table 4.29 Number of producers that buy inputs collectively

Criteria	Location	
	Comayagua	Olancho
Collectively	1(5%)	1(5%)
Individually	19(95%)	19(5%)

Source: Own elaboration

In Comayagua a couple of producers indicated that in spite of buying inputs individually, they take turns in the provision of vehicle to transport the purchased inputs from the store to their plantations.

Whereas in Comayagua producers collaborative efforts have been directed to pave the road Comayagua-Ajuterique–La Paz; in Olancho has been on the establishment of a packing plant to deliver their fruit. Nonetheless, the actions of producers in Comayagua are oriented to improve conditions of infrastructure, such as roads, which appears to have been within a communitarian context, often involving members of several sectors, including communal organizations, local government, cooperation agencies and private enterprises, for example exporters. These haven't been actions taken explicitly as producers of Asian vegetables, since it is a problem affecting other members of the community, even though it represents a palpable case of cooperation between producers and exporters. Some producers in Comayagua provided the next comments:

Here, with some producers and members of the community council (patronato), we have requested several times to the local government and the mayor, the reparation of the road, but they have never done anything (PRC16).

Well, we together with one exporter have been asking to the government to pave this road, but so far what they have done is just to scrape it (PRC17).

We have taken many steps to pave the stretch from Comayagua to La Paz. We have collaborated with the topographic survey and this stretch is going to be pave very soon and that is so partially because we have given a lot of money (EXPC3).

In Olancho, the demand of a packinghouse has been posed to the exporter as well as to different governmental levels and dependencies through AMPROVOL. As pointed out before, in accordance

with the Price Agreement, a collection center to pre-sort the fruit it is expected to be established soon, although there is not a defined date. In addition, it seems that through the creation of rural saving banks, producers are looking to overcome the problem of accumulating capital that could be loaned to members on terms that producers themselves consider realistic. Yet, their effectiveness in achieving this objective is to be seen. Some producers and a government official in Olancho provided the next comments:

Trough our association and with the support of SENASA we have insisted to the agro-exported and also we have been breathing down the neck of the government trying to get the establishment of a packing plant (PRO19).

We have been trying to get a packinghouse here in Olancho to reduce losses in transport. I am member of AMPROVOL and we have come together with the objective to export directly, buy together and have our own facilities (PRO1).

The local committees have been conformed as rural savings banks. There are in total six: Campamento, La Sierra, Colonia. Agrícola, San Marcos de Jutiquire, Gualaco y San Esteban (SCCO).

4.12.1.3 Trust

In Comayagua the perception of producers to fail in the accomplishment of objectives and mistrust on the leadership, under suspicion of taking advantage of their position on their own benefit has severely damaged the image of APROVEFEX. Consequently, the association was temporarily deactivated and recently revived in 2008 with a new structure, taking an active role in the price negotiation with exporters. Some cooperation agencies' officials and producers share the opinion that this organization has never been able to consolidate in part due to the lack of reliable leadership.

In light of the negative experience associated to the first Asian vegetables producers' organization along with attempts in other crops organizations, it has been generated certain apprehension of some producers towards this type of organizations. This was illustrated by some producers in Comayagua in the following way:

Here, there is no association. I was a member of APROVEFEX and I had to pay Lps. 100 to become a member, but never worked out, it was beneficial just for the board (PRC10).

Now, we are starting to organize us. We have a producers association from here, the region of Ajuterique and San Jerónimo its name is APROVEFEX and existed before; but there were

people who took advantage of the organization and they are not even producers. We have reactivated the association with the same name but different leadership (PRC20).

Yes, I see other producers; we talk about the crops, about the pests and how to control them. I am only take part in the irrigation district in other association I don't participate. I think there is lack of common vision; some people just go in the direction they want to go and things cannot work like that (PRC13).

In Olancho, the picture is different in the sense that producers didn't complain on leadership of their organizations. Nevertheless, credibility has decreased as some producers expressed to be disappointed, for the reason that up to now some of their organizations haven't accomplished their objectives. This impression concurred with what a government official working very close with these organizations expressed. On the other hand, some producers are more optimistic and still savor having been able to form a block to negotiate with exporters. They are expecting positive results from the organization they belong to, in particular the rural saving banks. This was illustrated by some producers and a government official in Olancho in the following way:

The Chain Sub-committee has been promoting our participation, but I don't take part in any association. Because since long time ago we have been always in the same thing that always results in anything. It is offered and offered, but at the end we never reach anything. I have lack of trust (PRO14).

What I can tell you is that these organizations didn't work as it was planned on their articles. In the case of AMPROVOL it was created to get funds from USDA, which were actually assigned to another purpose; and in the case of APROVEFEX it ended up in hands of one producer who later became an exporter (SCCO).

No, I am not member of any organization. There have been meetings among producers through SENASA. The thing is that when we have a problem some come and others don't. We are never well organized (PRO20).

4.12.2 Relations among Exporters.

There is no existing association of Honduran Asian vegetables exporters specifically representing the interests of its members to the government and industry in the pursuit of improving the profitability and sustainability of their industry or that helps to foster closer links amongst members and facilitate networks with other organizations. Information collected through interviews, reflects that relations among exporters of Asian vegetables evoke a more competitive and less cooperative orientation. Exporters reflected that in the following comments:

We have recently created the exporters association, but not of Asian vegetables. The objective is to promote mutual aid, exchange of information and to buy basic inputs to low costs (EXPC3).

There is no association, there is communication, but there is no association at all. We take part in other association with the companies we share the packing plant (EXPC2).

There is an association of producers with the aim to export, but it seems that it hasn't worked out, but there is no association of exporters (EXPC1).

4.12.2.1 Exchange of Information

Apparently, exchange of information among exporters is neither habitual nor spontaneous. Therefore it is limited. The competitive spirit has brought some exporters to a situation where they have got so caught up in the pursuit of winning that have lose sight of the benefits of communicating. An exporter put it:

We have a relationship of competition. But due to problems that there have been existing, we are looking to come together, but there is high rivalry among companies, but there are not bad relations, I mean relations are distant but cordial (EXPC1).

4.12.2.2 Share of Other Resources

It appears, that long standing problems or serious threats have induced otherwise reluctant exporters to put more effort into strengthening the sense of cohesion and common vision with their local competitors. For instance, as has been illustrated, exporters along with producers and the local community members have actively pursued paving of the road Comayagua-Ajuterique-La Paz. Furthermore, the uprising of producers from Comayagua and Olancho in season 2008 induced exporters to occasionally commit themselves on boosting their traditionally weak group dynamic in order to neutralize producers claims. Some exporters said the following:

Joint efforts with the community have been done. There is a study that presents the affected producers by the condition of roads. We have made two times the request of paving and apparently it has been approved (EXPC2).

We don't take part in any association, it hasn't happen. What prevails among us is self interest. We have come closer until now when serious pests' problems have become visible and we thought that Asian vegetables could collapse, then we started looking for other locations without much pests or to close down, because there were huge losses and we didn't get immediate support from the government to thwart the effects of pests (EXPC1).

4.12.2.3 Trust

The poor exchange of information and share of resources suggest that relationships among exporters are distinguished by mistrust, which is reflected in some exporters' discomfort with the attitude some competitors have assumed to protect their interests. This fact is apparently regarded as an evidence of skepticism and selfishness that inhibit cooperation. In this context, an exporter expressed that well established companies make difficult the prosperity of smaller companies. As an example of this situation, he quoted the unsuccessful attempt of the government in order to unify prices and quality standards. As mentioned in previous subchapter, this didn't occur because some exporters were unwilling to disclose the information. An exporter described it in this way:

Obviously there is no communication to exchange information and opinions. The problem is that well established companies don't collaborate with t small companies, instead they try to drive them under. There was an attempt of prices and quality standards unification through the Ministry of Agriculture, but the first negate it was (name of company) because it was in its interest (EXPC2).

4.13 End Market

In this section are presented the most relevant findings with reference to the market where Asian vegetables produced in Honduras are consumed. The information presented here covers aspects related to the segment of the population which consume these vegetables, their location and the competing countries also engaged in production of Asian vegetables, as well as this market current situation in terms of consumption.

4.13.1 Location of the End Market

As stated before, the main market of Asian vegetables produced in Honduras is the U.S. It is the only market where the produce arrives sold directly from exporters located in Honduras in a regular basis. Commercialization of Asian vegetables in the U.S is controlled by a few relatively large importing companies owned predominantly by Asian immigrants and located in large cities. These companies supply to Asian wholesalers, who in turn sell primarily to Asian clients including retailers and consumers.

Produce from Honduras is mainly transported by boat through South Florida and in a very few cases some shipments have arrived by plane to the Miami airport. Most shipments are received in

the East Coast by importers and/or wholesalers in Miami and New York from where they distribute them all over the U.S. and even to some places in Canada. The fruit produced in Honduras reaches the Canadian market depending on the distributors. According to some exporters, importers and/or wholesalers prefer to distribute to Canada fruit originated in Mexico in order to reduce the cost of transportation. In addition, Asian vegetables have very limited shelf life, increasing the risk of losses during long distance shipping. Exporting directly from Honduras to Canada might take up to 15 days. In this regard some exporters offered the following insights:

Our market is the U.S, particularly the East coast; I mean Miami, Florida and New York. We reach the Canadian market but not directly, rather through our distributors, we don't ship Asian vegetables from Honduras to Canada (EXPC3).

We don't export frequently to Canada, because there are high losses, you need 15 days to go and the shelf life of these products is short, some of them don't resist the journey. The most resistant are long squash and fuzzy squash the rest are very delicate. The cost of transporting the fruit to Canada is not a problem because the importer pays it, but he prefers to avoid this cost by buying from Mexico (EXPC2).

4.13.2 Population Segment

As pointed out in this study, according to interviewed exporters and importers, the major consumers of the referred Asian vegetables are Asian immigrants coming principally from Southeast Asian countries (Burma, Thailand, Vietnam, Laos, Cambodia, Malaysia, Singapore, Indonesia, Philippines) and to a lesser extent from East Asian countries (China, Japan and Korea) who brought with them to the U.S. their traditions and customs, including food. Some of these Asian citizens emigrated to the U.S in the 1960s and some after the Vietnam War. For these Asian natives this type of specialty product is a staple. These Asian vegetables are seldom available in retailers other than Asian supermarkets and restaurants. However, it has been observed an increasing trend for other groups of consumers to demand this type of vegetables, especially consumers with higher income who search for more variety in their meals and conscious of health issues. In Canada the main consumers of these vegetables are also Asian immigrants. Some exporters expressed this in the following way:

The market is steady, Asian vegetables are destined to a niche market comprised by Asian immigrants coming mainly from Southeast Asian countries (EXPC3).

You don't buy these products in a normal supermarket, very little. Asian population is something separated. You find them in Asian supermarkets and in restaurants that buy the

product to wholesalers. The highest volumes of consumers are people that immigrated after the Vietnam War and they brought their customs to the U.S. (EXPC1).

Vegetables are significant in the Asian diet. Price is the most important factor for regular consumers of Asian vegetables, but quality and health issues are also important. Asian customers, generally consume these vegetables stir-fried, steamed, braised or curried to create textures and flavors in their meals. Asian foods can be hot, cold, moist, dry, and heavy or light (Uhl, 2009). Even though general principles apply to all Asian cuisines, certain ingredients, cooking styles and flavors vary from region to region.

These vegetables are mainly consumed by Asian immigrants all over the U.S. in Texas, California, Florida and Chicago. Prices have just going up slowly. The market is steady, health is important but price is the most important factor for the consumers. Crisis has affected our business; people buy less (IMP1).

Asian vegetables are mostly consumed by Asian people as well as people who like to consume them. The majority of consumers look especially for price and quality produce (IMP2).

In both U.S. and Canada Asian vegetables consumers are the Asian community and some Americans who enjoy exotics fruits and who are concerned about their health (EXPC2).

According to the U.S. Census Bureau (2008)⁹³, Asians are the third largest minority group in the U.S., following Hispanics and black population respectively. Asian population reached 15.1 million in 2007, representing 5.0 percent of the estimated total U.S. population, which is of 301.3 million. They were the second fastest-growing minority group, with a 2.9 percent population increase with respect to 2006. As shown on Table 4.30, California with almost 5 million was clearly the state with the largest Asian population in 2007, followed by New York with 1.3 million and Texas with 810,000. The single-race Asian population of the U.S is relatively young in 2007 it had a median age of 35.4, compared with the population as a whole at 36.6.

Humphreys, (2008: 7-9) Director of the Selig Center for Economic Growth⁹⁴ has affirmed that Asians are better educated than is the average American, they hold many top-level jobs in management or professional specialties and there is an increasing number of successful Asian entrepreneurs. Therefore, the Selig Center estimates that Asians buying power represented US\$ 509

⁹³ <http://www.census.gov/Press-Release/www/releases/archives/population> [Accessed 12. 09].

⁹⁴ The University of Georgia, Terry College of Business. http://www.terry.uga.edu/selig/buying_power.html [Accessed 12. 09].

billion in 2008. The same author asserts that thanks to their higher average income levels, Asian consumer spend more than the average U.S household on food (groceries and dining out).

Table 4.30 Asian population estimates by main geographic areas U.S., 2007

Rank	Geographic Area	Asian Population Estimates
1	California	4,470,000
2	New York	1,340,000
3	Texas	810,560
4	New Jersey	648,750
5	Illinois	551,260
6	Hawaii	495,360
7	Washington	419,250
8	Florida	400,400
9	Virginia	369,600
10	Massachusetts	310,560

Source: Own elaboration based on the U.S. Census Bureau, 2008

4.13.3 Main Competitors

It appears that imports of Asian vegetables in the U.S. are dominated by Latin American countries. Apparently, there are a few key competitor countries for Honduran Asian vegetables in the U.S market. These are México and Dominican Republic. Although Guatemala and Nicaragua have recently entered the market, they still don't reach the exported volumes of the former. Importers and exporter said it the following way:

The main exporters of Asian vegetables to the U.S. are Dominican Republic, Guatemala, Mexico and Honduras. I think Mexico is the main exporter (IMP1).

The main competitor countries are México and Dominican Republic. I believe we are now in first place, I think we have displaced Mexico from the first position in terms of quantity. We are talking about exporting the whole year. In summer time California and Florida produce, but in general terms we in Honduras are the main exporters (EXPC3).

Our main competitors are Mexico and Dominican Republic. The main exporter to the U.S. market is Mexico, then Honduras and last Dominican Republic. In the 80s and 90s the number one exporter was Dominican Republic. Mexico is the main exporter due to its geographical proximity. It has been estimated that Honduras is the main exporter of Chinese eggplant to the U.S. Nicaragua is starting to produce but it has problems with the port, which is located away. The production exported to the U.S. is concentrated in Latin America (EXPC1).

It appears that Mexico is the major exporter of Asian vegetables to the U.S. market, the second and third place go to Honduras and Dominican Republic, respectively (Table 4.31). As seen in Table 4.31 the quantity of Asian vegetables exported from Mexico in 2000 was almost 12 times higher in comparison to Honduras and in 2006 it dropped to about 3 times higher. However, in 2008 the gap increased to 7 times. Some exporters estimated that Honduras is the main exporter of Chinese eggplant to the U.S.

Table 4.31 Main sources of U.S. imports of Asian vegetables 1998-2008 (Volume)

Quantity in Metric Tonnes			
Year	Mexico	Dominican Republic	Honduras
1998	90,387	1,592	3,230
1999	69,586	1,778	4,545
2000	67,322	2,023	5,792
2001	68,597	3,039	8,990
2002	66,787	3,066	9,648
2003	72,738	3,062	12,660
2004	72,330	5,892	24,095
2005	72,275	7,040	24,798
2006	76,086	8,664	26,327
2007	114,959	2,731	24,880
2008	118,238	2,663	17,001

Source: Own elaboration based on USDA/AMS, 2009⁹⁵

Mexico wins in terms of quantity, due to higher productivity and low transportation costs. Geographical proximity to the U.S. market gives Mexicans a cost advantage in delivering the produce by truck from Mexico to Arizona, Texas and southern California. However, buyers in the U.S. make trade-offs as they consider procuring from Honduras and Dominican Republic exporters in their efforts to obtain fruit of higher quality and to reduce the risk of failed delivery, due to weather conditions. According to some exporters, Asian vegetables are better suited to weather conditions in Honduras. Furthermore, Mexico faces the occurrence of unexpected weather conditions such as low temperatures (frost) which have a negative effect on cold sensitive crops such as this type of vegetables. An exporter gave the next illustration:

⁹⁵ Fruit and Vegetable Market News Reports: <http://marketnews.usda.gov/portal/fv> [Accessed 11. 09].

Dominican Republic and Mexico are the major competitors to Honduras. The advantage of Mexico is the cost of transportation; they leave the containers in the border of California and request the importers take them and pay us at the end of the season because the cost is very low. Nicaragua is also exporting. Although, the fruit produced in Honduras has better quality, the weather in Comayagua Valley is dry tropic. The problem with Mexico is frost weather; therefore they have higher production risk (EXPC2).

Dominican Republic enjoys the capacity of faster delivery to the U.S market. Since year 2000, most of Asian vegetables imports from Dominican Republic have been transported by plane through Miami, New York, Philadelphia and New Jersey, while some have arrived by boat to South Florida. Production of Asian vegetables in Dominican Republic begun in the 1970s and during the 80s it became the main exporter to the U.S market, but as has been mentioned before, pests problems and use of inappropriate pesticide drove it out of the market at the beginning of the 90s and returned to it until the end of the same decade.

Nicaragua has recently begun to export Asian vegetables to the U.S. market. It has domestic transportation problems resulting from the distance to shipment port. Guatemala has also entered the market.

4.13.3 Main Market Situation and Alternative Markets

According to exporters and importers, the U.S market of Asian vegetable remains steady with a slight increase in consumption, although the largest Honduran exporter expressed that he has never been able to supply the entire order posed by his buyer. This exporter provided the following description:

In this moment when the U.S. market is living through a possible recession period we are stable, there is always demand for these types of vegetables, in fact historically we have never been able to supply the total order placed by our buyer. There is market, but we don't see an excessive increase in demand and that is the interesting part of this value chain, because is a very stable market (EXPC3).

