

## **‘Los meses flacos’: seasonal food insecurity in a Salvadoran organic coffee cooperative**

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Central American coffee farmers commonly refer to annual periods of food insecurity as ‘los meses flacos’ – the thin months – indicating a recurring season in which they are unable to meet household food needs. Although this is a common phenomenon, little empirical research has documented the seasonal food insecurity that many small-scale coffee farmers face. Household surveys and focus groups were conducted with 29 members of an organic coffee cooperative in western El Salvador to determine the causes of, and responses to, seasonal food insecurity. Ninety-seven percent of households faced food shortages during some period of the year. The two most common proximate causes of food shortages were lack of income-generating opportunities to buy food and running out of staple food crops. Families coped with seasonal food shortages by borrowing money and food, seeking work outside of the community, changing diet, and selling livestock. It is clear that small-scale coffee farmers seek to maintain a balance between coffee, which provides income, and food crops, which provide staple food. Livelihood and income diversification are important coping strategies that should be supported; however, we conclude that efforts to address food insecurity in coffee regions require deeper structural changes to support peasant farmers.

**Keywords:** food security; livelihoods; subsistence agriculture; coffee; Central America

### **Introduction**

Even with new agricultural technologies, farming alone does not constitute a sufficient livelihood for many poor rural families in developing countries (Ellis 2000, Ellis et al. 2004). This is partly due to the seasonal nature of farming, which includes uneven income flows and food availability throughout the year. Alternative livelihood strategies include diversification of food cultivation, non-food crop cultivation, livestock, forest gathering, weaving, trade, employment in the service sector, and remittances (Ellis 1998, Dixon et al. 2001, Westphal 2008). Although grains may be stored to provide a more stable source of food throughout the year, many households cannot afford silos or do not produce enough grains to feed the household for the full year.

In general, seasonal irregularity of available food and income is particularly extreme for most poor small-scale farmers in the developing world who struggle to balance subsistence

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farming with market-oriented production. Smallholder farmers constantly face the dilemma of dividing land, time, and resources between crop production for income and subsistence agriculture for household food security (Steinberg and Taylor 2009). Although this is a reality faced by many of the world's farmers, coffee is a particularly important crop to examine in the context of livelihoods and food security. Coffee is one of the most valuable commodities in the world, providing important economic and environmental value to the regions in which it is grown, and produced in its majority by smallholder farmers (Jha et al. 2011). Food insecurity was not considered a relevant issue for farmers in coffee producing regions until recent studies, which were mostly focused on the impacts of coffee certifications, started to reveal its severity (Bacon 2008b, Jaffee 2007). In many coffee-growing communities farmers focus more time and energy on the coffee crop than food crops, and income from the one annual coffee harvest is often received in one or two lump sums rather than receiving income evenly throughout the year. As a result, many small-scale coffee farming families and communities struggle with periods of hunger, in addition to poverty and a lack of education, infrastructure, and support networks. In a recent survey of almost 500 smallholder coffee farmers in four countries, 63 percent of the interviewees reported they struggled to meet their basic food needs during at least one period of each year (Mendez et al. 2010b). The vulnerability of small-scale coffee farmers has received growing attention in the years since the global coffee crisis of the early 2000s (Mendez 2004, Bacon 2005, Bacon et al. 2008a). In 2000–2001 coffee farmers faced a green bean price crisis, in which Central American coffee revenues decreased 44 percent in one year (Eakin et al. 2006). A convergence of geopolitical factors, including market deregulation resulting from the fall of the International Coffee Agreement, oversupply of coffee in the world market, and consolidation of control by multinational coffee companies pushed coffee prices to historical lows in recent years, and contributed to the economic vulnerability of small producers (Eakin et al. 2006, Petchers and Harris 2008). Although world coffee prices constantly fluctuate, the 2001 price crisis was particularly devastating and many small-scale coffee farmers are still struggling to recover and cushion themselves from future shocks (Jaffee 2007).

Eighty-five percent of coffee farmers in Central America have small operations, and many have sought alternative income sources in order to respond to falling coffee prices (Bacon 2005). There is a growing movement among international development practitioners and academics to better understand causes and explore solutions to mitigate the vulnerabilities of rural agricultural families in coffee communities (Bacon 2005, Eakin et al. 2006). Vulnerability refers to difficulty coping with stresses and shocks and adopting longer-term livelihood strategies in response to such events (Scoones 1998). Proposed solutions to coffee farmer poverty and vulnerability include livelihood diversification (Petchers and Harris 2008), price premiums offered to farmers for environmentally-friendly production (i.e., organic or shade coffee certification) (Perfecto et al. 2005), and more direct payments to farmers, so that they are able to capture a higher percentage of the value of the coffee chain (e.g., fair trade channels) (Raynolds et al. 2007).

Although many studies focus on the effects of different coffee management systems and marketing structures on rural households (Mendoza 2000, Dixon et al. 2001, Bacon et al. 2008b, Westphal 2008, Mendez et al. 2009a, 2010a) and other studies analyze household food security in rural Latin America (Shriar 2002, 2007), none have specifically addressed the role of food crop production in food security for small-scale coffee farmers. Coffee farmers throughout Latin America refer to an annually recurring period of hunger as 'los meses flacos' – the thin months. Recent research has identified the seriousness of this phenomenon among coffee farming households, mostly as part of studies analyzing the

impacts of third party certifications (Jaffee 2007, Arnould et al. 2009, Mendez et al. 2010a). This has redirected considerable development support to smallholder farmers from a focus on coffee production to other livelihood strategies, such as food security (Mendez et al. 2010b). The specialty coffee industry has only recently begun to address this issue, although it has taken considerable hold, partly due to efforts from Green Mountain Coffee Roasters, a coffee company based in Vermont, USA, which commissioned the International Center for Tropical Agriculture (CIAT) to conduct a study on the topic in 2006 (Fujisaka 2007). They found that 67 percent of coffee producing households surveyed in Mexico, Guatemala, and Nicaragua experienced ‘los meses flacos’ for at least three months of the year (Fujisaka 2007). Based on these results, development organizations such as Save the Children, Food 4 Farmers, and the Institute of Development Studies have launched projects aimed at improving food security in coffee growing regions. However, despite the importance of this issue and the growing efforts to combat food insecurity, there has been little empirical research to document the complexity of seasonal food insecurity that coffee farmers face (Jaffee 2007, Bacon et al. 2008b). Several studies include data on the percentage of coffee producing households that experience food shortages in the context of coffee farmer livelihoods (see for example Shriar 2007, Bacon et al. 2008b). However these studies have not provided in-depth analyses of the nature of seasonal food insecurity including the causes and responses, or the balance between income generation and food production in ensuring household food security.

To address this gap in the literature, our case study focuses on the importance of food crops and the different ways coffee farming households attempt to achieve food security and cope with food shortages. We sought to determine whether small-scale coffee farming households are able to achieve food security through a combination of subsistence and commodity agriculture, through the following research objectives: (1) better understand the root causes of food insecurity in coffee farming communities; (2) determine if a combination of coffee and subsistence farming ensure food security for small-scale organic coffee farmers of El Salvador; and (3) analyze household responses to periods of seasonal food insecurity.

