



Changing asset endowments and smallholder participation in higher value markets: Evidence from certified coffee producers in Nicaragua [☆]



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ABSTRACT

This paper examines the capacities of smallholders in Nicaragua to exploit new linkages to certified coffee markets following the coffee crisis. Data on livelihood assets were collected from 292 households, which were clustered to test how differences in outcomes (asset building) reflect variations in initial asset endowments. The results suggest that most households built particular elements of their asset base and increased their resilience to future shocks. However, households struggled to make effective use of the gains for intensifying their livelihoods. Of the least-endowed households, few made investments in the scale or productivity of coffee, and most continued to depend heavily on subsistence production and seasonal off-farm income for survival. In conclusion, improved market access alone, even under relatively favorable market conditions and with considerable external support, will have uncertain impacts on rural poverty if the underlying constraints on household assets and investments are not addressed concurrently.

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Introduction

Intensify, innovate, and specialize – this was the essential message for governments and donors looking to address the devastations of the coffee crisis in Central America and other coffee producing regions. Between 1999 and 2005 prices paid for green coffee did not allow producers in Central America to cover their variable costs of production (IADB, 2002). Most smallholders reduced investment in coffee productivity, while others abandoned coffee plantations altogether, or uprooted plantations in favor of basic grains and other crops (Castro et al., 2004). Influential publications argued that smallholders had limited opportunities to increase their share of the benefits from trade in commodity coffee markets, given that the overwhelming proportion of economic returns flowed to actors in developed countries (Oxfam, 2001; Ponte, 2002; Gibbon and Ponte, 2005).

Consensus emerged that support for building smallholders' links to specialty coffee markets, including those for certified fair-trade and organic coffee, would improve the prospects for smallholders in the short and long term (USAID, 2003; Varangis et al., 2003; IICA, 2004; Bacon, 2005; Kilian et al., 2005). The

specialty market exhibited rapid demand growth, in contrast to slow growth for bulk coffees. Access to these markets required that smallholders meet stricter quality requirements and, in some cases, obtain access to certification. Subsequent development interventions aimed to improve coffee quality and productivity, facilitate access to certification, strengthen collective enterprises in regions where the production of high-quality coffee was most viable, and promote diversification out of coffee for regions with less potential.

Recently, however, various studies have tempered expectations regarding the poverty-reducing potential of access to markets for fair-trade and organic coffee. Arguments have centered on the persistence of low yields and relatively high labor requirements (Valkila, 2009; Barham et al., 2011; Beuchelt and Zeller, 2011), declining prices relative to conventional coffee (Weber, 2011), and the limits of smallholders to intensify coffee systems given their livelihood insecurities and rising production and household consumption costs (Raynolds, 2002; Bacon et al., 2008; Mendez et al., 2010; Wilson, 2010). These findings on coffee echo those of well-documented studies in the Mediterranean, Africa and Latin America on the struggles of smallholders to meet stricter buyer demands for product quality, volume, and timeliness of delivery across a range of agrifood sectors (e.g., Reinhardt, 1987; Dolan et al., 1999; Reardon et al., 2003; Garcia Martinez and Poole, 2004).

While NGOs, donors, and development agencies have maintained their enthusiasm for facilitating smallholder links to higher-value markets (Devaney, 2011), few value chain studies or

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assessments of value chain interventions have explicitly documented the impact of improved market access on poverty, gender, or the environment (Bolwig et al., 2010; Stoian et al., 2012). Project assessments generally have relied on only a few generic impact indicators (e.g., output per acre, size of holding, and income gained) and thus have provided limited understanding of the determinants of household participation and the benefits across different types of households (e.g., Zandniapour et al., 2004; Humphrey and Navas-Alemán, 2010). As a result, policy makers and development practitioners have inadequate guidance for the design of the necessarily complex interventions that seek to help farmers benefit more from their linkages with higher-value markets.

Deeper insights into how smallholders benefit from linkages to higher-value markets can be obtained by adopting a livelihoods perspective, with special emphasis on households' assets and the ability of households to build their endowments over time. In this paper, we undertake an analysis of household asset building in order to explore how differences in market participation reflect variations in households' endowments of livelihood assets, namely natural, human, social, physical, and financial capitals. We consider:

- initial asset endowments of producing households,
- the contribution of development interventions to household asset building,
- how initial asset endowments and subsequent household changes determine smallholders' participation in high-value export markets.

Section 'An asset building framework' describes the asset-building framework. Section 'Case study background' provides contextual information on the case study in Nicaragua. Section 'Study design and methods' discusses the methods used for data collection. Section 'Changes in assets of coffee producing households' presents the results on asset changes by coffee-producing households. In the final section, we discuss the implications of the findings for the design of development interventions aimed at linking smallholders to higher-value food markets.

An asset building framework

Poverty debates reflect a growing interest in the importance of assets for understanding poor people's ability to respond to shortages and shocks and generate future income and consumption (e.g., Moser, 1998; Rakodi, 1999; Anderson, 2012). Economists have argued that a focus on assets provides a better option for understanding the underlying causes and the dynamics of poverty than a focus on income or consumption variables alone (e.g., Birdsall and Londono, 1997; de Janvry and Sadoulet, 2000). Carter and Barrett's (2006) theoretical work on asset thresholds and poverty traps drew attention to how insufficient access to assets jeopardizes the long-term ability of households to pull themselves out of poverty. An understanding of asset endowments and interactions forms a core element of the frameworks for livelihood conceptualization and analysis (e.g., Ellis, 2000; Carney, 1998).

Academic discourse on the links between poverty reduction and access to higher-value markets suggests that the poorest smallholders often have too few assets to effectively participate over time. However, such insights into the roles of assets in shaping rural livelihoods have yet to translate into the design and assessment of interventions for linking smallholders to higher-value markets (Stoian et al., 2012). For example, the various methodologies for designing strategies that better link smallholders to markets pay little attention to households' capacities, needs, and

circumstances, thus making the implicit assumptions that (1) households have sufficient assets to effectively participate in higher value markets, (2) do not face substantial trade-offs when using these assets, and (3) are able to assume higher risks for their investments (Donovan et al., 2013). Making such assumptions reduces the complexity for methodological implementation but runs the risk of formulating intervention strategies that provide limited long-term benefit to the rural poor.

More effective policies, programmes and projects for linking smallholders to globalizing food markets will require that key aspects of the development challenge be addressed in formal tools and frameworks. The framework presented here stresses the relationships between a household's endowment of livelihood assets and its ability to engage in various livelihood activities (Fig. 1). Livelihood assets, namely natural, physical, social, financial, and human capitals, may be individual or collectively owned. These are built up through returns from market activities, remittances and inheritances, and inputs and services provided by NGOs and other external actors. Variations in asset accumulation may be explained, in part, by variations in the overall political, legal, and institutional context that shapes the decisions of producers and buyers. The stronger a household's asset base, the greater is its ability to expand and intensify livelihood activities and thus benefit from links with more demanding markets.

Households maintain different types of commercial relations with buyers linked to local, national, and international food markets. In addition, households may engage in seasonal and year-round labor provision. Investments in household labor and financial resources and returns to those investments vary according to the market and over time. To the extent that new (more intensive) market linkages require new (increased) investments, trade-offs are likely between assets and among activities required to implement other livelihood activities, including subsistence production. Opportunities to reduce the costs and risks related to market investments may originate from collective enterprises, other buyers, and nonmarket actors (e.g., NGOs and government agencies).

This framework suggests that the design of pro-poor interventions in value chains must progress beyond the categorization of the types of capital to identify priorities for policy and interventions supporting asset building. Such prioritization should relate poor peoples' access to different types of assets to the functions of those assets within changing and dynamic livelihood strategies, identifying the most effective livelihood development paths and the changing roles of different assets within those paths. The framework and methodological approach used here enables a systematic analysis of asset endowments and the varied livelihood strategies of the poor. It will help policymakers assess whether access to new or higher-value food markets will help households climb out of poverty, and address questions such as: Which households are more able to build their asset bases? How are assets built up over time? Which households are best able to invest in new or more intensive market linkages?

