

COFFEE RUST (*Hemileia vastatrix*) EFFECTS ON THE FOOD SECURITY AND  
LIVELIHOODS OF SMALLHOLDER COFFEE FARMERS IN GUATEMALA'S  
BOCA COSTA REGION

A Dissertation

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## ABSTRACT

The purpose of this study was to develop a framework to understand how coping mechanisms and livelihood diversification strategies were used to mitigate the coffee leaf rust's (CLR) effects on the food security and livelihoods of Guatemalan smallholder coffee farmers. This research used a qualitative instrumental case study methodology to develop a grounded theory based on the rich description and analysis of how one Guatemalan smallholder coffee cooperative was affected by the 2012-2013 CLR epidemic.

The cooperative members perceived the CLR epidemic as one crisis of many they faced in their lives. The CLR epidemic brought significant changes to the members' livelihoods strategy and increased food insecurity. Members reported production declines of 50 to 90 percent. Members chose to forgo organic production, borrow money, seek off-farm employment, diversify into food crops, and make major investments into renewing coffee fields infected with the CLR. The cooperative members reported ameliorating the effects of food insecurity by eating less food, skipping meals, eating less desirable foods, generating income from off-farm employment to purchase food, and borrowing money to purchase food.

Despite continual crises, and the threat of another CLR outbreak, the cooperative remained committed to producing high quality Arabica coffee. Members perceived using non-productive land to grow food crops as beneficial to improve food security. Diversifying coffee fields to produce other cash crops was not perceived as an

advantageous strategy to strengthen food security or livelihoods. Despite a history of assistance from external organizations before, during, and after, the CLR epidemic, members' livelihoods remained vulnerable. In light of the damaging effects that the CLR had on incomes, livelihoods, and food security, the cooperative's main objective remained exporting high quality Arabica coffee.

The smallholder coffee producer vulnerability framework was developed during the course of the research. The framework is intended to be used to understand coping mechanisms and analyze changing livelihood strategies resulting from coffee production disruptions. It is recommended that future research further explore perceptions of crop diversification, coffee production, and the CLR.

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## CHAPTER I

### INTRODUCTION

Coffee (*Coffea arabica*; *Coffea canephora*) is one of Guatemala's most important export commodities and supports the livelihoods up to 30% of the country's rural workforce (Lyon, 2011). Out of Guatemala's 22 administrative departments, 19 produce coffee; 80% of Guatemala's coffee is produced on small to medium sized farms (Tay, 2010). Coffee rust (*Hemileia vastatrix*) is a leaf-based fungus that can decrease coffee yields by up to 90% (Arneson, 2000). Coffee leaf rust (CLR) first entered Latin America from Asia in the 1970s. The most recent outbreak, detected in 2012, has cost Guatemalan producers hundreds of millions of dollars and affected the livelihoods of hundreds of thousands of coffee farmers and laborers (Dardon, 2013; Sanchez, Rizzo, & Ortiz, 2013; World Coffee Research, 2013).

World coffee prices steadily decreased throughout the 1990s. Prices experienced an exceptionally steep decline from 1999 to 2002; this period came to be known as the "global coffee crisis" (Gresser & Tickell, 2002; International Coffee Organization, 2014; Jha et al., 2011, p. 162). During the global coffee crisis, employment in Guatemala's coffee sector decreased by 41%, while across Central America 400,000 temporary and 200,000 full time coffee laborers lost their jobs (Gresser & Tickell, 2002). There were widespread reports of malnutrition and hunger in coffee producing areas, unauthorized migration to North America increased, primary school attendance rates dropped, and the World Food Programme declared a food security emergency in El Salvador (Bacon, 2010; Eakin, Tucker, & Castellanos, 2006).

Some worry Guatemala is on the verge of experiencing another coffee crisis brought on by the CLR epidemic (Kahn, 2014). Whereas coffee production in Guatemala used to largely take place on large estates or *fincas*, Guatemalan smallholder farmers now lead coffee production in the western highlands (Fischer & Victor, 2014). Coffee prices stabilized in the mid-2000s and Guatemalan smallholder coffee farms sprang up to meet the demand for lower yielding, but higher quality Arabica beans, that can only be grown in higher altitudes. Farmers usually grow these high altitude beans on small plots of land.

While there is a lack of knowledge about how food insecurity interacts with coffee production, several recent studies have shown that food insecurity in Central American coffee-growing communities remains a serious problem (Caswell, Mendez, & Bacon, 2012; FEWS NET, 2014; Mendez, Bacon, Olson, Morris, & Shattuck, 2010). In one survey of almost 500 smallholder coffee farmers in four Central American countries, 63% of respondents reported being food insecure during at least one part of the year (Mendez, Bacon, Olson, Morris, & Shattuck, 2010). Fujisaka (2007) found 67% of coffee producing households surveyed in Mexico, Guatemala, and Nicaragua were food insecure at least three months each year. Bacon et al. (2014) found smallholder Nicaraguan coffee producing households experienced on average 3.15 months of food insecurity per year.