The U.S. Census Bureau (Day, 1996: 12-16) projects that by 2050, the Asian population's share of the U.S population would be 9 percent, or more than 34 million, with a median age of 34.8 years. Furthermore, in 2013 Asians will have US\$ 752.3 billion in disposable income (The Selig Center for Economic Growth, 2008: 15) and have an average household income higher than the total U.S. population. On the other hand, new generations of Asians or Asian Americans now include families who have lived in the U.S. for one or more generations and some have no connections whatsoever

with their ancestral land, culture and customs. According to exporters, U.S. born Asian Americans have assimilated their U.S. born counterparts' food consumption habits and perhaps this would prevent a significant increase in the demand of Asian vegetables and Asian food in the U.S. market.

Exporters complemented this information through the following comments:

Here it happens something very interesting, the children of these Asian who emigrated from Taiwan and Vietnam no longer consume Asian vegetables, instead they eat fast food. Therefore the food culture is decreasing, that is why we say that the market is stable and we are not observing an excessive increase in consumption. Another interesting point is that the American (white) population has diversified its consumption culture and has extended its menu, now they consume a lot of fresh vegetables, so we are included there (EXPC3).

The market is not very large and consumption hasn't increased considerably. Consumption increases a little but it is growing. For instance bitter melon is good for the heart and circulation. In Japan they also eat a lot bitter melon, before they didn't consume it, but now they do it because of its medicinal properties. The tendency is the same in the case of all Asian vegetables. I don't believe the market will grow too much, because the major quantity of consumers is people who emigrated after the Vietnam War and they brought its customs, while today the Asian population was born in the U.S. and has taken the customs of that country. We still don't know if these citizens are going to maintain the customs of their ancestors. On the other hand it seems that Asians are transferring their customs to the rest of the population, it is probably that the market won't decrease, but it doesn't show the same increase than other American products (EXPC1).

Nevertheless, overall, it seems that the possibilities for expanding this market in the U.S. are substantial. Asian vegetables have the potential to become as widely accepted by U.S. consumers as tomato and potatoes. Some crops, such as Asian eggplants, are becoming an integral part of American diets (Hills, 2008)⁹⁶. The Economic Research Service, USDA (Lin et al., 2003:14) have predicted that, compared to 2000 by 2020 per capita daily vegetables consumption (with the exception of tomatoes) at home and away from home would increase. According to this report per capita daily vegetables consumption at home would increase from 82 to 85 grams and away of home from 22.83 to 24.92 grams; while per capita potato consumption (fried and other) is predicted to decline in both at home and away. All these changes appear to be driven by the growing awareness of the nutritional and health benefits associated with the consumption of fresh vegetables and fruits.

⁹⁶ <http://www.foodnavigator-usa.com/Financial-Industry/Asian-vegetables-an-untapped-market>. [Accessed 12. 09].

In addition, the increasing domestic transportation cost in the U.S. is making produce from Honduras more competitive. An exporter expressed that the increasing cost to transport vegetables produced in California to other cities in the East coasts provides a cost advantage to Honduran produce. He explained it as follows:

Currently, we are more competitive because Asian vegetables in California (produced by many Mexicans) are in trouble due to the high U.S. internal transportation cost and are not able to reach the East part, like New York and New Jersey. Transport makes us more competitive (EXPC1).

The European market offers an open opportunity for Asian vegetables produced in Honduras. Specific potential opportunities in European markets have already been identified by some exporters and we have knowledge that a European development cooperation agency has funded an eggplant market study for an exporter. Furthermore, according to an exporter, the European Community has pronounced its interest in supporting this industry. However, distance is seen as the main constrain in the development of exports of Asian vegetables from Honduras. According to exporters, distance increases the costs of transport and the risk of spoilage. Shipping by boat to Europe is not an alternative for these vegetables, because the quality deteriorates with long transport time. The ideal alternative would be to use air freight to transport vegetables from Honduras, but this is not possible due to the lack of direct flights to Europe. Other countries like Dominican Republic and Mexico do it, because they have the option to fly directly to Europe. In Honduras so far, as the researcher could ascertain, the only attempt in exporting to Europe was performed by PROVEVSA (the producer-owned company) in 2009. PROVEVSA, through an export-intermediary exported to Milan, Italy 200 boxes containing Asian vegetables. In this case the Italian buyer made arrangements with a large international air freight company to transport the fruit to Italy. Nevertheless, export-intermediary's non-fulfillment of his obligations discouraged continuity of this venture. Some exporters provided the following comments:

To Europe we don't export because of the freight cost, it is too expensive and we have enough market in the U.S. (EXPC3).

Mexico is exporting to Europe. However, the European Community market is open, but unfortunately is not possible to export because there are no direct flights, the vegetables have short shelf life and transit in an airport is harmful for the produce. Our company has explored the European market and is open; in fact one of the shareholders exports from Dominican Republic every day to Amsterdam and London that is way we were insisting in to fit out the Palmerola airport. The European Community even came to offer the same preferential tariffs offered by the U.S. They are willing to help, but without airport it is

impossible. The fastest sea freight to Europe takes 16 to 18 days and these vegetables don't resist more than 12 days (EXPC1).

PROVEVSA, we exported 200 boxes to Europe, to Milan through (name of company) which is an export-intermediary. The export-intermediary bought our fruit and was supposed to deliver it to the Italian importer. The first week we shipped 85 boxes but got paid one month after the operation and for us that is too much time. The Italian importer had a contract with (name of company) to ship the fruit to Italy (POCC).

In general, there is no demand of these Asian vegetables in Honduras. The local market has also been subject of consideration, but in Honduras hasn't developed yet a passion for these vegetables, although the government has considered promoting the idea to process these vegetables in order to appeal the local consumers and diversify the market alternatives of producers. No feasibility study or any market analysis has been carried out yet to assess this opportunity. A consultant working for the Asian vegetables Chain Sub-committee provided the following comment:

In the local market there is no demand for this produce, but it could be possible to implement a different presentation to attract consumers. Promoting Asian vegetables we have talking about searching financial support to make an analysis to identify transformation alternatives. The issue of processing is one of the challenges to make more profitable the production of Asian vegetables, especially now when the production costs are higher. The volume of rejected fruit is quite high and it could be find an alternative to make use of it (SCCO).

4.14 Summary of Results.

The purpose of this section is to present a short summary overview of the main findings uncover by this study as a means to provide some form of clarity for the reader. Findings presented in Table 4.32 were organized according to the structure contained in the conceptual framework which derives from the study's research questions. Emphasis is given to local actors, in particular to producers.

Table 4.32 Summary of Results

1. Introduction of Asian Vegetables	
Comayagua	Olancho
Japanese Entrepreneur	Government
2. Actors in the Chain	
Comayagua	Olancho
<ul style="list-style-type: none"> ▪ 2 Research Agencies. ▪ Approx. 500 Individual Producers. 	<ul style="list-style-type: none"> ▪ 1 Research Agency. ▪ Approx. 200 Individual Producers.

- 1 Producer-owned Co.
- 4 Exporters.
- Several Exports-intermediaries.
- 1 Exporter which takes the fruit to Comayagua.

3. Functions of Actors in the Chain

Function	Comayagua	Olancho
▪ Seeds and Seedlings Supply	Research agencies, two exporters and some individual producers.	Research agency and seldom if ever the exporter.
▪ Production Activities	Individual producers, producer-owned company and some exporters.	Individual producers.
▪ Exports Activities	Exporters, producer-owned company and exports-intermediaries.	Exporter established in Comayagua.
▪ Import Activities	An exporter vertically integrated and import companies in the U.S.	
▪ Wholesale Activities	Importers and wholesalers in the U.S.	
▪ Retail Activities	Asian Supermarkets and Asian Restaurants in the U.S.	
▪ Consumption	Mainly Asian citizens in the U.S.	

4. Distinctive Aspects of Producers

Aspect	Comayagua	Olancho
▪ Motivations to plant Asian vegetables (% of interviewed producers)	a) Stable income (65%). b) Improve income (50%). c) Unique alternative (15%). d) Financing and inputs by exporters (10%).	a) Higher income (60%). b) Stable income (35%). c) Unique alternative (15%). d) Help other people (15%). e) Possibility to export (10%). f) Inputs by exporter (5%).
▪ Average size of planted area per year (% of interviewed producers)	a) 55% plant 1.1 ha. (Small Producers). b) 35% plant 2.6 ha. (Medium producers). c) 10% plant 5.6 ha. (Large prod.).	a) 90% plant 0.8 ha. (Small Producers). b) 10% plant 2.1 ha. (Medium producers).

▪ Use of drip Irrigation and condition of accessories (% of interviewed producers)	a) 55% of small producers. All buy used or incomplete accessories. b) 71% of medium producers. All buy used or incomplete accessories. c) 100% of large producers. All buy new accessories.	a) 78% of small producers. 93% of them buy used or incomplete accessories. b) 100% of medium producers. All buy used or incomplete accessories.
▪ Gravity Fed Irrigation (% of interviewed producers)	a) 45% of small producers. b) 29% of medium producers.	a) 22% of small producers. b) 0% of medium producers.
▪ Fertigation & Mulch (% of interviewed producers)	a) 50% of large produces.	b) 17% of Small producers (only fertigation).
▪ Use of Machinery	Mainly soil cultivation.	Mainly soil cultivation.
▪ Storage Facilities	None.	None.

5. Business Environment in the Chain

Issue	Comayagua	Olancho
▪ Subsidies and Taxes on production	None.	None.
▪ Trade Agreements	DR-CAFTA	
▪ Regulations by local public entities (SENASA)	a) Compliance of GAP and GMP by producers and exporters based on requirements of importing country public agencies. b) Production of eggplant banned in some areas.	a) Compliance of GAP and GMP by producers and exporters based on requirements of importing country public agencies.
▪ Payment to SENASA for Farm Supervision	Lps. 500.00.	None.

<ul style="list-style-type: none"> ▪ Infrastructure Services provided by the government 	<ul style="list-style-type: none"> a) At least 15% of fruit loss owing to poor condition of secondary, local and minor earth roads. Primary roads are in fair condition. b) No electricity available to producers' plantations, only to exporters. c) Three irrigation districts constructed by the government and a large project it is underway. d) No public storage facilities available. 	<ul style="list-style-type: none"> a) Problem of secondary, local and minor roads is less severe. No more than 10% of fruit loss. However, the exporter has no packing plant and the fruit has to be transported to Comayagua where the fruit is selected and classified. b) No electricity available to producers' plantations. c) No large areas irrigated with infrastructure promoted by government. d) No public storage facilities available.
<ul style="list-style-type: none"> ▪ Institutional Services 	<ul style="list-style-type: none"> a) Technical support to producers is basically provided by private institutions and international cooperation agencies with involvement of the government. The leading role is played by FHIA, MTTH-DICTA and EDA. b) The Asian Vegetables Chain Subcommittee of the SAG has provided an important space to concertize the differences among producers and exporters. 	<ul style="list-style-type: none"> a) Government has a very active role in the provision of technical support and advice to producers through the Technical Unit of Asian Vegetables and complemented with MTTH-DICTA and EDA. b) The Asian Vegetables Chain Subcommittee of the SAG has provided an important space to concertize the differences among producers and exporters and has promoted the creation of several savings rural banks.

6. Supporting Markets

Markets	Comayagua	Olancho
<ul style="list-style-type: none"> ▪ Financial Services 	<p>Main source is the exporter. Other sources include relatives, BANADESA and in a less extent cooperatives and commercial banks.</p>	<p>Main source is the exporter. Notwithstanding, BANADESA in cooperation with the exporter and the technical Unit of Asian Vegetables of SENASA implemented a credit scheme not available in Comayagua. Other sources are cooperatives.</p>
<ul style="list-style-type: none"> ▪ Telecommunications 	<p>Mobile telephone is the way of communicating for most producers.</p>	<p>Mobile telephone is the way of communicating for most producers.</p>

▪ Irrigation Systems Suppliers	<p>a) Irrigation Supply Co., when the system is to be installed for the first time. Usually don't provide technical support.</p> <p>b) Exporters, projects and other agricultural companies when time to replace accessories.</p>	<p>a) Irrigation Supply Co., when the system is to be installed for the first time. Usually don't provide technical support.</p> <p>b) Exporter, projects and other agricultural companies when time to replace accessories.</p>
▪ Agricultural Machinery	The majority of producers lease machinery. They do it mainly from local entrepreneurs, but also from FHIA and MTTH.	The majority of producers lease machinery. They do it mainly from local entrepreneurs, but also from other organizations.
▪ Input Suppliers	<p>a) The most important are the exporters and agrochemical stores. Some exporters provide input on credit and others cash to buy them.</p> <p>b) Other sources are cooperatives and inputs hawkers.</p> <p>Input suppliers don't provide technical support.</p>	<p>a) The most important are the exporter and agrochemical stores. Exporter provides inputs on credit.</p> <p>b) Other sources are cooperatives.</p> <p>Input suppliers don't provide technical support.</p>

7. Vertical Relations (Relations between producers and exporters)

Issue	Comayagua	Olancho
▪ Type of relations	Mostly contractual (seasonal)	Contractual (seasonal)
▪ Criteria of producers to select among exporters	<p>a) Transparency in classification of fruit (65%).</p> <p>b) Distance to packinghouse (20%).</p> <p>c) Receive product in low season (20%).</p> <p>d) Price offered (15%).</p>	No choice since only one exporter buys from there.
▪ Power Relations	<p>a) Exporters set conditions of the contract.</p> <p>b) Quality standards are set by the market and other rules are set by the exporter based on importing country's public stipulations.</p> <p>c) Absence of private and external standards.</p> <p>d) Weak bargaining position of</p>	<p>a) Exporters set conditions of the contract.</p> <p>b) Quality standards are set by the market and other rules are set by the exporter based on importing country's public stipulations.</p> <p>c) Absence of private and external standards.</p> <p>d) Weak bargaining position of</p>

	<p>most producers.</p> <p>e) Large producers can negotiate with exporters.</p> <p>f) No shared production risk.</p>	<p>producers.</p> <p>e) No shared production risk.</p>
<p>▪ Flow of Knowledge</p>	<p>a) Exporters don't provide technical assistance in a regular basis.</p> <p>b) Producers receive technical assistance when growing for exports is a new experience.</p> <p>c) Technical support in situ has been oriented to conform with public regulations of the importing market and quality requirements.</p> <p>d) Exporters provide no information about the end market.</p>	<p>a) Exporter doesn't provide technical assistance in a regular basis.</p> <p>b) Producers receive technical assistance when growing for exports is a new experience.</p> <p>c) Technical support in situ has been oriented to conform with public regulations of the importing market and quality requirements.</p> <p>d) Exporters provide no information about the end market.</p>
<p>▪ Trust</p>	<p>a) Exporters generally pay in time.</p> <p>b) Suspicion on the classification process followed by some exporters.</p> <p>c) Perception that some exporters' technicians are to avoid diversion of produce to competitors rather than to provide technical assistance.</p> <p>d) Some exporters don't keep what they have promised to producers.</p> <p>e) Most exporters manage information distrustfully.</p> <p>f) Producers with a long standing relationship with exporters have preferential treatment.</p> <p>g) Some producers haven't honored their financial responsibilities.</p> <p>h) Some producers don't fully comply with regulations.</p>	<p>a) Exporter generally pays in time.</p> <p>b) Distrust on the fruits' management during transport to Comayagua.</p> <p>c) Suspicion on the classification process followed by the exporter.</p> <p>d) Exporter doesn't keep what he has promised to producers.</p> <p>e) Exporter manages information distrustfully.</p> <p>f) Exporter criticized by some producers and government officials for applying anti-competitive practices.</p>
<p>▪ Distribution of Gains</p>	<p>a) According to producers, prices they receive haven't change in proportion to the cost of production.</p> <p>b) According to producers, price fluctuations in the importing market are not reflected in the price they</p>	<p>a) According to producers, prices they receive haven't change in proportion to the cost of production.</p> <p>b) Chive flower has the higher price, but producers plant more Chinese eggplant which has the second highest price.</p>

receive.

c) Chive flower has the higher price, but producers plant more Chinese eggplant which has the second highest price.

d) Some exporters leave the price constant the entire year, while others change it depending on the season.

e) Producers accrue the lowest share of total value in the chain.

c) The exporter changes the price depending on the season.

d) Producers accrue the lowest share of total value in the chain.

8. Horizontal Relations (Relations among producers)

Issue	Comayagua	Olancho
▪ Existing Associations	<p>i) APROVEFEX (focused mainly in representation, negotiation and application for loans).</p> <p>ii) PROVEVSA (Profit oriented, with the purpose to export directly).</p>	<p>i) AMPROVOL (focused mainly in representation, negotiation and application for loans).</p> <p>ii) Six Rural Savings Banks (to accumulate capital that could be loaned to members on terms that producers themselves consider realistic)</p>
▪ Exchange of Information	<p>i) Orally communicated experiences appear to be essential and frequent.</p> <p>ii) Exchange of information is focused on discussions about crop management. Other topics are comparing received prices and rejection of fruits.</p> <p>iii) During the price negotiation sustained with the exporters in season 2008.</p>	<p>i) Orally communicated experiences appear to be essential and frequent.</p> <p>ii) Exchange of information is focused on discussions about crop management.</p> <p>iii) The spark of the price negotiation with exporters came from producers in Olancho.</p>
▪ Share of other resources	<p>i) Producers very seldom buy inputs together.</p> <p>ii) A few of the interviewed producers share vehicle to transport inputs.</p> <p>iii) Collective actions are in a communitarian context, including</p>	<p>i) Producers very seldom buy inputs together.</p> <p>ii) The demand of a packinghouse has been posed to the exporter as well as to different governmental levels and dependencies through AMPROVOL</p> <p>iii) The creation of rural saving banks,</p>

	members of several sectors. For instance, the improvement of secondary roads condition.	producers are looking to overcome the problem of accumulating capital that could be loaned to members.
▪ Trust	Perception of failure in the accomplishment of objectives and mistrust on the leadership has severely damaged the image of APROVEFEX.	Producers didn't complain on leadership of their organizations. Nevertheless, credibility has decreased due to failure in the accomplishment of objectives.

9. End Market

Issue	Comayagua	Olancho
▪ Location		U.S.
▪ Population Segment		Mainly Asian Americans citizens
▪ Main Competitors		Mexico and Dominican Republic.
▪ Opportunities and Tendencies	i) The market of Asian vegetables is small and is likely to remain that way in the short and medium term. ii) Distance (lack of air freight) is seen as the main constrain in the development of exports of Asian vegetables from Honduras to Europe. iii) No local market available.	