Case study background

Among agricultural products exported by Nicaragua, coffee is the most important, accounting for 37% of the total value of agricultural exports in 2008 (CEPAL, 2009). Nicaragua's average coffee productivity, at 672 kg/ha (green coffee), makes it the least efficient producer in Central America, at roughly 50% of the productivity of Costa Rica and 40% of the productivity of Guatemala (Varangis et al., 2003). There are about 48,000 coffee farmers in Nicaragua, 80% of whom are producers with less than 3.5 ha under cultivation (Flores et al., 2002). Despite the large number of smallholders, farms larger than 3.5 ha produce more than 85% of

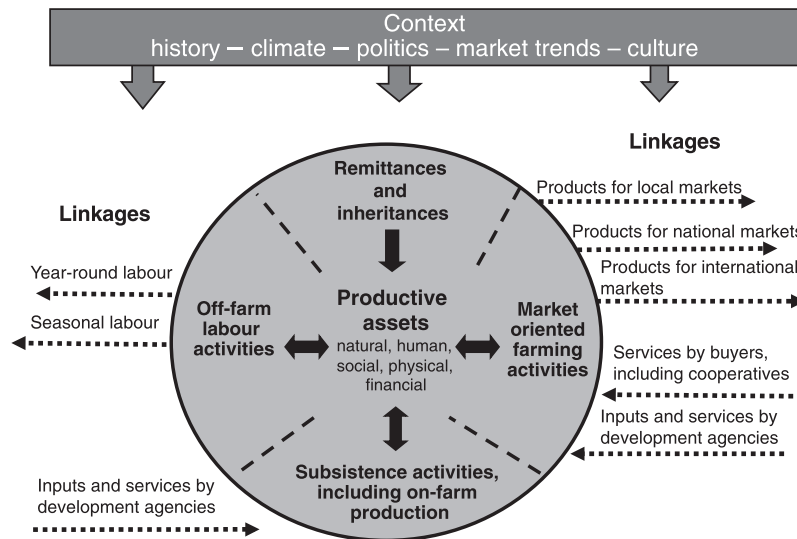


Fig. 1. Household asset allocations and linkages with markets and service providers.

the Nicaraguan coffee harvest due to higher intensity of management and better access to purchased inputs. In general, coffee producers are better-off than the landless or those who produce basic grains and tubers mainly for subsistence. That said, the poorest of coffee farmers often lack resources for coffee production and basic living expenses and are vulnerable to negative changes in output and input prices, production risks and other shocks.

The research examined asset building by smallholders in north-central Nicaragua who were linked to certified fair-trade and organic coffee markets through the cooperative Soppexcca. Soppexcca has roughly 500 members. It emerged in 2001 from the ashes of its predecessor cooperative, which dissolved due to unpaid debts owed to international coffee buyers. Soppexcca's membership more than doubled during the coffee crisis, as smallholders sought credit and higher coffee prices. In addition to providing access to certified markets, Soppexcca offers annual credit for coffee production, multi-year credit for strategic coffee-related investments, technical assistance for increasing coffee productivity and reducing environmental impacts of coffee production, and some forms of social protection. In 2009, all of Soppexcca's coffee exports were fair-trade certified, and approximately 15% were certified for both fair trade and organic. Since its beginnings, Soppexcca has maintained strong ties with a small group of European coffee buyers. Recently, the cooperative has forged ties with U.S. coffee buyers.

Soppexcca, like other relatively large and well established cooperatives in Nicaragua, maintains close links with NGOs and development projects. Between 2003 and 2009, Soppexcca received about US\$2.1 million from NGOs and development projects to build its infrastructure, strengthen its internal organization, and expand its service offer to members. Soppexcca maintains links to alternative lending institutions for access to low-cost credit for infrastructure development and the purchase of coffee from its members. In addition, Soppexcca receives support from coffee buyers in the form of fair-trade contracts (with social premium and floor prices) and zero-interest credit for purchase of coffee from its members. On average, in 2009, buyers offered Soppexcca prices that exceeded by 5–15% those established by fair-trade standards.

Study design and methods

Data collection focused on identifying changes in endowments of livelihood assets among coffee-producing households affiliated with Soppexcca during the four-year period between 2005–2006

and 2008–2009. Quantitative and qualitative data were collected to understand the changes in assets, and qualitative information was used to understand the relevance of and the reasons for the changes. Feasibility of empirical research and the tractability of analysis required a focus on specific elements of the five livelihood assets rather than undertake a comprehensive analysis of all asset concepts. After exploratory and participatory research among producers to validate asset concepts and methodology, the most important asset changes were assessed using the following set of indicators:

- *Natural capital*: access to land and area under coffee production, land tenure arrangements, access to fertilizers (proxy for soil fertility), and waste management.
- *Human capital*: management skills in coffee production, ability to participate in cooperative governance.
- *Social capital*: linkages and reciprocity in relationships with coffee buyers.
- *Physical capital*: capital for production and processing.
- *Financial capital*: access to credit, income benefit from coffee sales to Soppexcca.

In most cases, what we observed and measured provided a partial understanding of the five assets and their relevance for livelihood strategies. This is especially true in the case of social capital, the concept of which admittedly has been much contested (e.g., Fine, 1999). In research on smallholders, social capital has been explored in various ways, including interactions with neighbors (e.g., Elder et al., 2012) and links with farmer organizations (e.g., Uphoff and Wijayaratna, 2000). In this study, the assessment of social capital focuses on relations between Soppexcca members, the cooperative itself, and transactions with other coffee buyers, with special attention to the formation of mutually beneficial trading relationships. The data collected focused on the services and inputs received by smallholders from buyers, and, in the case of Soppexcca, the ability of the cooperative to service, and source raw material from, its members.

Environmental sustainability issues were addressed under the management of natural asset – soil fertility – and human asset – waste management practices. Commercial sustainability was subsumed within concepts of social and financial capital. Equity issues, such as differential impacts and outcomes for households, were addressed through the clustering approach.

In addition to information on assets, data were collected on other major income sources, on contextual factors that could have facilitated or hindered asset building, and members' insights into the reasons why a given change did or did not take place.

The sample included 292 coffee-producing households – about 95% of the membership of 11 of Soppexcca's 18 base cooperatives. Criteria for base cooperative selection included distance from Soppexcca's headquarters and geographical concentration of members in a given base cooperative. To facilitate data collection, preference was given to those cooperatives with a higher concentration of households. Unless otherwise indicated, coffee quantities are presented as pre-dried parchment coffee – the semi-processed state of coffee when it is sold by producers to buyers such as Soppexcca. One hundred pounds of export-ready (green) coffee is commonly processed from roughly 200 lb of pre-dried parchment coffee produced by farmers in north-central Nicaragua.

Data collection was conducted in Jinotega and Matagalpa districts during a nine-month period in 2009–2010. Primary data from household surveys and key informant interviews were supplemented by secondary information from Soppexcca staff. Twenty key informant interviews were conducted with Soppexcca leaders, international coffee buyers, certification agents, and other chain actors. Recall information was used to identify current asset endowments and changes in asset endowments over the assessment period.

Cluster analysis allowed for understanding the potential for asset building by different types of households. Clusters were formulated using a two-step clustering technique using SPSS. Two variables with strong correlation that formed the basis for formation of the clusters were (1) area under coffee production in 2008–2009 and (2) percentage of total household income derived from off-farm sources in 2008. A three-cluster solution emerged from this analysis, with household livelihoods descriptors and cluster characterization as follows:

- *Small-scale diversified livelihoods (SDL)* ($n = 77$): relatively small area under coffee production; high dependence on income derived from off-farm labor activities (often as wage labor for other, usually larger farmers); some contribution from other crops.
- *Small-scale specialized livelihoods (SSL)* ($n = 162$): relatively small area under coffee production; majority of income derived on-farm from coffee, with contributions from banana, citrus, beans and other products.
- *Large-scale specialized livelihoods (LSL)* ($n = 53$): relatively large area under coffee production; majority of income derived from coffee, with contributions from livestock, banana, citrus and other products.

Table 1 provides insights into the differences between the clusters. The mean total annual income for the sample was US\$4969 (or, given an average household size of 5.2, US\$956 per capita). Pushing up the average was total income for LSL households, which at US\$14,627 was several-fold higher than that of other households. For both LSL and SSL households, coffee contributed between 85% and 93% of total income. For SDL households, coffee contributed approximately 33% of total income, with 5% coming from other farming activities and 62% from off-farm. In most cases, these households depended on short-term, low-skill jobs in the agricultural sector. Across all the clusters, cash income derived from agricultural sources other than coffee was generally a small share of total income. The ANOVA results suggest that the cluster solution was robust and thus provided a solid basis for analysis of changes in livelihood assets.

Changes in assets of coffee producing households

Natural capital

Access to land and area under coffee production

The expansion of landholdings and the area under coffee production provide important indicators of natural capital management and the overall ability of smallholders to improve their well-being through access to speciality coffee markets. For both indicators, results suggest a notable improvement in natural capital for a broad section of the sample. Eighty households, or nearly one-third of the sample, expanded their landholdings. The average landholding increased from 4.6 ha to 5.1 ha (Fig. 2). Among the clusters, the largest percentage increase in landholdings, at 15.4%, was recorded by households from the SDL cluster. Households from the SSL cluster increased their landholdings, on average, by 11.8%, while, on average, households from the LSL cluster experienced limited change in landholdings.

