



Case Study

Tzisco — Mexico



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Root Capital is a nonprofit agricultural lender that grows rural prosperity in poor, environmentally vulnerable places in Africa and Latin America by lending capital, delivering financial training and strengthening market connections for small and growing agricultural businesses. As of June 30, 2014, Root Capital has loaned \$706 million to 520 businesses, reaching 856,000 producers directly, or a total of 4.5 million household members.

Our impact and metrics program has two aspects: portfolio-wide social and environmental due diligence, and detailed studies with our clients. Root Capital's loan officers use our Social and Environmental Scorecards to evaluate clients' social and environmental practices and their access to alternative sources of finance. The scorecards function as both a negative screen, filtering out prospective lending clients with undesirable practices, and a threshold test in which the loan officer must affirmatively identify how the client's business, and our support of that business, are expected to create positive impact. Our impact team synthesizes these ratings to categorize our portfolio of loans by type and depth of impact and for the continuous improvement of our client-selection criteria.

In 2011, we began to supplement our social and environmental metrics with deeper studies of selected clients to evaluate whether and how our client agricultural businesses support farmer livelihoods; to verify that we are truly reaching underserved businesses; and to inform our assumptions about what social and environmental practices truly create positive impacts. These case studies are primarily intended to estimate two levels of impact: that of our lending on clients, and that of our clients on the livelihoods of the smallholder farmers they serve. We qualitatively describe other types of impacts on farmers and their communities, as well as on the surrounding environment. Finally, we situate these impacts within the broader context of the country and value chain, to illustrate how agricultural businesses, end-buyers of agricultural product and financiers like Root Capital work together to grow rural prosperity for smallholder farmers and their communities.

These studies enable us to better understand both levels of impact (enterprise-level and household-level) and to provide both Root Capital and our clients with the information necessary to continuously improve our services. They also inform and serve as pilots for larger impact studies that we are conducting. Future studies will include more structured surveys of a larger number of farmers and cover additional issues such as gender and the environment.

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Introduction & Main Findings

Tziscac¹ is a primary-level² cooperative that aggregates and markets organic- and fair trade–certified coffee from 485 farmers in the southern Mexican state of Chiapas. The cooperative was established in 2003 by local coffee farmers in response to unfavorable market conditions, including low prices, high production costs, and limited yields, and has been a Root Capital client since 2011. As of 2014, Root Capital remained Tziscac’s only financier.

In 2012 and 2013, Root Capital, in partnership with Acopio,³ conducted a mobile-enabled data management project with Tziscac to help the enterprise digitize its inventory management system and internal farm inspection process. (For details on the mobile component, see Appendix A.)⁴ The project was part of a larger effort piloting the use of mobile data management platforms to generate actionable data for our clients alongside impact data for Root Capital and our partners.

While not designed as a traditional impact study, the engagement with Tziscac provided us with data pointing to the cooperative’s likely impacts on its members, in terms of both improved livelihoods and environmental performance, as well as a qualitative understanding of Root Capital’s impact on the cooperative. In summary, we found the following impacts on producers and on the enterprise itself.

Tziscac’s Impact on Producers

- Tziscac members earn more selling their coffee to the cooperative than they would on the local market.

Selling to the cooperative allowed members to receive a premium of 13 percent over the local market price, translating into an average incremental income from coffee production of \$410 per producer in a region where the average annual income is around \$720, according to the 2010 Mexican census. Producers reported that they used the extra income to pay for household needs such as food, clothing, medicine, and improved housing, as well as investment in their coffee farms. This income is particularly important given that:

- Nearly 70 percent of cooperative member households likely live in “moderate poverty,” above the \$2.50 per day international poverty line but below the national “asset poverty” line,⁵ according to the Progress out of Poverty Index[®].

¹ All cooperatives mentioned throughout this report have pseudonyms to protect client confidentiality.

² Primary cooperatives are owned and governed directly by individual farmer members, while secondary cooperatives and federations are groups of primary and secondary cooperatives, respectively. Among Root Capital’s client base in Latin America, primary cooperatives typically have no more than 500 members. Secondary cooperatives and federations typically have anywhere from 500 to several thousand members.

³ Acopio is a U.S.-based organization specializing in mobile data management for coffee cooperatives. The business was acquired by Fair Trade USA in early 2014, after the completion of this project.

⁴ We selected Tziscac for this mobile advisory project because it is representative of a segment of our portfolio consisting of earlier-stage, primary-level coffee cooperatives in Mexico. Tziscac, like other Root Capital clients in Mexico, operates in low-income areas and had minimal access to finance prior to Root Capital’s support. Similar to our other coffee clients, Tziscac generally pays above local market rates for coffee and provides other services to members, such as agronomic training. However, with 485 members, Tziscac has a larger membership base than most of our Mexican coffee clients, which have 320 members on average. Another important selection criterion was Tziscac’s interest in partnering with Root Capital to develop mobile data management solutions. We have found this interest to be critical to the success of mobile impact engagements.

⁵ Mexico’s National Council for the Evaluation of Social Development Policy (CONEVAL) takes a multidimensional approach to defining poverty, using three graduated lines, each looking at a household’s ability to purchase a basket of goods and services throughout the year, assuming its entire income were used exclusively to acquire these products: (1) asset poverty, or the inability to acquire a basic food basket, as well as to meet necessary expenses in health, education, clothing, housing, and transportation; (2) capacity poverty, or the inability to acquire a basic food basket and to meet necessary expenses in health and education; and (3) food poverty, or the inability to acquire a basic food basket.

- Seventy-two percent of cooperative members reported experiencing at least three months in the previous year in which they were not able to meet their households' basic food needs.

When asked about the main benefit of belonging to the cooperative, the vast majority (83 percent) of members pointed to the higher price per pound of coffee, compared to what they would have received selling the same volume to local intermediaries.

- The cooperative's agronomic training has likely contributed to improving members' farming practices and environmental performance.

In qualitative surveys conducted with a subset of members, producers reported adopting several soil conservation practices since joining the cooperative, including:

- Application of organic compost that boosts soil fertility;
- Use of organic litter that builds topsoil and retains soil moisture; and/or
- Use of live (i.e., vegetative) barriers that reduce wind and water erosion.

Tziscac has likely facilitated the adoption of these practices by providing training in sustainable agronomic practices to comply with the standards of its organic and fair trade certifications. This finding bears further investigation, as we did not ask producers explicitly about the drivers of their adoption of these practices.

Root Capital's Impact on Tziscac

- Root Capital financing has enabled Tziscac to provide advances to its members, with positive implications for the relationship between the cooperative and its members.

Root Capital has been the primary lender to Tziscac since 2011, providing the cooperative with \$1.2 million in trade credit to purchase and market its members' coffee. Prior to Root Capital's financing, according to the cooperative's board, Tziscac paid most farmers at the end of the harvest and/or did not have sufficient cash available to purchase all its members' coffee. This forced many farmers, who needed cash immediately, to sell the majority of their crop to middlemen at lower prices.