5. ANALYSIS AND INTERPRETATION OF RESULTS

Whereas the previous chapter presented the findings of this study, this one analyses, interprets, and synthesizes them. Therefore, the purpose of this chapter is to provide interpretative insights into the findings. The discussion takes into consideration the literature as relevant theories and the study are tied by comparing and contrasting them to relevant issues raised by the latter. The theoretical framework of the study (Figure 5.1) is included to tie what is presented here with everything that has been previously presented and therefore, to provide more understanding.

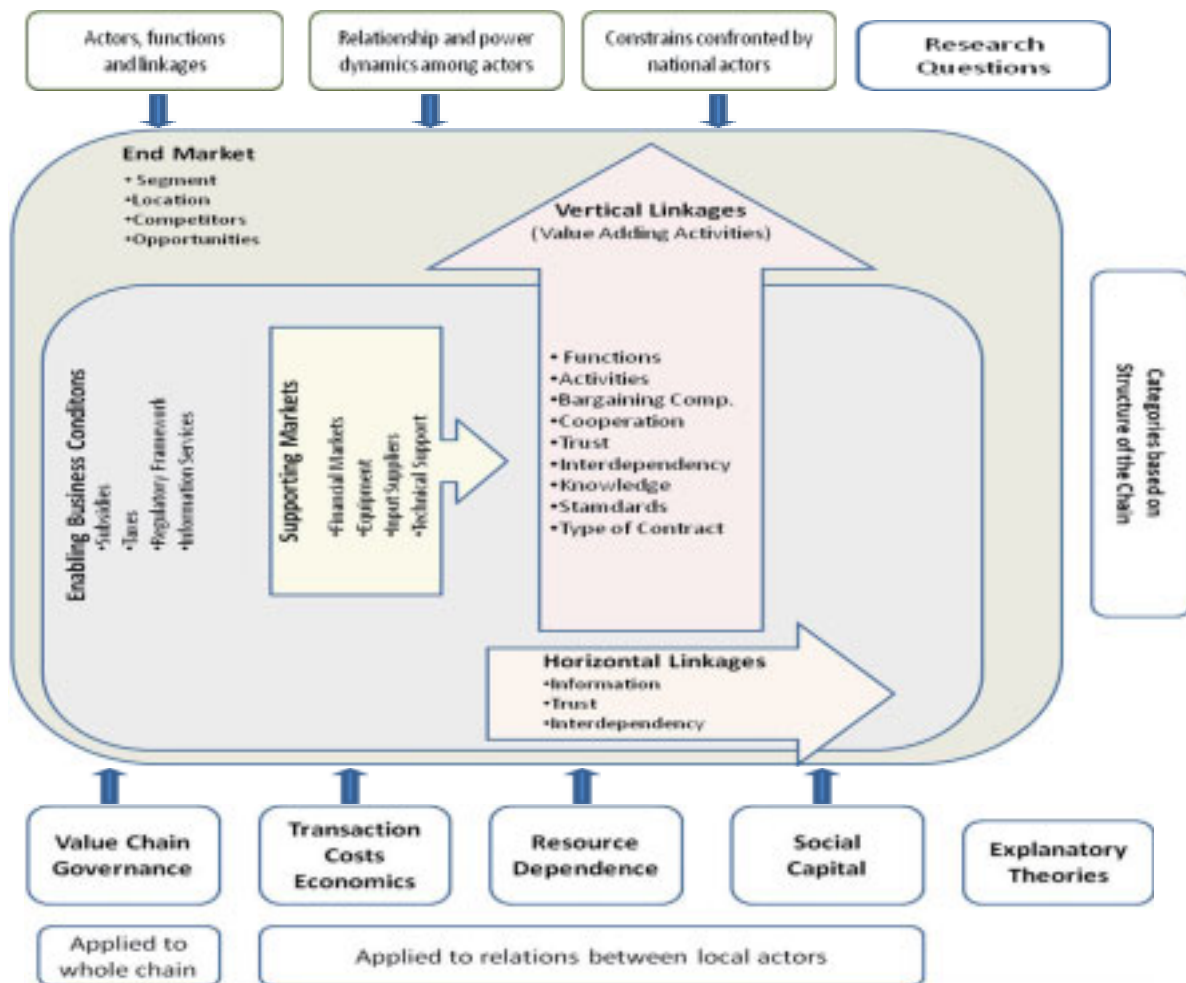


Figure 5.1. Schematic view of theoretical framework

Source: Own Elaboration

The chapter is organized by the following sections: i) introduction of Asian vegetables in Comayagua and Olancho; ii) about the geographic concentration of activities in Comayagua; iii) underlying reasons that encourage producers to plant Asian vegetables; iv) strategies of local actors

to access and secure participation in the international market; and v) market situation and tendencies.

5.1 Introduction of Asian Vegetables in Comayagua and Olancho

It emerges that Asian vegetables in Comayagua and hence in Honduras were introduced by the private sector initiative influenced by the confluence of several distinctive elements but without direct intervention of the government and other third parties. Note here, that although the government provided certain conditions through the encouragement of non-traditional exports, it didn't take any direct action specifically oriented to introduce Asian vegetables in Comayagua.

In contrast to Comayagua, in Olancho the introduction of Asian vegetables was the result of a deliberate effort of the government through the Ministry of Agriculture supported by a private agent. The government took the initiative in moving forward the production of Asian vegetables, with the hope that it will be compelling enough to draw producers toward it. In consequence, this process of crop diversification was expected to boost economic growth in a region traditionally oriented to produce staple crops.

5.2 About the Geographic Concentration of Activities in Comayagua

It appears that spatial concentration of related Asian vegetables' economic activities in Comayagua exhibits elements of geographic clustering (Figure 5.2). This line of thinking draws from the convergence of several disciplines, including economic geography, industrial organization, systems of innovation, strategic management and organizational economics, which have focused on the importance of geographical proximity and distance for local and regional competitiveness and development (Schmitz and Nadvi, 1999: 1503; Gordon and McCann, 2000: 515).

It must be noted, that the aim here is not, then, to use a cluster-based approach or to make an elaborated judgment whether this is in fact a cluster, but rather to shed light on the geographically concentrated functional interconnectivities that seem to be in operation in the region and which allow its integration to the value chain's broader context. Therefore, the discussion on the elements affecting the participation of local actors will be completed later on a value chain perspective.

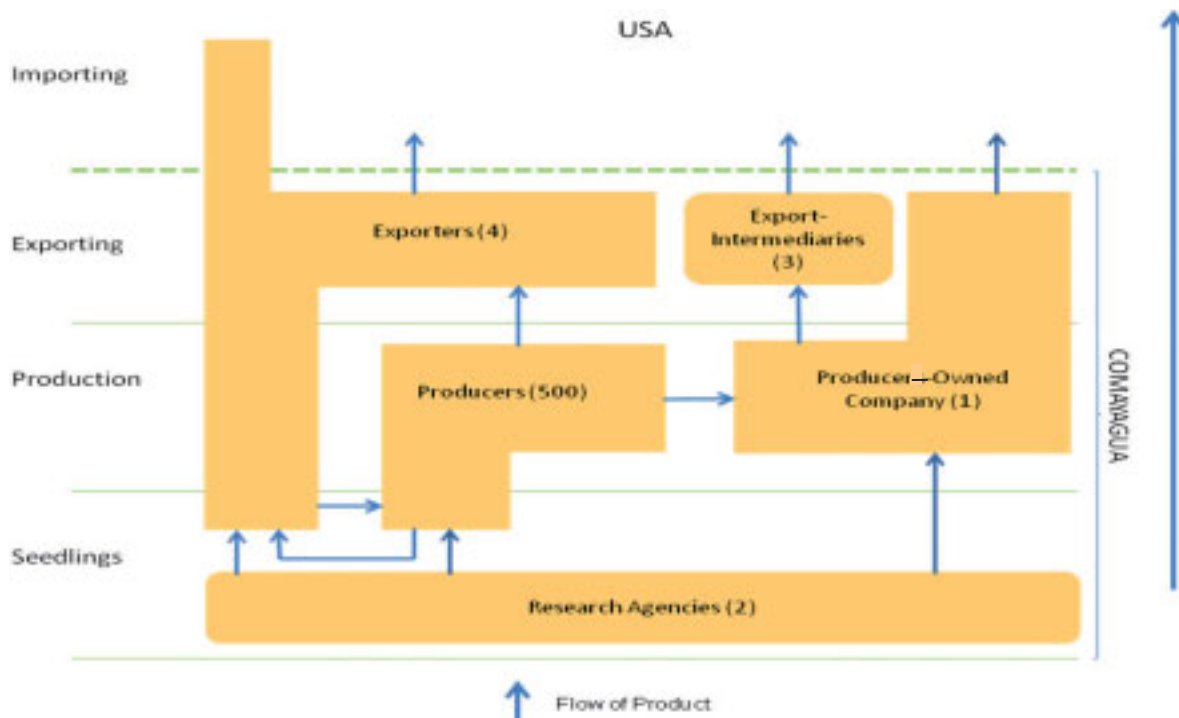


Figure 5.2 Actors in the value chain of Asian vegetables produced in Comayagua

Note: Figures within brackets represent the number of participants performing a function.

Source: Own elaboration

There are several definitions of cluster, in fact Rosenfeld (1997: 8) as well as Gordon and McCann (2000: 513) criticize that there is much ambiguity in the way in which the concept has been used. However, according to the literature the most widely accepted model is the one elaborated by Michael Porter (Rosenfeld, 1997: 8; Martin and Sunley 2003: 6). Porter (1998) defines cluster in the following way:

“As a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities (Porter, 1998:199)”.

UNIDO (2001) has elaborated a very similar definition to the one introduced once by Porter. UNIDO defines it as:

“Sectoral and geographical concentrations of enterprises that produce and sell a range of related or complementary products and, thus, face common challenges and opportunities (UNIDO, 2001: 9)”.

Although relative to other regions in the country, traditionally Comayagua’s horticultural exports activity has been stronger and in fact, is Honduras’ primary source of fresh vegetables for export including Asian vegetables. Most vegetables related exporting companies are located in the region.

Comayagua's Valley advantage stems from the available natural resources such as land, water and weather conditions, but as well from relatively good irrigation infrastructure and access to Puerto Cortes, the country's main international shipment port located on the Atlantic Coast. Nevertheless, it seems that for several reasons the development potential of this cluster has not been fully realized. As Ketels (2004:10) asserts, being close and working on related issues are not enough for positive cluster effects to occur, but active interaction has to be present and sufficient number of participants present for the interactions is needed. In other words, simply the fact that there is an agglomeration of companies in Comayagua alone is not sufficient to generate its realization as cluster, which depends on a wide array of factors, some controlled by government, others by private agents. Therefore, the geographic concentration and the apparent existing specialization in vegetable production of Comayagua have to be complemented with a pluralism of institutional involvement. A collaborative strategy sharing common vision that promotes alliances with various institutions, such as businesses, universities, research institutes, service support, public authorities, etc., has to be implemented.

Adopting Enright's characterization of clusters by stage of development (Enright, 2003:103-4), allows one to characterize the cluster organization in Comayagua as "Potential Cluster". Enright (2003: 104) describes this type of clusters as:

Those that have some of the elements necessary for the development of successful clusters, but where these elements must be deepened and broadened in order to benefit from the impact of agglomeration (Enright, 2003: 104).

The same author adds that to shift from potential to working cluster it is necessary to attract sufficient critical mass⁹⁷ of local knowledge and resources. In addition to this critical mass, it is necessary to develop favorable conditions of interaction and information flows. Similarly, Schmitz and Nadvi (1999: 1506-7) stress that to experience growth clusters need to be well connected to effective trade networks in order to access distant markets and is also necessary the existence of trust to sustain inter-firm relations.

⁹⁷ Critical mass refers to the integration of a sufficient number of companies in a cluster in order to achieve an internal potential (Lagos and Courtis, 2008). In other words, having available in the cluster enough local skills, suppliers, service support and businesses.

5.3 Underlying Reasons that encourage Producers to Plant Asian Vegetables

Production of Asian vegetables is associated by the majority of producers in both locations with the possibility to earn a stable and/or higher income. In the case of producers trying to reduce uncertainty or to have a stable income, it is likely that the combination of wide price fluctuations of most vegetables (e.g. tomato, see Figure 5.3) and inefficient rural markets⁹⁸ translated into high cost of commercialization, make production of other vegetables mainly sold in domestic markets, unattractive for them. MAH (2002:7) acknowledges this, by affirming that prices of most vegetables undergo notable levels of volatility. They might change from one day to another and sometimes even the same day. Figure 5.3 displays the high variability of tomato prices compared to three different Asian vegetables and maize during several years.

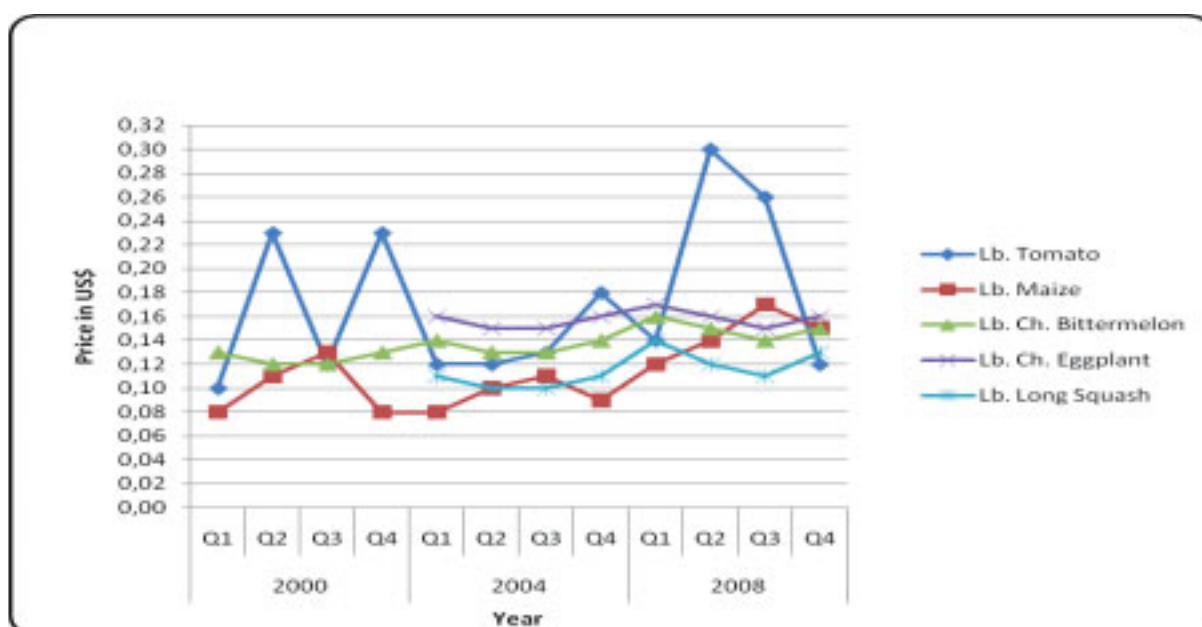


Figure 5.3. Variation of producers' price for selected crops (2000-2008)

Note: Prices of tomato and maize are wholesale prices and were transformed from Lps. to US\$. According to BCH the exchange rate in 2000 was 1US\$=Lps. 14,56; in 2004 1US\$=Lps. 18,20; and in 2008 was 1US\$=Lps. 18,89 (BCH, 2009). Prices of Asian vegetables are producers' price.

Source: Own elaboration based on interviews, documents review and SIMPAH, 2009⁹⁹

⁹⁸ Precarious condition of roads to access markets in rural zones of production and commercialization controlled by a reduced number of agents with oligopoly characteristics (MAH, 2002: 6; IICA, 2007:53).

⁹⁹ www.fhia.org.hn/simpah/simpah.htm [Accessed 7. 09].

Now, in the case of producers seeking to earn a higher income, it is likely to be related to the low price markets usually assign to staple crops. In contrast, high value agricultural crops (e.g. Asian vegetables), as their name indicates, generally have higher monetary values (Weinberger and Lumpkin, 2005: 10; Temu and Temu, 2006: 2; IFAD, 2008: 9). As a consequence, despite their higher costs of production, with an adequate management they generate higher economic returns per unit of land (Figure 5.4). Furthermore, most Asian vegetables planted in Honduras have the capacity to provide earnings in a relative short period of time (approx. 50 days after transplanting). As Figure 5.4 illustrates the production of tomato and Asian vegetables in Honduras entails higher costs than maize, but the net return the former provide is usually much higher.

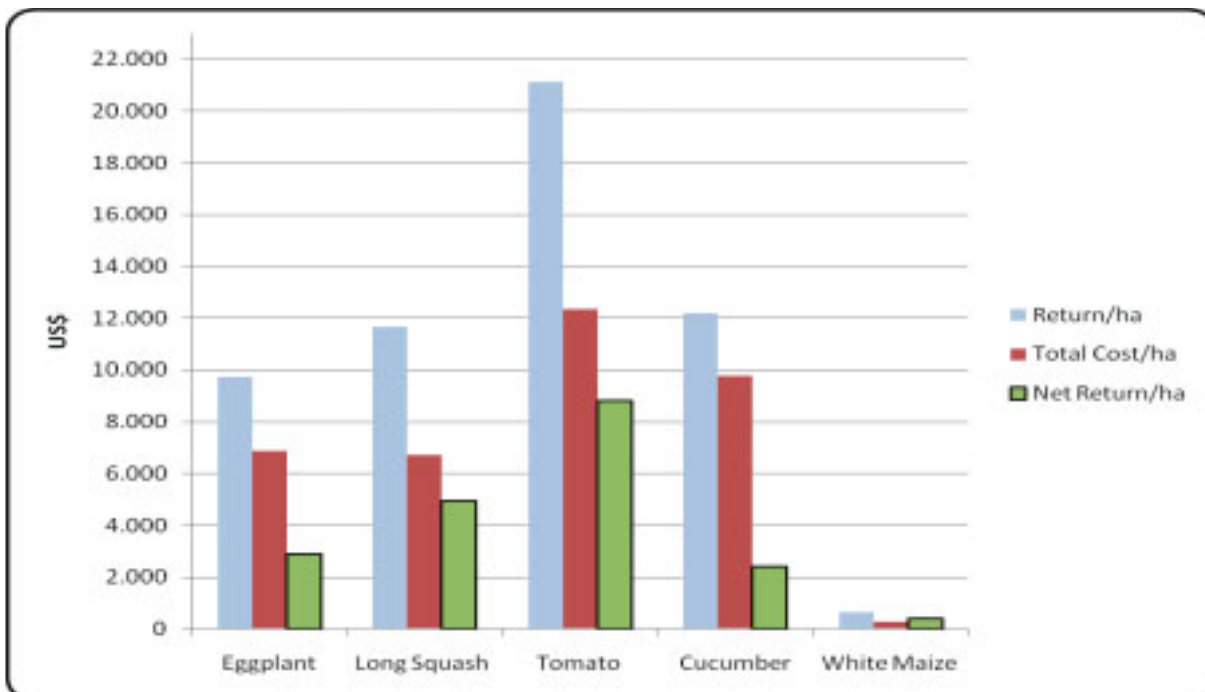


Figure 5.4. Net return of selected crops in 2007.

