Fresh supply chains for sustainable destinations: case study in La Fortuna

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La Fortuna, Costa Rica, has high potential for becoming a sustainable destination according to international GSTC standards; however, it lacks local sourcing of fresh agricultural goods, even tough, some of them there are locally grown. This research describes the agri-food produce supply chain of four selected products in the region and addresses governance mechanisms, price gaps and overall limitations for an effective supply chain.

Results provide an insight on the supply chain mechanism and main limitations of actors to create win-win partnerships resulting in large price gaps among supply chain links and procurement inefficiencies.

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1. Introduction

Sustainable supply chain management in agriculture is particularly important since sustainable agricultural products mean better standards of living for rural communities (United Nations 2015) and healthier products for an increasingly conscious tourism population (European Commission 2013, Giovannucci et al. 2012).

Agri-food supply chains are complex and further research can improve competitiveness of host regions, especially when these can be sustainable destinations. Sustainability can also be encouraged by a tourist-driven perspective. In this regard, the Global Sustainable Tourism Council (GSTC) in 2013 introduced a new certification especially designed for sustainable destinations (GSTC 2014) since there is growing consumer demand for sustainable tourism.

Matarrita-Cascante *et al.* (2010) addressed sustainability in La Fortuna and suggested several criteria by which this tourist region may be considered sustainable. Local sourcing and local prosperity are fundamental aspects for sustainable tourism. However, Canedo-Rivas (2012) analyzed how agricultural farmers are not included in the local supply chain and local restaurants do not source from local farmers.

Regional competitiveness is a key aspect of competitive supply chains especially if the agri-food supply chain can provide wider benefits to producers and consumers at the same time. Since sustainability in supply chains is improved by enhanced relationships among partners (Seuring and Müller 2008), this research focused on the

characterization of the food supply chain in this region and the analysis of governance mechanisms toward the creation of a sustainable destination in La Fortuna.

Integration of supply chains, as well as the adoption of sustainable practices, has proven to increase performance goals in the manufacturing industry (Zhu and Sarkis 2004) and in the food industry (Vasileiou and Morris 2006 Schiefer 2002, Berno 2006). Nonetheless, management faces problems when integrating the first links of the chain (Stoian and Gotret 2011) in an upstream flow, which in this case are agricultural ones.

According to Seuring and Müller's theoretical framework (2008), the supply chain is organized by the focal company and supply chain decisions are based on governance structures. This research addressed these aspects in a descriptive study of selected products grown in the region by small and medium farmers. The main goal of this research was to gain in-depth understanding of agricultural supply chains and their dynamics within a potentially sustainable destination.

Costa Rica has emphasized its tourism attractions in terms of natural amenities, including La Fortuna, whose economy has increasingly shifted towards tourism in the past 30 years and whose economy and population have shown rapid growth (Acuña and Ruiz 2000). La Fortuna's most important sectors in terms of economic shares are agriculture, tourism and trading/services. As for agricultural production in the Huetar Norte region of Costa Rica; 15% is transported to the rest of the country and 21% is targeted for the export market—with the highest proportion corresponding to fresh agricultural products (Zevallos 2013).

La Fortuna is located in the region of San Carlos (Figure 10), which is the largest canton in Costa Rica with 3347,62 km^2 and 6.5% of the national territory. San Carlos includes these districts: Ciudad Quesada Florencia, Buena Vista, Aguas Zarcas, Venecia, Pital, Fortuna, La Tigra, Palmera, Venado Cutris, Monterry and Pocosol (Local Goverment of San Carlos 2016). La Fortuna is the only one of these districts considered to be a tourist destination—all other are more agriculture-centered.

2. Literature Review

Supply Chain Management

Stoian and Gotret (2011) have characterized the differences between a poor performance in a supply chain and what is considered determinant for high performance. These are usually called value chains or sustainable supply chains. These differences are presented in Table 1.

According to Pagell and Wu (2009), a sustainable supply chain has good standards on traditional measures as well as in the other dimensions included in the definition of sustainable development: social and environmental aspects. Seuring and Müller (2008) define sustainable supply chain management as the material, information and capital flows as well as cooperation among companies while achieving goals in the economic, social and environmental dimensions of sustainable development, considering that these come from client and stakeholder requirements.