According to Tziscac's management, Root Capital's trade credit enabled the cooperative to reliably provide farmers with an advance (roughly 50 percent of the final price) upon delivery of their product. From our field experience, we know that this transition in the payment timing can enable farmers to sell more of their product to the cooperative than to middlemen, allowing Tziscac to fulfill contracts with its buyers and ultimately resulting in a higher income for members (who collect the cooperative's premiums for a greater volume of coffee). In this study, however, we could not ascertain whether the change in the payment mechanism was in fact correlated with a higher proportion being sold to the cooperative, as we did not ask farmers about their delivery rates.

Methodology

Through our mobile pilot engagement with Tziscac, we conducted both enterprise- and producer-level surveys.

We conducted structured surveys with 469 producers on poverty likelihoods and food insecurity levels, as well as members' perceptions of livelihood outcomes associated with cooperative membership. With a subset of 21 producers,⁶ we also conducted semistructured interviews on agronomic practices while accompanying inspections of their coffee farms. (See Table 1 for details on the producer-level survey instruments.)

Root Capital's Approach to Environmental Impact Assessment

Root Capital's environmental-impact assessment efforts focus on evaluating changes in farm-level environmental performance due to interventions by our client enterprises or by Root Capital. As a financial institution seeking to balance rigor with practicality, we take a "practices as proxy" approach, focusing our assessment on agronomic practices and looking to the broader community for experimental studies connecting these practices to quantitative environmental outcomes.

In the engagement with Tziscac, we looked at whether association with the cooperative has led members to adopt soil conservation practices correlated with increased soil fertility and improved soil structure, including the use of organic fertilizers, mulching, and vegetative barriers, as well as the recycling of coffee byproducts.

Subset of Agricultural Practices Surveyed

Practice	Expected Environmental Outcomes
Recycling coffee waste as organic fertilizer	Increased soil fertility and improved soil structure; if diverting organic waste streams, may also lead to reduced nutrient-loading of waterways
Use of fertilizer	Increased soil fertility and, if organic, improved soil structure
Use of live barriers, soil ridges, and/or terracing	Less erosion of productive topsoil

We triangulated survey responses with cooperative data on the land holdings and coffee management practices of all producers, collected by cooperative inspectors during the 2013 farm inspection process. This allowed us to contextualize results from the agronomic practices survey and identify broader trends.

We conducted enterprise-level surveys via qualitative interviews of cooperative management and agronomic extension staff, who are also cooperative members. These surveys were meant to complement and contextualize the producer-level surveys, informing our understanding of the cooperative's history, objectives, and services provided to members, as well as Root Capital's impacts at the enterprise level.

⁶ Root Capital staff opportunistically selected the interview participants from the group of producers visited by cooperative staff during the first several days of the farm inspection process. The interviewed sample was roughly representative of the larger cooperative membership in terms of demographics (age, gender, time with the cooperative) and average land holdings. The sample, however, contained a higher concentration of new members, with around two-thirds joining since 2010, including a number who had not yet completed the three-year organic-certification process.

Table 1: Producer-Level Survey Instruments

Instrument	Description	Sample Size
The Progress out of Poverty Index®	Developed by the Grameen Foundation, this poverty measurement tool is designed to evaluate the likelihood that a household is living below the poverty line, according to various national and international definitions. (Results are described in the body of the report and in greater detail in Appendix B.)	469
Most Significant Change methodology ⁷	This methodology involves using an open-ended, yet structured question – “Since you became a member of the cooperative, what has been the greatest change in your quality of life?” – to solicit individual experiences of impact that are more nuanced than multiple choice questions allow. (For details on the methodology, refer to Appendix C.)	469
Food insecurity survey	Root Capital's impact team compiled a three-question survey on food insecurity, building on questions used previously by partners, particularly Keurig Green Mountain and other members of the Sustainable Food Lab community, to understand the degree of food insecurity among producer members. (See Appendix D for the full list of questions.)	469
Agronomic practices survey (pilot)	Root Capital developed a semistructured survey to evaluate whether association with the cooperative has led producers to adopt specific agronomic practices that the broader conservation community has identified as important for good environmental health. This survey was a pilot tool to inform our emerging environmental-impact assessment strategy and was only used with a small sample of producers.	21

⁷ The Most Significant Change Methodology was developed by Rick Davies in 1996 and has since been adopted by many researchers and organizations as a means of participatory monitoring and evaluation. For more information, refer to: Rick Davies and Jess Dart, [“The ‘Most Significant Change’ \(MSC\) Technique: A Guide to its Use.”](#) Version 1, April 2005.

Context: Coffee in Chiapas, Mexico

Tziscão is located in the southern Mexican state of Chiapas, the country's poorest state. While Mexico is considered a medium-high-income country, with a per capita gross national income (GNI) of \$9,740 in 2012, over 75 percent of the population in Chiapas lives in poverty, with 32 percent living in extreme poverty, according to national definitions reflecting both income- and non-income-based indicators of poverty.⁸

Figure 1: Map of Mexico



Chiapas is also the most important coffee-producing state in Mexico and a globally significant biodiversity hotspot.⁹ The region's tropical rainforests provide ideal growing conditions for coffee. As a result, coffee farms managed under traditional agroforestry systems — which combine agriculture and forestry in order to mimic natural forest systems — continue to form an integral part of the landscape. Coffee production accounts for over 250,000 hectares in Chiapas, second only to maize in terms of agricultural land use, and the region contributes between 30 and 40 percent to Mexico's total coffee production each year.¹⁰

The coffee industry engages roughly half a million people in Chiapas and is the primary source of income for around a quarter of the state's economically active population.¹¹ Most coffee producers in Chiapas are smallholder farmers managing less than five hectares (just over 12 acres) of land and employing organic, agroforestry production methods. The vast majority of these farmers produce specialty-grade Arabica beans for international markets.

⁸ The Mexican government evaluates poverty using a multidimensional poverty methodology that looks at non-income-based indicators of poverty, such as poor health, lack of education, inadequate living conditions, and disempowerment, as well as lack of income. National poverty lines are therefore not directly comparable to international, income-based poverty lines, as defined by the World Bank. Mexico defines poverty as deprivation along at least one social dimension (e.g., health, education), as well as income below the national "well-being line," equivalent to around \$110 a month for rural residents in 2012; and extreme poverty as deprivation along at least three social dimensions, as well as income below the national "minimum well-being line," equivalent to around \$60 a month for rural residents in 2012. (The well-being line is based on the cost of a basket of basic food and nonfood goods, while the minimum well-being line is based on the cost of a basket of basic food only.) Consejo Nacional de Evaluación de la Política de Desarrollo Social, "Informe de pobreza en México" Mexico, CONEVAL, 2012.

⁹ Conservation International defines biodiversity hotspots as "the richest and most threatened reservoirs of plant and animal life on Earth." The state of Chiapas lies within the Mesoamerican hotspot. Conservation International, "[The Biodiversity Hotspots.](#)"

¹⁰ United States Department of Agriculture Foreign Agriculture Service, Global Agriculture Information Network, "[Situation Update: Coffee Rust in Mexico.](#)" 27 February 2013.