Note: Tomato and cucumber are produced to supply domestic and/or Central American markets. White maize is sold in domestic markets.

Source: Own elaboration based on EDA, 2007 and IICA, 2007

In principle, it could be argued that what has been previously reported explains why the majority of interviewed producers in Comayagua, a region more oriented to produce vegetables, decided to plant Asian vegetables as means to earn a stable income. Similarly in Olancho, traditionally oriented to production of staples crops, most interviewed producers plant Asian vegetables as means to earn higher income. Nevertheless, more research would be needed to verify this proposition, as we cannot assert which crop used to plant all interviewed producers before getting

engaged in production of Asian vegetables and other factors that may have influenced their decision.

Inputs supply on credit by the exporters is, in to a lesser extent, an additional reason to engage in the production of Asian vegetables. We suppose that is so, first because most producers don't expect to receive inputs from exporters timely and in the required amount. Secondly, inputs are remarkably important during the establishment period of the plantation (approx. 50 days); this is, from transplanting to beginning of production. Thereafter, the plantation itself provides the economic resources producers need to buy additional inputs on their own. However, we highlight that this doesn't mean that use of inputs supplied on credit by exporter is not an important issue; even so, according to this study for producers doesn't have the same weight than other motivations to plant Asian vegetables.

Thus, whereas staple and vegetables crops offer a less suitable situation in terms of risk exposure and income improvement, Asian vegetables, in turn, suggest a better perspective. This is precisely an important element that presumably has enormously contributed to the favorable acceptance of Asian vegetables in Comayagua and Olancho. In this regard an exporter provided the following statement:

The fact is, that producers enjoy an information advantage, in the sense that in the moment they plant certain area with these vegetables crops, they know to whom they are going to sell them and they have already knowledge of the price they are going to be paid, which is in addition, a fix price negotiated in US Dollars (EXPC3).

5.4 Strategies of Local Actors to Access and Secure Participation in the International Market

In this section transaction costs economics theory is applied to provide a framework for understanding the configuration of contractual relations between producers and exporters. Resource dependence and social capital theories are included to satisfy two gaps identified in transaction costs analysis. Resource dependence theory is applied to comprehend the role of power and social capital theory to understand the role of trust in the relationship between producers and exporters. Finally, theory of value chain governance is applied to understand the predominant type of chain (network) governance in the value chain of Asian vegetables produced in Honduras.

5.4.1 Vertical Relations between Local Actors from a TCE Perspective.

TCE theory is used to explain the incentives that lead producers and exporters to vertically link through the establishment of contractual relations.

Transaction costs are significant factors that might inhibit small producers entry into competitive markets (Pingali et al., 2005: 2) and exporters' responsiveness to market opportunities. They are the cost of carrying out any exchange (Hobbs, 1997: 1083) and are present from deciding to plant a crop to the way this crop is purchased in a supermarket. Asian vegetables are intrinsically quality-sensitive specialized crops raised for a niche market, hence subject to high transaction costs. TCE theory suggests that to lower these transaction costs exporters and producers rely on institutional arrangements such as written contractual agreements. Substantial literature is available, explaining this tendency in the agri-food sector (i.e., Hobbs, 1997; Hobbs and Young, 2001; Pingali et al., 2005; and Gulati et al., 2006). For instance, Gulati et al. (2006: 16-26) highlight the raise of contractual arrangements in both South and Southeast Asia as means to reduce transaction costs involved in the marketing of high-value agricultural products.

In relation to Asian vegetables produced in Honduras, contracts act as devices that allow exporters to ensure quality, quantity, and time delivery demanded by importers, as well as to guarantee adherence to food safety regulations and health concerns in the U.S. For producers, the incentive to get involved in these contractual relationships is to ensure a market for their product in order to improve revenue and/or reduce the revenue risk and to a lesser extent the provision of inputs on credit¹⁰⁰, as well as technical assistance provided by the exporters. Imbruce (2008:73) lends support to this argument, she found that Asian vegetables producers in Honduras contract with exporters to have stable income, financing and inputs and highest profit. Producing and selling agricultural products on a contractual basis have been extensively discussed by several authors (i.e., Glover, 1987; Little and Watts, 1994; Key and Runsten, 1999; Boland et al., 2002; and Morrison et al., 2006).

Sykuta and Cook (2001: 1273-4) distinguish three interdependent fundamental elements of contracts: i) the allocation of value, which refers to the distributions of gains from the contracted transaction, involving the price determination mechanism or the terms under which prices are paid.

¹⁰⁰ Although in some cases they are irregularly provided.

For instance, in Asian vegetables exchanges, there is a guaranteed price contract determined in advance by exporters. ii) The allocation of uncertainty, which relates to the uncertainty faced by the contracting parties, including the associated financial risk and the mechanism to reduce this risk. For instance, in the case of Asian vegetables, producers face the production risk and exporters deal with the market risk, which they successively pass to importers. And iii) allocation of property rights, which refers to the delegation of decisions regarding activities that affect the transaction. For instance, contracts allocate some decisions over production activities to exporters, such as the specification of input usage and attributes of the product.

5.4.1.1 Characteristics of the Transaction

In Williamson's (1979: 239 & 246-254; 1995: 27-31) point of view carrying out exchanges vary in respect of their uncertainty, frequency, asset specificity, and a characteristic added by others which is complexity (Hobbs and Young 2001: 40). Following this, it appears that uncertainty is the predominant characteristic in the exchange of Asian vegetables between exporters and producers. However, as it will be noticed these characteristics influence each other (see Table 5.1).

1) Uncertainty. This is probably the most important characteristic in the exchange between exporters and producers of Asian vegetables in Honduras. The main sources of uncertainty are related to incomplete or asymmetric information concerning current and future contingencies (bounded rationality). Therefore, it raises the cost of search and information (Hobbs and Young, 2001:40) to reduce opportunism of the transaction partner. The exporters have more information about the importing markets than producers and other local indirect actors do, therefore producers are able to reduce uncertainty by entering in contracts with them. These contracts provide a guaranteed market and price stability which confer to producers more certainty in relation to their income. Finding a buyer raises uncertainty, especially because as has been repeatedly indicated, Asian vegetables are not locally consumed and transactions take place in a near monopsonistic market, wherein the number of potential buyers is small. Pignali et al. (2005: 11) affirms that modern food systems are characterized for this type of markets. Technical issues are another important factor which increases producers' uncertainty. For exporters, food quality and safety related factors are a critical source of uncertainty in transactions with producers. Exporters might have serious problems in identifying true quality of the vegetables. The problem of information asymmetry becomes more serious as Asian

vegetables include some non-visual quality attributes difficult to observe and measure. For instance, those attributes related to food safety such as concentration of pesticides' residues and quarentenary pests affecting Asian vegetables.

2) Frequency. Frequency in Asian vegetables exchange relation is very much influenced by uncertainty. Jansson (1994: 72), Anderson (1996: 74-5) and Hobbs and Young (2001:40) lend support on this argument, as they assert that under greater uncertainty, frequent transactions lend parties to move towards contracting or other types of arrangement inclined to vertical integration. Transactions between producers and exporters tend to be conducted regularly based on seasonal contractual agreements, because as has been described, production and marketing of Asian vegetables for the U.S. market entail situations in which uncertainty plays a critical role. Williamson (2005: 7) explains that as transactions between producers and exporters are more frequent, it is justified to establish contracts, because this reduces the costs of building the relationship and opportunistic behavior. Put simply, low frequency of contracting in this case could result in high transaction costs.

3) Asset Specificity. In the case of Asian vegetables the relation between asset specificity and integration, seems to be as straightforward as suggested in TCE theory. That is, that higher asset specificity will lead towards more integration, which in this particular case is translated into forming contracts to reduce vulnerability to opportunistic behavior (Williamson, 1979: 241-2). However, arguably in the case of Asian vegetables produced in Honduras uncertainty plays a major role in the formation of contracts.

Bearing in mind the high perishability and quality sensitivity of Asian vegetables, it could be argued that specificity of location should be observed and therefore, packing houses always have to be placed near of producers' plantations. However, long distance transportation is performed by one exporting company which collects fruit from Olancho located at almost 300 km away from its packing house in Comayagua. It takes around 3.5 hours to reach Comayagua from Olancho by car.

Temporal specificity is extremely important for exporters and producers to guarantee the quality of vegetables and their high value. For that reason, Asian vegetables have to be harvested once they reach the point of maturation and are storage immediately under appropriate conditions.

Contracts allow exporters to ensure the accomplishment of these requirements. Dedicated specificity is observed because producers usually sell their seasonal production to one buyer, creating a relation of dependence. This dependence relation is intensified by the perishable condition of these vegetables, the existing small number of exporters buying them and the absence of local consumption. Thus, the exporter could seek to behave opportunistically by taking advantage of producer's need to harvest and sell the vegetables in a short period of time. To avoid this situation contractual relations tend to be used repeatedly.

A full specialization on Asian vegetables is somehow prevented. The required physical investments are the same for other vegetal crops and therefore, not limit the short-term movement from Asian vegetables to alternative crops. For instance, producers only would have to adapt the seedbed size and the distance among plants if they want to grow other crops, in fact, this is part of their set of strategies to have secured year long income. Exporters also have the flexibility to use their equipment (cooling rooms and conveyor belt) for alternative uses and the exporter collecting fruit from Olancho doesn't even have a packinghouse there. In relation to this, almost all exporters source other vegetables different than Asian vegetables to buyers in the U.S., although the latter are their main exporting activity.

Table 5.1 Main characteristics in the exchange of Asian vegetables (local actors)

Characteristic	Producer	Exporter
Uncertainty	Price Finding a buyer	Product quality Reliable supplier
Frequency	High	High
Asset Specificity	Human Temporal Dedicated	Human Temporal

Source: Own elaboration

The same partially applies for human investments, because some knowledge acquired is specific to the production and marketing of Asian vegetables. Nevertheless, up to now there are no private standards, certification programs or grades which could further exacerbate the need of specific human and physical investments. In spite of this, for producers a plantation of Asian vegetables per se may be regarded as a specific investment, since the lack of domestic market alone can form a major problem.

5.4.1.2 Categories of Transaction Costs

Based on Hobbs (1997: 1083) and Ruben et al. (2007: 61) we distinguish three main categories of transaction costs affecting the exchange of Asian vegetables between producers and exporters. These transaction costs affect differently to producers and exporters and are minimized through entering in contractual relations, they are: i) information costs; ii) negotiation costs; and iii) monitoring costs. Evidence suggests that, whereas the first and second categories may manifest during relationship initiation (i.e., ex ante) and over the course of the relationship (i.e., ex post), the third category tends to manifest only over the course of the relationship (see Table 5.2).

1) Information Costs. Apparently, for producers in both locations information costs are related to market opportunities and technical aspects related to quality attributes. They usually have incomplete or inadequate information regarding the importing market and it would take too much time and effort to access that information from sources other than exporters, although it seems that they provide it very limited. Exporters provide information about the product's price producers will be paid during the season and about the location of the market. Information costs can be seen from a technical perspective too. Although incomplete, exporters provide producers information on the visual and non-visual quality attributes of the vegetables and production procedures. As Asian vegetables have limited shelf-life and are quality-sensitive crops they require delicate management during growing and post-harvest stages. Exporters transfer to producers, information in the form of technical assistance which otherwise would be more costly to obtain. This assistance is mainly oriented to the use of permissible inputs and pest control practices, but also to a lesser extent and especially to less experienced or new producers, on cultivar selection, planting decisions and post-harvest management.

Producers often have more and better information about the quality of the product and exporters need reliable suppliers to supply the right quantity to a high quality demanding market. To exporters the reduction on informational asymmetries, which is translated in the reduction of costs, is the result of more control over production practices. As has been mentioned before, Asian vegetables are highly perishable crops, which makes it essential to coordinate harvest and delivery to avoid deterioration, otherwise the quality and quantity may be affected. Through contracting they are able to obtain information on how has been carried out the production process. Consequently, they are able to guarantee steady quality vegetables in terms of physical

attributes and food safety to their buyers. According to Venturini and King (2002: 72) contractual relations or closer vertical relations facilitates the transfer of information between local actors and reduces information asymmetries.

2) Negotiation Costs. Negotiating between parties is time consuming and expensive (Jansson, 1994: 71). Asian vegetables cannot be sold in the spot market, even if they have very low quality attributes. This is so, because consumption of most Asian vegetables in the local market is quite limited, except in the case of Chinese eggplant which is consumed by Asian immigrants, but still in relatively low volumes. For a producer planting Asian vegetables without having a contractual agreement with any of the exporting companies, means that he will probably incur in high negotiation costs to sell his produce, because exporters are not confident on the production procedures he has followed. Furthermore, when the negotiation takes place, there is a high possibility that the producer will do it with much reduced bargaining power, especially in the low season, when the quality criteria tends to be stricter. In Olancho, this condition is still more sensitive. There, producing Asian vegetables without contract is something in extremis, given that producers cannot even turn to alternative exporters and they might be compelled to through the product away.

From a different angle, negotiation costs for both exporters and producers are reduced as they repeat the transaction, because in general, the specifications in contracts have not changed very much in the course of past years and are expected to remain this way in the midterm. For instance, after planting one season, the producer already knows the quality parameters, the days and time of delivery to the packing plant or collection point, as well as when and how he will receive the respective payment.

3) Monitoring Costs. Since producers have information about the required quality characteristics of the vegetables and the accepted production procedures, as are for instance, the different predetermined product grades and the specification in the usage of permitted pesticides, the pre-sorting made by them in the field allows exporters to avoid incurring in excessive costs to assert vegetables true quality at the packing plant. Moreover, although a full system of tracking is not yet in place, exporters are able to trace the use of restricted pesticides through fast test procedures carried out at their packing plants (traceability). This is partially possible because

they have collected information about their suppliers' production process and know what they have produced, how they have produced it and when it was produced. It seems that besides the cost of doing it, these are the reasons why exporters are capable to avoid supervising frequently producers' plantations.

Producers' negotiation, they don't have to monitor issues related to payment procedures for the vegetables they sell to exporters.

Table 5.2 Main categories of transaction costs affecting local actors

Transaction Cost	Producer	Exporter
Information Costs	Price Quality Use of inputs Crop management (pests control)	Reliable supplier Quality Process of production
Negotiation Costs	No domestic market available Invariable specifications	Invariable specifications
Monitoring Costs	Payment	Reduced supervision of plantations

Source: Own elaboration

In summary, it has been argued in the foregoing that exporters and producers engage in contractual relationships, principally to reduce the uncertainty involved in the exchange of Asian vegetables, whereas economizing on the main transaction costs (information, negotiation and monitoring) they incur in carrying out this exchange. As spot markets are not able to provide these vegetables with the required specifications demanded by buyers without incurring in high transaction costs¹⁰¹ (Kherallah and Kirsten, 2001:20; Hobbs and Young, 2001: 19-24), these contracts function as a vertical coordination mechanism which allows both parties to meet their obligations to their respective buyers.

However, we have to be aware that not only exporters seek to minimize transaction costs, they also seek to minimize land costs, labor costs and investment costs. These costs are as well, generally reduced through contracting agreements with producers. Therefore transaction costs are only one factor (albeit very important) affecting the configuration of vertical relations among them and producers. We have referred to exporters, because they introduced contractual relations in the

¹⁰¹ For instance, the cost of searching information about reliable partners and price, as well as monitoring costs. According to Bardhan (1985: 1390) information costs constitute an important part of transaction costs.

production of Asian vegetables and some of them still manage their own plantations to source their buyers.

5.4.2 Power Relations between Local Actors

In this section we apply RDT to explain the power relations between producers and exporters.

The role of contractual arrangements between exporters and producers seems to be ambivalent. The exchange cannot be carried out without them, yet they protect some interests, but exclude others. It reveals the tensions inherent in the relation involving two actors that are shaped by mutual mistrust and that maneuver in different ways to overcome this problem. Watts (1994: 60-72) as well as Kherallah and Kirsten (2001: 26) emphasize that contracts cannot be considered a panacea for integrating small producers to high-value markets.

In addition, in spite of having a contractual agreement the costs involved in suing a breaching party are too high in an economic and social point of view. For producers the simplest alternative is to transit among buyers, for exporters the most realistic option is to deny future participation to negligent suppliers. As Imbruce (2008: 75) asserts contracts between producers and exporters have more symbolic than material meaning. However, in the case of producers, it seems that contracts enforce awareness that the consequences of breaking the agreed terms can be worse than being excluded of the chain.

Resource dependence theorists argue that the dependence of one actor is tied to the power of the other actor. When one partner controls resources (asymmetric condition) that are needed by the other partner, the latter becomes dependent upon the controlling party (Emerson, 1962:32; Dwyer, 1987:17; Johnson, 1995:4).

Collins (1975: 310-2) quoted in Galaskiewicz and Marsden (1978: 103) emphasize the central role of information as indirect control device, indicating that command of information channels is crucial in determining patterns of influence and legitimacy among organizations. According to this the existing skewed power relationship may be reflected through the exporters' provision of selective and partial information to producers. The flow of information from exporters to producers is related to the size of the area under production, the scheduling of production, quality parameters

and the use of permitted pesticides, but scarce on production processes, new technologies and the end consumers desire.

Furthermore, with the fact that producers have accumulated a wealth of knowledge and experience over the last years, some exporters, if not all, are now less involved in the provision of technical advice. This has intensified the existing skewed power relationships as the appearance of pests has threatened the continuity of production of Asian vegetables in Comayagua, leading exporters and government to assume a stricter position in relation to food safety and pest management practices of producers in Comayagua and to a lesser extent in Olancho.