### **Research approach**

We approached this analysis through two conceptual frameworks: sustainable livelihoods and food security. The sustainable livelihoods approach was used to analyze how rural households cope with poverty, food insecurity, and lack of access to resources. The food security framework helped explain the factors contributing to periods of and responses to hunger in households within the coffee cooperative. Although these concepts can be used to address issues at different geo-political scales (Scoones 2009), we used both of these frameworks to examine the household as the main unit of analysis.

### ***Sustainable livelihoods in coffee producing regions***

One of the most widely used definitions of livelihoods was developed by Chambers and Conway, which describes livelihoods as ‘comprising people, their capabilities and their means of living, including food, income and assets’ (Chambers and Conway 1991). Livelihood assessments look beyond income and take into account social and environmental resources in order to understand the complexity of survival, prosperity, and quality of life of rural people. The sustainable livelihoods framework considers the variety of strategies that people use to cope with vulnerability, including agricultural intensification,

diversification, and migration (Scoones 1998). The term ‘sustainable livelihoods’ generally refers to the resilience of households to environmental, economic, and social stresses and shocks (Bebbington and Batterbury 2001). The concept of livelihood diversification relates to household strategies to manage risk, maintain resilience, and cope and adapt to stresses and shocks (Carney 1998, Ellis 1998, Westphal 2008). Scoones (2009) points out that although livelihood assessments should consider social, cultural, and political contexts, many development projects over the last 30 years have overlooked the complex and interdisciplinary nature of livelihoods and misused the livelihoods framework. He emphasizes the need for livelihood analyses to account for local and global political forces, globalization, networks, and environmental challenges as the field of political ecology explicitly does (Scoones 2009).

The livelihoods of small-scale farmers are extremely vulnerable due to the rising cost of food and goods, droughts and diseases on crops, and family health problems. Coffee growers face an additional source of stress that makes them particularly vulnerable – coffee commodity price fluctuations. Alternative coffee certifications including organic, Fair Trade, and shade grown represent one potential response strategy to cope with this issue. Certifications can ensure that farmers are paid more stable and higher coffee prices, which can in turn help reduce grower vulnerability to market fluctuations. However, research is beginning to show that while alternative certifications may be a part of the solution, certifications alone are not able to ensure sustainable livelihoods for coffee farming households (Bacon et al. 2008b, Mendez et al. 2010a).

### ***Food security in coffee producing regions***

Food security refers to food availability, access, quality, safety, and nutrition (Pinstrup-Andersen 2009). The Rome Declaration on World Food Security states that: ‘Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy lifestyle’ (FAO 1996). Food security can be considered or analyzed at global, national, household, and individual levels, and can be either transitory or permanent (Pinstrup-Andersen 2009). Over the last four decades several paradigm shifts have occurred in food security theory and policy. In the mid 1970s research in relation to food security focused mainly on food production and supply, whereas in the early 1980s Amartya Sen highlighted the issues of access and entitlement in food security which became more common in policy initiatives after that point. In recent years the discussion has become less focused on food supply at the national level and more concerned with understanding risks, responses, and livelihood complexities as they relate to household food security (Maxwell 1996). Different regions and populations may face distinct types of food insecurity; in the US where there is a surplus of food, food insecurity is the result of unequal resource distribution (Rose 2008). In poor African countries, food insecurity is often caused by a lack of available food or inability to access food. In Latin America, food insecurity is generally caused by unequal access to food rather than a lack of total available food (Rose 2008).

More than one billion people worldwide experience some level of food insecurity, and there are many different proposals as to how to achieve food security (FAO 2009). Some in the field assert that food security can be ensured through improved agricultural practices, such as improved soil management (Lal 2009), or agricultural intensification of small-scale farm operations and biotechnology (Pinstrup-Andersen and Pandya-Lorch 1998). However, given that the number of hungry people has continued to rise despite the

spread of green revolution technologies, it is clear that the solution to food insecurity is more complex than merely increasing agricultural productivity (Sen 1981, Singh and Gilman 1999, McAfee 2008, Barrett 2010). Food insecurity is not simply about the availability of food based on total food production, but also an issue of lack of access to safe and healthy food by certain populations due to persistent poverty and inequality (Singh and Gilman 1999). At the national and community levels, major threats to food security include natural disasters, poverty, insufficient food production, high food prices, food policy, and low education levels (WFP 2009). At the regional and community levels, other factors such as inequality and access to land come into play as well (Altieri 2004). Food security is closely connected to livelihoods, where vulnerability to stresses and shocks, risk management, income generation, and overall well-being all affect the food security of households (Rose 2008). Livelihoods must be stable as a prerequisite for food security, and household food insecurity is an indicator of an unstable, unsustainable livelihood (Maxwell 1996).

Therefore, our study takes into account multiple livelihood factors to examine how small-scale coffee farmers approach food security and to understand why they continue to face food shortages each year. Our analysis emphasizes food access and availability. Throughout the paper we use the term food security to mean the ability of households to meet their basic food needs, and base our analysis on self-reporting by households as to whether they are food secure (Maxwell et al. 2008). Our research reveals the complexity of food security for households whose livelihoods are tied not only to subsistence farming but also to an international commodity market.

### **Study site**

Research was conducted in August 2008 in the municipality of Tacuba in western El Salvador. The municipality of Tacuba is located 18 kilometers from the nearest city of Ahuachapán, and 188 kilometers northwest of San Salvador. Although the town of Tacuba has paved roads, bus access, and several stores and eateries, the homes and farms of the coffee cooperative in this study are located between 3 and 10 kilometers from the town in a rural setting with dirt roads, intermittent access to running water and no electricity. After completion of this research, electricity became available to parts of the community; however few members of the coffee cooperative were able to afford the initial cost to connect to the grid. Farms are located at elevations between 500 and 1200 masl. The climate is subtropical humid with a rainy season between May and October. The natural vegetation of the region is classified as Holdridge life zone 4, or humid, subtropical forest (Holdridge 1987, MARN 2003).

This study builds on 12 years of a Participatory Action Research (PAR) process working to understand and improve livelihoods and conservation with a small Salvadoran cooperative of coffee farmers (Mendez 2008, Mendez et al. 2009, 2010b). The aim of this engaged research has been to benefit both researchers and communities, build collaborative relationships, and allow critical reflection by all parties (Bacon et al. 2005). PAR prioritizes the involvement of communities and individuals as participants in research and action as opposed to viewing communities as mere subjects of research (McIntyre 2008). Throughout the 12-year PAR process, the farmers have organized to form a second level cooperative, converted to organic coffee farming practices and accessed a relationship directly with a progressive coffee buyer. This cooperative was chosen for our study in order to ensure more candid responses due to the trust built over the long-term relationship. While it can be difficult to obtain accurate data on personal information such as income details and

concerns about food security, we believe we received more honest responses as a result of the established relationship with this population.