¹¹ Victor Pérez-Grovaz et al., "Case Study of the Coffee Sector in Mexico," research paper for Oxfam Coffee Report, "Mugged," 2001.

The Environmental Benefits of Smallholder Agroforestry Systems



A typical agroforestry coffee farm is a verdant, mixed-crop system with layers of coffee, banana or other fruit trees, cedar, and deciduous shade trees, designed to mimic coffee's native forest habitat. Agroforestry farms can range from more traditional, closed-canopy systems resembling secondary-growth forests¹² to more commercial systems with one crop variety and one or two varieties of shade trees.

Agroforests provide important ecosystem services, which are the benefits that people derive from natural ecosystems.¹³ The trees on agroforestry coffee farms, for example, enrich the soil through natural nutrient cycling¹⁴ and strengthen root systems, preventing soil degradation and erosion. They also capture and retain rainfall, help to regulate the local climate, and remove carbon from the atmosphere. By imitating secondary-growth forests, these agro-ecosystems also provide natural habitat for local birds and animals outside of conservation reserves and therefore serve as important regional wildlife corridors.¹⁵ Conservationists believe that these small agroforestry farms play a vital role in preserving Chiapas's remaining tracts of tropical rainforest. One recent study of the coffee landscape in Chiapas concluded that "an exodus of smallholder [coffee] farmers caused by decreasing coffee profitability could lead to the replacement of a farming landscape dominated by traditional shade coffee by cattle pasture and more intensively [i.e., sun-grown] managed coffee or other monocultures — land use changes that already seem to be underway" in other parts of Latin America.¹⁶

¹² A secondary-growth or secondary forest is a forest or woodland area that has regrown after a major disturbance, such as timber harvest or fire, to such an extent that the effects of the disturbance are no longer evident. It is distinguished from an old-growth or primary forest, which has not experienced such disruptions.

¹³ Ecosystem services are the benefits that people, including businesses, derive from ecosystems. Ecosystem services are organized into four types: (1) provisioning services, which are the products people obtain from ecosystems; (2) regulating services, which are the benefits people obtain from the regulation of ecosystem processes; (3) cultural services, which are the nonmaterial benefits people obtain from ecosystems; and (4) supporting services, which are the natural processes that maintain the other services. The International Finance Corporation, "[Guidance Note 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources](#)," 1 January 2012.

¹⁴ Nutrient cycling is the continuous exchange of organic and inorganic matter through an ecosystem, from the physical environment (e.g., soil, air), through living organisms, and back to the physical environment.

¹⁵ Teja Tschamke et al., "Multifunctional shade-tree management in tropical agroforestry landscapes — a review," *Journal of Applied Ecology* 48(3):619–629; Emma Bladyka, "Why Does Shade Matter?" *The Specialty Coffee Chronicle*, Issue 2, 2012.

¹⁶ Gotz Schroth et al., "Toward a climate change adaptation strategy for coffee communities and ecosystems in the Sierra Madre de Chiapas, Mexico," 2009.

Introduction to Tziscaco and Its Members

Tziscaco

Tziscaco is a cooperative that aggregates and markets organic- and fair trade–certified coffee from 485 small-scale coffee farmers in Chiapas to specialty coffee buyers in Europe. Together, these farmers manage over 1,400 hectares of agroforestry farms, 86 percent of which is certified organic, with the remainder in the process of becoming certified.

Tziscaco started operations in 2003 as part of a secondary-level cooperative, La Cañada (pseudonym), in Chiapas. La Cañada provided Tziscaco and associated organizations with marketing support, including financing to ensure primary cooperatives had enough cash on hand throughout the harvest season to purchase coffee from their members. Tziscaco left the secondary-level cooperative in 2009 due to concerns about corruption. At that time, Tziscaco began marketing its members' coffee directly.

Today, Tziscaco sells to four buyers, three international and one domestic. The three international buyers, who purchase only fair trade- and organic–certified coffee, paid \$2.10 per pound of washed Arabica coffee during the 2011–2012 season (final pricing data for the 2012–2013 season was not available at the time of publication). This price includes premiums of \$0.30 per pound due to the cooperative's organic certification, plus \$0.20 per pound due to its fair trade certification.¹⁷ The cooperative's domestic buyer, on the other hand, paid \$1.30 per pound during the same season for either nonorganic coffee or low-quality organic-certified beans.

During the 2011–2012 season, Tziscaco purchased organic, export-quality coffee from its members at a price of \$1.76 per pound, a 13 percent premium over the local market price of \$1.55 for conventional coffee. The cooperative paid the local market price for low-quality or nonorganic coffee, as it sold these beans at a lower price to a domestic buyer.

Cooperative members

The cooperative's 485 producer members come from 30 mestizo and indigenous Chuj communities within Chiapas. Ten percent of the members are women, although not all of these women actively manage their farms. In some cases, male producers list female relatives, particularly wives, as landholders in order to preserve the family's claim to the land should they migrate for work.

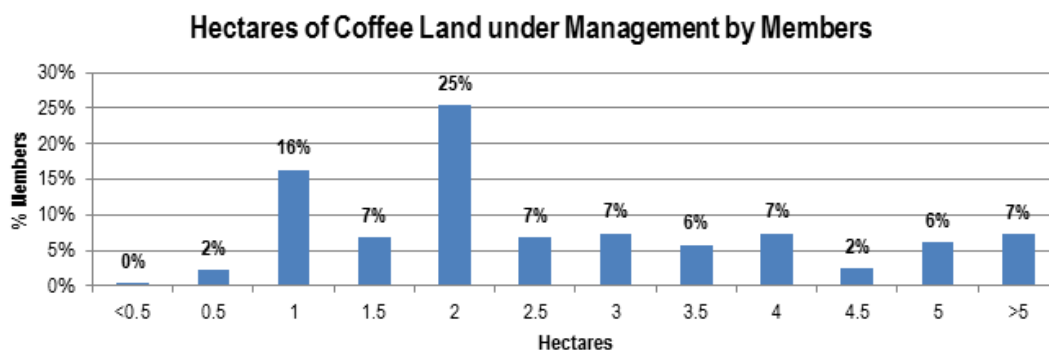
Like most coffee producers in Chiapas, the cooperative's members are predominately smallholders, with a median coffee farm size of two hectares, slightly above the national average of 1.24 hectares.¹⁸ Nineteen percent of the cooperative's members, however, manage one hectare of coffee or less. Seven percent of producers manage more than five hectares.



Members of Tziscaco. The cooperative's members are predominately smallholders, with a median coffee farm size of two hectares.

¹⁷ In addition, the cooperative is entitled to a price floor through its fair trade certification of \$1.40 per pound for washed Arabica coffee. The floor price is intended to protect small-scale coffee farmers from coffee price volatility, as small-scale farmers typically absorb the impact of price fluctuations and downward movements in the market.

¹⁸ Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación, "[Escenario Actual del Café](#)," July 2010.