Many households also increased their area under coffee production through new land purchases or the conversion of existing land to coffee production. Roughly half the sample, or 158 households, expanded coffee production. The average area increased from 1.9 ha to 2.5 ha (Fig. 3). Households from the LSL cluster increased area under coffee, on average, by 1.4 ha (28% increase over the pre-existing area). Households from the SSL cluster increased area under coffee, on average, by 0.4 ha (31% increase over the pre-existing area), while households from the SDL increased their area under coffee by an average of 0.29 ha (26% increase over the pre-existing area).

Expansion of landholdings and area under coffee represent considerable investments over multiple years. Households often

Table 1
ANOVA results comparing selected indicators across clusters.

	Cluster			Total (SD)
	Small-scale diversified livelihoods (SDL) (SD)	Small-scale specialized livelihoods (SSL) (SD)	Large-scale specialized livelihoods (LSL) (SD)	
Total income 2008 (US\$) $F(2,292) = 80.98, p < .05$	2617 (±2557)	2927 (±2730)	14,627 (±13,221)	4969 (±7605)
Income from sale of coffee 2008 (US\$) $F(2,292) = 50.73, p < .05$	867 (±1033)	2486 (±1828)	13,474 (±8579)	4053 (±4543)
Income from off-farm sources 2008 (US\$) $F(2,292) = 61.79, p < .05$	1618 (±1651)	157 (±466)	304 (±757)	569 (±1154)
Area under coffee production (ha) 2008–2009 $F(2,290) = 96.98, p < .05$	1.5 (±0.4)	1.8 (±1.5)	6.3 (±6.8)	2.5 (±2.9)
Highest education achieve Soppexcca-registered household member (highest grade achieved) $F(2,290) = 0.34, p > .10$	3.6 (±3.8)	3.0 (±2.2)	3.3 (±2.5)	3.2 (±2.7)
Age of household head registered with Soppexcca $F(2,290) = 2.84, p < .10$	44.1 (±12.2)	42.0 (±13.3)	48.6 (±10.7)	43.3 (±12.6)

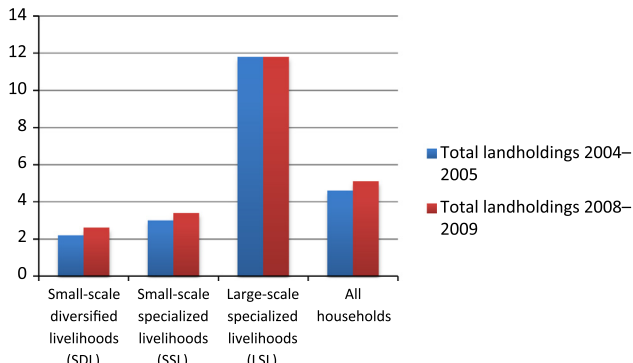


Fig. 2. Change in total land area (ha), by cluster, 2004–2005 to 2008–2009.

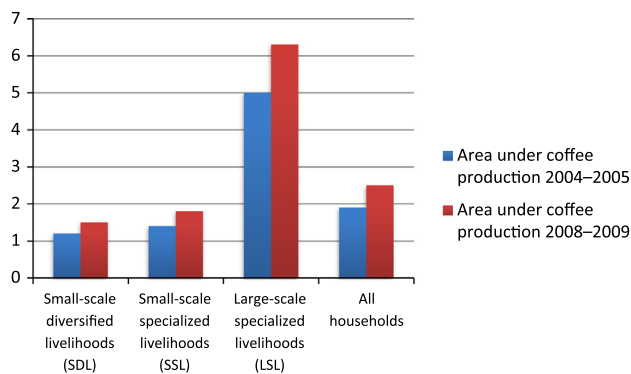


Fig. 3. Change in area (ha) under coffee production, by cluster, 2004–2005 to 2008–2009.

identified a mix of factors that allowed for expansion in coffee area, including access to credit with extended repayment periods, income coffee sales, and from other sources, including income generated off-farm. Soppexcca was the only source of multiyear credit identified by sampled households. Fifty-six per cent of the sample received three-year credit for land purchases and renovation of coffee plantations (for details, see the financial capital section). Logistic regression showed the relative importance of credit, off-farm income, and pre-existing land size in predicting the expansion of coffee production. The strongest predictor of coffee expansion was access to multiyear credit. For each US\$500 installment of credit obtained, households increased their odds of expanding their area under coffee production by nearly five times (Table 2).

Land-tenure arrangements

Land-tenure insecurity is a legacy of the agrarian reform, which left many potential coffee farmers in ambiguous legal positions regarding land ownership, vulnerable to appropriation of land titles by banks. This situation has long challenged rural development

in Nicaragua (Broegaard, 2005; Fraser et al., 2013). For some Soppexcca-affiliated households, uncertain tenure arrangements prior to joining the cooperative severely restricted investments in farm production. These households belonged to two Soppexcca-affiliated base cooperatives, which, when combined, formed roughly one-third of the SDL cluster. For members of one of these two base cooperatives, Julio Hernández, considerable progress was achieved in building natural capital and other assets during the period. However, for members of the base cooperative El Esfuerzo, insecure tenure persisted and would likely constrain their investments in coffee for the distant future.

The cooperative Julio Hernández illustrates key points in asset management and building. Prior to 2001, the members lived and worked on a state-owned coffee enterprise. In 2001, a collective title was obtained for the plantation, and soon after, individual plots were distributed among the former plantation workers. With individual plots came the urgent need for members to build skills in coffee production, renovate coffee plantations, and link with coffee buyers. Soppexcca facilitated the organization of the base cooperative and provided technical assistance and credit for coffee renovation. Productivity levels for Julio Hernández members increased significantly during the period, from a two-year average of 314 kg/ha in 2004–2005 and 2005–2006 to 503 kg/ha in 2008–2009 and 2007–2008. Anecdotal evidence suggested that the advances in productivity were linked to services provided by Soppexcca: pre-existing assets among members were relatively low and no other provider of technical assistance or credit was identified during the period. Moreover, Julio Hernández members emphasized the role of Soppexcca in building their natural and financial capitals during interviews.

However, the case of El Esfuerzo illustrates the vulnerability of households where members had yet to overcome power abuse and conflict related to land tenure. During the 1990s, the households that would form El Esfuerzo farmed collectively titled land and sold their coffee through a collective enterprise. The coffee was sold to an exporter who provided credit in exchange for a set amount of green coffee. In 1999, the exporter failed to provide credit, and households struggled to collect sufficient coffee to meet their delivery quota. In response, the exporter took possession of their land. The households retained a lawyer and fought the case for nine years before achieving success. Currently, the lawyer holds the collective land title and will release it to the households when she is paid the US\$80,000 owed for her services. By 2009, El Esfuerzo members continued to rank among the least productive coffee farmers and were among the least able to sustain their livelihoods through on-farm production.

Access to fertilizers (proxy for soil fertility)

Coffee production mines nutrients from the soil, which, if not replaced through organic or inorganic fertilizers, results in gradually declining productivity (Van der Vossen, 2005). Thus, use of fertilizers and maintenance of soil fertility are key indicators of resource management and sustainability. Evidence from long-term

Table 2

Multiple logistic regression showing effects of credit, off-farm income generation, and pre-existing land ownership on coffee expansion.

(N = 292) ^a	B	S.E.	Sig.	Odds ratio
Pre-existing land holding (2004–2005)	−.065	.025	.010	.937
% Income generated off-farm	−1.230	.525	.019	.292
Age of Soppexcca member	−.028	.013	.030	.972
Total credit received between 2004–2005 and 2008–2009 (US\$500 units)	1.589	.282	.000	4.897
N household members	−.038	.065	.561	.963
Constant	1.532	.572	.007	4.627

^a The model as a whole correctly classified 77.2% of all cases.

experiments in Nicaragua suggests that shade-grown organic and conventional coffee production can reach productivity levels of 1487 kg/ha and 1927 kg/ha, respectively, with 'moderate' levels of fertilization (Haggar et al., 2011). However, the average productivity for the sampled organic and conventional producers, at 726 kg/ha and 1278 kg/ha, fell far below these estimates. Among households in the SDL cluster, results were more discouraging still, at 552 kg/ha for organic producers and 582 kg/ha for conventional producers. This suggests that lack of access to fertilizers remains a barrier to building and maintaining natural capital.

All organic producers applied coffee pulp to their plantations as a source of fertilizer. For some, it was the main fertilizer. However, the coffee pulp available from a given farm likely provided only a fraction of the soil nutrients lost through coffee production.¹ For some organic coffee producers, processed chicken manure, sold under the brand name Biogreen, provided an important organic source of nutrients. One 45 kg sack of Biogreen provides 1 kg of nitrogen. However, between 2006–2007 and 2008–2009, on average, only 36% of organic producers applied Biogreen to their coffee plantations. Moreover, among these households, few were able to purchase enough Biogreen to achieve reasonable productivity levels.² The mean number of bags/ha of Biogreen applied ranged from a high of 21.9 in 2006–2007 to a low of 16.7 in 2008–2009. In general, these results suggest that soil nutrient requirements for organic coffee production are not being met, and therefore natural assets are being depleted.

