

Is Upgrading in Agri-Food Chains Possible? The Case of Small and Medium-sized Producers in Honduras

Ingrid Fromm



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1. Introduction

Agriculture is a key economic sector in Honduras, accounting for 13.6 percent of the GDP, 56 percent of the total export earnings, and employing 34 percent of the labor force (Banco Central de Honduras, 2006). Yet recent changes in sourcing, production and marketing of agricultural products as a result of increased globalization have impacted the agricultural sector in Honduras. Declining commodity prices and the increase in demand in developed countries for differentiated products has created opportunities for growth in non-traditional food products¹. Production patterns have also changed and become more “globalized”. Nowadays, different production, processing and marketing stages are located in several geographical regions of the world and are linked through various forms of coordination. Participants in these value chains are forced to compete; otherwise their participation may be compromised. Producers in developing countries are also faced with changes in consumer concerns for food safety and quality, which consequently, have increased the requirements for standards. All these changes in market structures and consumer behavior pose challenges for agricultural producers in Honduras and other developing countries.

At the local level, changes in the retail sector, particularly the greater share of supermarkets² has affected producers participating in agrifood chains. With the increase in urbanization³ and remittances flows⁴ in Honduras, consumer behavior becomes more complex and producers in value chains must respond to these changes as well. Demand for non-staples, convenience and processed foods have increased, thus increasing the need for value added and standards. In short, the whole procurement system requires other forms of coordination, pressuring local producers to comply with certain regulations. Competitive pressures require these SMEs to upgrade, otherwise their participation in value chains cannot be ensured.

¹ Banana production has dropped in the last decades, but there has been an increase in production and export of jalapeño and bell peppers, melons, watermelons, sweet potato, yucca, shrimps, and tilapia, among others (BCH, 2007).

² Berdagué et. al. (2004, 2005) and Reardon and Berdagué (2002) provide an analysis of the changes in the retail sector in Central American and other developing countries and the impact on local farmers.

³ Urban population has grown 4.2% annually since 1970. In 2005, 46% of the population was urban (UN Population Division, 2006).

⁴ Total remittances in Honduras increased to US\$ 2359 million in 2006 from US\$ 409.6 million in 2000. Remittances account for 25.5% of the GDP in 2006 (BCH, 2006). According to national statistics, 83.4% of the money received is spent on daily necessities such as food, clothing and housing (BCH, 2007).

2. Upgrading in Value Chains

In a value chain, local producers, in their interaction with local processors or exporters and international retailers have the possibility to acquire new skills and knowledge. The type of trust relationship and power dependence can determine how information flows and how firms upgrade. On the other hand, the implementation and compliance with standards provides opportunities for learning and acquiring skills and knowledge. The framework for this investigation (Figure 1) took into consideration these interactions and sought to explain how upgrading took place in local firms. First of all, there is a flow of materials taking place and starting from the producer side. The material is transformed as it passes through different links in the chain, where value is added (hence the term value chains) until it reaches the final consumer. On the other side of the chain, there is tacit knowledge that is passed down through the different links in the form of codified information. Transactions are taking place between the different actors, and in this interaction, something is happening as well. One or more links in the chain have a role of governance and coordinate the activities in the chain through different mechanisms. In this interaction, trust relationships may or may not be formed, and an opportunity to learn and upgrade is opened up to the producers.