From cooperative data, we know that members expected to harvest, on average, around 1,200 pounds of green coffee equivalent per hectare during the 2012–2013 season. This is on the lower end of the range for smallholder production in Central America (500 to 3,000 pounds per hectare), but higher than the average productivity for the state of Chiapas, which was 850 pounds per hectare during the 2011–2012 season.¹⁹

In addition to coffee, the majority of member households cultivate maize and beans for household consumption. Maize and bean plots are kept separate from producers' coffee farms, and are often located on sloping land with poor soil. Most producers use agrochemicals, such as herbicides and inorganic fertilizers, on their maize and bean plots to increase yields, a necessity given that many producer families rely on these crops for their subsistence. Some households also cultivate other vegetables; fruits, particularly bananas; and livestock, such as cattle or chicken, for a mixture of household consumption and local sale.

Many of the producers live and farm within the buffer zones of two UNESCO biosphere reserves: the Montes Azules Biosphere Reserve and the Lagunas de Montebello Biosphere Reserve. Montes Azules is one of the largest remaining tropical rainforests in Central America, home to over 500 endemic tree species. Lagunas de Montebello is located in the transitional region between the rainforests of southern Mexico and the coastal plains of western Guatemala and is known for its numerous lakes and its rich concentration of orchid species.²⁰ Conservationists believe that small agroforestry farms like those managed by Tziscac's farmer members play a vital role in preserving the remaining tracts of tropical rainforest within these important buffer zones.

Members live in moderate poverty.

According to a survey of producer members using the Progress out of Poverty Index® (PPI®), 74 percent of cooperative member households likely live in "moderate poverty," above the \$2.50 per day international poverty line, or approximately \$910 per year. The PPI® also indicates, however, that the majority of members (69 percent) likely suffer from "asset poverty,"²¹ defined by the Mexican

¹⁹ The information on average productivity in Chiapas comes from the following report: U.S. Department of Agriculture, ["Situation Update: Coffee Rust in Mexico."](#) Global Agricultural Information Network Report No. MX3015, 27 February 2013. Benchmarks for smallholder coffee productivity within Central America as a whole are from a combination of external sources — particularly recent surveys of coffee farmers across Mexico by the International Center for Tropical Agriculture (CIAT) and Catholic Relief Services — and internal impact-assessment studies conducted with coffee cooperative clients in Guatemala. Sam Fujisaka, ["Coffee Farmer Welfare in Nicaragua, Mexico, and Guatemala: Final Report to Green Mountain Coffee Roasters."](#) Cali, Colombia: CIAT, 2007; Michael Sheridan, ["Coffee Rust: Renovation."](#) Catholic Relief Services CoffeeLands Blog, no. 346, 9 April 2013.

²⁰ United Nations Educational, Scientific, and Cultural Organization, ["Biosphere Reserve Information: Lagunas de Montebello, Mexico;"](#) United Nations Educational, Scientific, and Cultural Organization, ["Biosphere Reserve Information: Montes Azules, Mexico."](#)

²¹ Mexico's National Council for the Evaluation of Social Development Policy (CONEVAL) defines poverty using three graduated lines, each looking at a household's ability to purchase a basket of goods and services throughout the year, assuming its entire income were used exclusively to acquire these products: (1) asset poverty, or the inability to acquire a basic food basket, as well as to meet necessary expenses in health, education, clothing, housing, and transportation; (2) capacity poverty, or the inability to acquire a basic food basket and to meet necessary expenses in health and education; and (3) food poverty, or inability to acquire a basic food basket.

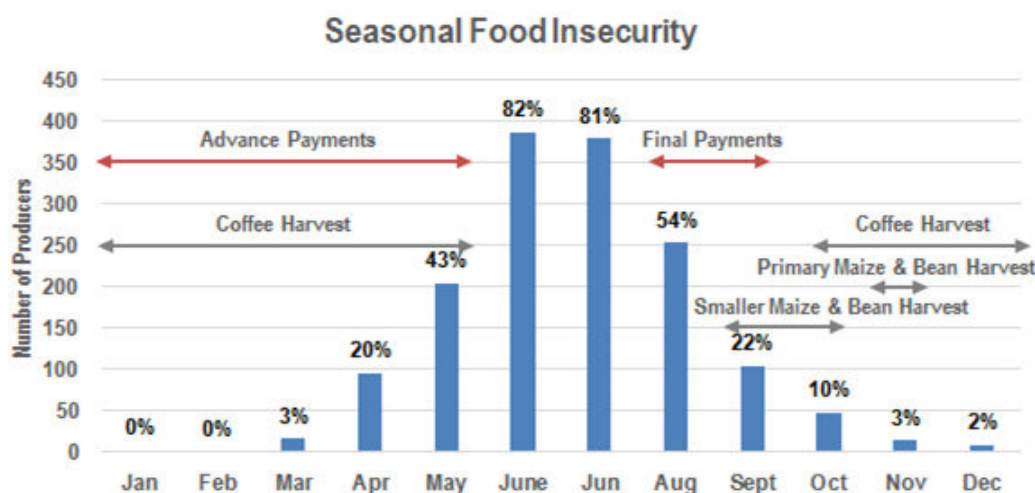
government as the inability to acquire a basic food basket while also paying for necessary expenses related to health, education, clothing, housing, and transportation.

The individual responses to the PPI® survey provide context to these statistics. While nearly all households (97 percent) have cement floors, 32 percent remain unconnected to a water supply, and all cook with firewood rather than alternative cooking fuels. The majority of households own basic assets, such as sinks, blenders, irons, and televisions. Education levels are low, with most women reporting either no education or up to three years of primary school.

Comparing these findings to national poverty data suggests that cooperative members are slightly better off than the average person living in Chiapas, but significantly poorer than the average Mexican. The average monthly income in Tziscasao members' municipalities in 2010 was 735 and 762 Mexican Pesos, respectively, equivalent to an annual income of around \$720, or just under \$2 a day.²² By comparison, in that same year the annual gross national income per capita in Mexico was \$8,590.²³

Members suffer from regular food insecurity.

Poverty, exacerbated by the highly seasonal nature of income from coffee production, leads to food insecurity for cooperative members. Ninety-five percent of producers surveyed reported experiencing “los meses flacos” — or “lean months” of regular food insecurity between May and August, during which they were not able to maintain their typical diet. Furthermore, seventy-two percent reported experiencing food insecurity for three or more months of the year.