The 29 households of the coffee cooperative studied have been affected by several important factors over the last five years. Nineteen farmers of the population belong to a first level cooperative<sup>1</sup> (whose members are individuals or families) that collectively manages 35 hectares of coffee, while the other 10 farmers are members of a different first-level cooperative where all land is individually owned and managed. These two cooperatives joined together to form the Association of Organic Coffee Producers of Western El Salvador (ACOES, for its acronym in Spanish), a second-level cooperative, with the objectives of sharing resources and gaining market power as a collective. Organized groups of small-scale producers are better able to receive a price premium for their coffee, have more bargaining power in the market, and can usually consolidate resources for coffee processing and sale (Lyngbaek et al. 2001, Bray et al. 2002, Philpott et al. 2007, Bacon et al. 2008b). The coffee cooperative was certified organic in 2005 after farmers learned of the benefit of alternative coffee certifications (mainly higher prices), through several training events and farmer-to-farmer exchanges in El Salvador and Nicaragua. In early 2008, ACOES sold its first coffee directly to a progressive North American importer, which pays a higher price and provides rural development support to farmers. In addition to being organic, the coffee is shade grown, which conserves biodiversity, enhances the quality of the coffee and provides farmers with a variety of products, such as fruits, firewood, and timber (Perfecto et al. 2005, Mendez et al. 2007).

In addition to coffee, all households in the study maintain subsistence plots of maize and beans which are staples in their diet, and some plots contain a small amount of other vegetables for consumption or occasional sale. These food plots are separate from the coffee, are located some distance from the home, and are in many cases located on steep slopes with maize and beans intercropped. Beginning in the early 1980s, the farmers began to manage their personal food plots using chemical fertilizers, herbicides, and pesticides to produce higher yields with lower labor investments. These technologies have been supported, to the present day, by the national agricultural extension service (CENTA) and many non-governmental organizations, which has contributed to the widespread use of green revolution technologies in the Salvadoran countryside. Most farmers reported adopting the use of agrochemicals after seeing the rapid effects of herbicides and yield increases from fertilizers on neighbors' farms. Many of the farmers today believe they have no choice but to spray agrochemicals for their land to produce maize and beans, yet they have difficulty affording chemicals.

## Methods

A semi-structured survey lasting approximately two hours was conducted in Spanish with each of the 29 members of the cooperative. Surveys were conducted in the home of each cooperative member with the assistance of one or two young people from the community who were hired to help navigate and assist with either asking survey questions or recording responses. The eight-page survey instrument, based on livelihood surveys developed by Mendez (2004) contained detailed questions on household demographics, migration,

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<sup>1</sup>First level cooperative members are heads of household and their families. Second level cooperatives are comprised of two or more first level cooperatives, and usually have a commercialization and export function.

household infrastructure, farm management, and food security. Total gross annual household income was estimated by asking the profession and earnings of each household member, calculated based on hourly wage or daily wage, number of hours or days worked per week or 'quincena' (two week period), and number of months per year worked. Some individuals worked multiple jobs at different times of the year which was explicitly asked in the survey and included in earnings calculations. Household income included the wages of members who had migrated outside of the community for work but did not account for costs associated with migration such as transportation, rent, and food cost. Those farmers who worked as day laborers on the collectively owned coffee farm or on another farm reported this income by stating the number of days worked per month, number of months worked per year, and daily wage. Farmers did not report wages from working on their own farms and did not include any unpaid family labor on their farms. Gross income from coffee was included as a lump sum in the calculation for those farmers who owned individual plots and were paid once annually for the coffee sale, whereas farmers who owned part of the collective coffee farm earned their income throughout the year in exchange for work days. Income estimates did not include crop production costs and did not account for agricultural or household expenses. Any wages from labor were added with other income provided by the occasional sale of fruits and vegetables, chickens, or other goods.

Two focus groups on food security were also held with cooperative members. One focus group was conducted with the eight males that comprise the ACOES board of directors, and a second was held with 12 members of a women's group that has been established by families of the cooperative. The purpose of the men's focus group was to identify sources, coping strategies, and potential long-term solutions to seasonal food insecurity. The meeting with female community leaders focused on their perspective on food insecurity and what specific foods are typical in the household daily diet. Survey and focus group results were translated to English, coded based on common responses and themes, and relationships between the following variables were analyzed for statistical significance:<sup>2</sup> degree of food insecurity (number of months households experienced food shortages) and (1) migration, (2) income per person, (3) diversity of food crops, (4) percent of food purchased versus produced, and (5) ratio of working household members to non-working members. We also tested size of landholdings per person and whether households ran out of maize and beans, the effect of migration on household income and degree of food security, and ratio of working household members to non-working members and income. We considered 'working members' to be males and females over age 14 who reported having a job including work inside the home (i.e., those that contributed to household income and/or food security); 'non-working members' were young children and children in school.

## Results

### *Household and farm characteristics*

Household surveys showed that the average number of household members was 7, with a maximum of 16 and minimum of 1. Mean household age was 27 years. Nearly all male and female adults had less than a second grade education, and most female adults and some

<sup>2</sup>Statistical analyses were conducted in SAS version 9.1. Relationships between livelihood variables were analyzed using Pearson's correlation and t-test.

males were illiterate. The average grade level achieved for male cooperative members was between first and second grade (1.7 years of schooling), and for female household leaders the average was less than first grade (0.6 years). There was a wide range of education levels among children of cooperative members both within and between families; some had studied through ninth grade, others had never attended school, and many left school around fourth grade. The average education level achieved by children of cooperative members over six-years-old was fourth grade, with roughly a third of these children still studying.

All cooperative members had plots separate from the coffee farms to grow the staple food crops of maize and beans in rotation. These food plots were all managed conventionally, in contrast to the coffee farms which were managed organically. Twenty-four of the 29 farmers surveyed owned land for maize and bean farming, while the other five households rented a small parcel of land for this purpose. The mean size of land used by each farmer exclusively for food crops, including land both owned and rented, was 0.58 hectares. Thirty-four percent of farmers grew vegetables in addition to maize and beans in their food plots, most commonly tomato and peppers. Households also had access to a variety of fruits from the shade trees in coffee plantations and in homegardens bordering the house, including orange (*Citrus aurantium* and *Citrus sinensis*), banana (*Musa sapientum*), plantain (*Musa paradisiaca*), avocado (*Persea americana*), mango (*Mangifera indica*), pineapple (*Ananas comosus*), coconut (*Cocos nucifera*), lemon (*Citrus limetta*), guisquil (*Sechium edule*), and cashew (*Anacardium occidentale*).

### ***Income***

Mean gross income for households of the coffee cooperative was \$2037 (n = 29; min = \$1425; max = \$9680), or \$298 per capita based on the average of seven household members. El Salvador's annual mean income per capita was \$3547 for 2007 (Department of State 2010). A comparison of adjusted gross incomes for 10 cooperative members in the years 2001 and 2008 showed an average increase in annual income of \$109.32 over seven years. Adjusted annual income was \$983 and \$1263 for 2001 and 2008, respectively<sup>3</sup>. Three of the 10 members compared reported less income in 2008 than in 2001 (an average of \$45 less). It should be noted that household income varies from year to year, and our survey data only captured income reported for 2008. However we believe 2008 incomes to be fairly representative of annual household income based on the 15 years we have worked in the region. The most notable change in income for all cooperative members that year was due to increased revenue from direct coffee sales to a solidarity coffee importer under organic certification. Several survey questions focused specifically on how these factors had affected income and household livelihoods. Most producers responded that they were grateful for the small amount of extra income but felt that it had not made a significant impact. The extra income was used to repay informal loans, buy farming inputs, buy food, pay for children's school supplies, or make home improvements such as a new roof. Several producers responded that the additional income had allowed the cooperative to not borrow money to cover production and processing costs. One producer explained: 'The sale gave us a few extra cents but I can't say that we're

<sup>3</sup>2001 incomes were adjusted for inflation using the consumer price index (CPI). Income data from 2001 were reported by Mendez (2004).



on our way up. We still had debt to the coffee processing plant so the extra money went there’.