It may be argued that exporters are afraid that as producers develop competences they will no longer rely on them. It may be that exporters are afraid of losing power or that there will be a power shift as producers become more experienced. An example is the emergence of the producer-owned company which members, by means of this experience, have gained a better understanding of marketing activities and hence feel prepared to export on their own. According to its members, when the producer-owned company came on the scene the exporters were forced to raise the price they offer to individual producers. RDT asserts that an actor seeking control over other party can act to increase the conditions that facilitate control, and thereby increase its control over the other party (Pfeffer and Salancik, 2003: 259-60). They indicate for instance, the actor's discretion in the allocation, access, and use of the critical resource to maintain status quo such that the asymmetrical dependence relationship continues (Ganesen, 1994: 4).

There has been a great deal of controversy over the way exporters¹⁰² grade and sort the vegetables, especially during the low-season. It is not clear which grades they apply in the low season, because they reject more fruit than in the high season even when producers follow the same parameters in both seasons. Producers argue they follow the parameters the exporters have provided in the field. This issue not only reveals the nature of the unbalanced power relationship between producers and exporters, but also the existent interdependence relationship between them.

¹⁰² Particularly with respect to the largest exporter in Comayagua which also collects fruit from Olancho.

Apparently, the quality control exerted by the exporters is more generous in the high season, owing to the fact that their buyers demand larger amount of product and they (exporters) are in a desperate position to fulfill these expectations. Under these circumstances, producers may be capable of selling to the exporter more quantity (less rejection), to obtain a higher price (depending on the exporter) and what's more, to receive some incentives such as transport of the fruit from the plantations to the packing plants carried out by the exporters. Hence, producers prefer to plant large areas in the high season. Some actors provided the following comments:

During the low demand season USA and Mexico are producing Asian vegetables, and here, the exporters only take first quality fruit. However, in the season from November to March or April (high season), sometimes when there is no fruit in the USA, even third quality fruit is taken by the exporters (MTTC).

The best season to plant is from August, but I plant the whole year. We plant more area from August because the packing (quality control) and price are better, then we get more money (PRC4).

We export Asian vegetables all year. We export approximately 450 containers per year. In the high season we export 70% of this quantity and in the low season 30%. The high season goes from November to April. In low season we deliver approximately 4 containers per week, while in the high season we deliver up to 2 containers per day (EXPC2).

Misunderstanding of quality grading has probably arisen from four sources: i) the majority of exporters have refused (only one accepted to do it) to make openly available the grading standards they apply in their packing plants. ii) Producers are not able to observe the process of sorting at the exporters' packing plants. Some packing plants are open, however it may take hours to observe the sorting process and producers don't do it, due to high opportunity cost. iii) Producers don't employ scales to weight boxes; therefore their claims about rejected fruit may be groundless, as they deliver underweight boxes to exporters' packing plants. iv) Poor post-harvest handling has adverse effect on quality, most notably during transport to the packing plants (damaged boxes, roads and vehicles).

Yet a producer who may have obtained a good yield seems to be doubtful about what will be the end outcome, because all factors above indicated. This suggests that risk is ever present, even having a secure market and secure price. In this regard, RDT suggests that the lack of self-sufficiency leads to dependence on other actors and introduces uncertainty into the dependent actor decision making environment (Varadarajan and Cunningham, 1995:287; Casciaro and Piskorski,

2005: 172). Exporters have no losses, as one of them expressed, “losses are only those that producers have, here at the packing plant we have no losses”. Exporters take what meet their quality standards and it is not clear what happen with the rest. No one seems to know what happen with the rejected fruit. This phenomenon is what precisely seems to justify providing information on the grade standards they apply at their packing plants. As a result, producers switch among exporters principally based how they sort (rejection) the fruit and second on price, because there is not significant variation among firms in terms of price. Instead, Imbruce (2008: 76) found that the first reason why producers of Asian vegetables in Honduras switch exporters is pricing and the second reason when they believe that firms reject the fruit based on false quality claims. A producer in Comayagua made the following comment:

The percentage of loss depend on the season, because when there is higher demand the exporters eliminate less fruit, that is what help us as producers, is not really the price, but the packing (quality control), because the exporters need more fruit (PRC2).

For instance, the USDA Marketing Agricultural Service has developed three different grades standards for eggplants¹⁰³, for which there are clearly described attributes. The aim of these grades standards is to provide the industry involved in growing and shipping the product, with a common language for describing quality and condition of commodities in the market place (USDA/AMS, 1997)¹⁰⁴. It may be that exporters during the low season select merely fruit with the highest grade standard. However, producers are only informed about the general required characteristics of the vegetables.

The researcher’s interpretation is that the effect on exporters doesn’t seem to be as severe as in the case of producers. Apparently, they (exporters) have enough space to maneuver under these circumstances because they are less dependent. This draw from two points, i) the low control exercised by Asian retailers and other international actors over the chain; and ii) the closer and balanced relationship between importers and exporters. The first point is supported by the absence of private standards or certification programs, today commonly observed in mainstream vegetables value chains wherein, as Reardon (2005: 22) affirms supermarket chains and large processors

¹⁰³ Although there are no official grade standards for Asian eggplants (Lamberts, quoted in Krigsvold and Gómez, 2003: 53).

¹⁰⁴ Source: <http://www.ams.usda.gov> [Accessed 10. 09].

implement private quality and safety standards. Imbruce (2008: 76) lends support to this argument. This author points out that there is not standardized system of grading along the entire chain of Asian vegetables, which makes more ambiguous the assessment of quality. However, in the case of eggplants for instance, the market is highly demanding in terms of firmness, ripeness, size, color and damage (Krigsvold and Gómez, 2003: 52). Imbruce (2008: 76) adds about the second point, that because Asian vegetables are bought on consignment, it is likely that importers in the U.S. reject the fruit the market cannot absorb and transfer the losses to exporters in Honduras and subsequently to producers. Nevertheless, regarding the second point, we have found that exporters have long term win-win relations with their main buyers. Although the fruit is accepted on consignment, the exporters are able to negotiate the minimum price they are willing to sell a container for, rather than per box, which means that the importers buys all boxes in the container. The importer gets at least the cost price and makes money off of moving the maximum number of boxes. Therefore, independently of how much the importer sells the exporter knows the minimum profit he will get.

In summary, at the end what defines the profit of producers, other things being equal, is the quality assessment made by exporters at their packinghouses, based on inadequately socialized parameters, which reduces procedure's transparency. In Olancho this situation is more complex for the reason that there is no packing plant and the fruit has to be transported to Comayagua, which is a driving distance of almost 300 km or 3.5 hours in a relatively good road. Therefore, given rise to more speculation about the exporter's management during transport and its effect on quality.

The upshot leads to the deduction that exporters determine how the incomes are distributed at the local level. In this sense resource dependence points that the more powerful party is in a position to create more favorable terms of trade and divert the profit from the less powerful party (Ganesan, 1994: 4). In fact, it appears that exporters and Asian retailers capture the highest percent of the chain total value share with 26 and 31 percent respectively¹⁰⁵. It is like that they perform the most adding activities in the chain. Importers gains depend on volume of produce they sell and obtain around 16 percent of total value share.

¹⁰⁵ See section 4.11.1.4 Distribution of Gains.

RDT suggests that dependent exchange partners may wish to regain control and influence their power balance by acquiring and defending a secure and adequate supply of critical resources or by developing substitute sources which can reduce their dependence (Andaleeb, 1992 and Arndt, 1983 quoted in de Wulf and Odekerken-Schröder, 2001: 93). Consistent with that, producers particularly in Comayagua attempt to contest exporters' power through different measures. i) The most obvious seems to be by switching among exporters after the contract expires. It is probable, that this alternative provides the large amount of independence and the lowest social cost to producers. ii) Another approach to attenuate the apparent unbalanced power relationship with exporters is not being loyal with the contractor exporter by means of deliberately selling the produce to any of his competitors. This is in fact a producers' default on contractual terms. Thus, the social cost associated to this alternative is high and the producer face the risk of being excluded of the chain. For that reason producers usually undertake this action cautiously with the support of a relative or a close partner. iii) Some producers prefer to avoid being dependent on exporters. They operate their plantation with their own resources, usually savings from last plantation or other sources, they don't take inputs on credit from the exporter. Furthermore, some of them produce their own seed. Thus, these producers are able to sign contract with different exporters simultaneously. iv) depending on the Asian vegetable they plant, producers are conferred with some bargaining power too. Producers who plant Chinese eggplant and chive flower are priority for exporters. Chinese eggplant is the vegetable with highest demand from exporters' buyers in U.S. and they pay the highest price for chive flower. As previously indicated, in 2006 production of Chinese eggplant was banned in several localities of Comayagua, therefore those producers who are able to produce it are rewarded with services, such as free transport of the produce from the plantation to the packing plant. Few producers plant chive flower, mainly large producers do it, because it may take around 8 months before it can be harvested and for most producers that is too much time without earning money. v) The last alternative advocates for collectivism. So far the most successful but ephemeral attempt has been the price negotiation in 2008, which brought together producers from both locations. The producer-owned company is still in its infancy, but emerges as an important long-term alternative to improve producers bargaining power.

5.4.3 Trust between Local Actors

Here is applied social capital theory as an attempt to establish a link between the quality of outcomes and the level of trust observed in the relationship between producers and exporters.

Social capital theorists recognize that lack of existence of some forms of social capital such as trust affects efficiency of groups by impeding coordinated action (Coleman, 1988: S100-1; Putnam, 1993a:167). Matching with that, the low level of trust among local actors has eroded their willingness to collaborate and makes very difficult to obtain the benefits derived from working cooperatively rather than competing each other. More often than not, the occurrence of problems is attributed to the negligence or bad faith of the other party. Broken promises and lack of understanding prevail among local actors. Trust in this case has very much to see with the credibility of the parties. Chambers et al. (2005: 3) assert that there is an ever present mistrust atmosphere in the Honduran horticultural sector. Stonich (1993) quoted in Imbruce (2008: 77) asserts that this mistrust is a continuation of a historical legacy between international capital and peasant farmers in Honduras.

We would add that this low level of trust is a major contemporary problem in the Honduran society, which goes beyond the vertical relations and horizontal relations between actors in the chain of Asian vegetables as well as at the entire agricultural sector. This problem has its roots in the deficit of values regulating social life and the population low prospects to observe a significant change on the current situation. According to the National Transparency Report produced by the National Anti-Corruption Council/Consejo Nacional Anticorrupción (CNA), 93 percent of respondents in a national survey expressed to have little or not at all trust on other individuals (CNA, 2007: 5), and the level of mistrust on public institutions and large companies is also high, none of them reached a credibility level of over 50 percent (CNA, 2009:81). The same document reports the more than 30 percent of respondents believe it is impossible to eradicate corruption in the country (CNA, 2007: 5). In addition, the United Nations Development Program reports a low participation of Honduran citizens in associations other than religious organizations as compared to the majority of Latin American countries (PNUD, 2006: 104). In this respect, Fukuyama (2000: 4) asserts that all groups embodying social capital have a certain radius of trust, that is, the circle of people among whom cooperative norms are operative. This reduces the ability of group members to cooperate with

outsiders. The same author adds that in Latin America, social capital resides largely in families and a rather narrow circle of personal friends (Fukuyama, 1999 quoted in Fukuyama, 2000: 5).

Kilpatrick, (1999: 1) found that trust and networks are important indicators of social capital. Therefore, faced with this scenario of declining social capital and powerlessness; individualism and/or resignation tend to prevail in the relations between producers and exporters characterized by power unbalance. Arguably, these can be seen as some of the causes of failure of collective action strategies of Asian vegetables producers aimed to modify power relationship with exporters. The poor effectiveness of their collective action has been not only influenced by the negative rules of conduct observed by some producers, but also due to the notion of subordination derived from producers' helplessness. For instance, some producers recognize their fear to be regarded as rebellious by exporters and therefore being taken out of the chain. After all, even under the current difficult conditions, planting Asian vegetables for the exporters in Comayagua is the best option they have available.

It is precisely this condition of producers' helplessness of being able to shift the rules of the game in their favor, wherein seems to rely a major portion of exporters' power. This fact is connected with the perception that those who have economic and political power can neutralize the public function and therefore underpin the weakness of the rest (CNA, 2009:157). In this sense Woolcock and Narayan (2000: 234) based on an institutional perspective of social capital argue that the vitality of community networks and civil society is largely the product of the political, legal and institutional environment.

The price negotiation with exporters was a visible impact of the power of producers acting collectively, however this was an ephemeral effort and apparently the government has stepped aside. Thus, what has been generated is what Ramirez and Berdegue (2003: 3) have called pseudo-collective actions which have been artificial and ephemeral designed solely as a function of the objectives of an externally inspired project or policy. As Putnam (1993a: 167) emphasizes, the success in overcoming dilemmas of collective action depends on the broader social context.

Likewise, common vision emerges as an important missing mechanism guiding the relations of exporters. There have been deliberate moves by some exporters to undermine each other's

operations and efforts, so as to reduce the number of participating companies, in order to get a bigger share of the market. Imbruce (2008, 75) reported these incidents as competition through pricing wars and improved services to farmers in order to win farmers' favor in Comayagua. However, this study found that in Olancho this was not the case. Instead, a "predatory exporter" offered higher prices exclusively to the producers supplying the competitor and not to its own suppliers. The result was that the competitor was driven out of the market. As the competitor went out of the region, the "predatory exporter" is now the only buyer in the region and producers are more vulnerable. Therefore, this type of predatory behavior has had negative effects not only for producers, but as well on the whole chain. For instance, an exporter expressed his willingness to share more information related to the grading standards he applies at his packing plant, but he was restrained because the largest exporter, the same which collects fruit in Olancho was reluctant to do it. Bouma (2001: 86) stresses that actors do not compete individually for market position, rather they compete as part of a supply chain system targeted to meet the specifications of a particular market segment.

As has been stressed above, this lack of trust has resulted in important information being withheld by exporters, which could help guide policies and decisions made by the government for the industry. Besides quality assessment of the vegetables, information relating to prices offered by the importing companies is not readily available to the general public and thus it is difficult to determine the actual profit margins and the cost of marketing imposed by exporters. According to social capital theorists the first direct benefit of social capital is information (Adler and Kwon, 2002: 29). Coleman (1988: S104) informs that an important form of social capital is the potential for information that inheres in social relations. Thus, in accordance to this theory, in the context of Asian vegetables produced in Honduras, social capital seems to be fragile.

5.4.4 Inter-firm Governance in the Value Chain

In this section we reconcile our results with global value chains governance theory. Based on governance theory formulated by Gereffi et al. (2005) relations between producers and exporters can be characterized as having a captive-based governance structure, wherein the exporters exert dominant control over the activities carried out by producers (see Figure 5.5). According to Humphrey and Schmitz (2008: 264) in agribusiness value chains outgrower schemes are the best example of captive suppliers.

Exporters exercise coordination through the communication of product specifications relating product characteristics and production processes to ensure that Asian vegetables meet the standards required by the export market. This type of governance suggests a high degree of explicit coordination and a large measure of power asymmetry (Gereffi et al., 2005: 88). Following, we discuss the pattern of governance found based on the three key determinants of value chain governance patterns identified by Gereffi et al. (2005: 84).

5.4.4.1 Complexity of Transactions

Asian vegetables are high quality products; they are exotic and produced for a niche market. Consequently, the product and process specifications required to export them are not simple to transfer. For instance, The Federal Food, Drug, and Cosmetic Act and the introduction of the U.S. Bioterrorism Act in 2002 rested the responsibility on exporters and Honduran government to assure importers and U.S. government authorities that Asian vegetables produced in Honduras are safe for consumption. In addition, to remain competitive in the market, exporters have to be sure that quality of vegetables is not only good, but consistent, and this is particularly complex with quality-sensitive crops such as Asian vegetables. Exporters as well have to deliver the vegetables on the scheduled time. Therefore, they have to transmit detailed instructions to producers to meet the specifications of the importers and the U.S. government authorities. According to Dolan and Humphrey (2004: 494) complexity of information raises due to product differentiation strategies of buyers and the increasing complexity of the regulatory environment.

5.4.4.2 Ability to Codify Transactions

Although surrounded by some confusion, Asian vegetables attributes are codified. The importers define the product standards and the exporters communicate them to producers. The production process specifications, including labeling are based on public food safety standards defined by U.S. government authorities. There are neither private standards nor certification of Asian vegetables produced in Honduras. Recently, the Honduran government with the support of exporters introduced the Phytosanitary Guide to control and regulate the production of vegetables. This guide is based on the requirements of several U.S. agencies, including FDA, APHIS and EPA. It demands the establishment of GAP and GMP in all farms and packing plants involved in the production of Asian vegetables.

5.4.4.3 Capabilities in the Supply-base

Technical capabilities of most producers are not sufficient to act upon the information from exporters. Production of Asian vegetables is concentrated on small producers who manage semi-technified production systems and have limited access to information regarding export markets requirements in terms of product and processes. Therefore, exporters are forced to coordinate producers' production activities in order to ensure quantity and quality. They carry out inspections in the plantations and follow test procedures at their packing plants to verify whether producers comply with the requirements.

The relationships between exporters and importers display the characteristics of a relational linkage (see Figure 5.5). The complexity of transaction is high for what has been indicated before in the description of the relationship between producers and exporters. Reliance on importers' informal and experiential knowledge is probably the major channel of exporters approach to U.S. relevant market knowledge acquisition and use. Therefore, there is an important flow of information between importers and exporters without undue formalities and this is tacit knowledge acquired in part by practice and that hardly can be codified. Exporters and their main buyers have developed closer and long-term relationships and there is mutual dependence. Power is symmetric and the risk is distributed on mutual agreement. In one case there is forward and backward integration, other exporter have formed a strategic alliance with his buyer and in the most recent formed relationship the importer invest on the exporter. Therefore, exporters seem to be competent to perform their function and meet the requirements of importers. An exception is the producer-owned company which doesn't operate regularly due to lack of unreliable buyers and capital. However, when they have exported on their own their relation with importers may as well be characterized as relational.