Table 1. Characterization of poor and high performance of a supply chain

Criteria	Poor performance/supply chains	High performance/sustainable supply chains, value chains
Purpose	Competitiveness of actors	System competitiveness and long-term vision
Orientation	Guided by the supply	Guided by the demand
Objective	Maximize earnings and minimize costs without considering aspects other than the economic ones	Add value through productivity, quality, traceability and differentiation
Vision	Commercial relationships and supply of products in short or medium term	Commercial relationships and supply of products in medium or long term, with win-win strategies
Organizational structure	Independent actors	Interdependent actors
Type of relationships	Low level of cooperation and trust among actors	Medium to high level of cooperation and trust; clear and transparent definition of norms
Information flows	Low and limited to commercial transactions	Relevant and timely for effective development of actor relationships

Source: Bourgeois and Herrera (1999), Stoian and Gotret (2011)

From these definitions, two predominant issues can be highlighted. The term *sustainability* includes managerial decisions on economic, environmental and social criteria and sustainable supply chains demand collaboration among actors of the supply chain.

Supply chains and governance mechanisms

Traditionally, smallholders are recognized as having partial integration in the market as well as limitations for operating under market principles (Friedmann 1980). The new form of agri-food governance is buyer-driven and has developed sophisticated participation rules (Vorley 2001); therefore, the implications for smallholder agriculture in the new forms of agri-food governance can be a challenge.

Peculiarities of smallholders sustain that no single model for strengthening their supply chains can apply universally (IFC 2013). The characteristics of actors, products and governance mechanisms (Gereffi *et al.* 2005) partially define the dynamics, possibilities and strategies for successfully coordinating with actors along the supply chain.

Alternative coordination mechanisms need to be created so that small farmers are included; however, these always creates costs—transaction costs. Therefore, the objective of new institutional economics, founded by Coase (1937) and followed by Williamson (1985), is to study conditions

under which firms (or supply chains) are more transaction-cost efficient than markets.

Supply chain partner selection is based on transaction costs between both parties (Hitt 2012). The process of getting to an agreement among actors generates frictions and higher transaction costs that are the result of asymmetries in access to information, bounded rationality and opportunistic behavior among actors (Wiliamson 1979). Transaction costs define the relationships created among supply chains.

Gereffi *et al.* (2005) suggest a governance typology in global value chains, bounded to the structural transaction-costs theory proposed by Williamson (1991), which divides supply chains into

1. Market structures: This is the lowest level of cooperation between actors in which the buying-selling rules are clear and of common understanding. Transactions are simple and there is no need for a structure to make any kind of transfer: the transactions are made in markets. There are low transaction costs so actors do not tend to deal with any kind of institutional arrangements.
2. Hierarchy: Product and transaction requirements are very specific and because of that, enterprises and supply chains tend to integrate vertically. Generally, there are larger controls over production and commercialization due to asset specificity.
3. Hybrid structures: These are structures that are not located in any of the extremes presented above. Due to differences in asset specificity, products characteristics and transaction complexity, these structures are defined as hybrid (Williamson 1991).

Gereffi *et al.* (2005) then also classified hybrid structures as follows:

1. Modular value chains: The ability of codifying product specification is less complex than the products themselves. Product specifications are codified through a common understanding between buyers and suppliers, so that they only have to work though codified products instead of analyzing the product each time the transaction occurs, reducing transaction costs.
2. Relational value chains: These take place when specifications of a product cannot be codified, transactions are complicated and the capacities of suppliers are high. In these cases, information flows and constant communication among partners is needed and therefore, changes in partners can create high costs.
3. Captive value chains. These occur when the ability to codify and product complexity specifications are high but the capacities from suppliers are low. These face changing prices and the buyer, rather than the seller, is the most significant actor in the decision-making process.

3. Methods

In-depth interviews were carried out with important institutions in the region, including La Fortuna's Development Association (ADIFORT), the regional Ministry of Agriculture (MAG), the National Bank of Costa Rica, the Costa Rican National Chamber for Ecotourism and Sustainable Tourism (CANAECO) and the Costa Rican Chamber of Restaurants (CACORE). These

interviews were intended to address the region's plan for development as well as sustainability's triple bottom line and development perspectives.

Methods for data collection: farmers

The district of La Fortuna was established as the site for analysis because of its sustainable destination framework. Although the borders of the wider supply chain spread to the international market, the focus for analysis and the farmers' sample was estimated according to the geographic limits of the district, since one of the objectives of sustainability is to source locally and the goal of the research is to address this specific topic.