Ninety percent of households had multiple income sources other than the sale of coffee. Fourteen different income-generating activities aside from coffee sales were cited, with the most common being the sale of fruit and vegetables (21 percent), a household member working as a housekeeper outside of town (21 percent), sale of prepared foods (17 percent) and a household member working as a salesperson outside of town (17 percent). Selling maize and beans was not considered a significant source of income by any of the households in our study. The majority of households had one or two other income sources in addition to coffee, and several households had as many as five sources of income other than coffee. Cooperative households had between one and seven working members (all over the age of 14), with an average of three working members including women working inside the home. There was a significant correlation between the ratio of working to non-working household members and income per person<sup>4</sup>, as well as between total income and total number of working household members<sup>5</sup>, as would be expected. However, this did not translate to a significant correlation between the ratio of working to non-working members and the degree of food insecurity experienced by the household. Although the cooperative had access to loans for coffee production and processing, no households in the study reported having access to savings or formal credit. Fifty-five percent borrowed money from friends and family to buy a variety of items including food, fertilizer and pesticides, medicines, and books and uniforms for children in school.

### *Migration*

Sixty-two percent of households had at least one immediate family member who had migrated outside of Tacuba for work. The majority who had left the community were in their twenties and all were children of the head of household. In all but one household, migration had occurred in the last four years so this was a relatively new trend in the community. Destinations included the Salvadoran cities of Ahuachapan, Santa Ana, La Libertad, Usulután, and Zacatecoluca, and the capital city San Salvador. None had migrated outside of El Salvador presumably due to financial barriers. Children who had migrated from Tacuba worked as housekeepers, nannies, cooks, security guards, soldiers, farm hands, and salespeople. Thirty-one percent of ACOES households had one family member who had migrated, 28 percent had two migrating members, and one household had four family members who migrated from the community. The average number of migrating members in the population was one per household.

We found no correlation between migration and degree of food security (number of months of food insecurity experienced by the household). However, there was a significant relationship between migration and household income, where for each migrated member household income increased by an average of \$912.<sup>6</sup> This finding is consistent with Barham et al.’s study in Oaxaca, in which income from remittances is more important than what is earned through coffee (Barham et al. 2011). It should be noted that although family members working in cities earned much higher incomes than were available in

<sup>4</sup>Pearson  $r = 0.451$ ;  $p \leq 0.021$ .

<sup>5</sup>Pearson  $r = 0.385$ ,  $p \leq 0.048$ .

<sup>6</sup>Pearson  $r = 0.45$ ;  $p = 0.02$ .

Tacuba, these individuals spent part of their income on lodging, food, and transportation and did not contribute their entire income to the household.

### *Food security*

Throughout the surveys, food security clearly emerged as a major concern for households. Ninety-seven percent of households in the population reported being food insecure at some point in the year based on the question: 'Is there a period of the year when you have difficulty meeting the basic food needs of your family?' During the food security focus groups, men discussed the difficulty of managing maize and beans in the food plots due to the high cost of chemical inputs. The women's group highlighted concerns about daily diet and children not getting enough food at certain periods of the year. One female leader within the cooperative highlighted the importance of food security in her children's development: 'Bad nutrition is the root of many of our problems. When my kids go to school hungry, they can't study'.

Survey responses showed that household food security was pursued through a variety of strategies, including diversifying income and sourcing food from food plots, homegardens, and diverse coffee agroecosystems. Income was required to buy chemical inputs for food crops, and to purchase whatever food was needed that was not grown in the food plots. A small amount of income was generated from the occasional sale of surplus fruit and vegetables from the coffee farms and homegardens. Households that grew a greater diversity of food crops produced a larger percentage of household food but were equally likely to face food shortages. There was no significant difference in the degree of food insecurity between households that had a variety of vegetables in their food plots and those that had only maize and beans. In addition, the degree of household food insecurity was not correlated with income per-person.

Food plots provided on average half (54 percent) of all household food throughout the year. The other half was generated through food purchases, food from shade trees and homegardens, or borrowed food when income was unavailable. The purpose of food plots was to provide the two staple foods of the diet (maize and beans). Roughly one third of the farmers grew other vegetables in food plots, mainly tomato and green pepper destined for sales. Focus group discussions showed that because food plots were such an important source of food for the household, farmers were reluctant to experiment with new crops or to grow food crops without chemical inputs. In a focus group on food security, one farmer stated:

The most important thing is to maintain the maize and beans. One year we had a crisis with a plague on maize and could not produce. I said to myself: 'This is not an easy life, to live like this. I don't live in peace, I don't sleep in peace, or eat in peace'.

This indicates just how much these households were dependent on food generated in their plots to meet their needs. Despite reliance on food plots, households also spent an average of 42 percent of their income (\$860) on food. Rice was purchased by the greatest number of households (76 percent), followed by chicken and eggs (59 percent), sugar (52 percent), and beans (45 percent) (see Figure 1). Rice and sugar were not grown in the immediate region, and beans were purchased to supplement beans grown in food plots. Over half of the households bought chicken or eggs on occasion in spite of more than half of households owning chickens, and numerous families had ducks and/or rabbits for food. The main vegetables that households grew and purchased were onion, pepper, and tomato, as well as potato,

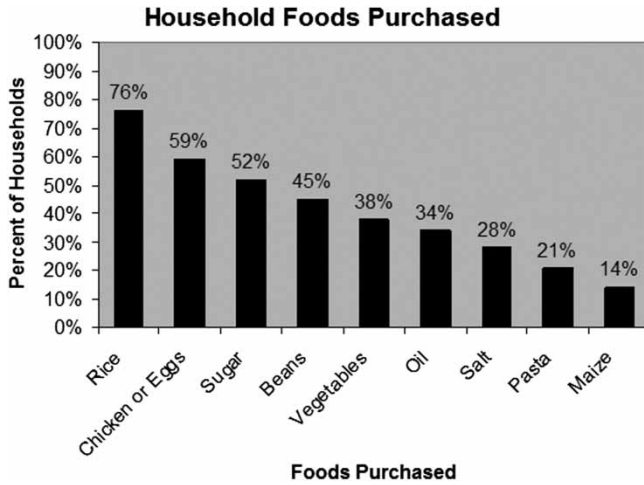


Figure 1. Types and percentages of food purchased by 29 coffee producing households in Tacuba, El Salvador.

guisquil, and cucumber. There was no significant difference in the number of months of food insecurity experienced by households that purchased the majority of their food (more than 50 percent) and those that produced the majority of their food.