In the rest of the chain linkages, it is likely that they exhibit the characteristics of relational governance structure too (see Figure 5.5). All these linkages are all located in the U.S. and are distinctive with Asian ethnic ties. Marketing and distribution of Asian vegetables is tied to Asian immigrants' populations. In other words, from importing until consumption the chain is dominated by Asian origin citizens and this is a noticeable distinction with respect to mainstream vegetables chains. Importers, wholesalers, retailers and consumers are present in larger cities and a broad cultural diversity is behind them, including citizens with different ancestral roots such as Korean, Malaysian, Philippine, Thai, Vietnamese, Chinese, Indonesian and Japanese. This seems to be

consistent with Gautam (2005: 39-44) who affirms that Asian vegetables retailers in Michigan do not enter in contractual agreements with suppliers, instead they work on a spot market relationship, based on long term satisfactory business relationship.

From the previous discussion on governance structure it seems reasonable to assume that there is not well defined Asian vegetables value chain leader. This is an ethnic value chain wherein the predominant governance pattern suggests the emergence of power symmetric relationships among all actors except between producers and exporters in Honduras.

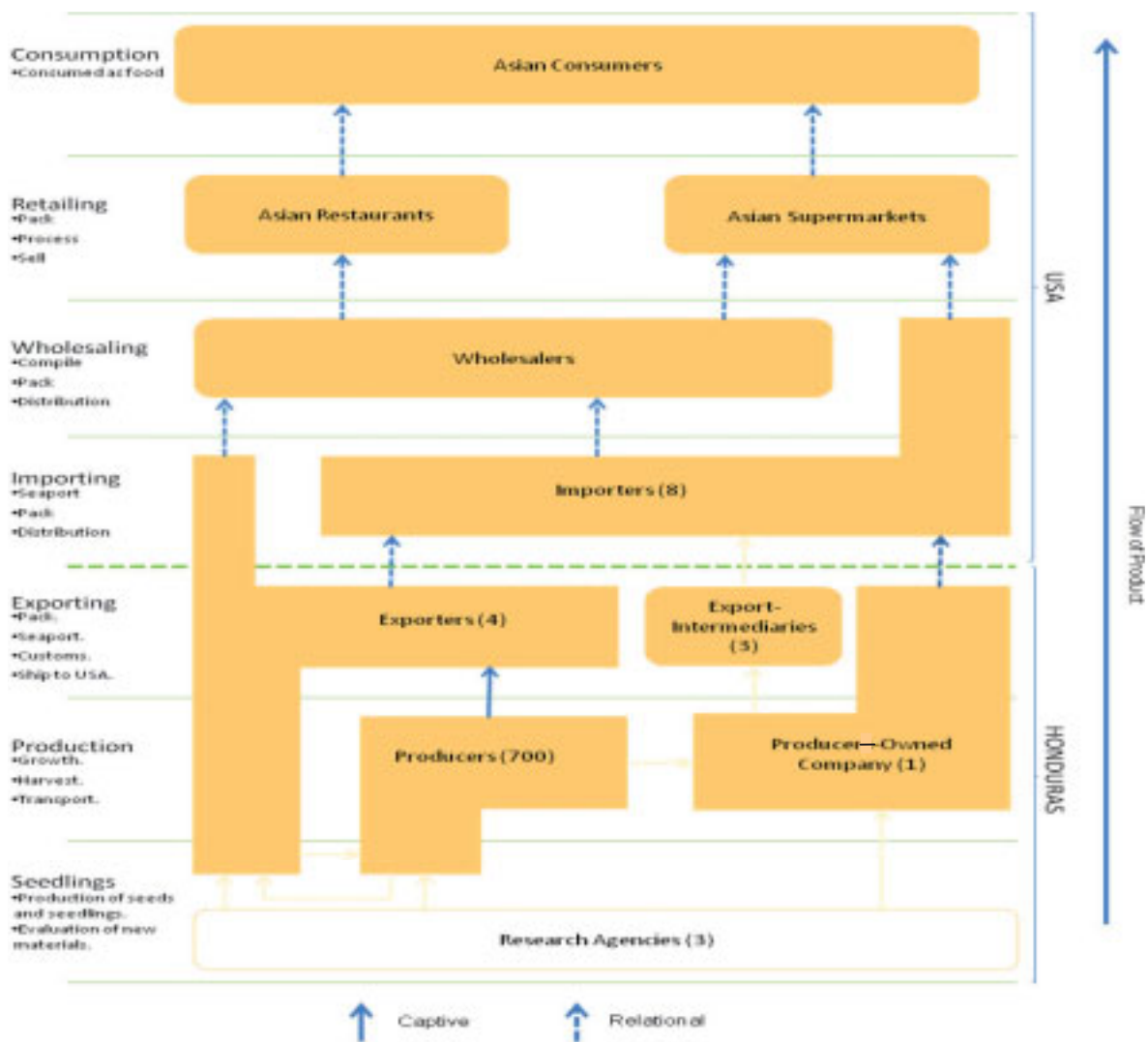


Figure 5.5. Value chain of Asian vegetables produced in Honduras: Governance types
 Note: Figures within brackets represent the number of participants performing a function.
 Source: Own elaboration

Our results suggest that the quality standards are set by large importers located in major U.S. cities and that these standards vary depending on the nationality of the Asian importer. However, due to this study limited availability of detailed information about the relationship between importers, wholesalers and retailers, this suggestion may lack precision. Similarly, Imbruce (2008: 76) found that it is the wholesalers in New York that really set the quality standards and benefit from sorting the fruit according to the quality of their daily inventories.

5.4.5 The Role of the Government

Although some efforts are visible, missing public strategic services, as well as poor quality of those in place have a significant negative effect on the costs involved in carrying out exchange between parties participating in the production and marketing of Asian vegetables. The corresponding result is thus, the limited increase in productivity and competitiveness of local actors and their performance in the chain. North (1990: 110) states that third world countries are poor because the institutional constraints define a set of payoffs to political/economic activity that do not encourage productive activity.

5.4.5.1 Trade Policies

The sector of Asian vegetables is unregulated with limited government specific policy interventions to date. The sector has not been affected by price controls, trade licensing requirements and direct tax regime or other any type of trade control or tariff.

There are not explicit trade barriers for Asian vegetables between the U.S. and Honduras. Nonetheless, shipment inspections apply. Despite of the continuation of prevailing market conditions, the effect and implications of the DR-CAFTA in the production of Asian vegetables and the horticultural sub-sector in general, remains to be seen. One has to be aware that in general producers lack enough knowledge and understanding to be able to take advantage of DR-CAFTA. The government has not done too much to modify this situation. Alternatively, with the implementation of this trade agreement the exporting sector is seen as one of the main winners (Aráuz, 2004: 281).

It is imperative to consider is that main competing countries (Mexico and Dominican Republic) and new entrants (Guatemala and Nicaragua) in the export business of Asian vegetables enjoy the

same benefits granted by the U.S. government through this trade agreement. In this sense, if pertinent actions to improve the performance of the local chain are not taken in the short-term, it could imply a further deterioration of Asian vegetables exports sourced from Honduras. Rosales (2004: 165) stress that the government should focus on strengthening the activities that foster the proper performance of value chains.

5.4.5.2 Institutional Services

Within the basic thrust of government's economic policies oriented to diversify the economic base to break the reliance on a narrow range of traditional crops and to foster private sector development and competitiveness, it was recently established in 2007 the Asian Vegetables Chain Subcommittee. This is in the researcher's view, a major step towards the integration of the sector in order to respond to export market opportunities and improve the socioeconomic conditions of producers. This Value Chain Initiative approach has been the first attempt of encouraging a close working relationship and understanding amongst the major actors and participants in the Asian vegetables industry in Honduras. A strategic plan has been formulated to guide the actions of the sector, but so far it has not been put into practice. It seems that there is lack of consensus about its application between actors and the government.

In this regard, very often the government interventions have had limited success in addressing the underlying factors that cause local actors vulnerability within the chain, because of its weak enforcement capacity. Nonetheless, some indirect actors have a different opinion and attribute the poor progress to failures originated from government's unrealistic outlook. For instance an official on an international cooperation agency provided the following comment:

Beyond the fact of having the chain, so far we have not seen any positive work. From my point of view the meetings are a waste of time, because participants are mostly people of SAG, they dream too much and never land. Many stakeholders have withdrew, like NGOs that provide technical assistance, input suppliers and only the people of SAG has remained, in my opinion there is not good representation (EDA).

On the other hand, the government's budget for research and technical assistance to the industry and in general to the agricultural sector¹⁰⁶ is much reduced, relying largely on foreign assistance. Programs are mainly reactionary in nature and concentrating on short-term problem solving

¹⁰⁶ In fact, is like that for all economic sectors, but specially agriculture. For more detail see Serna (2007: 8-10).

(diseases control) and missing out more important programs that would, in the long run, have a significant positive impact on Asian vegetables related activities. For instance, action has been taken only after serious pests' problems have arisen. These problems have hampered dramatically the performance of the producers and exporters, most notably in Comayagua, where in several locations production of Chinese eggplant has been banned. This has had significant transaction costs implications not only to producers who have to search information on alternative vegetables or places to plant, but also to exporters who have to search additional producers in unbanned locations. The limited extent of technical assistance programs is illustrated through the comment of an official working with one of the most active research institutions providing support to producers and exporters in Comayagua:

Now that the project has finished, the service is generally free of charge when somebody request only information, if we have to travel to the farm there might be a charge, for other services such as seedlings production, soil and water analysis and seed there will be a charge. When Asian vegetables came to Comayagua we were focused on varietal analysis, but today we are concentrated on providing answer to several current problems (FHIAC).

Serna (2007: 7-8) notes that, in spite of its importance the rural sector and particularly related agricultural activities they don't receive nor the amount neither the quality of support necessary to compete, sustain growth and increase the income.

5.4.5.3 Regulatory Framework

The government through SENASA plays an active role in the regulation of product and process standards in the sector. Here again, it has been criticized because of its weak enforcement capacity. For instance, several producers don't follow entirely the rules set by the public authority. Moreover, some pests have emigrated from Comayagua to Olancho affecting production on the region, and there is an increasing number of producers in Comayagua who grow their own seeds without following the required certification standards and regulations.

In reference to the more dynamic and apparently effective involvement of SAG agencies observed in Olancho. In the researcher's view, this stem from several reasons: i) in Olancho there is an specific unit created to deal with Asian vegetables' issues; ii) there are fewer producers and area under production is smaller, which facilitates closer communication and exchange of information; iii) the country's production of vegetables is concentrated in Comayagua, therefore SAG has to

deal with a broader range of problems and actors; iv) producers in Olancho are less experienced in production of vegetables, hence are more likely to heed SAG's call.

5.4.5.4 Infrastructure Services

The basic premise that competitiveness requires the existence of adequate public infrastructure has not been fully accomplished yet, and there is a long way before reaching it. Poor condition of secondary roads due to inadequate or not available routine maintenance, leads to considerable reduction in produce quality. In addition, this increases vehicle maintenance costs, which are associated to information costs on replacement parts, repair shops and transport operators. This situation is particularly evident in Comayagua where the most transited roads are in poor condition. For exporters, an important step to reduce monitoring costs is to ensure quality control through adequate transportation, but this seems to be difficult to attain given the condition of roads in Comayagua. Precarious condition of roads to access markets in rural zones of production is one of the main factors affecting the efficiency of rural markets in Honduras (MAH, 2002: 6; IICA, 2007:53). Dorward (2001: 71) asserts the high transaction costs may be associated with poor communication, increasing the need to monitor quality. On the other hand the adoption of mobile telephones has not only reduced transaction costs, but also has increased the velocity of transactions.

Facilities such as cold storage rooms and refrigerated trucks are beyond the reach of producers. Temperature is the single most important factor in maintaining quality after harvest (Bachmann and Earles, 2000:2). This factor, along with the poor condition of secondary roads affects negatively produce quality and have an adverse impact on producers profit and increase the exporters' cost of monitoring even when this is done at their packing plants.

5.4.6 Supporting Markets

It seems that there is a relatively developed market for business services in both locations. However, most local supporting services providers don't have the capacity and resources to provide technical assistance and depending on the relation with the buyer, he might provide the service on credit.

5.4.6.1 Financial Services

Access to financing for producers tends to be restricted because commercial banks are not willing to lend to them and the amount lend by the exporters is insufficient to meet their production needs. Additionally, the provision to credits to producers from the national bank (BANADESA) is as well limited. Although there is a vegetables production oriented financing scheme, the process of financing is to slow and the terms are costly. Furthermore, it is likely that the financial scheme implemented through BANADESA in Olancho won't be possible in Comayagua because of the bad experience in the former, the organizational problems associated of dealing with more producers and the high risk involved.

Despite the fact that this issue is most pressing for producers, exporters are also affected, as most banks are averse to agricultural lending due to a perception of high risks. This situation increases the burden on exporters, who have to find alternative ways to fill this gap not only for their own activities but also for producers'. Since producers have less financing alternatives are tempted to misuse exporters' credit. Consequently, exporters incur additional expense to monitor and ensure themselves that producer is creditworthy. Additionally, it is not possible to invest in necessary improvements to upgrade without finance from financial institutions. In environments where financial markets are imperfect and credit is rationed can prevent a large proportion of the population from making productive investments (Binswager and Deininger, 1997: 48)

5.4.6.2 Production Inputs

Costs of production inputs have been increasing rapidly in the last years, especially fertilizers (FHIA, 2008:1). Production inputs are mainly supplied on credit by the exporters. However, the amount received from exporters is not enough or is not timely delivered. It is likely that to ensure supply of vegetables some exporters offer more than what they can actually give. For producers this situation implies spending more time searching for information on prices and alternative supply markets. Some producers therefore, reduce the optimal amount of fertilizer use or apply cheaper pesticides with lower effectiveness. Hence, the yields per unit of land and quality are poorer, reducing the returns. Moreover, transaction costs such as searching labor, searching machinery services to prepare land in the adequate moment and in some cases searching transport services to deliver the produce in the right time are additional obstacles.

In view of these constraints UNO (2007: 4) suggests that developing countries would benefit from public-private partnership that assist producers with access to credit, technical assistance, capacity building and marketing information.

Barrett and Mutambatsere (2005: 10) on revising the history of agricultural markets in developing countries conclude that the fundamental functions of input and output distribution, post-harvest processing and storage, as well as the persistent challenges of liquidity constraints have characterized agricultural markets in these countries under all forms of organization.

As an alternative to soften the negative impact of relatively developed supporting markets, inputs increasing costs and exporters' irregular provision of inputs producers tend to plant smaller areas, particularly in the low season. This strategy allows them to reduce the aforementioned costs, risk and to adhere to a staggering pattern of cultivation, which gives them the possibility to plant Asian vegetables continuously the whole year. The researcher could observe in the fields that producers don't plant with Asian vegetables the total amount of land they have available. For instance, normally, a producer owner of 2 ha., doesn't plant the entire area simultaneously with Asian vegetables, rather he would plant 1.0 ha with any Asian vegetable and the remaining area with staple crops, such as maize or beans. Hence, through these strategies they are able to rotate land, while satisfying crop management requisites and food needs, as well as conferring them the prospect to ensure uninterrupted production and the derived income throughout the year.

Right now, I can plant just 1 mz, and then when it grows and I see that it will begin to give some production, I ask for new plants to the exporter to plant the next area of 1 mz. So I go behind, staggering and avoiding to be left with nothing. That was a problem we used to face before, because we usually planted just one season and then we have to look for something else to plant (PRC11).

I plant staggered areas from 0.5 to 1 mz. I can't plant more at once, because I don't have enough resources. It is difficult to get qualified labor, there are no people. There are some companies that produce cucumbers and pick up people in trucks and the cost of labor has gone up too, but there is land to plant small pieces with eggplant. I plant the whole year, permanently, before to finish harvesting one area I plant the next one. (PRC6).

Furthermore, producers mainly in Comayagua pursue to extend the length of the harvesting period. In Honduras, the harvest period for Asian vegetables such as eggplant and cucurbits normally initiates 50 to 60 days after transplanting and is expected to last from 4 to 5 months depending on climate conditions and varieties (Rivera et al., 2008b: 3, 56; Rivera et al., 2008a: 2, 3, 45, 47, 49).

Producers harvest fruit during 6 to 7 months, whereupon, they foresee to receive some additional revenue. We note here, that this practice increases significantly the risk of rejections from the exporter, given that quality of the fruit diminishes considerably, because the planted crops simply were not developed to have a longer harvesting period. In this regard an exporter expressed that producers manage Asian vegetables as subsistence crops.

Producers here are subsistence producers and that is reflected in the fact that Asian vegetables are export crops, but producers manage them as if they were subsistence crops. Subsistence crops in the sense that in order to have more revenue, they keep cutting fruit up to 6 months, in despite that it is not anymore feasible (EXPC2).

5.5 Market Situation and Tendencies

As stated before, according to this study's findings the major demand driver of this food system is ethnicity and currently the major opportunity lies in selling to Asians consumers groups. Therefore, from a broad U.S. perspective, the market of Asian vegetables is small and is likely to remain that way in the short and medium term. To our knowledge Asian vegetables are consumed fresh, neither there is processing activities, nor organic market for these vegetables.

In light of what have been indicated above, Walters et al. (2008: 503) in a study to determine key attributes that influence Asian vegetable purchase decisions in Illinois, U.S., found that most non-Asian citizens are unfamiliar with most Asian vegetables and did not consume them in a regular basis. The same authors report that most consumers expressed a strong interest to learn more about these vegetables. They conclude that there is opportunity to increase consumption of Asian vegetables by educating non Asian consumers about them (Walters et al., 2008: 503). In addition, Krigsvold and Gómez, (2003: 42) assert that demand of Asian vegetables relies highly on first generation of Asian immigrants due to the fast integration of second generation citizen into American society and its adoption of American food.

Though, several authors including Walters et al. (2008) have reported that demand for Asian vegetables is rapidly increasing in the US due the increasing ethnic diversity in the population, a rapid rise in popularity of Asian cuisines, more emphasis on healthy and specialty foods, and increasing familiarity with the foods' culinary uses (Bachmann, 2002: 2; Ernst and Woods, 2005: 1; University of Kentucky, 2006: 1; Lamberts, 1992: 79).

However, Honduran producers and exporters might not make the most of the appealing prospect outlined above, especially if we base on recent U.S. imports figures. At a glance, we could draw from Figure 5.6 that traditionally the quantity of Asian vegetables imported from Mexico has been higher compared to Honduras. Certainly, the major international suppliers of Asian vegetables in the U.S. market are Mexico followed by Honduras both in terms of quality and quantity (Fintrac 2000, quoted in Gautan, 2008: 25; and in Krigsvold and Gómez, 2003: 43).