Among households that produced conventional coffee, the relatively high cost of inorganic fertilizer (Ganes-Chase, 2009) presented a challenge to replenishing soil nutrients lost to coffee production for cash-strapped producers. Data on inorganic fertilizer utilization ('complete' and urea) were collected from 152 households between 2006–2007 and 2008–2009. Twenty-two households, or 14% of those sampled, reported no purchase of inorganic fertilizer during the entire period. For any one year, the percentage of households that reported inorganic fertilizer usage varied from a high of 79% in 2008–2009 to a low of 61% in 2006–2007. Evidence suggested that overall fertilizer usage by households in the SDL and SSL clusters was on the rise. The number of SDL households that applied at least one bag of complete fertilizer increased from 21% in 2006–2007 to 42% in 2008–2009. Similarly, 75% of SSL households applied at least one bag of 'complete' in 2008–2009, compared to only 53% in 2006–2007. No major change was reported in fertilizer use for LSL households. On average, 92% of LSL households applied 'complete' fertilizer between 2006–2007 and 2008–2009. Despite the overall increase in fertilizer application, however, households in the SDL cluster generally did not reach the estimated nitrogen threshold (39 kg of nitrogen/ha) for achieving reasonable productivity levels. Most households identified annual credit from Soppexcca and other coffee buyers as the main contributing factor to increased fertilizer purchases.

Human capital

Management skills in coffee production

One important element of human capital for coffee growers is the knowledge, skills and capacity to manage plantations sustainably and produce uniform, high quality beans. In general, smallholders in Nicaragua do not practice regular pruning or other

forms of improved crop management on their coffee plantations (Rice, 1999). This, combined with knowledge that several of Soppexcca's base cooperatives had only recently gained land titles and thus the opportunity to invest in their coffee production, suggests that overall human capital endowments in this context were low prior to the period. Before joining Soppexcca, most interviewed households reported not having access to technical assistance for coffee production. Technical assistance and training by Soppexcca in shade management and pruning techniques aimed to support their members to sustain coffee yields, while at the same time enhancing natural capital (e.g., reduced contamination, protection from erosion, and enhanced nutrient recycling).

Results among the sample were mixed. On one hand, most households acquired new skills for reducing contamination from coffee milling and providing higher-quality coffee. Fifty-four per cent of the households reported the application of selective harvesting (of mature beans) during the period. Most of these households were from the SSL cluster ($n = 31$) and the LSL cluster ($n = 12$). Six households from the SDL cluster reported the implementation of selective harvesting. Similarly, 66% of the households disposed of wastewater in infiltration pits in 2008–2009 (compared to only 11% of the sample three years prior). SSL households were the most likely to have adapted the new techniques for wastewater treatment (74%), followed by LSL households (70%) and SDL households (58%).

The overall low coffee productivity suggests that improper plantation management may continue to be a genuine concern. While it was not possible to observe or measure plantation management practices for this study, insights were gained on the effectiveness of technical assistance through interviews with technical assistance staff and from Soppexcca members. The evidence suggests that Soppexcca's technical assistance program struggled to provide the coverage and quality of services needed for upgrading the production skills of poor coffee farmers. According to one key informant, efforts to encourage more intensive plantation management have been ineffective, due in part to (1) a reluctance by producers to trim or stump coffee trees that are productive and (2) the inability of Soppexcca staff to work intensively with producers to upgrade their crop management skills (Pinedo, 2009). Soppexcca had yet to implement a monitoring system for plantation management. Moreover, there was no link between Soppexcca technical assistance and the credit department.

Households reported their perceptions on the value of technical assistance for coffee production between 2007–2008 and 2008–2009. For most households, Soppexcca was the only provider of training and on-site technical assistance. Forty-four per cent ($n = 129$) reported being dissatisfied or highly dissatisfied with technical assistance provision. Selected household responses shed light on the nature of the problem:

- *Household #26*: "We were visited once in 2008, but the extensionist didn't provide technical advice; he arrived to inform us of a meeting at the cooperative."
- *Household #265*: "I lack advice when I need it: on one occasion, I requested a visit from the extensionist because the coffee berries were falling off the branches, but he never came."
- *Household #187*: "He only comes to estimate the harvest. I am only able to consult with the extensionist during training events—that is how I have obtained technical assistance."
- *Household #277*: "Visits are only for estimating the harvest—the extensionist does not know my coffee plantation. He sends others from the community to assist me and does not provide advice."

¹ To achieve reasonable yields from organic coffee production in Nicaragua, Haggar et al. (2011) reported the use of nearly 9 tons of coffee pulp per ha/year. This is roughly two to three times as much pulp as just returning the pulp from the coffee produced.

² To keep coffee yields at a reasonable level and to maintain soil fertility, a minimum of 36 kg of nitrogen/ha need to be supplied annually (Valkila, 2009). This assumes that producers recycle their coffee pulp and use nitrogen-fixing shade trees – both of which are common practices among smallholders in Nicaragua.

Table 3
Characteristics of trading relationships for coffee sold by Soppexcca members.

Buyer	Two-year average farm gate price (2007–2008 to 2008–2009)	Payment conditions in 2008–2009	Services offered in addition to coffee marketing in 2008–2009
Soppexcca	Organic: US\$136 Conventional: US\$109	Floor price (fair trade) Interest rate 1.2%/month Initial payment with short term credit (20%), partial payment upon delivery to warehouse (60%), final payment in June (20%)	Technical assistance Certification Fertilizer for purchase (delivered to farm) Short- and long-term credit (no collateral required, interest rate between 1.2% and 1.3%/month) Emergency credit Other services ^b
Market buyers ^a	Conventional: US\$97	Full payment upon delivery Price to producer: direct exporter price, minus commission	Purchase of coffee Exchange of basic food items for parchment coffee (before and after harvest) Short term credit (no interest on credit taken prior to harvest; 5%/month interest on all other credit) Flexibility in credit repayment (paying coffee debt with basic grains production)
Community-based buyers	Conventional: US\$97	Land title not required for credit Full payment upon delivery, price based on New York market price	Technical assistance Short-term credit (interest rate at 1.5–2%/month) Fertilizer for purchase (delivered to farm) Transport of coffee to warehouse
Direct exporters	Conventional: US\$99	Contract required for credit (with collateral) Final payment upon delivery, priced based on New York market price	Short-term credit (Interest rate 1.5–2%/month)

^a Information based on results from 18 key informant interviews carried out on-site with buyers of coffee at the markets of Jinotega and Matagalpa in August 2009.

^b For example, emergency transport to hospital, contributions to meeting funeral expenses, assessment with land tenure disputes.

- *Household #282*: “Sometimes he indicated which product I should use, but the extensionist did not indicate the doses and I burned the plants.”

Skills for cooperative governance

A share in ownership and governance by members is an important cooperative principle and feature of human capital. Findings showed that representation of members on the board of directors was mostly tokenism. The main reasons were insufficient skills by the board and lack of information from Soppexcca. The former president of the board noted that she received no training in basic business or in cooperative management prior to assuming her post as the board president. During her period on the board she had limited understanding of how Soppexcca formulated its prices for parchment coffee, nor did she participate in setting the agenda for board meetings. Other informants noted that the board and Oversight Committee did not have access to timely financial information, due mainly to the absolute lack of the information, rather than inaccessibility of the information. Interviews highlighted the board's reluctance to question, debate, or probe Soppexcca's executive management in strategic decisions and investments. External service providers remained distant on the empowerment of Soppexcca's members and engaged directly with Soppexcca's professional management.

Strong professional leadership, combined with a long-term commitment from buyers and NGOs to its development and the institutional framework provided by fair-trade certification has played an important role in building Soppexcca's organizational asset base, but this has come through external investment rather than organic human capital growth among the membership. Limitations to build effective internal leadership within the cooperative has resulted in a high concentration of power and information in the professional manager, hence vulnerability of the organization and all the value chain relationships.

Social capital

From an individual or household perspective, the extent to which linkages with coffee buyers generate tangible benefits for maintaining and improving livelihoods forms an important element of social capital (Portes, 1998). Our discussion of social capital focuses on the supply-chain relationship benefits derived from collaboration with Soppexcca and the significance of institutional arrangements for reducing transaction costs.