*Causes of food insecurity*

Farmers whose families were food insecure (n = 28) were asked to list all of the reasons why they experienced food shortages (see Figure 2). Fifty percent of food insecure households

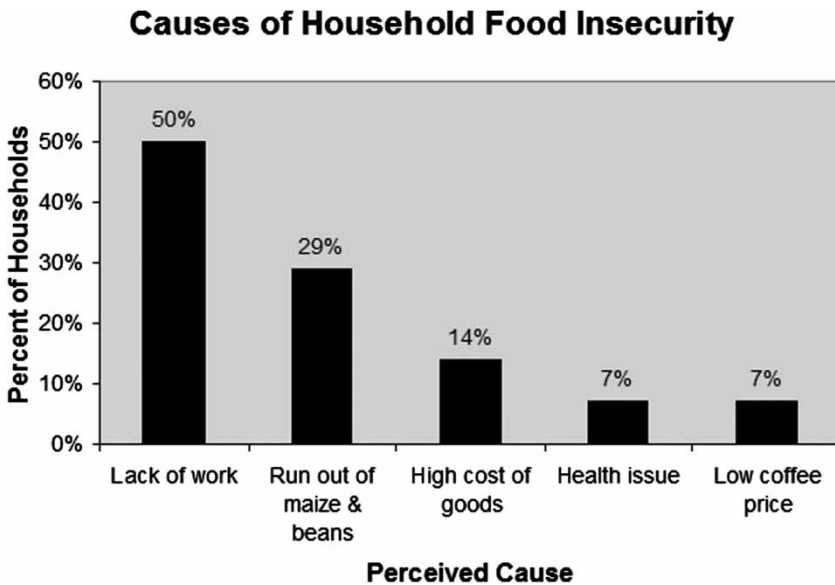


Figure 2. Perceived causes of seasonal food insecurity for 29 coffee producing households in Tacuba, El Salvador.

stated that one of the main reasons they experienced these periods is that there was no work in the community and therefore no income. Another cause of food shortages was that families ran out of stored food from their food plots and homegardens and didn't have money to purchase food. Farmers of the cooperative have just one planting of maize and beans during the rainy season starting in May and one annual food crop harvest in October. They dry the maize and beans and store them in bins or sacks inside the home. Some producers sold a portion of their maize and beans at harvest time when their income was low, and many then had to purchase these grains several months later when their stored supply was depleted. Twenty-nine percent of households in the sample stated that the reason for periods of hunger is that the family used up their supply of dried corn and beans for the year. Households with access to more land per person were equally likely to run out of maize and beans as those with smaller landholdings. Fourteen percent of households cited the high cost of basic goods as contributing to their food shortages, seven percent of families were vulnerable due to a health problem in the family, and another seven percent cited the low price of coffee as a threat to food security. One household mentioned the responsibility of the government in their food security problems, and one household cited bad weather for crops as a threat to food security. In the focus group with farmers, many people identified the high cost of farm inputs (fertilizer and pesticides) as a reason for not producing enough maize and beans. Farmers expressed a sense of dependence on these inputs to maintain maize and bean yields, and indicated that they generally could not afford to apply them at the rates recommended by the National Center for Agricultural, Livestock and Forestry Technology (CENTA).

### *Responses to food shortages*

The 28 households who faced food shortages responded to these periods in a variety of ways, and many households combined several strategies to respond to periods of hunger. Households coped with periods of hunger by borrowing money from family or friends, eating less, changing their diet, borrowing food, selling chickens, seeking other work, and using any money saved from the coffee sale or other income sources (Figure 3). Twenty-nine percent of households borrowed money from relatives and friends in order to buy food. Households also borrowed food (25 percent), ate less (25 percent), and ate different foods based on what was available and cheapest (25 percent). Focus groups revealed that households also decided to take one or more children out of school when the family faced difficulty meeting food needs. Some parents also forwent one or more meals per day in order to provide enough food for their children.

### *Seasonality of food insecurity*

Farmers were asked to list all the months when their families faced food shortages. Some households responded that they were food insecure throughout the whole year, while most cited a particular month or season as the worst time of the year. Although the timing of hunger varied between households, some patterns in the seasonality of food insecurity emerged. One trend was that the two peak periods of food insecurity, June–September and December–February, coincided with the coffee harvest and the application of chemicals to the food plots (Figure 4). The months between June and September, the rainy season in El Salvador, were the worst for food insecurity for two main reasons: households had run out of stored maize and beans from the previous year's harvest in October/November, and the high cost of agrochemicals to maintain food crops. This is the season when

### Household Responses to Food Insecurity

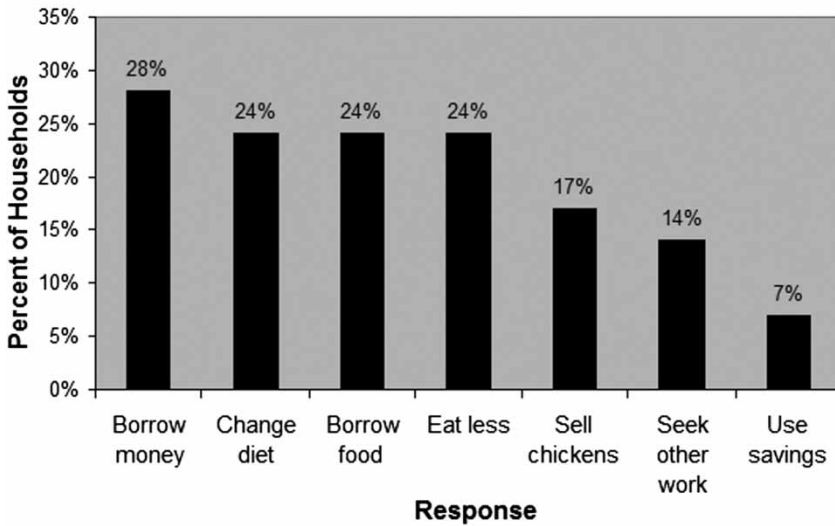


Figure 3. Responses to periods of food insecurity by 29 coffee producing households in Tacuba, El Salvador.

farmers plant and actively manage their food crops using fertilizer, herbicides, and pesticides. Therefore some who cited these months as the worst for food security said it was due to the economic investment required at that time.

The other peak period of food insecurity, beginning in December and lasting through February, can be explained by the fact that these months coincide with the coffee

### Seasonal Food Insecurity

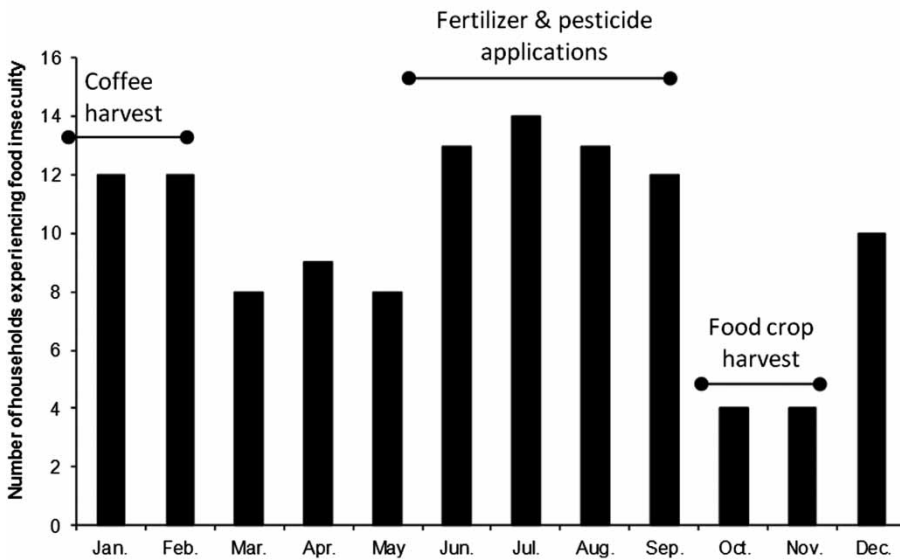


Figure 4. Months of food insecurity reported by 29 coffee producing households in Tacuba, El Salvador.