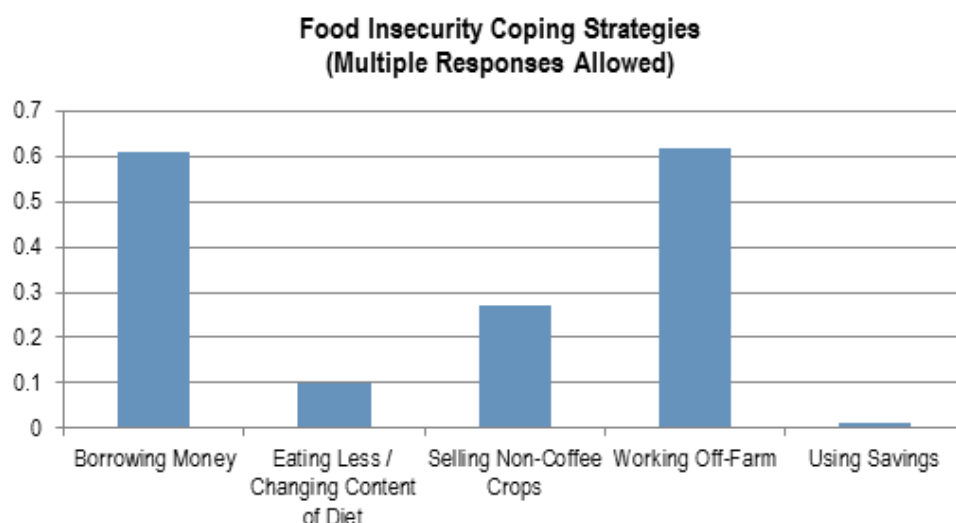
²² Medición de pobreza en los municipios de México, 2010, [Mexico's National Council for the Evaluation of Social Development Policy \(CONEVAL\)](#), December 2011.

²³ The World Bank, ["Mexico: World Development Indicators."](#)

Similar to other coffee-producing communities,²⁴ the pronounced jump in food insecurity among cooperative members between May and August can be attributed to a confluence of three factors.

- First, producer households rely heavily on the cultivation of maize and/or beans for their subsistence, yet they generally cannot produce enough of either crop to last throughout the year, with most exhausting their stocks from the fall harvest by the spring or early summer.
- Second, households generally lack enough disposable income throughout the year to purchase supplemental food or other household needs. This is particularly true during the summer months, when members have depleted the initial, partial payments from the coffee harvest ending in March, April, or May (depending on altitude) and have not yet received their final payments from the cooperative. Food is also more expensive during the summer due to high demand.
- Finally, many households invest in agrochemicals for their maize and bean plots during the spring and early summer months in preparation for the next harvest, diverting disposable income from immediate household needs.

Member households reported relying on a number of coping strategies to alleviate food insecurity, primarily finding seasonal and informal off-farm employment (62 percent); and borrowing money from family, community members, or private entities (61 percent). Fifty-six percent of the households surveyed reporting using two or more coping strategies.



²⁴ Recent research suggests that the lean months are a common phenomenon across many coffee producer communities in Mexico and Central America. One study, conducted by the International Center for Tropical Agriculture (CIAT) on behalf of the U.S. coffee company Keurig Green Mountain, found that 54 percent of coffee-producing households surveyed in Mexico experienced at least three months of persistent food insecurity each year. In Nicaragua and Guatemala, the numbers were even higher, at 56 percent and 88 percent, respectively. Members of Tziscac fall on the high end of this range, particularly within their national context. Sam Fujisaka, ["Coffee Farmer Welfare in Nicaragua, Mexico, and Guatemala: Final Report to Green Mountain Coffee Roasters."](#) Cali, Colombia: CIAT, 2007.

Tzisco's Impact on Its Producer Members

Cooperative members earn more selling their coffee to the cooperative than they would on the local market.

Tzisco pays its members a higher price for their coffee than that offered by the local market, leading to income improvements for members. Since 2010, the cooperative offered price premiums of six to 13 percent over the prevailing local market price. These premiums derive from Tzisco's organic and fair trade certifications, which enable the cooperative to secure higher prices in the international market. Through its fair trade certification, for example, the cooperative is entitled to a price floor of \$1.40 per pound for washed Arabica coffee. The cooperative also receives a fair trade premium from its buyers of \$0.20 per pound, as well as an organic premium of \$0.30 per pound.

Table 2: Tzisco's Prices vs. Local Prices, USD/Pound (Mexican Pesos/Kilogram)²⁵

	2010–2011	2011–2012	2012–2013
Local Market Price	\$1.69 (45 pesos)	\$1.55 (45 pesos)	\$1.51 (42 pesos)
Tzisco Price for Organic, Fair Trade Coffee	\$1.87 (50 pesos)	\$1.76 (51 pesos)	\$1.61 (45 pesos)

During the 2011–2012 season, Tzisco purchased over 480 tons of washed Arabica coffee from its members, making just under \$1.9 million in payments to households across 30 communities. Tzisco's premium of 13 percent over local market prices translates into an average incremental income of \$410 per household; this is beyond what producers would have realized selling to other buyers.

While actual incremental income realized by each producer during the 2011–2012 season varied depending on landholdings and productivity, this data indicates that Tzisco is having a positive impact on its members' incomes. As the average Mexican household consists of four individuals, an annual incremental income of \$410 per member household would translate into an extra \$100 per household member.

During the Most Significant Change (MSC) interviews, the majority (83 percent)²⁶ of producers cite this price premium — and the corresponding increase in income — as the most important benefit of membership in Tzisco. (For a full description of responses to the MSC interviews, refer to Appendix C.) Producers join and remain in the cooperative because of the opportunity to receive higher and more stable prices than those offered by local intermediaries. In the words of one farmer:

In the past, before we were members, we sold our product through intermediaries, at whatever price they would pay us. If it was 100 pesos per basket . . . well, then it was 100 pesos. If it was already dried, maybe they'd give you 15 or 20 pesos per kilogram. There was nowhere to sell it. But once we joined the organization, we became part of fair trade, and we got a different price.

²⁵ Using the average exchange rate for each coffee season: for 2010–2011, MXN 1.00 = USD 0.082; for 2011–2012, MXN 1.00 = USD 0.076; and for 2012–2013, MXN 1.00 = USD 0.079.

²⁶ According to a representative random sample of 50 percent of the MSC interview recordings.

The price premium is especially important when the market price drops. During these times, Tziscáo, through its fair trade and organic certification, can command higher prices due to the price floor and premiums. As one producer reported, “What we like most about this price is that it is guaranteed. Even when the price is low here, the price [we get] doesn’t rise or fall... This is the difference and the advantage.”



Tziscáo member sorting parchment coffee. In 2011/2012, Tziscáo purchased over 480 tons of washed Arabica coffee from its members.

Another producer explained that “the rise and fall of prices doesn’t worry me, because I know that I have someone who will buy from me, and I have this assurance. So there’s no problem.” Producers contrasted the security of selling to Tziscáo to the uncertainty of selling to local intermediaries, who often change their prices suddenly to take advantage of market conditions: “The cooperative quotes us a price and sticks to its word. It’s not like [other local buyers] that raise and lower the prices.”

During interviews, producers reported using the extra income to pay for immediate household expenses — most notably food, medicine, and clothing — as well as making longer-term investments in their houses or on their coffee farms. One producer reported, “Thanks to the [higher] price, I made my home. I have a home.” Another producer stated, “We use the money we get from our coffee to buy food for the house or medicine for the children when they are sick.” Several producers also reported using the incremental income to invest in another business or pay off debts.

The data suggests, however, that the incremental income received from selling to Tziscáo improves producers’ livelihoods but is not lifting members and their families out of poverty. Many farmers reported that the price offered by Tziscáo is only slightly higher (“más elevadito”), and hard to stretch beyond meeting basic household needs. As a result, most members of Tziscáo, while likely better off than their counterparts selling into the local market, still live in moderate poverty and suffer from food insecurity for one or more months each year.