In general, smallholders rarely have access to affordable credit in Nicaragua (Bastiaensen, 2005). Prior to joining Soppexcca, most households from the SDL and SSL clusters (69% and 67%, respectively) sold their coffee exclusively to buyers in the towns of Jinotega and Matagalpa. In contrast, only 36% of households from the LSL employed intermediaries for marketing their coffee prior to joining Soppexcca. Few households reported access to buyer-provided credit in the year prior to joining Soppexcca (20%) and even fewer reported access to buyer-provided technical assistance (9%). Households from the LSL cluster were more likely to have forged linkages with direct exporters prior to their having joined Soppexcca, and thus were more likely have access to credit and higher prices.

Having forged new linkages with Soppexcca, most households retained their previous relationships with pre-existing coffee buyers. Buyers differed in terms of services offered and the transaction costs of doing business (Table 3). Relative to other buyers, Soppexcca was the most demanding in terms of quality but also offered the most extensive range of services. In 2008–2009, credit was available for most members without formal land titles or other forms of collateral at an annual interest of 16% for annual credit and 14% for multiyear credit. Soppexcca was the only buyer that offered protection from future downturns in coffee prices through the fair-trade floor price.

Soppexcca provided other valuable services. Beginning in 2007, the cooperative employed a team of eight extensionists to provide

technical assistance. In addition, Soppexcca provided safety nets for its members (vehicular transport for emergencies, donation of a coffin on the death of a member or member's spouse, credit/donations for medical expenses), and access to development projects. However, doing business with Soppexcca was relatively costly. Payment for coffee was made in three installments, with final installment (approximately 20% of the total price) being delayed until May–June. All credit and payment transactions required travel to Soppexcca's office in Jinotega and producers assumed all risks for transport of coffee to the warehouse.

Compared to Soppexcca, transactions with market buyers offered faster payment, with cash upon delivery of coffee and credit on demand; however, producers had to trade off ease of sale and timeliness of payment against generally slower business processes and higher costs for credit.

Few sampled households sold to direct exporters of coffee ($n = 5$). Exporters provided annual credit on a contract basis, with land titles generally required as collateral unless producers had a history of compliance with contractual obligations. Annual credit during the 2008–2009 season was offered at a 17% annual interest rate. Producers had the option to receive final payment (market price minus amount of annual credit) upon delivery of parchment coffee. Additional services, such as on-site technical assistance and pick-up of parchment coffee, were not reported.

Side-selling is a common but complex phenomenon affecting cooperative operations and relationships with members. Data on coffee sales by buyer indicated Soppexcca's difficulty in increasing its capture of raw material from its members. For organically certified households, the mean percentage of coffee sold to Soppexcca between 2007–2008 and 2008–2009 was 73%, while for conventional producers, the mean percentage was 57% (Table 4). This suggests that price was not the major factor behind selling to buyers other than Soppexcca. Responses presented below illustrate the diversity of reasons. The most common response hinged on the need to cover production expenses for the coffee harvest ($n = 31$). In other cases, households identified emergencies and expenses as the main reason for selling to other buyers ($n = 8$), poor quality ($n = 4$), and restricted access to credit ($n = 2$). Below are quotes from households in SDL cluster (emphasis added):

- *Household #190*: “Don Osman pays better than Soppexcca; Soppexcca has too many price deductions, and he is less concerned with quality.”
- *Household #24*: “Because my brother needed money, I sold coffee in the market to resolve his need.”
- *Household #188*: “Due to delays in the provision of credit—the intermediary is much quicker. Soppexcca always delivers credit in June, while the intermediary delivers in May.”

Table 4
Percentage of coffee sold to Soppexcca, by producer type and cluster.

Cluster	Average % of production sold to Soppexcca from 2006–2007 to 2008–2009 (SD)	N
<i>Conventional^a</i>		
SDL	54.6 (±32.8)	50
SSL	59.5 (±30.9)	128
LSL	53.5 (±33.9)	43
Total	57.2 (±31.9)	221
<i>Organic</i>		
SDL	70.1 (±33.3)	27
SSL	74.5 (±22.5)	32
LSL	77.0 (±30.0)	10
Total	73.2 (±27.8)	69

^a Differences between the means for conventional and organic producers were significant at the .05 level.

- *Household #19*: “The amount of credit offered by Soppexcca is very small. . . from ‘Atlantic’ [direct coffee exporter] I receive US\$10,000 and Soppexcca has not provided any. Soppexcca also demands too much in terms of quality.”
- *Household #194*: “Transport is very difficult from our farm to the road. The other buyer collects our coffee at the farm.”

Physical capital

Capital for processing

Improvements in infrastructure at the household level played a major role in Soppexcca's strategy for improving coffee quality. Physical capital for wet milling includes the construction/refurbishment of mill enclosures, construction/refurbishment of fermenting tanks, and the purchase/repair of machines for depulping and pumping water. Table 6 provides clusterwise details of household expenditures. The average investment by households from the SDL cluster was US\$198 during the period, skewed upwards by a few households; among the 72 households in the cluster, only 12 reported cash investments for improved wet milling. Investments by SSL, while significantly higher than those of the SDL cluster, remained low at US\$593. Moreover, 70 SSL households, or nearly half the cluster, reported no cash investments during the period. Investments by LSL households, at nearly three times those of SSL households, showed considerably less variation within the cluster. Credit by Soppexcca contributed roughly 48% of the total reported household expenditure.

Capital for production

Households also reported their acquisition of machinery, tools, and infrastructure for agricultural production in addition to those used for wet milling. Notable is the extremely low investment by households in the SDL cluster, at US\$91 (Fig. 4). When investments were made by SDL households, they were generally confined to basic tools for production of coffee and basic grains (machetes, shovels, and sprayers). Similar to experiences in the building of physical capital for wet milling, households in the SSL cluster achieved higher investments than their SDL counterparts, but the absolute level of investments was low. In general, findings suggest that households from SDL and SSL clusters struggled to build their physical capital endowments for farm production compared to the level of productive investments made by LSL households. These included relatively large purchases of machinery for the production of coffee, investment in livestock, and generation of off-farm business activities.

Financial capital

Access to credit

The ability of households to build natural and physical capital was strongly related to their access to multiyear credit. Between

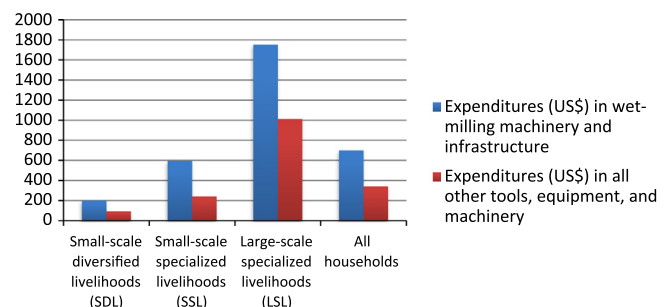


Fig. 4. Purchase of tools, equipment, and machinery, by cluster, average 2005–2006 to 2008–2009.

Table 5
Estimated income (US\$) benefit from coffee sales to Soppexcca, by cluster (average, 2007–2008 to 2008–2009).

Cluster	Average total coffee production (45 kg sack green coffee)	Potential income if all coffee sold to Soppexcca ^a	Potential income benefit if all coffee sold to Soppexcca ^b	Actual income taking into account sales to other buyers	Income foregone due to sales to other buyers	% income benefit forgone due to sales to other buyers
<i>Conventional</i>						
SDL	5.9	643	71	611	32	45
SSL	18.0	1962	216	1875	87	41
LSL	100.2	10,922	1202	10,363	559	46
Total	31.3	3412	376	3251	161	43
<i>Organic</i>						
SDL	6.6	898	257	821	77	30
SSL	9.5	1292	371	1198	94	26
LSL	49.4	6718	1927	6275	443	23
Total	14.0	1904	546	1758	146	27

^a The following two-year average farm gate prices were offered by Soppexcca: US\$109/45 kg sack for conventional coffee and US\$136/45 kg sack for organic coffee.

^b Difference in income generated from 100% of coffee production being sold to Soppexcca versus income generated from 100% of coffee being sold to other buyers. A two-year average farm gate price of US\$97/45 kg sack was used for estimating income from sales to other buyers.

2004–2005 and 2008–2009, 56% of the sample, or 164 households, received credit for the purchase of land or expansion of coffee production. SDL households (36%) were the least likely to have received access to multiyear credit during the period, compared to SSL households (65%) and LSL households (58%). The average amount of credit was US\$1271. Among the clusters, the average amount varied from a low of US\$889 for households in the LSL cluster to a high of nearly US\$1319 for households in the SSL cluster. Among households in the SDL cluster, an average of US\$957 in credit was received, all of which Soppexcca provided.