In 2014, INEC conducted the agricultural census, but there is no accurate information about this study's population target since farmers dedicated to agricultural products were not identified on a regional scale (district) but on a wider canton scale. Information about the exact number of farmers dedicated to the selected products was not available.

Meetings with La Fortuna regional MAG were the basis for product selection. Products suggested by the regional director were papaya (*Carica papaya*), yuca/cassava (*Manihot esculenta)* and plantain (*Musa balbisiana*, *Musa acuminata* or a mix of these) (Hernández 2015). However, pineapple (*Ananas comosus*) and taro (*Colocasia esculenta)* production were also included in the questionnaire. Pineapple was included because it can be produced in this region; in fact, 47 percent of Costa Rica's pineapple production is located in the northern region of the country (CANAPEP 2015) and because it is widely consumed on a national scale. Taro was also included in the analysis because it is produced in La Fortuna and it represents an opportunity for promoting local food in restaurants targeted to tourists. This is one of the objectives of the National Plan for Healthy and Sustainable Food promoted by the Costa Rican Chamber of Restaurants (CACORE 2015).

To get an approximate number of farmers in the region, geographical information on people dedicated to agriculture was obtained from INEC, as well as desegregated demographic, social and economic data. All other information was obtained from field research.

In an exploratory phase, pilot interviews were carried out in training sessions organized by MAG-La Fortuna. Three visits were planned in order to identify the main regions and to validate the information provided by INEC and the selected products before interviewing farmers and restaurants.

A stratified sample was estimated according to the proportion of people dedicated to the agricultural sector of the economy in the district. Six communities within La Fortuna were considered for the sample selection: Agua Azul, Sonafluca, Tres esquinas, La Perla, Los Ángeles, El Tanque and San Jorge. Sample size for farmers was estimated on a 90 percent confidence interval and 108 farmers were interviewed in these communities.

Direct questionnaires were applied from September to December 2015 in several visits to the region. All routes were designed according to INEC's map, previous visits and information about important farmers in the region and others farmers had previously mentioned. All houses in the selected regions

were visited, and those identified as small and medium farmers were interviewed.

Methods for data collection: hotels and restaurants

For selection of the hotels and restaurants, a list of hotel and restaurant licenses was requested from the San Carlos local government. From this list, a total of 325 licenses were active; however, several belonged to the same management. For example, if a hotel had three restaurants, there would be four different licenses, one for the hotel and three for the restaurants although procurement and managerial decisions were taken by the same person. There were several hotels on the list that did not include restaurants and therefore these were not interviewed. In addition, some small restaurants and hotels had closed by the time the research was conducted; therefore, the population was reduced to 53.

All restaurants were contacted; however, the response rate was 50 percent of the population. Interviews were carried out from September 2015 to January 2016 in previously requested meetings with the procurement managers; 30 complete questionnaires were filled out by restaurants in La Fortuna.

4. Results

Supply chain analysis

This section characterizes the main actors of the fresh produce supply chain and addresses their dynamics and governance structures.

Input sources

There are two main agricultural input suppliers in La Fortuna: El Colono and Almacen Agroveterinario Dos Pinos, which are private institutions. Farmers often get their inputs from these as well as either from governmental institutions (especially papaya seeds) or from their buyers, who often provide some inputs if their sellers are committed to a longer-term agreement.

Institutions such as MAG are often committed to supporting farmers to getting their inputs at lower prices; however, 10 farmers mentioned how input prices are high and they believed the government should support them in lowering at least the main agrochemical inputs. There were no farmer organizations in this region to strive for policy reforms that could eventually lead to structural policy changes that could lead to lowering input prices.

Farmers

The population in La Fortuna is 73% rural and 27% urban (INEC 2015) and most farmers live in rural regions, close to their farms. Socioeconomic development (SD) is divided into the five categories, shown in Table 2.