Cooperative training has likely improved members’ farming practices and environmental performance.

Through our agronomic practices survey, conducted with a subset of 21 cooperative members, we sought to understand whether Tziscáo’s training program has led producers to adopt specific coffee

management practices that the broader conservation community has identified as important for coffee productivity and for good environmental health.²⁷ For the purposes of the pilot, we focused on conservation practices related to soil fertility management and erosion prevention (described below in Table 2).

Table 3: Subset of Agricultural Practices Surveyed

Practice	Expected Productivity Outcomes	Expected Environmental Outcomes
Recycling coffee waste as organic fertilizer	Higher productivity	Increased soil fertility and improved soil structure; if diverting organic waste streams, may also lead to reduced nutrient-loading of waterways
Use of fertilizer	Higher productivity	Increased soil fertility and, if organic, improved soil structure
Use of live barriers, soil ridges, and/or terracing	Higher productivity	Less erosion of productive topsoil

Responses to our survey suggest that Tziscac has likely improved the agricultural practices of its farmer members by providing ongoing training in sustainable agriculture. In many cases, the cooperative is facilitating farmers' transition from no-input, "nutrient mining" production systems that deplete soil fertility to systems that build soil health through the use of fertilizers and erosion-prevention techniques. Nutrient mining — or the removal by crops of soil nutrients without sufficient replenishment in the form of fertilizers, green manure, etc. — is a widespread problem among smallholder farmers in developing countries, resulting in low yields and, over time, complete soil exhaustion.

Agronomic Training and Internal Inspections

Tziscac's agronomic training focuses on the use of best management practices to increase productivity, protect the health of farm-level ecosystems, and ensure compliance with the standards of the cooperative's certifications. The training program consists of two annual workshops, which are obligatory for all cooperative members, on topics ranging from the creation of organic compost to pruning techniques. Four technical staff (*técnicos* — themselves coffee producers and Tziscac members) conduct these workshops, which generally last one to two days, within each of the 30 communities that sell coffee to the cooperative. The agronomic training program is funded through the cooperative's certification premiums and coffee revenues.

Técnicos monitor the adoption of practices covered during the training workshops and broader compliance with certification requirements through inspections of cooperative members' farms and wet mills every six months. They also use these semiannual inspections as an opportunity to provide members with individualized recommendations related to production or processing improvements.

²⁷ As a financial institution, Root Capital takes a "practices as proxy" approach in our environmental-impact assessment work, focusing on changes in agronomic practices and looking to the broader conservation community for experimental studies connecting these best management practices to quantitative environmental outcomes. For more details on our approach to environmental-impact assessment, including a description of practices examined, refer to Appendix E.

About half of the producers surveyed reported practicing organic, agroforestry coffee production before joining the cooperative. Their production systems, however, were “natural” or “organic by default.” Due to financial constraints and/or limited agronomic knowledge, these producers did not use any inputs, synthetic or organic, to maintain soil fertility. Because of this lack of investment, they were likely degrading the health and productivity of their farms over time. The remaining half of producers reported using synthetic inputs, such as chemical herbicides or fertilizers, before joining the cooperative. (From conversations with cooperative staff, we believe that this small sample of 21 producers contained a disproportionate number practicing conventional agriculture before joining the cooperative. The cooperative’s agronomic trainers, who live and work among producer communities, believe that most producers had not used agrochemicals before joining the cooperative.)

Essentially all producers were thus required to change their farming practices upon joining the cooperative in order to comply with the standards of its organic and fair trade certifications, which together prohibit the use of chemical inputs and require the use of habitat, soil, and water conservation practices. Indeed, producers reported making a number of changes in practices since joining the cooperative, with the degree of change depending on the production system used before joining the cooperative.

Before, when I was not a [member], we applied chemical fertilizer. Once we started to work organically, we created terraces and [used] organic compost.

When I was not a member, I used chemicals. . . . Before I was in the association, I asked myself, “Is this [organic production] good? Will it give me results?” I decided it would. Now, I use [coffee] pulp and make compost as well.

[Before], we burned the scrub [to manage ground cover]. But now . . . we don’t like to burn. One feels that it’s not a good thing to do. I was going to burn my corn field, but now I appreciate the “waste” [leaf litter, corn stalks] more because it protects the soil. We’ve changed our mindset.

I’ve changed [my practices] around pruning. Before, I would cut the ground cover very close [to the ground] — very low. But now, we are leaving about five centimeters (Permanent ground cover can help preserve root systems and prevent soil erosion.)

Both producers and técnicos also described visible improvements in the health of their farms and coffee trees since their association with the cooperative. Several farmers, particularly those previously using agrochemicals, observed increases in soil moisture and soil organic matter. During one of our field visits, one técnico proudly pointed to the health of the soil on his farm, showing the greater presence of vegetative litter and the increased moisture content. Another producer reported that his “coffee is more beautiful with the organic fertilizer” — healthier, likely due to higher soil fertility — while his neighbor compared “the good” cherries that he receives now to the “tiny, thin” ones that he used to harvest when he used chemical fertilizers.



A Tziscaco member provides information about her coffee farm as part of the mobile advisory project conducted in 2013.

While we cannot conclusively connect these changes in practices or likely farm-level environmental health outcomes to interventions by Tziscaco, especially given the lack of a control group, our interviews strongly suggest that producers would not have known or been given incentives to adopt these more sustainable practices without the support of the cooperative's agronomic training team. One producer, for example, said that he had to work hard to learn all the improved organic techniques, even though he had not used agrochemicals before joining Tziscaco 10 years earlier. He mentioned the creation of organic compost from on-farm materials as particularly challenging at the beginning because he often did not have the coffee pulp, leaves, and livestock manure required. Now, he says, making organic compost is easy, in part because he has more coffee and therefore more coffee pulp on his farm. Another producer also stressed the important role played by the cooperative's técnicos in transferring knowledge:

[Before joining the cooperative] we didn't know where to go for the information. But now we do. Now that we are in the program, the técnicos provide instructions [in good coffee management]. This has given us good results.

It is unclear whether cooperative training has improved members' productivity.

In our agronomic practices survey, we asked farmers whether their productivity had changed after joining Tziscaco. Responses suggest that productivity outcomes have been mixed and are largely dependent on the production system used by farmers before joining the cooperative.

Producers using agrochemicals, particularly chemical fertilizers, before joining the cooperative experienced a drop in yields as they transitioned to organic production methods. The literature indicates that organic and conventional coffee production systems can reach similar levels of productivity, assuming similar levels of nitrogen inputs in the form of fertilizers and active plant maintenance. Many small-scale organic coffee producers, however, do not achieve these levels of organic inputs due to income, resource, and knowledge constraints, and so generally realize lower yields than producers using concentrated, chemical fertilizers.²⁸

Producers practicing organic production prior to joining Tziscas described mixed changes in productivity since their association with the cooperative. One member reported, “We produced then as we do now. It’s not too much or too little. We always get something for consumption, enough to survive.” Others, however, described noticeable yield improvements due to the adoption of improved management practices.