harvest. Although this period immediately follows the food crop harvest when staple foods of maize and beans are abundant, 43 percent of households in the cooperative were food insecure in January and February. Of the seven households that reported experiencing food insecurity during this period, five cited the lack of paid work as the cause. Households of the cooperatively owned coffee farm were equally likely to be food insecure at this time due to lack of paid work as households who owned their own smaller coffee parcel. Although members of the collective farm were paid based on the number of hours worked, they were not compensated until after payment was received for the January coffee harvest. What this finding indicates is that although households had staple foods during this period, they did not have income with which to buy other foods such as rice, chicken, eggs, sugar, vegetables, and cooking oil. Although this does not necessarily represent a state of hunger or food shortage, it meets the definition of 'food insecurity' based on both household perceptions and the standards outlined by the FAO (see p.4). The seven households that grew a variety of vegetables in their food plots (tomatoes, peppers, cabbage), in addition to their staple crops, did not report being food insecure during January and February. October and November, which coincided with maize and bean harvests, were the most food secure months among cooperative members. Many families experienced several months of food security in March, April, and May because money became available from the coffee harvest at that time.

### ***Farming practices***

Beginning in the early 1980s, the farmers in this study began to manage their personal food plots using chemical fertilizers, herbicides, and pesticides to obtain higher yields with lower labor requirements. However, focus group discussions revealed that one factor limiting farmers from producing more maize and beans was the high cost of these inputs, because farmers were rarely able to afford the quantities of inputs that they felt necessary for optimal production. The cost of seeds was not a major issue in the cooperative since most farmers saved seeds and/or shared seeds with each other. All participants in the men's focus group agreed that they could not grow food crops organically for the following reasons: (1) the difficulty of applying bulky organic compost to steep and remote corn/bean fields; (2) the difficulty of producing and storing enough organic compost for both the coffee farm and individual food plots; (3) the high cost to buy organic fertilizer; (4) the risk of low yields; and (5) pest and disease problems. Farmers claimed to have tried growing food crops organically with very little success. Several farmers who had attempted to grow food crops without any inputs, conventional or organic, said their crops did not grow. One farmer explained the ongoing difficulty of meeting food needs by saying that the high altitude and other environmental conditions of their communities were conducive to coffee growing but not good for grains such as maize and beans.

### **Discussion**

Although a great deal of research has been dedicated to the contribution of coffee farms to rural livelihoods (Mendez et al. 2004, Milford 2004, Bacon 2005, Eakin et al. 2006, Petchers and Harris 2008), this study instead focused on the role of food plots in sustaining livelihoods and food security for small-scale diversified coffee farmers. Results of our research showed that 97 percent of households in the study felt food insecure at some period of the year. This result is high compared to a similar study with coffee farmers in Nicaragua, where 69 percent of households experienced food insecurity at some point in the year

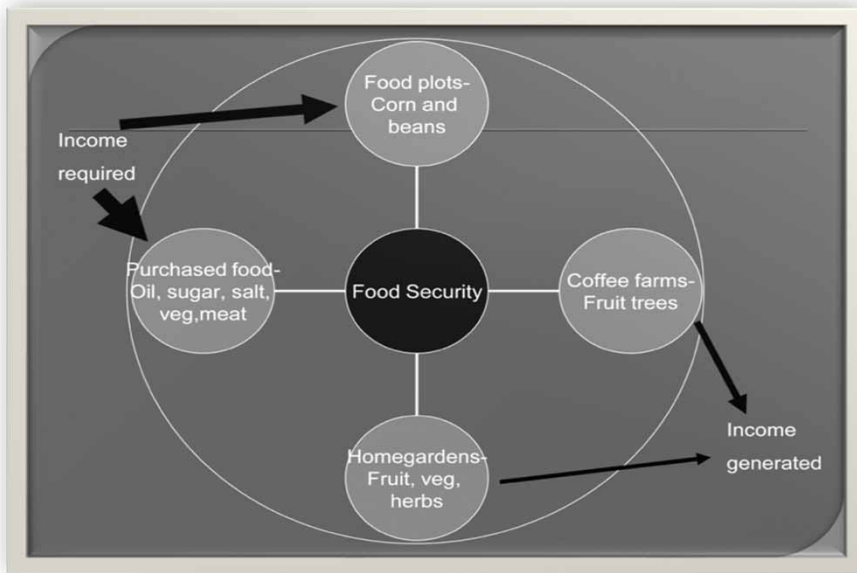


Figure 5. Food security portfolio of coffee cooperative households in Tacuba, El Salvador. The thickness of the arrows indicates that in most households, more income was required for food than is generated from food sale.

(Bacon et al. 2008b) and a similar population in Honduras where 36 percent of households were seasonally food insecure (Shriar 2007). This difference may be explained by the fact that Nicaraguan farmers in the Bacon et al. study and Honduran farmers in Shriar's study had two annual harvests of food crops versus the single harvest in El Salvador.

Our survey and focus group data showed that food security for households of the cooperative was managed as a diversified portfolio to minimize food-related vulnerability. Household food security was pursued through both food access and availability and income access and availability (Figure 5). Income was required to buy chemical inputs for food crops, and to purchase whatever food was needed that was not grown in the food plots, while a small amount of income was generated from the occasional sale of surplus fruit and vegetables from the coffee farms and homegardens. Families obtained food staples from food plots and also from homegardens, fruit trees in coffee farms, and at the market. This diversification of food sources to minimize vulnerability mirrors the type of diversification discussed within the sustainable livelihoods literature (Carney 1998, Ellis 1998, Westphal 2008). Similar to the livelihood behaviors observed by Scoones (1998), the farmers in our study aimed to achieve stability and resilience by relying on a variety of different income sources and by maintaining food plots, homegardens, and coffee plots for food and income. Research on Guatemalan peasant farmers showed the cultural importance of growing maize and other staple crops even when it was economically unprofitable. Isakson found that peasant farmers grew cash crops in order to complement their livelihood activities but not to replace the important act of household food provisioning (Isakson 2009). Our research supports this finding that farmers deliberately maintain a diversity of crops – in particular a balance of cash crops and subsistence agriculture – in order to maintain some level of control over their food source in the face of unstable agricultural markets.

Food plots provided roughly half of household food throughout the year, while the other half was a combination of purchased food, food from shade trees and homegardens, and borrowed food when income was unavailable. This result is similar to a study of small-scale farmers (one hectare or less) in Uttarakhand, India where farm output provided an average of half of household food (Rais et al. 2009). Our findings showed higher levels of food production compared to a recent study in Mesoamerica, which found that, on average, coffee households produced 39 percent of total food consumed in a sample 469 households in El Salvador, Nicaragua, Guatemala and Mexico (Mendez et al. 2010a). Our results on food production were lower than those reported by Bacon et al. (2008b) in Nicaragua, where the majority of 177 smallholder coffee households reported producing between half and three-quarters of their food. Together, these studies suggest that smallholder coffee farmers in Mesoamerica may be producing between 40 and 74 percent of food consumed by the household. Households in the ACOES cooperative spent an average of 42 percent of their income on food, which is lower than the worldwide average for poor people who spend 60 percent of their income on food (FAO 2009). This is likely because the households in our study had relatively secure land access, which is not the case for much of the world's poor.