Most of the population (82%) has a low, medium-low or medium SD; however, the largest percentage (68.4%) is considered as medium while only 1 GMU is considered as high and 9 as low. In farmers' households, there were an average of 3.91 people per household (SD = 1.60), the mean, median and mode were all rounded to four people per household, following a normal distribution. The national average of persons per

household for 2014 was 3.30. National averages per quintile go from 3.57 members (fifth) to 3.10 members (first). In La Fortuna, 35.6% of households had more than four members, which is slightly higher than the fifth quintile in national terms

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Table 2. Socioeconomic levels of La Fortuna's population, 2015

Socioeconomic level	Frequency	Percentage (%)	Cumulative percentage (%)
Low	9	5.9	5.9
Medium-low	12	7.9	13.8
Medium	104	68.4	82.2
Medium-high	26	17.1	99.3
High	1	.7	100.0
Total	152	100.0	

Source. INEC, 2015; N = 152 (GMU: geographical minimum units: INEC's measurement of minimum geographic measurements for analysis)

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The number of household members was usually negatively correlated with per capita income. Therefore, lower national per capita incomes can be expected in La Fortuna; however, income and agricultural incomes are not the focus of this research.

Farmers have a mean of 25.26 years of experience working in the agricultural sector, with a minimum of two years and a maximum of 62, therefore there is high variation (SD = 13.943). While some have worked as farmers their entire lives, some others changed recently shifted to agriculture, since the construction sector deteriorated in the region a few years ago. Both, agriculture and construction jobs are considered non-skilled labor and workers can switch easily from one activity to the other. Some farmers (eight) that have recently moved to agriculture, mentioned how they were forced to shift from other tourism-infrastructure related jobs to agriculture as a consequence of the recent economic crisis of 2008–2009.

In terms of agricultural dependency for economic performance, 63% of farmer households depend only on agricultural production, while 37% do not. As for their proportional income distribution, 73% mentioned all of their income comes from agriculture and farming.

Table 3. Income from agriculture and education level of farmers, La Fortuna, 2015

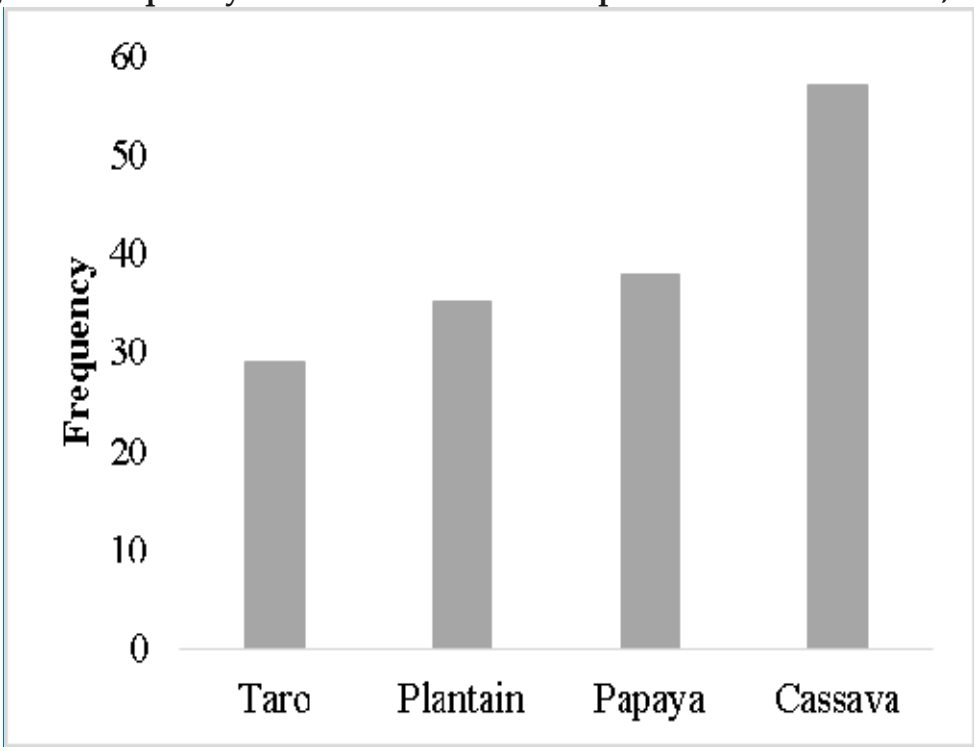
Education level	Income from agriculture					
	100%	75%	50%	25%	NA	Total
Less than 6 years	17	1	3	2	1	24
	70.8%	4.2%	12.5%	8.3%	4.2%	100.0%
6 years	45	4	4	5	0	58
	77.6%	6.9%	6.9%	8.6%	0.0%	100.0%
Less than 11 years	12	0	1	0	0	13
	92.3%	0.0%	7.7%	0.0%	0.0%	100.0%
11 years	4	4	1	1	0	10
	40.0%	40.0%	10.0%	10.0%	0.0%	100.0%
Higher education	2	1	0	0	0	3
	66.7%	33.3%	0.0%	0.0%	0.0%	100.0%
Total	80	10	9	8	1	108
	74.1%	9.3%	8.3%	7.4%	0.9%	100.0%