The issue is complicated by the fact that productivity depends on a large number of factors — such as coffee tree age and density, soil management, shade management, pruning practices, and ability to invest in inputs — and ultimately relies on individual producers’ ability to effectively implement the cooperative’s training in best management practices.

²⁸ J. Haggard et al., “Coffee Agroecosystem Performance Under Full Sun, Shade, Conventional and Organic Management Regimes in Central America,” *Agroforest Systems* 82 (2011): 285-301.

Root Capital's Impact on Tziscão

Root Capital financing has enabled Tziscão to provide advances to its members, with positive implications for the relationship between the cooperative and producers.

When Tziscão left the secondary cooperative La Cañada in 2009 due to concerns that the cooperative was misappropriating certification premiums, it wished to start exporting its members' coffee directly. However, Tziscão lacked the market connections and financing to do so, as La Cañada had previously handled the export process, including the securing of pre-harvest financing. Given its remote location and lack of traditional collateral such as fixed assets, Tziscão was not able to access commercial financing. For two years, the cooperative relied on financing from two local institutions, including another producer organization, but found the financing insufficient for it to collect and commercialize all of its farmers' coffee.

In late 2011, Tziscão applied for a loan from Root Capital, securing a trade credit loan of \$400,000. During the 2012–2013 harvest season, the loan doubled to \$800,000. As of 2014, Root Capital remained Tziscão's only source of working capital.

According to Tziscão's management, Root Capital financing allowed the cooperative to transition from paying members for their coffee at the end of the season to paying farmers a base price (roughly 50 percent of the final payment) upon delivery. This change in payment timing was crucial to Tziscão's operations, as farmers seek to sell their coffee within days of harvesting and washing it and, given immediate financial needs, are often unwilling to deliver to the cooperative unless it has cash on hand.

Based on field experience and studies (in progress), we have found that without financing, cooperatives lose substantial volumes to side-selling, threatening contracts with buyers. This scenario can damage the cooperative's reputation and undermine its relationship with members, both critical for long-term business sustainability. In this case, farmer livelihoods also suffer, as farmers sell to intermediaries at lower prices.

Side-Selling

Side-selling, a dirty word in the specialty coffee sector, refers to the sale of coffee by cooperative members to intermediaries outside of the cooperative. The middlemen, often referred to pejoratively as "coyotes," are typically hired by national coffee trading houses to buy coffee from producers. Although the middlemen pay at- or below-market rates, they offer an enticing proposition to producers: they can pay farmers upon delivery for their coffee. This immediate payment is particularly important during the harvest, when farmers incur the majority of their on-farm investments to pay temporary laborers, and simultaneously have little savings remaining from the last coffee harvest for food and other household expenses. Unlike the intermediaries, a cooperative lacking external financing or self-capitalization is often hard-pressed to pay its members market rates upon delivery and generally offers only a portion of its final price upon delivery, with the remaining payment made two to three months later.

Side-selling has deleterious long-term effects for the producer and enterprise alike. For the producer, selling to middlemen typically results in a lower price per unit in the long run, because although intermediaries may offer a higher spot price, the cooperative generally pays a higher total price once it is paid by the ultimate buyer in the United States or Europe. (In years when the coffee price spikes, the intermediaries' total price might be larger, but cooperatives exporting into specialty markets generally pay more over the course of various cycles, which include years when the coffee price falls.) Meanwhile, for the enterprise, if the volume delivered by the producer is lower than the quantity expected due to side-selling, the cooperative may fail to fulfill its contracts to buyers. Default on sales contracts threatens current and future contracts and thereby the cooperative's ability to stay in business and benefit producers in the future.

The degree of side-selling is contingent on the producer's access to liquidity at key moments in the agricultural cycle and his loyalty to the cooperative. The enterprise has three possible times at which it can pay producers for their coffee: before the harvest with credit, during the harvest with spot payments, and several months after the harvest once the buyer fulfills its contract with the cooperative. In the first two instances, the enterprise is competing with intermediaries, which often also offer pre-harvest credit and payments upon delivery. Thus, to decrease side-selling among its members, the enterprise would ideally offer both pre-harvest credit and payment upon delivery. The former allows the farmer to bypass an unfavorable loan, which he would pay back with coffee at a lower price, often compounded by a higher interest rate. The latter — payment upon delivery — also gives the farmer the needed liquidity to avoid selling coffee to intermediaries at lower spot prices.

The loyalty that exists between the producer and the cooperatives also likely influences the producer's decision about whether to sell his coffee to the cooperative or to other buyers. Producers may feel loyal to the cooperative due to shared history, culture, or ethnicity. Present and past benefits of cooperative membership, such as internal credit programs and technical assistance, may also enhance the relationship and reinforce farmers' motivation to sell to the enterprise on terms that may be less favorable in the short term (for example, a lower spot price in the form of a partial payment) but more favorable in the long run due to the generally higher price and other services offered by the cooperative.

Indeed, Tziscaco's management reported that Root Capital financing provided the cooperative with much-needed liquidity that allowed it to deliver on its promises to purchase members' coffee and consolidate its sourcing base. Given its stronger position, the cooperative says it is now able to start to think of scaling its operations. Cooperative staff stressed the importance of Root Capital's trust in the newly independent business at a time when it could not access sufficient financing from other sources.

Conclusion

Through this engagement, we found that Tziscac is having a moderate, although by no means immaterial, impact on the livelihoods and environmental performance of its members. Cooperative members reported income improvements associated with the higher prices paid by the cooperative, as well as adoption of soil conservation practices, likely through its agronomic training program. Members continue, however, to live in moderate poverty due to ongoing challenges related to small landholdings, low yields, limited household assets, and uneven cash flows.

We also found that Root Capital financing is likely strengthening the relationship between the Tziscac and its members by enabling the cooperative to shift from paying farmers at the end of the coffee season to paying them a base price upon delivery. In other contexts, we have seen that this transition can help cooperatives consolidate their membership base, with positive implications for long-term business viability and member livelihoods.

This engagement, while providing us with data pointing to the likely impacts on the cooperative and its farmer members, also raised questions meriting further research, which we believe are relevant to the specialty coffee sector more broadly:

- What services might the cooperative provide to have a greater impact on producer livelihoods?

Tziscac's moderate impact on its members' livelihoods is likely representative of many of our younger coffee cooperative clients operating in markets with intermediaries that pay farmers at or below market rates. Tziscac's higher pricing is improving producers' incomes, but it does not provide its members with other high-value services, such as credit, that would support further livelihood improvements.

In impact studies with other coffee cooperative clients (including a comparative study with four cooperatives in Guatemala, the results of which will be published in late 2014), we are learning that higher pricing, while often the primary motivator for farmers to join a cooperative, is generally not enough to ensure an enduring, resilient, and high-impact relationship between farmers and a cooperative. Other services and interactions are needed to build a strong and mutually beneficial relationship between farmers and the enterprise. In particular, in our fieldwork we are seeing that producers consistently rank credit as the most important ancillary service, often followed by agronomic assistance and community programs. Root Capital is now exploring ways in which we might support our clients in offering these high-value services, or in improving the quality of these services, through our advisory activities.