The main patterns in the data on seasonality of hunger demonstrate that households were most food secure during the months of food crop harvest, while the months of greatest food insecurity coincided with the coffee harvest and chemical applications to food plots. Few households experienced hunger in October and November because (1) they had abundant food immediately following the food crop harvest, and (2) some households received income at that time from selling a small amount of maize and/or beans at harvest time. During the period from June to September, when food plots were being actively managed, farmers faced two major challenges that resulted in the greatest number of households experiencing hunger. First, many households had run out of stored staple food. It was at this time of the year that staple foods were most expensive because they were in highest demand. This practice of selling staple foods at harvest time and then buying the same food later at a higher price has been documented in poor rural communities in Honduras as well (Nygren and Myatt-Hirvonen 2009). Although this could potentially contribute to food security through a small amount of income, it also has the disadvantage of reducing the amount of staple foods available to the household later in the year. This reinforces our findings that two key interrelated challenges to attain food security are that households produce insufficient food to provide for both household consumption and income generation, and that total household income remains insufficient and poorly distributed throughout the year. The second major challenge experienced from June to September was that farmers managed their food crops with at least one application of herbicide to prepare for planting, several applications of chemical fertilizer, and a variety of pesticides, all of which were costly and required a significant investment during this period.

Half of the households that experienced food insecurity from December through February cited the lack of work as a major cause of food insecurity. Although the coffee harvest occurred at this time and required many days of work by farmers and family members, farmers were generally not paid during the coffee harvest. Members who owned individual parcels of coffee were not paid for their labor, and members of the collective coffee farm were not paid until after the harvest when the cooperative received payment for the coffee shipment. This period of food insecurity ended for many households between February and March, most likely because money from the coffee sale had been received at that point.

The finding that January and February were food insecure months for many households is surprising, given that this period follows the food crop harvest. One would expect that



households would be food secure because they have access to maize and beans from the October/November harvest. However, our research shows that access to maize and beans alone does not constitute food security for many households because they lack income with which to buy additional foods including rice, chicken, eggs, vegetables, sugar, and cooking oil.

This finding has several important implications. First, discussions of household food security need to take into account food appropriateness and preference. Our study was designed specifically to capture household perceptions about food security rather than relying on caloric counts to determine if households were food secure. This includes a more nuanced approach to food security, which goes beyond food availability and access to account for food preference and appropriateness as well, as per the FAO definition. According to some households in our study, food security meant having access to sufficient food of their choosing including a variety of foods beyond just maize and beans; this is illustrative of the distinction between food insecurity and hunger.<sup>7</sup> Second, households rely on both food and income in an attempt to meet a diet that includes both staple foods and supplemental foods. Therefore, supporting efforts to increase staple food yields while also increasing income, and spreading income and food more evenly throughout the year, are necessary for households to achieve true food security.

The variation in responses on the seasonality, causes, and coping behaviors in our study reflected the huge variation in circumstances from household to household in terms of income, number of working and non-working family members, migration, size of food plots, crop diversity, and management practices. This underscores the importance of analyzing food security at the household level and taking into account the complexity of livelihoods in assessing the food security of a population as food security theory and policy have done in recent years (Maxwell 1996, Rose 2008, Barrett 2010). Our analysis showed no significant relationships between the degree of food insecurity (number of months in which a household had difficulty meeting its basic food needs) and land size per person, crop diversity, income per person, ratio of working to non-working members or migration. Many of the assets that contribute to food security, including access to income, land, labor, small livestock, and support networks overlap and affect both household livelihoods and food security, making it difficult to isolate the factors that drive household food insecurity (Figure 6). Therefore it is important to analyze household food security using a combination of qualitative and quantitative livelihood data to reveal the complexity of the causes and coping strategies of food insecurity in coffee farming households.

Results on the perceived causes of and responses to hunger varied greatly for different households. Half of households attributed periods of hunger to lack of work, as there were few paying jobs in the area. Lack of employment opportunities is a challenge faced by rural people throughout the world, and in many cases is caused or exacerbated by a lack of government support for rural development. As agriculture is losing importance in the Salvadoran economy (Cuellar et al. 2002, UNDP 2010), there are few other opportunities for work in the rural region of Tacuba. Our data showed that lack of employment was the main reason for migration.

Roughly one-quarter of households in our study (29 percent) did not have enough staple foods to last them through the year, presumably due to lack of land, low productivity, or a

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<sup>7</sup>The status of being food insecure, and people's perceptions of food security, are subjective matters that can vary based on cultural expectations, food quality, food sovereignty, and nutritional adequacy. For a detailed discussion, see Maxwell (1996).

## Livelihoods and Food Security

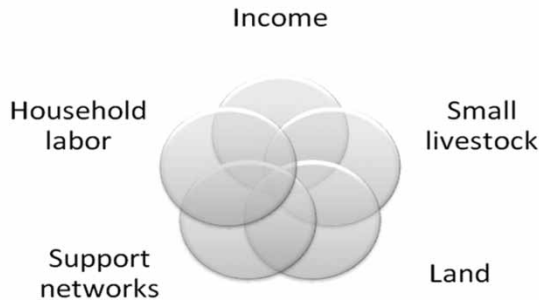


Figure 6. Key assets, including access to income, labor, land, small livestock, and support networks, overlap in their influence on both household livelihoods and food security.

combination of the two. Several important factors underlie farmers' inability to produce enough food, including land subdivision and soil degradation. With each generation land is split among a household's members, often into parcels too small to feed a large family. Most cooperative members received small plots of land during El Salvador's agrarian reform in the 1980s, which have since been subdivided several times resulting in very small individual plots. Another limiting factor on farms is poor soil quality from decades of continuous cropping with minimal soil building. Farmers have relied on synthetic fertilizers for crop nutrients rather than soil organic matter since the 1980s, resulting in severely depleted soils – 'tierra cansada', or tired earth – as many farmers observed.

Other survey responses as to the causes of food insecurity, including the rising cost of food, family illness, and unpredictable weather, all underscore the fact that, despite diversification, the livelihoods of these farming families were unstable and vulnerable to stresses and shocks. In addition to the proximate causes of household food insecurity reported in our survey, an examination of the root causes of food insecurity reveals that the prevalence of resource inequality in El Salvador, as in many parts of Latin America, is one fundamental challenge to poverty reduction and food security (UNDP 2010). In addition, in recent years the Salvadoran government has redirected resources away from rural agriculture in favor of urban development and the growth of factories (Hecht and Saatchi 2007). Such phenomena have undermined food security in rural areas, causing many farmers to abandon agriculture in search of more profitable and stable endeavors often in urban areas (Hecht 2004).

A significant relationship found in this analysis is that households with members who had migrated to a nearby city or the capital city had higher incomes. However in spite of higher incomes, households with migrated members did not experience fewer months of food insecurity. This finding indicates that either household income would need to increase even more in order to ensure food security, or that increasing household income through migration is not necessarily an effective strategy for ensuring food security. This may be because migration diverts labor away from agriculture, leaving fewer adults of the household available for farm labor. An additional factor is that migrated members do not contribute all their earnings back to the household and instead use much of their income for living expenses. Because our income calculations include total earned by migrated members, this is an overestimation of the amount actually contributed to the household by migrated members. Nevertheless, migration is an important consideration in understanding household food security. Continued migration from rural agricultural communities has the

potential to significantly influence community economics and culture, as well as local environments and the dynamics of food security (Keleman et al. 2009).