Most farmers received almost all their income from agriculture-related activities whether these were solely crop production or farming; some farmers also combined it with other jobs such as drivers, agriculture machinery rentals, apartment rentals or security guards. These were the jobs mentioned most and their working relatives work mostly in beauty salons or as elementary schoolteachers.

Most of the jobs farmers mentioned are non-skilled labor or low-skilled labor. This situation corresponds with farmers' low academic profile; since 75.9% only have elementary school education, including 22.2%, which who did not complete it. Only three people from the sample (2.8%) had achieved some kind of higher education. However, even when education increased, farmers still received most of their income from agriculture ($\chi^2 = 1.20$).

Around half of farmers in this region usually grew more than just one product (44.4%), while 55.6% stuck to one product. Most popular crops were cassava (55%), papaya (38%), plantain (35%) and plantain (30%). Farmers do not rely only on one product—they mentioned prices fluctuate significantly during the year and having more than one product allowed them to increase their financial stability. Some farmers grew a mixture of these products or mixed them with less popular products such as ginger and sweet potato (Figure 1).

Figure 1. Frequency distribution of selected products for La Fortuna, 2015



Although there is much research on the importance of written contracts to enable farmers to increase their development goals, especially for economic stability, in La Fortuna, most farmers worked with their supply chain partners without a contract (69.4%), while 23.1% used a verbal contract and only 7.4% had a written one. According to their responses, this situation occurs because they preferred to choose from the market if there were any buyers who would pay a higher price than the last person/company that bought their product.

Creating trust among supply chain partners is fundamental to sustainable supply chain performance; however, there were no risk-sharing mechanisms for farmers to rely on their buyers, and therefore they were constantly searching for better options; which farmers understand as buyers who offer better prices.

In terms of association and organizational skills, only 39 farmers (36%) mentioned they belong to some type of farmers' organization; however, these are no local cooperatives or farmers' associations but rather larger countrywide associations.

Most farmers sold their produce to intermediaries and packing companies (Table 4), although they often mentioned they were uncomfortable when asked about why they chose to work with them; however, these actors were the only ones who would buy their entire production and collect it at the farm gate. Restaurants bought mostly from intermediaries (Table 5), reasons being they already know their suppliers or because of ease of the transaction.

Table 4. Frequency of supply chain partner selection for farmers, La Fortuna, 2015

Type of buyer	Frequency	Percentage (%)
Intermediary	53	49
Factory	39	36
Farmers' market	10	9
Supermarket	5	5
Restaurant	1	1
n =	**108**	**100**

Table 5. Frequency of supply chain partner selection for restaurants, La Fortuna. 2015

Type of seller	Frequency	Percentage (%)
Intermediary	19	63
Both	7	23
Farmers	4	13
n =	**30**	**100**

Local buyers

Restaurant decision makers had a mean of 9.84 years of experience, with some mentioning less than a year of experience and the maximum respondent mentioned 30 years of experience (SD = 7.761).

Educational level of restaurant managers or procurement managers was higher than farmers, which was expected; 43.33% of them had gone on to higher education (college) and 46.66% had between six and 11 years of high school education. These are significantly higher than the educational level of farmers, although farmers have more experience. Also, 60% had received training courses while working in the tourism or sourcing sectors.

Farmers' lack of organization replicated in the restaurant sector: 73.3% did not belong to any type of organization either in the tourist sector or in the sourcing sector. Tourism organization is a common topic in the country, especially when dealing with sustainability issues. CANAECO, the Costa Rican National Chamber for Ecotourism and Sustainable Tourism, supports business linkages, for example as well as sustainable initiatives and training courses; however, there are only five hotels affiliated with this institution in La Fortuna (Carballo 2015).

In spite of sustainability promotion and the national certification for hotels, restaurants and tour operators, only seven restaurants claimed they are part of the Costa Rican Sustainable Tourism Certification (CST), three other respondents claimed they have strived for it in the past but did not continue to pursue it since it has very high standards and they were not sure if it is worth it.