CLR (*Hemileia vastatrix*) is a fungus that affects the health and production capability of coffee (*C. Arabica* is affected much more than *C. canephora*). Infection sites first appear as yellow spots on the underside of a plant's leaves. These spots

increase in diameter and turn a darker yellow or orange-red as the spots begin to produce spores (Arneson, 2000). CLR causes defoliation, which reduces yields on average 30% if left unmanaged, however losses on individual farms can reach 100% (Arneson, 2000; Cristancho, Rozo, Escobar, Rivillas, & Gaitán, 2012; Ferreira & Boley, 1991; Monaco, 1977). As of 2013, 70% of Guatemala's coffee farms were infected by CLR (ACAN-EFE, 2013). Applying copper-based fungicide has traditionally been the principal method for controlling the spread of CLR, however fungicides are costly and must be applied within specific weather conditions to be effective (do Céu Silva et al., 2006).

CLR has been present in Guatemala since 1984, however the prevalence of the recent outbreak has raised alarm within scientific and policy communities (Schieber & Zentmyer, 1984). The Guatemalan government declared a state of emergency to stem the financial losses incurred from the CLR outbreak in February 2013. The national association for the Guatemalan coffee industry (ANACAFE) and international governmental and non-governmental aid agencies pledged financial and technical support during an emergency summit meeting in April 2013 (World Coffee Research, 2013). Much like the global coffee crisis of 1999-2001, anecdotal reports have indicated that coffee production disruptions from CLR led to increased poverty, food insecurity, and migration of Guatemalan coffee farmers, laborers, and their families (Agren, 2014; Castillo & Aleman, 2014; Malkin, 2014; Tran, 2013). However, no peer-reviewed studies have been published verifying these reports.

## **Statement of Problem**

While most acknowledge that food insecurity exists in Central American coffee producing regions, little is known about how this food insecurity affects coffee production modalities (Bacon, Mendez, Gliessman, Goodman, & Fox, 2008; Jaffee, 2007; Morris, Mendez, & Olson, 2013). Coffee production remains an important livelihood activity for millions of Guatemalans. The Guatemalan government and international aid agencies made a renewed commitment to reduce Guatemala's high rate of food insecurity (Feed the Future, 2011; Secretaría de Seguridad Alimentaria y Nutricional, 2013). While the phytopathological effects of coffee rust is well known, little is known about how the CLR epidemic affects the food security and livelihoods of coffee farmers, laborers, and members of their households.

## **Purpose of the Study**

The purpose of this study was to develop a theory about how the CLR affects the food security and livelihoods of members from one Guatemalan coffee cooperative.

## **Research Objectives**

1. Describe the effects of the CLR epidemic on the cooperative members' food security.
2. Describe the effects of the CLR epidemic on the cooperative's livelihoods (e.g. employment, social networks, health, and education).
3. Describe and analyze coping mechanisms that the cooperative members employ to preserve their livelihoods from the CLR's effects on coffee production.

4. Develop a grounded theory to explain how the food security and livelihoods of the cooperative are affected by the CLR epidemic.
5. Develop a smallholder coffee producer vulnerability framework that could be used to forecast how the food security and livelihoods of smallholder coffee producers may be affected by future production disruptions.

### Theoretical Framework

This research examined the food security, livelihoods, and coping mechanisms (Figure 1) of one Guatemalan coffee cooperative.

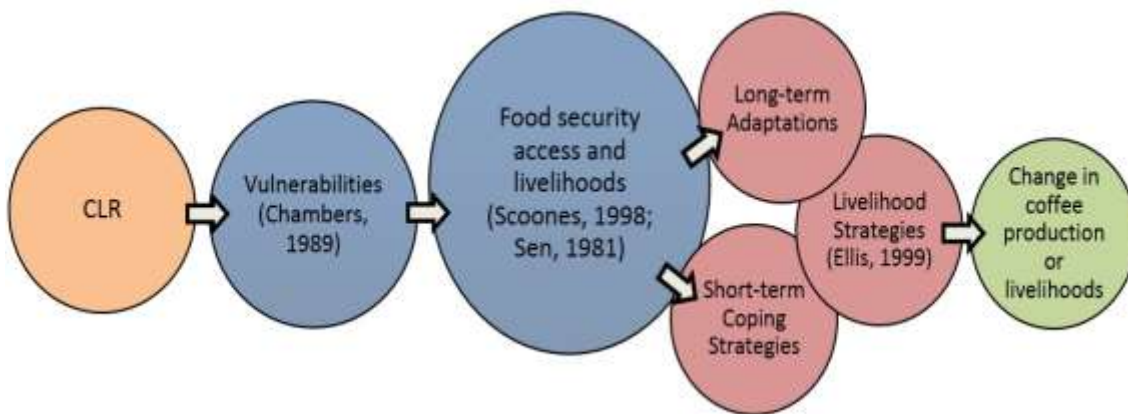


Figure 1. Theoretical framework.