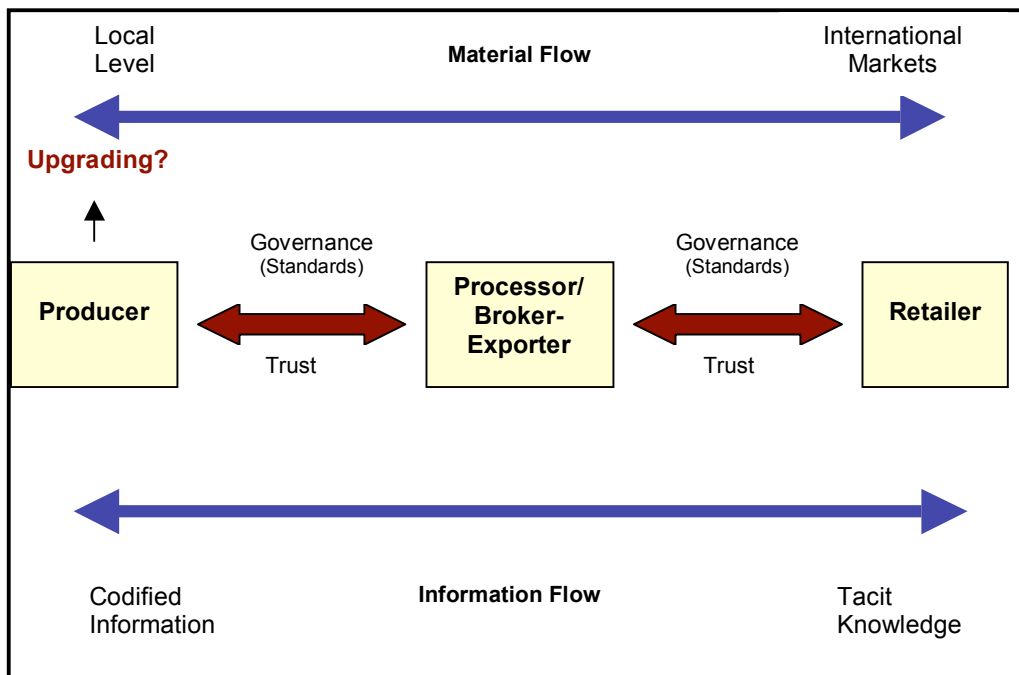


Figure 1. Framework for study

3. Upgrading in Value Chains: The Case of Small Producers in Honduras

For the purpose of this study, three different groups were investigated. These groups were the traditional primary commodity chain, the plantation product chain and fresh produce chain. Producers from these three different types of chains were chosen according to the characteristics described in Table 1. These chains were chosen because they are representative of the situation in which Honduran producers find themselves. Furthermore, most of the agricultural production of the country can be divided into these groups. Fewer producers find themselves in organic chains, for example. Therefore, this schematisation seemed resonant with the current situation of the agricultural sector throughout the entire country.

Table1: Types of Agricultural Chains

Type of Chain	Characteristics
Traditional Primary Commodity Chains	<ul style="list-style-type: none">▪ Chain governed by internationally operated traders▪ Traders exercise little control on production and quality▪ Quality enforced through price▪ Chain coordination loose and indirect▪ Profit lies in volume, not margins▪ Examples: Coffee, cocoa, cotton
Traditional Plantation Product Chains	<ul style="list-style-type: none">▪ High level of integration▪ Production carried out in large plantations in developing countries, owned by international traders▪ Traders outsource production by contract farming▪ Traders introduce innovations in production and processing▪ Quality assured by traders▪ Developing countries profit mostly from employment in primary production but not from value added generated▪ Examples: Bananas, pineapples, melons, palm oil, sugar, rubber
Fresh Product Chains	<ul style="list-style-type: none">▪ Retailers in high value markets in developed countries or supermarkets in developing countries set quality standards▪ Suppliers profit from high margins▪ Production organized under contracts▪ Not many producers in developing countries able to comply with standards▪ Participation requires rigorous application of cutting-edge technology in production, storage and transportation▪ Examples: Off-season and exotic fruit and vegetables, fresh fish and crustaceans, special beef products

3.1 Upgrading

Upgrading refers to the acquisition of technological capabilities and market linkages that enable firms to improve their competitiveness and move into higher-value activities. More than half of the producers (55%) had changed the type of product. In the case of palm oil producers, many had changed the variety of the palm they were using for production. Furthermore, horticultural producers had changed in several occasions the varieties as improved seeds become widely available in the local market. Few producers (12%) had changed the formulation, because many of them sell unprocessed products. About 25% of the producers have improved the packaging. Producers were asked to classify the type

of investment made on an ordinal scale (Table 2). Most firms that have implemented changes made investments of either 1-3% or 4-6% of the total costs (53%).

Table 2: Investment in Product Upgrading

	Percent
0	34.3
<1%	5.9
1-3%	31.4
4-6%	21.6
7-9%	5.9
>9%	1.0
Total	100.0

In order to understand the driving factors behind product upgrading, producers were asked to state the reasons that drove them to implement changes and improve their products. Most of them agree that it was competitiveness that pushed them to upgrade (65.7%). However, 22.4% responded that the customer demanded these changes and therefore they had to upgrade. Almost all of the producers interviewed had implemented changes that would improve their production processes. These changes were oriented towards field practices (77.5%) and post-harvest management (88.2%). Marketing activities are less of a preoccupation for most producers, as only 9.8% of the producers have carried out any marketing activities (Table 3).