In terms of contract mechanism, 50% worked with their fresh produce suppliers without a contract, 40% with a verbal contract and 10% with a written contract. This situation had a similar pattern in the previous stage of the supply chain since most farmers did not work with a written contract; however, most restaurants worked directly with intermediaries rather than farmers.

Exports and the Costa Rican market

In farmers' interviews, seven mentioned they own their means of transportation and therefore they sold directly to the local farmers' market, in street sales and in three cases they transported directly to the National Center for Food Supply and Distribution (CENADA), located 125 km away. In cases in which farmers sold to intermediaries, once these products left their farms, most farmers did not know where or to whom products were sold; only five farmers who sold to intermediaries knew where their products were finally consumed.

Production from farmers who sold directly to factories was turned into either frozen products or chips (especially in the case of plantain and cassava). Papaya was also exported either fresh or frozen. There are four factories in La Fortuna, which can absorb the local supply and usually buy all of the farmers' harvest, which is a valuable asset from the farmer's perspective; two of these factories sold their produce exclusively to foreign markets and the other two sold mainly to the local market, at least as first tiers.

According to FAOSTAT (2015), Costa Rica exports fresh plantains to North America and the European Union (EU); however, exports significantly reduced from 2006 to 2009 and have remained low since then. Dry plantains were first exported in 2006 and exports have increased significantly, especially from 2010 on. Fresh papaya is mainly exported to Canada, since papaya from Costa Rican is banned from entering the United States. Taro is exported to North America and to the EU in small quantities however', exports began in 2012, and so this is a new market. From these selected products, cassava is the most important product in the foreign market. The main market for cassava is the United States since it has been about 70% of total exports for the past 10-year span.

Supporting actors

The University of Costa Rica (UCR), Costa Rica's Technical Institute (TEC) and CATIE (Tropical Agricultural Research and Higher Education Center) are universities that farmers recognize because they have received previous support from them in the form of research and improving their production capacity. The National Institute of Learning (INA) is a teaching center widely recognized by small and medium farmers and hotels and restaurants because they have received training courses from this institution, such as. Food-handling courses and agricultural technical courses.

ADIFORT, La Fortuna's development association has a major influence on a local scale because of its economic capacity and good organizations skills; it works from two main pillars—social projects and economic projects (Román 2015). ADIFORT is involved in the organized farmers' market, which is held every Friday.

The main source of income and social mobility for families in La Fortuna is tourism or tourism-related activities; but the second most important sector is agriculture (Román 2015, Hernández 2015). As for financing, most loans were related to tourism; however, in recent years, these have decreased and people in the region have searched for financing for other types of businesses,

including agriculture and farming projects (Rodriguez 2015).

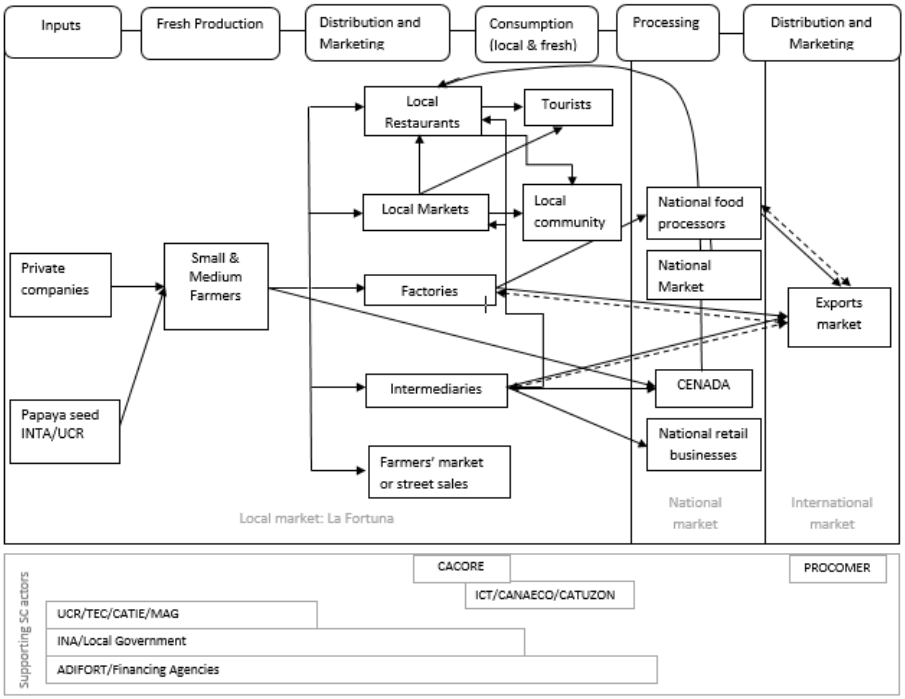
From the perspectives of tourism and restaurants, the Costa Rica Tourism Institute (ICT) plays an important role in promoting the country as a sustainable, green and authentic destination; however, restaurants and hotels in the region are more acquainted with ICT because of the CST certification program, which is the national certification for sustainable tourism.