Many farmers in El Salvador have already abandoned agriculture in search of more profitable endeavors to provide remittances to families, which has contributed to food insecurity at the national scale as agricultural prices rise (Hecht 1996). Our results show, however, that all household members who had migrated from the community had done so in the past five years, indicating that migration is a relatively recent phenomenon within the cooperative. This could be attributed to the fact that these farmers produce a relatively high value cash crop, in addition to subsistence farming. Although coffee production in El Salvador is slowly declining, coffee continues to have a high production value and to receive more support from the government and aid organizations than many other agricultural products (Cuellar et al. 2002).

The main household responses to food insecurity in the cooperative were consistent with World Food Programme data indicating that during periods of hunger, poor households respond by changing diet, eating less, borrowing money, migrating, and taking children out of school (WFP 2009). Comparing the coping strategies discussed by Maxwell et al. (2008) in the food security literature with our data shows that food insecure people exhibit similar behaviors across different contexts. The top five coping strategies among different populations in their study throughout Africa were to limit meal size, reduce the number of meals, borrow food, eat less-preferred foods, and for adults to eat less so children can eat. Our data in El Salvador showed similar hunger responses. Many households in our study responded to difficult periods in more than one way, evidently to minimize their vulnerability in as many ways as possible.

We found no significant correlation between income per person and the number of months of food insecurity experienced by households. This is not surprising given that even the household with the highest annual income in this cooperative was relatively poor, with \$1613 per person<sup>8</sup>, compared to El Salvador's national average income of \$3547 per capita (Department of State 2010). Average household income did not dramatically increase between 2001 and 2008 for the 10 cooperative members who were included in the earlier study (Mendez 2004). Organic certification and the direct coffee sale in 2007–2008 did not have a major impact on income, and the slight increase has not been enough to ensure food security. Most cooperative members were grateful for the small amount of extra income earned through these alternative coffee markets, but did not feel it had made a major difference in their lives. Although the cooperative received an estimated additional US \$0.50 per pound of certified organic coffee, this still only represents a small increase in total income because they produce small volumes of coffee. Our findings are consistent with other research showing that the market alone, even through alternative coffee certifications, is not enough to ensure a sustainable livelihood and food security (Bacon et al. 2008a, Bacon 2010, Mendez et al. 2010a). This raises the question of how coffee farmers, progressive coffee buyers, researchers, and NGOs can better work towards the shared goal of food security for coffee farming households. As the two most commonly cited reasons for food shortages were lack of employment and insufficient supply of staple foods, it is clear that coffee-farming households depend on both income and subsistence production for food security. Furthermore, the high cost of food and farm inputs along with the seasonal nature of farm income makes households even more vulnerable to food

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<sup>8</sup>Even this income was significantly higher than other cooperative households. The second highest household income per person was \$527.

insecurity. Efforts aimed at improving food security for coffee producers should therefore support diversified livelihood and food security strategies that will sustain families through periods of stress, rather than focusing exclusively on coffee production.

## Conclusion

Our analysis presents a case study documenting 'los meses flacos' a common phenomenon experienced by many small-scale coffee farmers. Although coffee farmers see these 'thin months' as an unavoidable reality and many within the coffee industry are aware of the situation, few studies have examined seasonal food insecurity among coffee producers. Our research reveals the complexity of food security for small-scale coffee farmers, showing that even within one small producer cooperative there are numerous causes of food insecurity and coping strategies. This suggests that there is no single prescriptive solution to improve food security among coffee growers. We conclude that market-based mechanisms, including alternative coffee certifications like organic and Fair Trade, can contribute to improving environmental and social conditions, but they are not sufficient to solve the problem of food insecurity for small-scale coffee producers. Solutions that seek to improve rural livelihoods and ensure household food security by increasing incomes only address one aspect of the diverse household food security portfolio. Other issues, such as deeper structural challenges, need to be taken into consideration in order to find more permanent solutions to this problem.

The introduction of new and stable income-generating activities could help address the current problem of lack of work in the community. This could include agroecotourism focused on coffee farming, artisanal activities, or projects to add value and market agricultural crops as jams, dried fruits, or prepared sauces. Access to credit (Shriar 2007) and education (Toledo and Burlingame 2006) could help households diversify income-generating opportunities, especially given the currently low education levels in many coffee-farming communities. There is also need for the strengthening of support networks through cooperatives and farmer-to-farmer exchanges, so that farmers are better able to access markets, information, and credit. For the 29 percent of households who did not produce enough staple foods to last them through the year, increased subsistence production could be a partial solution as well. There are multiple factors preventing farmers from growing enough staple foods for the year, including insufficient and marginal land, the need to divide their labor between coffee and food crops, and the high cost of fertilizer and pesticides farmers have come to depend on to grow their maize and beans. Helping poor rural farmers decrease their dependence on costly chemical inputs could lower vulnerability to price increases and limit the food insecurity they currently face during months of fertilizer and herbicide applications (Mausloff and Farber 1995, Bunch 1999). Risk-averse farmers are often unwilling to experiment with different management practices, so they may need to see the results of trials before adopting new techniques. Two ways to address this would be for extension agents to create demonstration plots showing techniques that reduce the need for chemical inputs, and for farmers from neighboring communities to participate in exchanges in which they share information and experiences about agroecological management in the local context.

Future research on this issue should address the barriers to agroecological food plot management which has been shown to improve yields in hillside agriculture while keeping external inputs, and thus costs, low (Bunch 2002). Food policy and food utilization (as defined by Barrett 2010) are important issues related to food security, but an analysis of these factors was beyond the scope of this study. Specifically, there is a need to address the

effects of national food policies on subsistence food price regulation (i.e., access), the nutritional quality of existing diets, and the distribution of food within households as related to gender and age.

Work aimed at improving livelihoods and conservation for small-scale coffee farmers should address the important role of household food production in reaching the goal of food security. While many coffee farmers struggle to produce enough food to feed the household, the strategies used among this cooperative indicate that many farming households intentionally manage a variety of crops, both for sale and consumption, and a variety of income-generating activities in order to balance their assets and manage risk. Any intervention with the goal of improving the economic and social conditions of coffee farmers should support farmers in their efforts to develop a strong, diversified portfolio of livelihood activities and food sources.

Deeper structural changes are also necessary to help peasant farmers emerge from the cycle of poverty and food insecurity. The Salvadoran government has reduced investment in agriculture (such as extension and plant breeding activities) over the past 20 years (Cuellar et al. 2002), which has contributed to the erosion of the livelihoods of small-scale farmers. A re-investment in agriculture through support for agroecological food crop management could help promote a greater level of food self-sufficiency by minimizing the need for agrochemicals and increasing yields through crop diversification and soil building. Government programs offering farmers the opportunity to access affordable land and providing incentives for restoring degraded farmlands through sustainable farming practices would also allow farmers to increase food production. In addition, supporting food security of small-scale farmers requires more institutional support for infrastructure development in rural areas, including road paving, electricity, water access and waste management, as well as access to low-interest credit and capacity building such as literacy programs and cooperative strengthening. Such policy-level interventions addressing structural issues must be better integrated with on-the-ground strategies that focus on increasing income, food production, and value added at the farm level.

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