Table 3: Changes Process Upgrading

	Field					
	Practices	Post Harvest	Standards	Logistics	Equipment	Marketing
Yes	79 (77.5%)	90 (88.2%)	73 (71.6%)	16 (15.7%)	27 (26.5%)	10 (9.8%)
No	23 (22.5)	12 (11.8%)	29 (28.4%)	86 (84.3%)	75 (73.5%)	92 (90.2%)
Total	102	102	102	102	102	102

Functional upgrading can be defined as increasing value added by changing the mix of activities conducted within the firm or moving the locus of activities to different links in the value chain. The producers were also asked to explain why and how these changes took place. Only 30% of the firms visited had undergone such changes. Most of the firms visited had added value to their products or increased the efficiency of their processes but functional upgrading had not taken place. Furthermore, it remains unclear whether or not these firms had added value faster or significantly better than the competition. In essence, upgrading refers to the acquisition of technological capabilities, skills and market linkages that enable firms to improve their competitiveness. Table 4 shows that the cases in which producers found new market functions were rare (4.9%). The locus of activities appears to not be moving to other links in the chain. However, the mix of activities within the firm is more likely to change.

Table 4: Functional Upgrading

	New Activities Absorbed	New Market Functions	New Logistics Functions	New Management Functions	Outsourcing certain Activities
Yes	28 (27.5%)	5 (4.9%)	12 (11.8%)	12 (11.8%)	17 (16.7%)
No	74 (72.5%)	97 (95.1%)	90 (88.2%)	90 (88.2%)	85 (83.3%)
Total	102	102	102	102	102

3.2 Trust, power relations and coordination

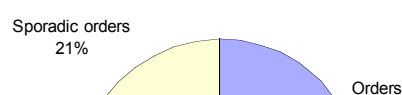
It seems that most companies are dependent on just a few clients. Over 80% sell more than 80% of their total production to just 3 clients. Those firms that have a more diversified client base are few; a mere 2% sells less than 50% of their production to more than 3 clients. These chains exhibit a quasi-hierarchy type of relationship because the lead firms are exerting a high degree of control their suppliers, in these case the Honduran agricultural producers, frequently specifying the characteristics of the product to be produced, and sometimes specifying the processes to be followed and the control mechanisms to be enforced. A significant problem for these firms is the danger of “lock-in”. A large part of their output is going to one or a small number of customers, and they are specialized in one particular activity, in this case production. They are heavily dependent on this relationship.

The producers in the study have limited bargaining power, especially those in the coffee sector. In the case of the coffee producers, over 35% of the producers had to accept the price offered by the buyer, even when this price was lower than the average market price for the coffee. In the case of the palm oil and horticultural producers, most agreed that the prices were market-based prices (Table 5).

Table 5: Price Determination

	Price Negotiation			Total
	Firm	Buyer	Market-based	
Horticultural	2	8	28	38
Coffee	2	15	25	42
Palm Oil	0	0	22	22
Total	4	23	75	102

The type of contractual relationship a firm has with the buyer is a coordination mechanism in the value chain analysis. Lead firms coordinate activities in the chain and one way of doing this is through contracts. At least 45% of the producers studied have formal contracts with the buyers. About 34% have written orders and 20% receive sporadic, informal orders (Figure 2).



The perception of trust was measured. Producers were asked how much trust they had in their buyers. The results vary according to the type of product (Table 6). Most of the producers in the palm oil industry agree that they have trust in their buyers. The answers the horticultural producers gave were also skewed towards more trust. The coffee producers were almost equally distributed between much trust in the buyers and little trust. In very few instances did a case answer that there was no trust between the firm and the buyer.

Given that many of the producers interviewed agreed that they trusted the buyers, then a higher availability of information flowing would be expected. In the case of the palm oil producers, this is the case. About 26% of the coffee producers do not receive any type of information from the buyers and only 13% of the horticultural producers are in this category.

Table 6: Perception of Trust

	Much trust	Moderate trust	Little trust	No trust	Total
Horticultural	16 (15.7%)	13 (12.7%)	8 (7.8%)	1 (1%)	38 (37.3%)
Coffee	15 (14.7%)	15 (14.7%)	12 (11.8%)	0	42 (41.2%)
Palm Oil	18 (17.6%)	4 (3.9%)	0	0	22 (21.6%)
Total	49 (48%)	32 (31.4%)	20 (19.6%)	1 (1%)	102 (100%)

Producers were asked to describe what type of information they receive (Table 7). Sixteen of them already affirmed that they don't receive any type of information. The rest of them do receive information about product specifications (37.3%), quality standards (20.6%) or market information or more (7.8%).