CATUZON is the Northern Region Tourism Chamber, which is a community organization that promotes tourism, especially linked to the northern part of the country; 43 businesses are affiliated with this chamber (ICT 2016), including hotels, restaurants, tour operators and transportation agencies. In terms of tourism promotion and support, only five institutions are currently affiliated with CANAECO, the main advocate of sustainability and tourism (Carballo 2015). There is not enough information to ascertain why hotels and restaurants do not participate as members of these institutions; however, there are low organization skills and a lack of willingness to associate among both sectors in the region.

Procomer, which is the national institution in charge of promoting exportation of goods and services, assesses all companies interested in exporting; including those who export agricultural goods. It provides guidance to new exporters and those who already export; Procomer also provides international market information; however, this institution works on a national scale.

The graphic representation of the supply chain can be observed in figure 2, were supporting actors are located outside the supply chain structure.

Figure 2. Supply chain of selected fresh agricultural produce, La Fortuna, 2015



Price analysis

Farmers sell their produce to different types of consumers, classified in five different types of buyers, and the mean price paid per buyer is shown in Table 6. Price ranges according to type of buyer are significantly different for papaya and cassava, but not for plantain or taro.

Table 6. Prices received by farmers per type of buyer of fresh products, La Fortuna, 2015*

Products	Type of buyer					Sig (0.95%)
	Restaurant	Small markets	Factory	Intermediary	Farmers' market /street sales	
Papaya		143	155	155	325	0.009
Cassava		161	156	160	304	0.000
Plantain	120	108	121	123	118	0.923
Taro	217	282.61	262.56	229.97	543.47	0.564

*Prices in Costa Rican colons (price equivalent 544 colons = $USD 1, 30 May 2016).
Papaya, cassava and taro: prices per kg; plantain price per unit.

Restaurants were also asked about the mean price of these products, results are shown in Table 7. There are no significant differences in this case; means prices are the same, regardless of the supplier.

Table 7. Prices paid by restaurants per type of seller of fresh produce, La Fortuna, 2015*

Products	Type of seller			Sig (0.95%)
	SM farmer	Intermediary	Both	
Papaya	613.75	671.25	650.83	0.982
Cassava	445	449.58	427.78	0.959
Plantain	165.25	173.73	144.29	0.426

*Prices in Costa Rican colons (price equivalent 544 colons = USD 1, 30 May 2016.
Papaya, cassava and taro: prices per kg; plantain price per unit.

Price sold by farmers to intermediaries and price at which restaurants buy from intermediaries were as follows: papaya 333.065%, cassava 180.988% and plantain 41.243%. Taro was not considered for this analysis since the proportion of restaurants who regularly bought taro was too small.

5. Discussion

Gereffi (1994) defines governance as "authority and power relationships that determine how financial, material and human resources are allocated and flow within a chain." Governance is based on the complexity of the information between actors in the chain, how the information for

production can be codified and the level of supplier competence (Gereffi *et al.* 2005).

According to Gereffi's hybrid structure classification, the fresh agri-food supply chain of La Fortuna classifies as a captive governance structure since suppliers (farmers) depend on a small numbers of buyers who "wield a great deal of power" (G. Gereffi 1994), while small- and medium-scale farmers (SMFs) are dependent on the conditions established by their buyers.

SMFs do not have any type of farmers' organization; all of them negotiate sale of their produce on their own. This system limits their bargaining power since they are SMFs and cannot exert any type of market power through price and volume control. All farmers have a positive perception of a potential SMF organization; however, no one has launched any initiative yet, perhaps because of lack of organization skills.