- How effective are coffee cooperatives' agronomic extension programs in improving farmers' productivity and environmental performance?

In the case of Tziscac, members' persistently low productivity suggests that the cooperative faces resource and knowledge constraints that prevent it from adequately meeting the agronomic needs of its members through training or other forms of extension. We have seen similar findings with coffee cooperative clients elsewhere, suggesting that coffee cooperatives, even those with significant experience, may require more targeted support in this area.

Root Capital is exploring this question in our client studies going forward, using an environmental survey tool based on the agronomic practices survey piloted in this engagement with Tziscac. The module evaluates whether client services, such as agronomic training, have influenced farmers' use of sustainability practices that affect environmental performance, productivity, and/or product quality. Learning from these studies will inform our environmental-impact framework and the implementation of service offerings for clients.

Appendix A: Mobile Data Management Project

Root Capital partnered with Acopio,²⁹ a U.S.-based organization specializing in mobile data management for coffee cooperatives, to develop and pilot mobile-enabled data management solutions for Tziscac. Root Capital and Acopio developed two data-management platforms for the cooperative, based on its needs:

- An inventory management system that allowed the cooperative to collect real-time data on coffee purchased from its producer members during the harvest season, including data on coffee volume, quality, and pricing; and
- Digital inspection forms that streamlined the cooperative's internal audits of members' farms and wet mills to ensure member compliance with organic- and fair trade-certification standards.

Acopio used Ruby on Rails to program the inventory management system and Open Data Kit to digitize the inspection forms. Both platforms were programmed to allow offline use, with subsequent syncing to a cloud-based server, to enable cooperative staff to manage data anywhere, regardless of Internet access. This was a critical design component, given the region's lack of connectivity.

Upon completion of the pilot in 2013, cooperative staff positively reviewed the technology, which they found streamlined the reporting of information from producers' parcels to the centralized office and reduced errors due to damaged or lost documentation. Managing the syncing of data collected offline, however, proved challenging, particularly as the cooperative office lost its Internet connection midway through the pilot, requiring the staff to travel to an Internet café in a nearby town to update the centralized database.

In light of this and other mobile pilots in both Africa and Latin America, we are now refining our strategy for client information and communications technology (ICT) support to ensure that the process is user-friendly for our clients and creates value for all parties involved.

²⁹ Acopio was acquired by Fair Trade USA in early 2014, after the completion of this project.

Appendix B: Summary of Progress out of Poverty Index® Data

The Progress out of Poverty Index® (PPI®) is a poverty measurement tool developed by the Grameen Foundation that consists of 10 questions about a household's characteristics and asset ownership, customized by country, designed to evaluate the likelihood that the household is living below the poverty line.

Tziscas's technical staff delivered the PPI® survey for Mexico during the 2013 inspection of producers' wet-milling facilities, which the cooperative conducts annually according to the requirements of its fair trade certification. From a sample of 469 producers interviewed, we found an average PPI® score of 32.4, which maps to a 15.6 percent likelihood of living under \$2.50 per day, a 27.4 percent likelihood of living under the Mexican food poverty line, and a 68.7 percent likelihood of living under the Mexican asset poverty line. This suggests that most member households live in moderate poverty.

The following are the full results of the 10-question survey for Mexico.

1. How many household members are ages 0 to 17?

Responses	Informants #	Informants %
4 or more	36	7.68
3	53	11.30
2	111	23.67
1	118	25.16
0	151	32.20

2. What is the highest level that the female head/spouse has passed in school?

Responses	Number of Respondents (%)
None	119 (25.4%)
Up to third grade	183 (39.0%)
Fourth grade through high school	158 (33.7%)
College preparatory 1–3	5 (1.1%)
Normal/technical/commercial	1 (0.2%)
No female head/spouse	3 (0.6%)

3. How many household members have a written employment contract for a salary or for an indefinite period?

Responses	Number of Respondents (%)
None	465 (99.2%)
One	3 (0.6%)
Two or more	1 (0.2%)

4. What is the main material of the floor of this residence?

Responses	Number of Respondents (%)
Dirt	13 (2.8%)
Cement/concrete	456 (97.3%)

5. How is water supplied to the residence's toilet for flushing?

Responses	Number of Respondents (%)
No toilet or no water supply	150 (32.0%)
Carried by bucket	284 (60.5%)
Piped	35 (7.5%)

6. Does the residence have a medium sink for washing dishes?

Responses	Number of Respondents (%)
No	36 (7.7%)
Yes	433 (92.3%)

7. What fuel do you usually use to cook or heat food?

Responses	Number of Respondents (%)
Firewood	469 (100%)
Other	0 (0%)

8. Does the household have a blender?

Responses	Number of Respondents (%)
No	145 (30.9%)
Yes	324 (69.1%)

9. Does the household have an electric iron?

Responses	Number of Respondents (%)
No	131 (17.9%)
Yes	338 (72.1%)

10. How many televisions does the household have?

Responses	Number of Respondents (%)
None	90 (19.2%)
One	347 (74.0%)
Two	30 (6.4%)
Three or more	2 (0.4%)

Appendix C: Summary of Most Significant Change Responses

The Most Significant Change (MSC) Methodology involves using an open-ended yet structured question — “Since you became a member of the cooperative, what has been the greatest change in your quality of life?” — to solicit individual experiences of impact that are more nuanced than multiple-choice questions allow. The methodology was developed by Rick Davies in 1996 and has since been adopted by many researchers and organizations as a means of participatory monitoring and evaluation.

Tziscão’s technical staff asked the MSC question of 469 producers during the 2013 inspection of producers’ wet-milling facilities, using the Acopio platform to record the responses. We then categorized a randomized sample of 228 responses.

Note that some respondents reported more than one benefit.

Most Significant Benefit of Cooperative Membership	Number of Respondents (%)
Higher price	190 (83%)
Support through social projects	45 (20%)
Reliable off-take	15 (7%)
Agronomic training	11 (5%)
Reliable weighing of coffee	7 (3%)

Appendix D: Summary of Food Insecurity Data

Tziscac's technical staff delivered a structured survey on food insecurity during the 2013 inspection of producers' wet-milling facilities. The survey consisted of the following questions:

- Are there any months during which your household experiences difficulty in maintaining its typical diet? (Are there any months when it is difficult to purchase food?)
- (If yes) Which months?
- (If yes) What coping strategies do you use? (Options: Eating less, changing diet, borrowing money [to maintain food consumption], seeking other work, or other.)

From a sample of 469 producers interviewed, we found that 96 percent experience at least one month with persistent food insecurity a year, with 72 percent experiencing food insecurity for three or more months a year. Most producers experience food insecurity during the period between May and August, particularly during June and July, when 82 and 81 percent, respectively, suffer from inadequate food.

Member households rely on a number of coping strategies during seasons of food insecurity, namely: borrowing money from family, community members, or private entities (64 percent); finding off-farm employment, generally seasonal and informal (60 percent); or selling other products, such as fruits or livestock (27 percent). Fifty-four percent of the households surveyed reporting using two or more of these strategies.