Table 7: Type Information Received

	Percent
Product Specifications	37.3
Quality Standards (QS)	20.6
Product Specifications and QS	18.6
Product Specifications and Market Information	2.9
Product Specifications, QS, and Market Information	4.9
None	15.7
Total	100.0

Because of the position of the firms interviewed at one end of the value chain (i.e. the producer side) the instances where the firm had any contact to the end consumer were few (11.8%). Even fewer were the instances when any type of marketing activity involving the end consumer was done. Only 9.8% of the cases reported marketing activities to the end consumer (Table 8).

Table 8: Contact and Marketing to End Consumer

	Contact End Consumer	Marketing End Consumer
No	90 (88.2%)	92 (90.2%)
Yes	12 (11.8%)	10 (9.8%)
Total	102	102

3.3 Standards

The enforcement of standards is becoming increasingly relevant in the value chain analysis and the discussion on integration of developing country firms in global value chains. There are numerous standards a producer can comply with. More often than not, producers had to comply with more than one standard. There is also a greater variety of standards because this study was conducted across different production sectors and thus different standards are required. Producers cited different reasons for implementing standards. The answers are equally divided among those firms that believe this is the best strategy to remain in the market (45.9%) and those who think they do this out of competitiveness (48.2%). Producers were asked if the implementation of standards has led to a gain in new knowledge and 82% of those firms asked agree that they have acquired new knowledge (Table 9). They were also asked if they have acquired new technology because of these changes and if they feel that they have a more secure position in the chain as a result of the implementation of standards and upgrading. More than half of the firms (66.7%) have acquired new technology and over half (64%) also feel that their position in the value chain is more secure.

Table 9: Gains from Standard Implementation

	New Knowledge	New Technology	Secure Position Chain
Yes	84 (82.4%)	34 (33.3%)	66 (64.7%)
No	18 (17.6%)	68 (66.7%)	36 (35.3%)
Total	102	102	102

Did upgrading have an effect on the sales of the firms? From the correlation results, several conclusions can be drawn. First of all, there is a significant positive relationship between product upgrading and Total Sales. The point-biserial coefficient of 0.426 indicated that the effect was medium. In the case of process upgrading, the effect was small, but the correlation was significantly positive. Firms engaging in functional upgrading activities had greater sales, as the r_{pb} shows. The correlation analysis indicates that there is a positive correlation between upgrading activities and increase in sales. Producers implementing and complying with standards can also expect greater sales.

The second part of the analysis dealt with trust, relationship between the actors and the effect on the sales. It appears that the trust relationship between the producers and the buyers has a significant effect on the total sales (Table 10). The correlation coefficient indicated that this effect was large. Firms that have greater trust on their buyers also have greater sales. The trust relationship seems to be an important factor. The type of contractual relationship (a more binding relationship was a contract, a less binding relationship was a sporadic order) also has an effect on the total sales. There

is a positive relationship between the type of contract and total sales, although the effect is small. Another variable analyzed was the investment in R&D. Firms with a larger investment in R&D also had larger sales. The effect of Spearman's coefficient is large. There is a positive relationship between the frequency of contact between the buyers and producers and the total sales. Those firms having more frequent contact with the client also had greater sales. The coefficient of 0.639 indicated a large effect. Likewise, those firms receiving more and better information from the clients had greater sales. The effect was also large for this variable. Finally, one can conclude that the longer a firm is in a business relationship with the buyers, the greater the sales.

Table 10: Correlation Results

Variable	Spearman's r_s	Point-biserial r_{pb}	Effect
Trust Buyers	0.546**		Large
Type of Contractual Relationship	0.273**		Small
Investment in R&D	0.569**		Large
Frequency Contact Buyers	0.639**		Large
Information Received	0.604**		Large
Years in Business Relationship	0.223*		Small
Product Upgrading		0.426**	Medium
Process Upgrading		0.225*	Small
Functional Upgrading		0.484**	Medium
Implementation of Standards		0.468*	Medium

** Correlation significant at the 0.01 level (2-tailed)

* Correlation significant at the 0.05 level (2-tailed)

Humphrey and Schmitz (2002) observed also that the process of acquiring new functions (i.e. functional upgrading) which generates higher incomes is potentially a critical part of an upgrading strategy. Nevertheless, this requires large investments.

Table 11: Regression Results

	Unstandardized Coefficients		Standardized Coefficients
	B	Std. Error	Beta
(Constant)	.032	.307	
Investment R&D	-.002	.090	-.003
Investment Marketing Activities	-.167	.094	-.189
Investment Product Upgrading	.231	.083	.361*
Investment in Process Upgrading	.031	.146	.029
Investment in Functional Upgrading	.156	.061	.305*
Number Employees	-.001	.001	-.081

The results (Table 11) indicate that the presence of R&D and marketing activities do not make a significant contribution in the prediction of the outcome, in this case, the change in sales between 2001 and 2006. However, there is a significant effect on the change in sales when a firm invests in product and functional upgrading. Investing in product and functional upgrading will significantly have an effect on the income of a firm. The investments in process upgrading appear to have no effect on the change in sales, as does the size of the firm in terms of number of employees.