Most farmers sold their produce either to intermediaries or to factories, which determined prices. Usually, quality of agricultural products is encoded, but quality standards for agricultural products in this region are not stable; according to interviewed farmers, price and quality are relative terms. When agricultural supply is high, quality standards are very strict; however, when supply is low, buyers do not take into account their quality standards, often buying produce they would not normally buy. Nonetheless, farmers are price takers.

There is a lack of backward information along this supply chain. When farmers were asked if they knew where their produce was sold, most did not. In only five cases farmers knew exactly where their produce was consumed. Bullwhip effects would certainly affect negatively on farmers' incomes since there is no market-risk information. This is a problem in the sense that farmers would not adapt to changing trends fast enough because of their lack of awareness of market trends.

According to Seuring and Muller (2008), first tiers of the upstream sustainable supply chains would adapt to changing consumer demands either through certification systems or by focal companies. In this case, focal companies are the only source of market information for most farmers and therefore would base their farming decisions on these. Certification systems, however, are not popular in the region; none of those interviewed had enrolled in any type of certification system.

Those who make sourcing decisions in restaurants are aware of the importance of sustainability and local sourcing—they often explained their good relationships with SMFs. They know their target market and are informed of changing trends in clients' needs. Since tourism is gravitating toward sustainability and corporate social responsibility, hotels and restaurants expressed willingness to follow these patterns.

On the other side of the supply chain, farmers were willing to sell their produce to buyers other than intermediaries and factories because most of them felt prices paid for their products were not fair. However, the first problem in linking these two is quantity: if all restaurants in La Fortuna bought all of their products locally, they would purchase only 14.2% of plantains, 0.4% of cassava and 2.5% of papaya grown by SMFs.

Finally, restaurants need at least a weekly supply of fresh produce, while farmers harvest in a six-month period for cassava and taro and do not stagger their harvest in order to offer their produce consistently to local restaurants. Prior coordination is necessary so farmers plan their harvest according to their potential buyers' needs.

6. Conclusion and recommendations

The fresh product supply chain is very complex and since there is no farmers' organization, their decision-making process in selecting partners is scattered among different buyers. In some cases, farmers even sell to intermediaries who transport products all the way to the country's urban area. On the other hand, farmers buy from intermediaries who travel from this urban area to La Fortuna.

Since restaurant owners and managers are aware of the importance of buying locally, especially in the agriculture sector, there is a possibility for these to collaborate. Also, farmers would find prices paid by restaurants significantly higher than those they currently receive from their buyers, therefore there is an incentive for both sides. Nonetheless, this potential trading mechanism would only include a small proportion relative to the number of fresh products harvested in the region.

The education level and socioeconomic conditions of farmers are still a challenge in this region; investment in these aspects could exponentially increase their possibilities for engaging in high-value global chains—to engage in value-added products or promote innovation in business models of these supply chains.

Although it is a popular characteristic in agricultural supply chains for farmers to depend on buyers, this is still a challenge, since SMFs would sell their produce whatever the price, having no control over any decision-making procedures aside from their harvest; there are no bargaining mechanisms, and conditions are set only by buyers.

Collaboration among SMFs and local restaurants would help the tourism sector not only to comply with sustainable certification standards but also to provide an enhanced experience for tourists by offering local food, which has proven to increase tourist satisfaction in other locations (R. Sims 2009). Governance mechanisms from the tourism sector that push this type of initiative are essential since the agricultural sector of the supply chain lacks organization skills. CACORE's national plan for local food in a possibility for supply chain enhancement; however, incentives for restaurants to participate should be promoted in order to obtain higher policy implications and better standards of living for the rural areas.

Promotion of this type of initiative can promote development in rural areas, creating opportunities for people to prosper and reducing socioeconomic problems that occur with rural to urban migration. Generating possibilities for development in rural areas is key to sustainable development in a region in which most of the population is located in rural areas, often with lower standards of living.

This research provides a characterization of the fresh product supply chain and

emphasizes the main issues of farmers' lack of bargaining power and market knowledge. The asymmetry of information among these two groups of actors was expected because of other empirical results; however, this research provides a full characterization of the supply chain and of its governance mechanism. Further research on how to improve bargaining power of SMFs with low individual quantities as well as improvement in association and organization skills are needed to extend benefits from supply chains and promote rural and local development.

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