As noted previously, many sampled households (57%) reported no access to annual credit prior to joining Soppexcca. During the assessment period, opportunities for obtaining annual credit increased, in part due to linkages with Soppexcca, with only 12% of sampled households reporting no access to annual credit. Among the households that received annual credit, most ($n = 160$, 55%) reported Soppexcca as their only source of credit. Other sources included specialized lending organizations, coffee buyers, NGOs, and, to a lesser extent, informal lenders and commercial banks. Collateral requirements varied.

While the terms offered by Soppexcca were relatively favorable, the average amount provided by Soppexcca was small. For example, in 2007–2008, the mean credit value for SDL households was US\$197, US\$390 for SSL households, and US\$1805 for LSL households. Even for households with relatively small coffee holdings, credit from Soppexcca was unlikely to cover variable production costs, much less facilitate more strategic investments in asset building. Moreover, few households were able to access credit consistently: only 9.3%, 11.3%, and 25% of the SDL, SSL, and LSL households, respectively, were able to access annual credit for each year of the assessment period. Between 20% and 55% of SDL households ended the production year with debt to Soppexcca, with similar results recorded for SSL households.

Income benefit from coffee sales to Soppexcca

Findings about benefits of coffee sales through Soppexcca are illuminating. As noted above, it is not uncommon for smallholders to divert sales from formal to informal channels. Table 5 presents estimates of the income benefit for Soppexcca members from coffee sales, taking into account sales to Soppexcca and to other buyers and allowing for the differences in farm-gate prices between coffee buyers. Among households from SDL and SSL clusters that produced conventional coffee, the actual income benefits from participation in Soppexcca were small, at US\$32 and US\$87, respectively. These income estimates reflect that 41%–45% of the potential income benefit from the sale of fair trade coffee was lost due to the selling of coffee to other buyers. Certified-organic

households from the SDL and SSL clusters experienced higher income benefits than their conventional counterparts, at US\$77 and US\$94, respectively. However, these households also struggled to maximize their income benefits from participation in formal markets. On average, 27% of the total potential income benefit from the sale of fair trade organic coffee was lost due to the selling of coffee to other buyers. For producers of conventional coffee, the small size of the price benefit generated through sale of coffee to Soppexcca may have facilitated their decision to sell to other buyers. For both types of producers, the strong need to sell coffee outside of Soppexcca often reflected farmers' urgent needs for annual credit linked to coffee production, for the ability to respond to shocks, and to smooth income generation over the year.

Discussion

For poor smallholder coffee growers, research has highlighted both the potential and the limitations of asset building by coffee growers in Nicaragua in response to more intensive value chain interactions and development interventions. Our discussion begins with a look at the overall changes in asset endowments and then examines the differences in asset building based on cluster affiliation.

Many households built up key elements of natural capital, including expanded areas under coffee production and renovated coffee trees. These investments helped to overcome the erosion of natural capital that took place during the coffee crisis. For households that depend on coffee production for most of their income, these investments are likely to have positive future impacts on rural livelihoods. Access to credit with extended repayment periods played a critical role in expanding and improving natural capital. On the other hand, lack of progress in addressing other dimensions of natural capital, such as nutrient mining due to lack of affordable fertilizers and insecure land tenure, are likely to diminish hopes that poor households will improve their coffee productivity in the future.

A similar pattern of significant, but incomplete, asset building was detected for the other capitals. In terms of human capital, evidence suggests that most households acquired new skills that improved coffee quality, but few households had acquired the more complex skills for improved plantation management – a critical determinant of coffee productivity and disease resistance. The ability to implement more intensive production practices was also linked to endowments of human and financial capitals, which were also severely constrained in many cases.

Results suggest that there were limited impacts to build human capital through cooperative-provided technical assistance.

Table 6
Differences in asset building in response to new links to certified coffee markets (N/A – not applicable).

Cluster	Social capital	Natural capital	Human capital	Physical capital	Financial capital
<i>Small-scale diversified livelihoods (SDL)</i>					
Evidence of considerable asset building	N/A	N/A	N/A	N/A	N/A
Evidence of low to moderate level of asset building	New links to Soppexcca – a trusted buyer of coffee and provider of marketing, technical assistance, and credit services	Generally able to expand area under coffee production and renovate existing plantations through Soppexcca credit	N/A	N/A	Limited income benefits from certified coffee
Evidence of little/no evidence of asset building	Lack of complementary assets implied that households struggled to benefit significantly from new links; links maintained with local coffee buyers	Major limitations for improving soil fertility	Least likely to have upgraded knowledge and skills for improving coffee quality; few able to modernize plantation management practices	Least able to reinvest gains from higher coffee prices or improved credit access into the accumulation of physical for on-farm production	Least likely to have access to multiyear credit; access to annual credit limited due to low productivity
<i>Small-scale specialized livelihoods (SSL)</i>					
Evidence of considerable asset building	Links to Soppexcca provided first-time access to credit, technical assistance and other services; greater capacity to leverage Soppexcca access for building of other assets (e.g., natural capital)	N/A	N/A	Major gains in machinery and infrastructure for wet milling, often with assistance from Soppexcca credit	N/A
Evidence of low to moderate level of asset building	Links maintained with local coffee buyers, due to stronger pre-existing links and inability to fully take advantage of Soppexcca access	Possibility to expand area under coffee production, renovate existing coffee plantations, and expand total agricultural area, often with Soppexcca-provided credit	Likely to have upgraded knowledge and skills for improving coffee quality	Limited investments on other tools, equipment and machinery for on-farm production	Limited income benefits from certified coffee limited; most households with new access multiyear credit; limited amount of annual credit accessible
Evidence of little/no evidence of asset building	N/A	Major limitations for improving soil fertility	Difficulty to modernize plantation management through access to technical assistance	N/A	N/A
<i>Large-scale specialized livelihoods (LSL)</i>					
Evidence of considerable asset building	N/A	N/A	Generally able to upgrade their knowledge and skills for coffee production; effective access to complementary assets (social and financial capitals) for modernizing production system	Significant increase in physical capital through higher coffee prices and long-term credit; average investments for wet milling exceeded those of SSL households by twofold	Some income benefits from certified coffee; access to multiyear and annual credit was favorable
Evidence of low to moderate level of asset building	Pre-existing endowments were relatively high, with strong links to local intermediaries and direct exporters of coffee; Soppexcca offered an additional source of credit	Relatively large pre-existing areas of agricultural production; area under coffee production increased, on average	N/A	N/A	N/A
Evidence of little/no evidence of asset building	N/A	N/A	N/A	N/A	N/A

Soppexcca had no monitoring system in place nor had it attempted to link technical assistance with its other services (e.g., credit) or external services (e.g., specialized providers of business development and technical services). Donors, projects, and NGOs that financed technical assistance by Soppexcca were reluctant to insist on accountability or engage Soppexcca in identifying outcome-enhancing measures.

Results also draw attention to challenges faced by Soppexcca's volunteer leadership to effectively participate in Soppexcca's governance. Volunteer leaders lacked basic business skills prior to assuming their posts, as well as access to critical information on business performance. They indicated apprehension about confronting authority, and conflicts emerged among members when professional managers were questioned. Reluctance to challenge the management was likely enhanced by the failure of Soppexcca's predecessor cooperative, juxtaposed with its success in expanding sales of certified coffee and securing support from NGOs and projects.³ Results here support previous findings on the autocratic nature of cooperative governance in Nicaragua and the distant engagement of NGOs in the development process (Kroeker, 1996).

Links to Soppexcca and markets for certified coffee resulted in an important increase in social capital for households. Soppexcca offered some protection from the recurrent economic, social, and environmental uncertainties that characterize coffee production in Nicaragua. Technical assistance and credit allowed households to rebuild assets that were eroded during the coffee crisis. For many households, Soppexcca offered the first opportunity to access credit and technical assistance since they initiated coffee production. Despite the importance of links to Soppexcca, most households diverted considerable quantities of coffee to local intermediaries or direct exporters. Mujawamariya et al. (2013) suggest that smallholders' decisions to deal with buyers outside the cooperative likely responds to their trust relations within local buyers based on repeated transactions in credit. Evidence from Soppexcca supports this argument. The use of credit for meeting consumption needs, combined with the relatively high costs of selling to Soppexcca (e.g., high quality demands, delayed payment, and transport to warehouse) also encouraged side selling by Soppexcca members. Households managed a portfolio of buyer relationships in such a way as to optimize the relationship between product prices and production, access to credit and transaction costs of and sales.

In general, households struggled to build physical capital for agricultural production, in general, and coffee production, in particular. The general expansion of wet-milling infrastructure and equipment was one element of physical capital where considerable investments were detected. Multiyear credit by Soppexcca facilitated these investments. The credit was provided to Soppexcca by NGOs looking to support the cooperative in its efforts to enhanced coffee quality and reduce water consumption and contamination in the processing of coffee cherries.