In an attempt to identify which factors are critical to product upgrading, variables were tested in order to determine which had a significant effect on product upgrading. The results indicate that producers investing in R&D and marketing activities have significantly more likely to upgrade their products than those firms not having any investments in these activities. Furthermore, the availability of information appears to be an important factor in product upgrading. Having contact with the end consumer appears to be a relevant factor in product upgrading, as does implementing standards. Finally, the effect of technical assistance on product upgrading was also significant. In other words, firms upgrading their products were likely to have technical assistance as well (Table 12). In the case of functional upgrading, the investment in R&D and marketing activities is a critical factor. Likewise, the availability of information, contact to the end consumer and the implementation of standards have a significant effect on functional upgrading. The only factor not having any significant effect on functional upgrading is the presence of technical assistance (Table 13).

Table 12: Chi-square Product Upgrading

Product Upgrading	Phi Value
Investment in R&D	,442**
Investment in Marketing Activities	,396**
Information Availability	,347**
Contact End Consumer	,275*
Implementation Standards	,473**
Technical Assistance	,290*

Table 13: Chi-square Results Functional Upgrading

Functional Upgrading	Phi Value
Investment in R&D	,565**
Investment in Marketing Activities	,379**
Information Availability	,226*
Contact End Consumer	,354**
Implementation Standards	,336**
Technical Assistance	,059

4. Conclusions

This paper sought to explain the upgrading opportunities of SMEs participating in agri-food chains. It focused on the local producers how their interaction with local processors or exporters and international retailers opened up the possibility to acquire new skills and knowledge. In particular, the type of trust relationship and power dependence was analyzed to determine how information flows and how firms upgrade. The implementation and compliance with standards was observed to see if new opportunities for learning and acquiring skills and knowledge were present.

Most of the producers studied had engaged in upgrading activities, particularly process upgrading. As suggested by Kaplinsky and Readman (2001), this upgrading trajectory begins with process upgrading, then moves to product upgrading, to functional upgrading and last of all, to chain upgrading. It can be concluded that firms find themselves in the early stages of upgrading. Because of

the nature of agricultural production, it is perhaps not surprising that these SMEs seek to improve production processes. Changing a method of production, such as implementing drip irrigation, has a stronger effect on the productivity and profits than growing a new variety of a crop. Only a number of producers had engaged in functional upgrading activities, citing high investments as the reasons for not pursuing any change. Given the conditions of the financial market in Honduras, credit is difficult to access and the conditions are often not favorable for small producers. Yet the producers that did engage in functional upgrading had done so in stages, strategically improving over time. They had normally started out producing undifferentiated agricultural products, and then they had found a more profitable activity and focused on it, outsourcing the less profitable activities. As an example, a horticultural producer in the Comayagua region started out producing fresh vegetables sold in the local market. He spotted the opportunity of moving into logistics and began buying products from other producers, packing them and selling them to higher-end supermarkets not only in the region, but also in the major cities. The investments he had to make in a processing facility and in delivery trucks was significant. It is important to point out that only monetary investments were made. His firm had to acquire knowledge and expertise and had to build up strong business relationships with the buyers, where information was exchanged. He also had to comply with certain requisites and standards demanded by the buyers.

In the case of the horticultural producer from Comayagua, building a trust relationship with the buyers was part of the success of his business. Over time he established a high trust relationship that helped him acquire new information and knowledge from his client. Trust and the type of business relationship a firm has with the buyers appear to be important factors for firms in value chains. Firms in high-trust relationships with the buyers could expect higher sales. The flow of information, the type of business contract and the frequency of this contact with the buyers was also influential in the performance of the producers. Many firms received information not only about the product or product specifications, but also information on quality and the market.

Globalization has changed trade, opening market opportunities and increasing the competitive pressures for producers in developing countries. In empirical studies on value chains, upgrading is studied on a wider context, one in which the relationships with lead firms and other actors is included. Instead of simply analyzing the firm, the inter-firm relationships within value chains are observed to determine how they affect different types of upgrading. In the case of agrifood chains in Honduras, the interaction with processors and exporters, as well as the type of trust relationship between the firm and other actors appears to determine whether small-scale producers have opportunities for acquisition of knowledge and upgrading.

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