On the other hand, the rate of growth of these imports has varied significantly in the last ten years. At the beginning of this decade imports of Asian vegetables from Honduras exhibited a positive tendency with an average annual growth of approximately 27 percent (1998-2003). In the same line, Krigsvold and Gómez, (2003: 46) observed in 2002 an aggressive average annual growth of 18 percent in Honduran exports of Asian eggplants. Conversely, during the last years (2004-2008) this fast growing tendency has fallen to -7 percent (Figure 5.6). In the last three to four years Honduran exports of Asian vegetables have progressively decreased not only in terms of quantity but also in their rate of growth.

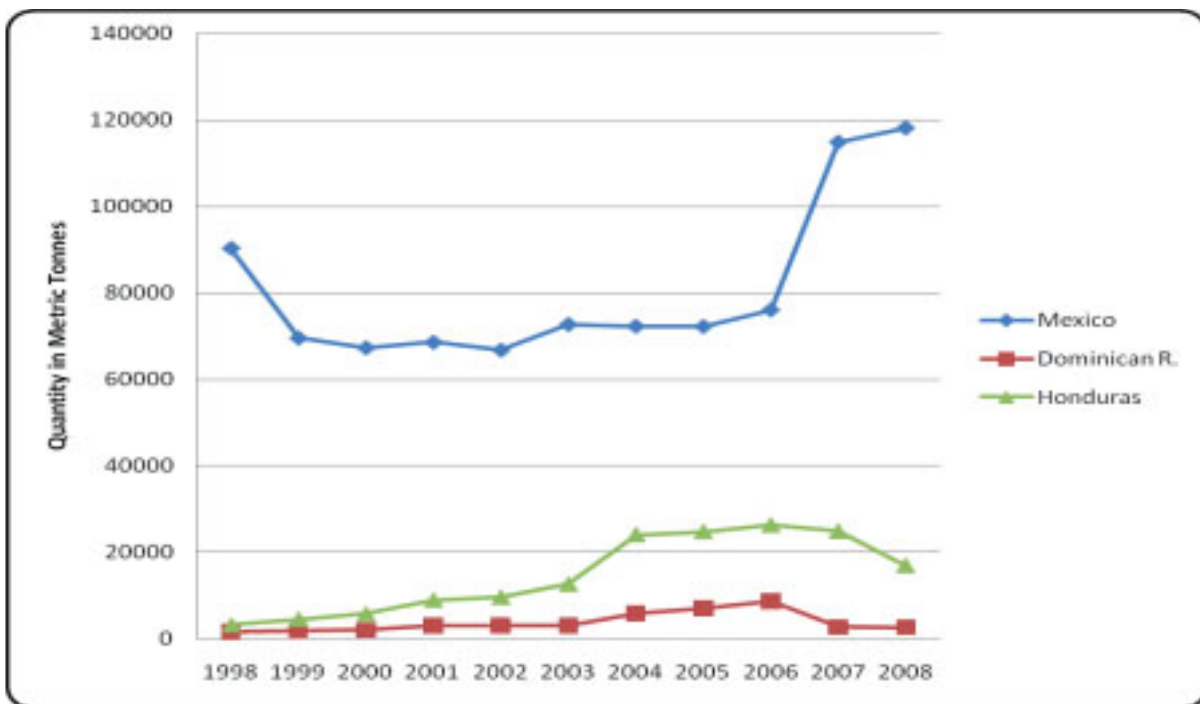


Figure 5.6. Main sources of U.S. imports of Asian vegetables 1998-2008 (Volume)

Source: Own elaboration based on USDA/AMS, 2009

In contrast, Mexico which from 1998 to 2003 displayed a negative average annual growth rate of approximately -3 percent, in recent years (2004-2008) has increased it to more than 14 percent (Figure 5.6).

Arguably exports of Asian vegetables from Honduras have not progressed in the last years due to the junction of all factors affecting the value chain discussed in this study. The current state of exports from Honduras reflects the presence of anomalies on the mode the local value chain of Asian vegetables is operating. In light of this, it may be not surprising that the consequences be as disastrous as it was with the local tomato industry, or with the Asian vegetables industry in Dominican Republic.

Asian vegetables industry in Honduras was once perceived by the government and non-government agencies as a model of non-traditional agricultural exports from Central America that was worthy of replication (Imbruce, 2008: 69). Thus, based on the current situation it appears that Honduras may lose its archetypal status and therefore may be pulled out of the chain leading to the consolidation of new competitors.

Furthermore, as general retail chains become aware of the increasing popularity of Asian vegetables, it is likely that they will enter into this niche market. For instance, Gautan (2005: 65) affirms that some mainstream supermarkets in Michigan are beginning to carry some of the more popularly known Asian vegetables. It could be expected that consistent with their current strategy of offering consumers more variety and high quality produce, these mainstream supermarkets will bring new rules into play. This can have significant implications for the whole chain and subsequently for local actors in Honduras, in particular for producers, which seem not to be prepared to face this eventual future challenge.

The European market remains as a great opportunity, however, distance is seen as the main constrain in the development of exports of Asian vegetables from Honduras. The most important challenge is logistics. The long period of transit (22 days) by boat considerably reduce quality and shelf life of vegetables. Airfreight is not an alternative because is too expensive. In addition, a recent study stresses that the lack of marketing may be a problem as Honduras is not known as exporter of Asian vegetables in Europe.

It appears that development of the local market would require education efforts combined with promotional activities to promote familiarity and consumption of Asian vegetables. However, as Walters et al. (2008: 504) highlight these efforts should work with existing consumer attitudes and behaviours that have to be defined based on market research.

5.6 Revisiting Assumptions

The assumption underlying this research was that local actors' access to international markets is increasingly dependent on participating in international production networks, usually led by large firms from developed countries. This assumption turned out to be partially true.

The study findings indicate that access to international markets of local actors involved in the industry of Asian vegetables is dependent on participating in the value chain of Asian vegetables. However, at the same time, it should be noted that value chain of Asian vegetables is driven by ethnicity and marketing of exotic Asian vegetables varieties, variables that differ from mainstream value chains led by large retailers. Contrary to mainstream retailers, Asian retailers buy from wholesalers in the spot market, which indicates that their criteria of choosing suppliers relies mainly on price while other criteria such as food safety, quality and variety matter less. Further, as previously indicated, food safety and environment issues in this value chain are primarily regulated by U.S. government agencies rather than by international actors in the chain.

In addition, although they have started to venture, retailing giants still haven't capitalized on Asian vegetables¹⁰⁷ opportunities by organizing chains through the establishment of private standards and certification programs, which would probably entail a significant change in the market relationship among producers, exporters, wholesalers and importers.

¹⁰⁷ At least those Asian vegetables exported from Honduras.

6. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The summary and conclusions from this study follow the research questions and the findings. They address the following areas: i) introduction of Asian vegetables in Honduras; ii) distinctive aspects of producers; iii) relations among actors participating in the chain; iv) enabling business environment; v) supporting markets and end market.

Additionally, the researcher offers recommendations based on the findings, analysis, and conclusions of this study. These recommendations that follow are for: i) government agencies; ii) local actors involved in the value chain of Asian vegetables; and iii) recommendations for further research.

6.1 Introduction of Asian vegetables in Honduras

Although it could be argued that introduction of Asian vegetables in Honduras was something fortuitous, derived from the confluence of several distinctive elements, the leading role played by private agents definitively cannot be neglected. A conclusion to be drawn from this finding is that private sector has represented a vital link to move forward the country's access to new international markets (Altenburg, 2006: 37). This is especially critical in niche markets such as Asian vegetables, where various Asian ethnic groups have different preferences; therefore, determining what the market wants may be particularly difficult without the adequate links.

On the other hand, it has to be mentioned that the government through policies oriented to encourage exports and that allow more foreign direct investment in the country contributed (albeit not directly) to stimulate the introduction and spreading out of Asian vegetables in Honduras. Before its introduction in Comayagua, production and marketing of Asian vegetables consumed by Asian immigrants in U.S. were totally unknown in Honduras. Nowadays, production has expanded to Olancho and as result several exporters, several hundreds of producers and other members of the Honduran population have found in this economic activity their main way of living. Furthermore, a group of producers has resorted into working collectively, trying to export on their own despite of the challenges they face.

In this sense, it can be concluded that public-private partnership (albeit intermittent and not in the desired degree) has proven to be a necessary pre-condition to access this international market and to improve the responsiveness of local actors to the challenges posed by participating in it.

6.2 Distinctive Aspects of Producers

Production of Asian vegetables in Honduras is concentrated on small semi-technified producers whose main motivations to plant these vegetable crops are the resulting income-enhancing and risk reduction opportunities. It can be argued that niche markets such as Asian vegetables consumed in the U.S. represent an excellent opportunity for these producers to attain these aspirations because of the relatively small production volumes demanded. Nevertheless, a related conclusion is that these potential opportunities are not utilized automatically. In fact, it depends on particular economic, social, political and environmental conditions. For the majority of these small producers of Asian vegetables, income is stable and/or higher compared to small producers of staple crops and other vegetables marketed locally. Even so, most of them are still poor.

6.3 Relations among Actors participating in the Chain

Applying value chain analysis this study presents how local actors have accessed a high value market through their insertion in a network of contrasting relations such as interdependence, cooperation and confrontation.

6.3.1 Relations of Local Actors

Local actors engage in contractual relations primarily to reduce the uncertainty involved in the exchange of Asian vegetables, whereas economizing on the main transaction costs. However, socially and culturally framed lack of trust between producers and exporters is ever present. Similarly, frictions derived from mistrust are strongly present in relations at the horizontal level. Neither producers nor exporters trust their peers.

Although the degree of mistrust varies depending on both the exporter and the producer, tensions and conflicts of interest form a constant subtext in their relationship. In the case of Olancho this situation is more visible because there is only one exporting company participating in that region. Yet, existing skewed power relations which preclude transparency in the resolution of disputes further exacerbate the difficulties to promote collaborative behavior. The flow information between

links is fractured. In addition, economic gains are not equally distributed among the various actors in the chain.

There are two primary conclusions that can be drawn from what have been indicated above. First, local actors haven't still acknowledged the need for consensus and long-term perspective which would facilitate reaching a commitment of collaboration between them. Most local actors view building a trustful relationship as an expense rather than an investment. The second related conclusion is that derived from this lack of long term vision, hitherto local actors haven't developed joint lines of action that would enable them to sustain and improve their participation in the international market of Asian vegetables.

This situation has created barriers that block the upgrading prospects of local actors, particularly for producers who have more limited access to resources necessary to cope with the challenges of increasing competition. Seeking, thereby to stimulate a transformation or reorientation in the way local actors work together is imperative to ensure greater stability and presence of local actors in the market.

6.3.2 Relations among other Actors in the Chain

In contrast to relations between local actors, relations involving international actors reflects a more trustful and collaborative structure. The business relationship between exporters and importers evinces a commitment to win-win situations. They have pursued collaborative efforts and working together over the long-term. Therefore, there is more interdependency and power balance shaping their relationship.

A conclusion to be drawn from this issue is that social and cultural normative contexts have a substantial impact on the commercial relationships among all actors (local and international) in the value chain of Asian vegetables. This is in fact a conclusion regarding inter-organizational cooperation that has been advanced by sociologists and management theorists. In the case of international actors, the social and cultural normative impact is probably major than asset specificity's influence, which concerning the relationship between exporters and importers is in effect determined by the existing degree of cooperation. In this study it has to see not only with national culture, which plays a fundamental part in a value chain that is distinctive with strong Asian ethnic ties, but also with professional culture. The level of education of Honduran exporters

is more comparable to that of their Asian-American counterparts, rather than to that of the less educated local producers in Comayagua and Olancho. This condition added to the eroded social norms in the local environment makes more likely that exporters' high-trust cooperation with international actors will occur easily.

In addition, the no existence of a clear value chain leader leads to the conclusion that the evolution of the value chain of Asian vegetables is marked mainly by changes in importing country's government regulatory framework and external factors rather than in actors' advances in product innovation or consumer demands, as it is the case of most mainstream value chains. Furthermore, a related conclusion is that although Asian vegetables are intrinsically high valuable and conformance of quality is important, they are not much differentiated products that predominately compete on a lowest cost basis. Therefore, the overall structure of the chain is driven by price-based transactions and not much value is added along the chain.

6.4 Enabling Business Environment

This study's findings illustrate how several strategic public services are not adequately provided to local actors in the chain. This includes limited availability or too costly financial, physical and human resources. A conclusion to be drawn from this is that, although the government has enforced related policies oriented to fix some of the major constrains affecting local actors in the chain, none of its proposed remedies has addressed the fundamental causes. For instance, producer's persistent low educational level as result of the poor quality of education in rural areas.

In addition, it can be concluded that there are limits to government's capacity to implement and enforce regulations, in some cases due to the lack of the necessary resources. In this respect, it can be mentioned the no enforcement of regulations pertaining to the application of banned pesticides to the plantations and production of non-certificated seed, especially in Comayagua.

The Asian Vegetables Chain Subcommittee launched by the government with the aim to assists local actors in the chain is in its initial stages. A related conclusion is that it remains to be seen whether it has the required leadership to increase the awareness and knowledge associated to value chains development as a competitive response to the changing market demands. Additionally, it can be concluded that the absence of informal mechanisms that permit the formation of a cohesive

sector, represents a major challenge not only for the Chain Sub-committee but to all local direct and indirect participants in the chain.

6.5 Supporting Markets

In spite of the noted supply shortcomings exporters through the embedded services they create are the largest providers of services to producers. These services include mainly inputs sold on credit, financial services and in to a lesser extent technical support. On the other hand, there are few public sector services providers. Besides, in both locations Comayagua and Olancho, there are enough additional private sector services providers and competition among them has increased over the years. However, in general services are becoming more expensive or their provision on credit is not available and the relationship of service suppliers with clients is limited to a pure commercial exchange. Most of them don't provide advisory services. For instance, provision of technical assistance to ensure that sold inputs are properly used. A conclusion to be drawn from this is that this situation has facilitated and contributed to consolidate the dominant role of exporters with respect to producers.

6.6 End Market

Asian vegetables sourced from Honduras are first and foremost consumed in the ethnic Asian market located in the U.S. By definition the ethnic Asian market in U.S. constitutes a niche market. There is a sizable segment of population in several states of the U.S. which has ethnic Asian origins. Although other groups of the population have showed evidence of the increasing interest on Asian vegetables; their consumption is likely to remain steady on the short and medium term. Traditionally, Asian vegetables produced in Honduras have enjoyed privileged position in terms of quantity and quality. However, in recent years exports from Honduras have progressively decreased and new competitors have arrived. A conclusion to be drawn from this is that sustained participation of local actors in this particular chain and consequently in this market has to be viewed with cautious optimism in the light of the current constrains affecting their performance. In other words, local actors are, at present, operating on a knife edge and the situation may turn more precarious if the appropriate course of action is not taken.

A related conclusion is that participation in European markets of Asian vegetables produced in Honduras is out of the scope of exporters and importers. Accessing the European market

encompasses factors that involve issues such as availability of direct air flights from Europe to Honduras, because shipment by boat takes too long in relation to the shelf life of these vegetables. There are no commercial scheduled direct flights between Honduras and any of the European countries. Going via U.S. or other Latin American countries are the only ways. Therefore, it would be too expensive to ship Asian vegetables by air to Europe.

6.7 Recommendations

In this section the researcher offers recommendations based on the findings, analysis, and conclusions of this study. Given that there are multiple factors that affect the performance of the value chain of Asian vegetables and acknowledging that recommendations to improve some of these factors such as infrastructure, agricultural credit services and technical assistance have been extensively discussed somewhere else, the emphasis here is on the relationships between local actors participating in the chain.

6.7.1 Policy Implications

Government should continue actively promoting the value chain initiative coordinated through the Asian Vegetables Chain Sub-committee. It should persist on creating an environment conducive to a process of ongoing dialog among direct in indirect actors in the chain. It is necessary to share common and complementary interests which in turn will help to resolve disputes and stimulate cohesion.

However, to accomplish what has been indicated above, the government faces two major challenges. First, it is necessary to really understand how the entire value chain operates, from production in Honduras to consumption in the U.S. This is important to identify what each link has to offer and what it needs from others, and therefore to know objectively the reality of local actors' situation. Secondly, it needs to increase awareness among local actors on the importance of having a value chain's vision rather than an individual vision. It is a huge but rewarding challenge for the government to convince local actors to view the value chain as a viable and favorable business strategy and therefore gain their enthusiastic support to the initiative. Thus, here is important to stress the lessons learned from the past, not only in this particular value chain, but also in other local chains and in neighboring countries chains.

Asian Vegetables Chain Sub-committee should pursue to act as neutral facilitator in order to make easy getting the sustained commitment of local actors. It is important that the Chain Sub-committee be viewed as impartial and trustworthy. Traditionally, government agencies have been criticized for acting politically biased or/and having favoritism for powerful and influential actors or groups.

6.7.2 Recommendations for Local Actors

In this intensively competitive world of changing markets, producers and especially exporters should be aware that they are faced with new demands, making it very difficult to remain sustainable competitive. Examples around the world have illustrated the importance of setting common goals and working collaboratively for the survival and growth of business in different economic sectors. Therefore, local actors are forced to build collaborative relations that enable them to better respond to potential market changes. This implies more commitment and leadership from them.

6.7.3 Further Research

Based on the limitations of the current study a further similar study should be undertaken but including a larger sample of local and particularly of international actors to assess the extent to which the same or similar findings would be revealed. Moreover, this would allow the assessment of the most recent changes experienced in the value chain, and their implications for success or failure of local actors taking part in this specific international market.

An analysis and comparison of Asian vegetables' value chains in competitor countries should be undertaken. This should be aimed to uncover similarities and differences among these chains, but also to benchmark the performance of the value chain of Asian vegetables produced in Honduras. This would allow direct and indirect actors involved in the local value chain to be acknowledge and learn from other countries experiences.

Value chain analysis is a useful tool to reveal how the gains of participating in markets are distributed among actors in the chain, as well as what are the prospects for continued participation of these actors. However, a recommendation derived from this study is that to obtain a realistic picture of the situation, the analysis should look beyond the integration of economic activities and functions performed by actors. In this sense, it is reasonable to examine the social, cultural and

economic relationships among actors and how the institutional context in which they interact influence these relations. Along with what have been indicated before, a value chain analysis should therefore, consider the contribution of different disciplines.

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APPENDIX A

Sample Respondents.