The income benefits from access to certified-coffee markets were generally limited during the period under assessment, reflecting the high prices of conventional coffee relative to those for certified coffee. At the time of data collection (2009–2010), international commodity prices for coffee were higher than at any period in the past 20 years. However, boom and bust are recurrent features of coffee markets, suggesting that a future analysis of

income benefits from another crisis would present strikingly different findings. Indeed, Soppexcca's initial growth occurred before the period of this study when the price premium for certified coffee was very attractive to smallholders struggling with the aftermath of the coffee crisis. Despite relatively small income benefits, engagement with the cooperative was important for other reasons: access to credit facilitated coffee production and provided a form of insurance against shocks such as illness, death, and crop failures, which otherwise would have resulted in asset erosion. While many households received credit for coffee production for the first time through Soppexcca, access to credit was often inconsistent and the amount of credit was insufficient to intensify coffee production or make longer-term strategic investments in asset building.

This study offers a cautious but positive view on the potential of poor smallholders to improve livelihood security through links to cooperatives and higher value coffee markets. Feasibility constraints limited the chosen set of indicators of livelihoods assets, but the most significant changes have been captured. Improvements in natural, social, and financial capital ensured that households had the minimum endowments needed to participate in the Soppexcca value chain. Access to Soppexcca offered safety nets, lower marketing risks, and access to inputs, which have important positive implications for livelihood maintenance and security. On the other hand, there was little evidence that interventions by the cooperative and its NGO and donor partners allowed households to intensify production or to generate new products and services outside of the coffee value chain. The extent to which potentially greater gains in livelihood security could have been achieved through physical capital expansion aimed at increased efficiency and productivity of other crops, such as bananas, beans, and corn, remains to be explored by Soppexcca and its external partners. Thus complex business skills remained undeveloped. This may be explained by the incomplete nature of asset building during the assessment period, the overall weak household asset endowments prior to the assessment period, and the time it takes to develop individual human and collective social capital.

Heterogeneity in asset building

Significant variation due to pre-existing endowments was evident in the ability of households to build assets. Table 6 summarizes and compares asset building between the three clusters. In general, SDL households were the least likely to have achieved major advances in asset building. This was especially true in terms of human, physical, and financial capitals. SDL households benefited from certified-coffee markets mainly through access to Soppexcca safety nets and reduced vulnerability to external shocks. The experiences of SDL households that seem to fall below a responsiveness threshold showed that rural poverty goals might best be achieved by helping those households with the smallest asset endowments to transition out of agriculture. SSL households experienced altogether greater gains in asset building and the gains were more evenly spread across the different types of capitals. Nevertheless, the better-endowed LSL households were the primary beneficiaries in terms of financial capital and most of the other areas of asset building.

Conclusions

This study applies a livelihoods asset framework to understand smallholder assets building in response to new links with a coffee cooperative that enabled participation in high-value certified-coffee markets. Embedded in these links were a set of interactions, interventions, and processes that shaped how smallholders participate in the value chain. This use of a livelihoods asset framework

³ During the coffee crisis, Soppexcca used half of the social premium from fair-trade coffee sales to pay down the debt with coffee buyers. In 2009, the decision was made to apply half the social premium to pay down the new debt acquired in the purchase of the processing plant. Both uses of the premium can be justified from a business perspective; however, concerns arise as to whether an empowered board of directors would have invested the premium in the same matter, especially after having paid off the initial debt to buyers.

marks a conceptual and methodological contribution to the literature through its exploration of how households are able benefit from new links to markets, the differences in household participation based on variations in livelihood strategies and initial asset endowments, and the role of cooperatives and development interventions in creating important linkages between producers and international markets.

How did initial asset endowments and subsequent household changes determine smallholders' participation in high-value export markets? In short, did the access to certified-coffee markets help the poorest? The analysis presented here suggests that the institutions, interventions, and processes related to participation in certified-coffee markets did achieve a broader set of outcomes than merely accessing favorable prices, including building a sustainable and more competitive value chain, the building of more viable cooperatives, and building of specific assets by some of the poorest farming households. It was shown that all of these outcomes were important to creating a viable coffee value chain providing some livelihood improvements and even a pathway out of poverty for many of the households linked to it.

However, even a cursory examination of Table 6 shows that those with better initial asset endowments (i.e., the LSL households) gained the most from the interventions and new opportunities accessed through Soppexcca. This conclusion, together with the evidence that the least well-endowed experienced the least asset building in absolute terms, suggests that a multiple threshold concept of asset endowments is likely to operate: that is to say, there are likely to be multiple thresholds, such as an upper threshold above which the better-off producers benefit little, an intermediate threshold above which producers can take advantage of the opportunities, and possibly a lower threshold below which the poorest may experience asset depletion resulting from development interventions that increase risk and vulnerability (Donovan and Poole, 2013). The Soppexcca experience also shows that achievements do not come cheaply or quickly; they result from years of investments by coffee buyers, donors, and civil society, Soppexcca, and cooperative members.

Conclusions on economic and environmental sustainability are tentative, because sustainability was not the focus of the study and changes will only be demonstrated over the long term.

This study – even using a reduced set of livelihood asset indicators – highlights the challenges and dilemmas for poverty-reduction policies based on more intensive links to higher-value markets. It suggests a development strategy that recognizes the complexities and trade-offs among asset types that are by no means discrete, but often are complementary and sometimes antagonistic. The study highlights the important role that cooperatives play in building the capacities of the poor to participate in higher-value markets. It also suggests that cooperatives will benefit from greater attention to the consolidation of their internal governance mechanisms, as well as support in the design, implementation, and monitoring of cooperative-provided services. Finding viable solutions to the complex problems facing cooperatives and their members will require deeper engagement with stakeholders, including NGOs, buyers, and government agencies.

There are additional lessons: first, the notion of asset complementarities. For example, a clear conception of financial capital is important. Financial capital is more than income or credit arrangements. Working financial capital underpins investment in other livelihood assets, particularly natural and physical, such as fertilizer (for maintaining natural capital) and agricultural equipment and roofing (for physical capital). It is also an important entitlement mechanism to meet general household expenses and other human capital-building pathways such as educational expenses for children. Thus financial capital has two important

characteristics: it is a means to an end rather than an end in itself; and it is fungible: actually it is a means to various ends. But while the provision of credit is of primary importance, it is not a panacea.

Other complementarities exist: contextual or idiosyncratic household constraints affect the capacity of smallholders to take advantage of new opportunities, for example, labor constraints that inhibit physical expansion of farms as well as the adoption of improved management practices. Investments involve strategic choices and often significant trade-offs between diverse livelihood activities, as well as risk of asset depletion: livelihood losses. For broader social objectives, interventions required will be more complex and involve a range of services that take into account asset trade-offs, particularly among the poorest. Heterogeneity and complexity thus make intervention targeting a serious ethical necessity.

Second, because of complementarities and trade-offs, projects and interventions must not merely address the weakest links in the chain, through interventions directly targeting specific weaknesses such as the provision of finance or of technical assistance. Programmes and policies must reflect a more holistic approach to value chain enhancement, specifically addressing the underlying constraints and capacities of smallholders: land tenure, credit collateral, small scale, labor constraints, technological change, principles and practice of cooperative action, and enhancement of business skills, all within a framework of environmental, social, and economic sustainability.