I. Producers in Comayagua

Code	Since	Crops	Location
PRC1	1994	Chinese Eggplant, Indian eggplant, Chinese bitter melon, Indian bitter melon, and fuzzy squash	Las Canoas
PRC2	1995	All that are produced in Comayagua including chive flower	Las Liconas
PRC3	2001	Chinese and Indian bitter melon	El Sifón, Ajuterique
PRC4	1996	Long squash, Chinese bitter melon, Thai okra, eggplants.	El Sifón, Ajuterique
PRC5	2002	Long squash, okra, bitter melon, and Chinese Eggplant	El Sifón, Ajuterique
PRC6	1996	Chinese Eggplant, long squash, fuzzy squash, bitter melon	San Jerónimo
PRC7	2002	Chinese eggplant	San Jerónimo
PRC8	1999	Chinese eggplant, Chinese bitter melon, Indian bitter melon, fuzzy squash, and long squash	San Jerónimo
PRC9	2005	Indian bitter melon, long squash, and Chinese Eggplant	San Jerónimo
PRC10	1995	long squash, bitter melon, Chinese okra, Thai okra	EL Cruciyal
PRC11	2003	Eggplant, bitter melon, and okra	El Cruciyal
PRC12	1996	Thai okra , long squash and Chinese bitter melon	El Cruciyal
PRC13	2002	Cucurbitaceous	El Cruciyal
PRC14	2000	Chinese and Indian Eggplant, fuzzy squash, long squash, Chinese and Thai okra , Chinese, and Indian bitter melon	El Sifón
PRC15	2001	Currently fuzzy melon, long squash, Thai and Chinese okra	Los Cascabeles
PRC16	2003	Long squash	Los Cascabeles
PRC17	2001	Chinese eggplant, long squash, okra, Chinese bitter melon, and Indian bitter melon	Playitas
PRC18	1999	Chinese eggplant, Chinese and Indian bitter melon, long squash, Chinese okra and Thai okra	El Cruciyal
PRC19	2002	Bitter melon	El Sifón, Ajuterique
PRC20	1990	Bitter melon and eggplant	El Sifón, Ajuterique

II. Producers in Olancho

Code	Since	Crops	Location
PRO1	2001	Eggplant, long squash, fuzzy squash and okra	La Lima, Campamento
PRO2	2002	Indian eggplant, fuzzy squash, and long squash	La Lima, Campamento
PRO3	2004	Chinese eggplant, fuzzy squash and long squash	La Lima, Campamento
PRO4	2003	Eggplant, fuzzy squash and long squash	La Sierra, Lepaguare
PRO5	2003	Long squash, Thai and Chinese okra, Chinese eggplant.	La Concepción, Juticalpa
PRO6	2005	Chinese and Thai eggplant, and long squash	La Concepción, Juticalpa
PRO7	2001	Eggplant, fuzzy squash and long squash	Gualaco
PRO8	2003	Chinese eggplant, long squash, and fuzzy squash	Gualaco
PRO9	1994	Thai and Chinese eggplant, bitter melon	El Tejar,
PRO10	1994	Chinese eggplant, Thai eggplant	San Marcos de Jutiquile
PRO11	2000	Long squash, fuzzy squash, okra and Indian eggplant	La Sierra Lepaguare
PRO12	2002	Fuzzy squash, long squash, and Indian eggplant	La Sierra, Lepaguare
PRO13	1999	Bitter melon, fuzzy squash, long squash, Thai and Chinese okra, Chinese and Thai eggplant	Punta Caliente, Lepaguare

PRO14	2003	Long squash and fuzzy squash	El Encinal, Lepaguare
PRO15	2005	Long squash	El Encinal, Lepaguare
PRO16	2005	Long squash	Las Flores, Lepaguare
PRO17	2003	Long squash, fuzzy squash, eggplant, and bitter melon	Las Minas, Lepaguare
PRO18	2004	Thai and Chinese eggplant	Aldea La Puzunca
PRO19	2003	Thai and Indian eggplant, and long squash	Las Tablas, Guayape
PRO20	2000	Thai and Chinese eggplant, long squash, Chinese Okra	Las Tablas, Guayape

III. Producer-owned Company (Comayagua)

Code	Since	Crops	Respondent
POCC	2008	Chinese, Indian, and Thai eggplant; Chinese and Indian bitter melon; long squash; fuzzy squash; Thai and Chinese okra; chive flower	Founder Member

IV. Exporters (All in Comayagua)

Code	Since	Crops	Respondents
EXP1	1993	Chinese, Indian, and Thai eggplant; Chinese and Indian bitter melon; long squash; fuzzy squash; Thai and Chinese okra; chive flower	Owner, Co-owner/General Manager, and Packing Plant Manager
EXP2	2005	Chinese, Indian, Thai, and Japanese eggplant; Chinese and Indian bitter melon; Thai and Chinese okra; chive flower; long squash; and fuzzy squash	Owner/General Manager, Assistant Manager, and Packing Plant Manager
EXP3	1994	Chinese, Indian, Thai, and Japanese eggplant; Chinese and Indian bitter melon; Thai and Chinese okra; chive flower; long squash; and fuzzy squash	General Manager

V. Importers (All in Miami, FL)

Code	Crops	Respondents
IM1	Chinese, Indian, and Thai eggplant; Chinese and Indian bitter melon; long squash; fuzzy squash; Thai and Chinese okra; chive flower	Assistant Manager
IM2	Chinese, Indian, Thai, and Japanese eggplant; Chinese and Indian bitter melon; Thai and Chinese okra	Global Sales Manager

VI. Government Agencies

Code	Institution	Respondent	Location
SCVO	National Horticultural Chain Committee	National Director	Tegucigalpa
SENC	SENASA	Regional Director	Comayagua
UTVOO	SENASA	Director Technical Unit of Asian Vegetables	Olancho
DICTO	DICTA	Asian Vegetables Technician	Olancho
SCCO	National Horticultural Chain Committee	Asian Vegetables Consultant	Olancho
BND	BANADESA	Director of Trust Fund	Tegucigalpa

VII. Research Agencies

Code	Institution	Respondent	Location
FHIA	FHIA	Director of Research Station	Comayagua
MTTHC	MTTH	Technician	Comayagua
MTTHO	MTTH	Technician	Olancho

VIII. Input Supplier

Code	Respondent	Location
INPSC	Manager Agrochemical Store	Comayagua
INPSO	Co-owner/Manager Agrochemical Store	Olancho

IX. Research Agencies

Code	Institution	Respondent	Location
EDA	EDA	Specialist on Marketing and Logistics	Tegucigalpa
TECH	TECHNOSERVE	Agro-industries Coordinator	San Pedro Sula

APPENDIX B

1. Sample Producers' and Producer-owned Association's Interview Schedule

Contact Information: Date of interview/Name/Location

1. Since when do you grow Asian Vegetables?
2. What is your motivation and objectives to plant Asian vegetables?
3. What is the gap between your objectives and the current situation?
4. Which Asian vegetables do you produce?
5. Is this your main source of income?
6. How much area do you plant during each season?
7. During which season of the year do you plant and Why?
8. How much do you harvest per season?
9. How many people do you employ and do you use family labor?
10. What are the main activities you have to do in order to produce the product?

Business Enabling Environment

Policy Environment

1. Do you receive any subsidy from the government?
2. What kind of taxes or tariffs do you have to pay?

Legal Framework

1. Do you have land property rights?
2. What kind of regulation does the government impose to you?
3. Does the government monitor the enforcement of these rules and which methods are used?

Infrastructure

1. How does the infrastructure affect the performance of your business (roads, electricity, storage and telecommunication)?
2. What are you doing about these problems?

Institutional Environment

1. Does the government provide you technical support?
2. Does the government promote your participation in any organization?
3. Do you take part in research activities?
4. Does the government provide credit services for your activity?
5. Which other institutions provide support?

Supporting Markets

Equipment

1. From where do you get the required machinery and equipment to carry out activities?
2. How did you learn to use it?
3. Are you satisfied with what you have? (Is it enough to work appropriately?)
4. Could you use this technology for other purposes?

Financial

1. From whom do you get credit?
2. What are the terms of the service?
3. For what do you use these financial resources?
4. When do you ask for additional financial support?
5. Which other support services do you use?

Vertical Linkages

Input suppliers

1. Who are your more important suppliers and what do you buy from each?
2. Which are the terms?
3. Are you satisfied with the service?
4. Are there problem in obtaining some important inputs?
5. Have you ever purchased inputs jointly with other producers?

Buyers

1. Who are your buyers?
2. Since when do you sell to them, and why do you sell to them?
3. Which level of formality has the transaction?
4. Which are the contractual terms?
5. What rules, requirements or standards do you have to fulfill?
6. Who set those rules and why?
7. Have those rules changed through the time and what has been the impact on your business?
8. Does the buyer monitor the enforcement of these rules?
9. Do you have technical support from the buyer in order to accomplish rules?
10. How do you assess your performance of product, process, and services?
11. What are your prospects or expectations for the future?

Horizontal Linkages

1. Do you know who the leaders in terms of production are?
2. Have you contact with other producers and which kind?
3. Do you take part in any kind of association with other Asian vegetables producers? If yes

4. What are the benefits of this relationship?
5. Do you take part in other association (No Asian Vegetables producers)?

Costs and Margins

1. How do you get information about the prices?
2. Who set the price?
3. Does the price change and why?
4. What is the sale price you get for the product?
5. Cost of production per unit (ha)?

End Market

1. Do you get information about the end market and how?

2. Sample Exporters' Interview Schedule

Contact Information: Date of interview/Firm/Name/Position/Location

1. Since when do you export Asian Vegetables?
2. What is your motivation and objectives to export Asian vegetables?
3. What is the gap between your objectives and the current situation?
4. Which Asian vegetables do you export?
5. Is this your main source of income?
6. How much do you export per season? (volume)
7. During which season of the year do you export and why?
8. How many people do you employ?
9. What are the main activities you have to do in order to export the product?

Business Enabling Environment

Policy Environment

1. Do you receive any subsidy from the government?
2. What kind of taxes or tariffs do you have to pay?
3. Which types of non-tariff barriers affect the industry?

Legal Framework

1. How is the registration process?
2. What kind of regulation or standards does the government impose to you?
3. Does the government monitor the enforcement of these rules?

Infrastructure

1. How does the infrastructure affect the performance of your business (roads, electricity, storage and telecommunication)? (Problems)
2. What are you doing about these problems?

Institutional Environment

1. Does the government provide you technical support?
2. Does the government promote your participation in any organization?
3. Do you take part in research activities?
4. Does the government provide credit services for your activity?
5. Which other institutions provide support?

Supporting Markets

Equipment

1. Where do you get the required inputs, machinery and equipment to carry out activities?
2. Could you describe the most important equipment and machinery?
3. Are you satisfied with what you have? (Is it enough to work appropriately?)
4. Could you use this technology for other purposes?

Financial

1. From whom do you get credit?
2. What are the terms of the service?
3. For what do you use these financial resources?
4. When do you ask for additional financial support?
5. Which other support services do you use?

Vertical Linkages

Suppliers

1. Who are your more important suppliers and what do you buy from each?
2. Why did you choose them?
3. Which are the contractual terms?
4. What rules, requirements or standards does your supplier have to fulfill?
5. Who set those rules?
6. Do you monitor the enforcement of these rules?
7. Have those rules changed through the time and what has been the impact on your business?
8. Do you provide technical support to the supplier in order to accomplish rules?
9. There have been conflicts?
10. How do you assess the performance of your suppliers?
11. What are your prospects for the future?

12. Would you have interest to participate in upgrading activities?

Buyers

1. Who are your buyers and how many are they?
2. Since when do you sell to them and why?
3. Which level of formality has the transaction?
4. Which are the contractual terms?
5. What rules, requirements or standards do you have to fulfill?
6. Who set those rules and why?
7. Have those rules changed through the time and what was the impact on your business?
8. There have been conflicts?
9. How is the process of negotiation?
10. Does the buyer monitor the enforcement of these rules?
11. Do you have technical support from the buyer in order to accomplish rules?
12. How do you assess your performance in terms of product, process and services?
13. What are your prospects or expectations for the future?

Horizontal Linkages

1. Do you have contact with other exporters of Asian vegetables?
2. Do you take part in any kind of association with other Asian vegetables exporters? If yes
3. What are the benefits of this relationship?
4. Do you take part in other association (No Asian Vegetables exporters)?

Costs and Margins

1. How do you get information about the prices?
2. Who set the price?
3. Does the price change and why?
4. What is the sale price you get for the product?
5. Cost of production per unit (ha)?

End Market

1. How do you get information about the end market?
2. What are the characteristics of the end market?
3. What are your prospects for the future?
4. Who are the international actors participating in the chain?
5. Which are their characteristics?

3. Sample Importers' Interview Schedule

Regarding your Honduran suppliers of Asian vegetables

1. What is your main function regarding Asian vegetables sourced from Honduras?

2. Which Asian vegetables produced in Honduras do your company buy?
3. Since when do you buy those Asian vegetables produced in Honduras?
4. Why do you buy Asian vegetables produced in Honduras?
5. Which season of the year do you import Asian vegetables from Honduras?
6. Which criteria did you apply to choose among different Honduran exporters?
7. Which are the contractual terms?
8. How is risk distributed?
9. What rules, requirements or standards do your supplier has to fulfill?
10. Who set those rules?
11. Do you monitor the enforcement of these rules?
12. Do you provide technical support to your Honduran suppliers of Asian vegetables in order to accomplish these rules?
13. How do you assess the performance of your Honduran suppliers?
14. Have you ever visited your Honduran supplier of Asian vegetables?
15. How do you assess the relationship with your Honduran suppliers of Asian vegetables?
16. What are your prospects for the future regarding your relationship with Honduran exporters?

Regarding your buyers of Asian vegetables

1. Which activities or function do your buyers perform?
2. Where are they located?
3. Which rules, requirements or standards do you have to fulfill?
4. Who set those rules? There are private standards?
5. Does the buyer monitor the enforcement of these rules?
6. Do you have technical support from the buyer in order to accomplish those rules?
7. Does the buyer know the country where are produced those Asian vegetables that he buys from you?

Regarding the End Market

1. Do you know who the end consumer of Asian vegetables is?
2. Where are they located?
3. How do you get information about the end market?
4. Which countries are the main exporters of Asian vegetables to the USA and in which place is Honduras in terms of value and volume?
5. What are your prospects for the future regarding the markets of Asian vegetables?
6. Which price do you receive for the product?
7. Who set the prices?

4. Sample Government Agencies' Interview Schedule

4.1 National Horticultural Chain Committee (Tegucigalpa)

History of the Chain Subcommittee

1. When was the Asian Vegetables Chain Subcommittee organized?
2. What is the objective?

3. Has increased or decreased the number of participants? Why?

Organization of the Chain Subcommittee

1. Who are the members of the chain subcommittee?
2. What is the mechanism of coordination?
3. How often do you meet?
4. What kind of economic support does it have and from whom?
5. Which other dependencies of the Ministry of Agriculture participate?
6. There are other institutions participating? (NGO's, Cooperation Agencies)
7. What is the role of the Ministry of Agriculture?
8. There is a list of producers, exporters and other actors?
9. There are producers and exporters that don't participate in the chain?
10. How is the current performance of the chain?
11. What problems do you visualize in the development of the chain?
12. What opportunities do you visualize in the development of the chain?
13. Which are the linkages and actors in the value chain of Asian vegetables?
14. To whom would you recommend me to interview?
15. Do you have any available document about the chain?

4.2 SENASA (Comayagua)

1. What kind of regulation does the government impose to local actors in the chain?
2. Does the government monitor the enforcement of these rules?
3. Does the government through SENASA provide technical support to local actors?
4. Does SENASA take part in research activities?
5. How does the infrastructure affect the performance of actors in the chain (roads, electricity, storage and telecommunication)?
6. Which are the linkages and actors in the value chain of Asian vegetables?
7. Could you provide us information about producers?
8. What kind of taxes or tariffs do the exporters have to pay?
9. Which types of non-tariff barriers affect the industry?
10. How long does it take to clear imports and exports?
11. Which other government dependencies are related to the industry?
12. Which trade policies and agreements affect the industry of Asian vegetables?
13. Where is located the importing market of Asian vegetables exported from Honduras?
14. Which countries are the main exporters of Asian vegetables?
15. Do you have any available document about the chain?

4.3 SENASA-Technical Unit of Asian Vegetables (Olancho)

1. Since when are Asian vegetables produced in Olancho?
2. Why there is only one exporting company coming to Olancho?
3. What are your prospects for the future regarding the participation of local actors?
4. Which technological level have producers of Asian vegetables in Olancho?
5. Which area is under production with Asian vegetables?

With the exception of interview questions 6, 7, 8, 9 and 10 the rest of the schedule of questions is similar to the one elaborated for SENASA Comayagua.

4.4 DICTA (Olancho)

1. What kind of technical support do you provide to producers and exporters?
2. How often do you visit producers?
3. Which production areas are under the supervision of DICTA?
4. Why there is no packing plant in Olancho?
5. Do you play any role in the resolution of conflicts between producers and exporters?
6. Do you monitor the enforcement of rules?
7. How does the infrastructure affect the performance of actors in the chain (roads, electricity, storage and telecommunication)?

The rest of the questionnaire includes the first five interview questions included in the schedule of questions elaborated for SENASA-Technical Unit of Asian vegetables in Olancho.

4.5 Consultant National Horticultural Chain Committee (Olancho)

With the exception of interview question 3, the rest of the schedule of questions is similar to the one elaborated for DICTA (including those questions taken from the schedule elaborated for SENASA-Technical Unit of Asian vegetables).

5. Observations Guide

5.1 Location of Production Areas and Packing Plants

1. Access
2. Size
3. Condition

5.2 Working Environment and Activities Carried Out by Actors

5.2.1 Producers Activities

1. Crop management practices
2. Harvesting
3. Sorting
4. Packing
5. Transporting
6. Labor employed
7. Meetings with other producers or actors

5.2.2 Exporters Activities

1. Reception or collection of vegetables
2. Washing

3. Sorting and grading
4. Packing
5. Storing
6. Cooling
7. Transporting
8. Labor employed

5.3 Conditions of Infrastructure Affecting Local Actors

1. Roads
2. Storage facilities
3. Others (electricity, telephone lines)

5.4 Characteristics of Actors' Assets

1. Soil conditions
2. Type and condition of equipment
3. Type and condition of machinery
4. Type and condition of inputs