References

- Anderson, B., 2012. Converting asset holdings into livelihood: an empirical study on the role of household agency in South Africa. *World Development* 40 (7), 1394–1406.
- Bacon, C., 2005. Confronting the coffee crisis: can fair trade, organic, and specialty coffees reduce small-scale farmer vulnerability in Northern Nicaragua? *World Development* 33 (3), 497–511.
- Bacon, C., Mendez, V.E., Flores Gomez, M.E., Stuart, D., Diaz Flores, S.R., 2008. Are sustainable coffee certifications enough to secure farmer livelihoods? The millennium development goals and Nicaragua's fair trade cooperatives. *Globalizations* 5 (2), 259–274.
- Bastiaensen, J., 2005. Institutional entrepreneurship for rural development: the Nitlapán banking network in Nicaragua. In: Ruben, Bastiaensen (Eds.), *Rural Development in Central America: Markets, Livelihoods, and Local Governance*. St. Martin's Press, New York.
- Barham, B., Callenes, M., Gitter, S., Lewis, J., Weber, J., 2011. Fair trade/organic coffee, rural livelihoods, and the “agrarian question”: southern Mexican coffee families in transition. *World Development* 39 (1), 134–145.
- Beuchelt, T., Zeller, M., 2011. Profits and poverty: certification's troubled link for Nicaragua's organic and fair trade coffee producers. *Ecological Economics* 79 (7), 1316–1324.
- Birdsall, N., Londono, J.L., 1997. Asset inequality matters: an assessment of the World Bank's approach to poverty reduction. *American Economic Review* 87 (2), 32–37.
- Bolwig, S., Ponte, S., du Toit, A., Riisgaard, L., Halberg, N., 2010. Integrating poverty and environmental concerns into value chain analysis: a conceptual framework. *Development Policy Review* 28 (2), 173–194.
- Brogaard, R., 2005. Land tenure insecurity and inequality in Nicaragua. *Development and Change* 36 (5), 845–864.
- Carney, D. (Ed.), 1998. *Sustainable Rural Livelihoods: What Contribution Can We Make?* Department for International Development, London.
- Carter, M., Barrett, C., 2004. The economics of poverty traps and persistent poverty: an asset-based approach. *Journal of Development Studies* 42 (2), 178–199.
- Castro, F., Montes, E., Raine, M., 2004. *Centroamérica: La crisis cafetalera: Efectos y estrategias para hacerle frente*. World Bank, Washington, DC.
- CEPAL (Comisión Económica para América Latina y el Caribe), 2009. *Nicaragua: Evolución económica durante 2008 y perspectivas para 2009*. LC/MEX/L.913. CEPAL, Mexico City.
- De Janvry, A., Sadoulet, E., 2000. Rural poverty in Latin America: determinants and exit paths. *Food Policy* 25 (4), 389–409.
- Devaney, P.L., 2011. *Global Agricultural Value Chains: Sustainable Growth as a means for Sustainable Development*. Community Development Investment Review, Federal Reserve Bank of San Francisco, pp. 2–11.
- Dolan, C., Humphrey, J., Harris-Pascal, C., 1999. *Horticulture Commodity Chains: The Impact of the UK Market on the African Fresh Vegetable Industry*. Working Paper, vol. 96. Institute of Development Studies, Brighton.
- Donovan, J., Cunha, M., Franzel, S., Gyau, A., Mithofer, D., 2013. *Guides for Value Chain Development: A Comparative Review*. Technical Centre for Agricultural and Rural Cooperation (CTA)/ICRAF, Wageningen, The Netherlands.

- Donovan, J., Poole, N., 2013. Asset building in response to value chain development: lessons from taro producers in Nicaragua. *International Journal of Agricultural Sustainability* 11 (1), 23–37.
- Elder, S., Zerriffi, H., Le Billon, P., 2012. Effects of fair trade certification on social capital: the case of Rwandan coffee producers. *World Development* 40 (11), 2355–2367.
- Ellis, F., 2000. *Rural Livelihoods and Diversity in Developing Countries*. Oxford University Press, Oxford.
- Fine, B., 1999. The developmental state is dead: long live social capital. *Development and Change* 30 (1), 1–19.
- Flores, M., Bratescu, A., Martínez, J.O., Oviedo, J.A., Acosta, A., 2002. Centroamérica: El impacto de la caída de los precios del café. CEPAL, Mexico City.
- Fraser, J., Fisher, E., Arce, A., 2013. Reframing 'Crisis' in Fair Trade Coffee Production: Trajectories of Agrarian Change in Nicaragua. *Journal of Agrarian Change*. <http://dx.doi.org/10.1111/joac.12014>.
- Gibbon, P., Ponte, S., 2005. *Trading Down: Africa, Value Chains, and the Global Economy*. Temple University Press, Philadelphia.
- Ganes-Chase, J., 2009. What's with the Weather? Coffee Talk, November, p. 10.
- García Martínez, M., Poole, N., 2004. The development of private fresh produce safety standards: Implications for developing Mediterranean exporting countries. *Food Policy* 29 (3), 229–255.
- Hagggar, J., Barrios, M., Bolaños, M., Merlo, M., Moraga, P., Munguia, R., Ponce, A., Romero, S., Soto, G., Staver, C., Virginio, E., de, M.F., 2011. Coffee agroecosystem performance under full sun, shade, conventional, and organic management regimes in Central America. *Agroforestry Systems* 82 (2011), 285–301.
- Humphrey, J., Navas-Alemán, L., 2010. Value Chains, Donor Interventions and Poverty Reduction: A Review of Donor Practice. IDS Research Report 63, IDS, Brighton, UK.
- IADB (Inter-American Development Bank), 2002. Managing the competitive transition of the coffee sector in Central America. Discussion Paper prepared for the Regional Workshop. The Coffee Crisis and its impact in Central America: Situation and Lines of Action. Antigua, Guatemala, April 3–5, 2002.
- IICA (Instituto Interamericano de Cooperación para la Agricultura), 2004. Cadena agroindustrial de café. Report prepared by IICA for the Nicaragua Ministry of Agriculture and Livestock (MAGFOR), Managua, Nicaragua.
- Kilian, B., Jones, C., Pratt, L., Villalobos, A., 2005. Is sustainable agriculture a viable strategy to improve farm income in Central America? A case study on coffee. *Journal of Business Research* 59 (3), 322–330.
- Kroeker, C., 1996. The cooperative movement in Nicaragua: empowerment and accompaniment of severely disadvantaged peasants. *Journal of Social Issues* 52 (1), 123–138.
- Mendez, V.E., Bacon, C.M., Olson, M., Petchers, S., Herrador, D., Carranza, C., Trujillo, L., Guadarrama-Zugasti, C., Córdón, A., Mendoza, A., 2010. Effects of fair trade and organic certification on small-scale coffee farmer households in Central America and Mexico. *Renewable Agriculture and Food Systems* 25 (3), 239–251.
- Moser, C., 1998. The asset vulnerability framework: reassessing urban poverty reduction strategies. *World Development* 26 (1), 1–19.
- Mujawamariya, G., D'Haese, M., Spellman, S., 2013. Exploring double side-selling in cooperatives: case study of four coffee cooperatives in Rwanda. *Food Policy* 39 (2013), 72–83.
- Oxfam, 2001. *Bitter Coffee: How the Poor are Paying for the Slump in Coffee Prices*. Oxfam International, Oxford.
- Pinedo, R., 2009. Personal Interview. 24 November 2009.
- Portes, A., 1998. Social capital: its origin and application in modern sociology. *Annual Review of Sociology* 24 (1), 1–24.
- Ponte, S., 2002. The "latte revolution"? Regulation, markets, and consumption in the global coffee chain. *World Development* 30 (7), 1099–1122.
- Rakodi, C., 1999. A capital assets framework for analysing household livelihood strategies: implications for policy. *Development Policy Review* 17 (1999), 315–342.
- Raynolds, L., 2002. Consumer/producer links in fair trade coffee networks. *Sociologia Ruralis* 42 (4), 404–424.
- Reardon, T., Timmer, C.P., Berdegue, J.A., 2003. The rise of supermarkets in Africa, Asia, and Latin America. *American Journal of Agricultural Economics* 85 (5), 1140–1146.
- Reinhardt, N., 1987. Modernizing peasant agriculture: lessons from El Palmar, Colombia. *World Development* 15 (2), 221–247.
- Rice, R., 1999. A place unbecoming: the coffee farm in northern Latin America. *Geographical Review* 89 (4), 554–579.
- Stoian, D., Donovan, J., Fisk, J., Muldoon, M., 2012. Value chain development for rural poverty reduction: a reality check and a warning. *Enterprise Development and Microfinance*.
- USAID, 2003. USAID's Response to the Global Coffee Crisis. Fact Sheet. <http://www.usaid.gov/press/factsheets/2003/fs030304_1.html> (16.06.10).
- Uphoff, N., Wijayarathna, C.M., 2000. Demonstrated benefits from social capital: the productivity of farmer organizations in Gal Oya, Sri Lanka. *World Development* 28 (11), 1875–1890.
- Varangis, P., Siegel, P., Giovannucci, D., Lewin, B., 2003. *Dealing with the Coffee Crisis in Central America: Impacts and Strategies*. World Bank Policy Research Working Paper 2993, World Bank, Washington, DC.
- Valkila, J., 2009. Fair trade organic coffee production in Nicaragua: sustainable development or a poverty trap. *Ecological Economics* 68 (2009), 3018–3025.
- Van der Vossen, H., 2005. A critical analysis of the agronomic and economic sustainability of organic coffee production. *Experimental Agriculture* 41 (4), 449–473.
- Weber, J., 2011. How much more do growers receive for fair trade-organic coffee? *Food Policy* 36 (5), 677–684.
- Wilson, B., 2010. Indebted to fair trade? Coffee and crisis in Nicaragua. *Geoforum* 41 (2010), 84–92.
- Zandniapour, L., Sebstad, J., Snodgrass, D., 2004. Review of Evaluations of Selected Enterprise Development Projects. Microenterprise Report 3. USAID, Washington, DC.

Further reading

- Utting-Chamorro, K., 2005. Does fair trade make a difference? The case of small coffee producers in Nicaragua. *Development in Practice* 14 (3/4), 584–599.