Most scholars agree on the basic elements of the FAO’s 1996 World Food Summit food security definition, which stated 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 life.” (Barrett,



2010; Caswell, Mendez, & Bacon, 2012; FAO, 1996, para 12; Maxwell et al., 1999; Morris, Mendez, & Olson, 2013; Pinstrup-Andersen, 2009). This study focused on the element of economic access that coffee laborers, smallholder producers, and members of their family have to acquire food. Sen's (1981) theory of food entitlement decline (FED) was used to frame food security access. Sen's (1981) theory of FED stated that food insecurity is not caused by food unavailability, but instead by the inability to economically access food by the production, purchase, trade, or the transfer of resources.

Scoones' (1998) diverse livelihoods framework, consisting of human capital (e.g. health, education), physical capital (e.g. farm inputs, equipment), social capital (e.g. cooperatives, social networks), financial capital (e.g. credit, savings), and natural capital (e.g. forests, water) was used to frame this research. It was hypothesized that CLR would increase the food security-related vulnerabilities of coffee laborers and smallholder producers. As a response, coffee laborers and smallholder farmers would react with long-term adaptations and short-term coping mechanisms to preserve their livelihoods. These adaptations and coping mechanisms would lead to evidence of change in the nature of coffee production or livelihood activities. A livelihoods analysis takes into account all assets, resources, and most importantly, the capabilities people have to overcome food security-related vulnerabilities (Bebbington, 1999; Scoones, 1998). Integrating a food security-related vulnerability framework provides a prescriptive method of analyzing food security's causes and reduction methods (Lovendal & Knowles, 2006). Chambers (1989) defined food security-related vulnerability as consisting of external risks, shocks, and stresses, and internally, the difficulty in coping

with the risks, shocks, and stresses (Dilley & Boudreau, 2001; Frankenberger, 1992; Watts & Bohle, 1993).

### **Conceptual Framework**

Prior studies of vulnerable Central American households involved in coffee production revealed that households responded to food insecurity by developing short-term coping mechanisms and long-term adaptations (Bacon et al., 2014; Eakin, Tucker, & Castellanos, 2006; Fischer & Victor, 2014; Morris, Mendez, & Olson, 2013; Tucker, Eakin, & Castellanos, 2010). Furthermore, smallholder coffee farmers in Central America responded to agricultural challenges such as climate change, market fluctuations, and disease/pests by shifting production toward lower risk subsistence food crops and other livelihood activities (Baca, Läderach, Haggard, Götz, & Ovalle, 2014; Bacon et al., 2014; Eakin, Tucker, & Castellanos, 2006; Fischer & Victor, 2014; Tucker, Eakin, & Castellanos, 2010). It was hypothesized that coffee laborers and smallholder producers would respond to the CLR epidemic in similar ways than they do when experiencing food insecurity and agricultural challenges caused by other stimuli (Figure 2).



Figure 2. Conceptual framework.

### **Research Questions (RQs)**

1. How has the CLR epidemic affected the food security of one Guatemalan coffee cooperative?
2. How has the CLR epidemic affected the livelihoods (e.g. employment, social networks, health, and education) of one Guatemalan coffee cooperative?
3. What short-term coping mechanisms are cooperative members employing to address the effects of the CLR epidemic on their livelihoods?
4. How are the coping mechanisms contributing to the cooperative members' livelihoods?

### **Need for Study**

This study provided an analysis of the CLR's effects on household food security and livelihoods of a Guatemalan coffee cooperative. Anecdotal reports indicated that the loss of production and labor opportunities from the 2012 CLR outbreak affected the food security and livelihoods of vulnerable Guatemalans (Agren, 2014; Castillo & Aleman,

2014; Malkin, 2014; Tay, 2014; Tran, 2013). However, no peer-reviewed published studies have investigated these claims. The 1999-2001 global coffee crisis created a socio-economic upheaval in many Guatemalan rural communities and changed the Guatemalan coffee industry (Fischer & Victor, 2014). In light of the CLR crisis, this study provided recommendations on how to strengthen the resilience of smallholder coffee producing communities in Central America.

### **Delimitations**

1. This study was delimited to one coffee producing community in the Quetzaltenango department of Guatemala.
2. Data were collected on one selected dimension of food security: the economic access (ability to acquire through trade, production, purchase, and transfer) to food.
3. Data were collected on members' livelihood strategies that included agricultural production, off-farm employment, and on-farm non-agricultural income generation.
4. Data were collected from November 2014 to December 2014.
5. Data were collected primarily from cooperative members who were (a) dependent upon coffee production for their livelihoods; and (b) whose production was affected by the CLR outbreak.
6. Qualitative data were collected using semi-structured interviews of community members, focus group interviews, passive and active observation, key informant interviews, document analysis, and site visits.

## **Limitations**

There were three main limitations to the study. First, data were collected over a relatively short period of time. The researcher collected data during three visits, consisting of 15 complete days from November 2014 to December 2014. The data reflected the interviewees' perceptions and the researcher's observations during that time. The researcher attempted to maximize the time spent in the community (e.g. sharing meals with interviewees) as much as possible. The researcher also attempted to ask questions, acquire documents, and triangulate findings with key informants about other months of the year and/or periods of time.

Second, the sources of almost all of the data were from the members of one cooperative. Data were collected primarily from in-depth semi-structured interviews of cooperative members. The researcher used observations and reflections that were based on experiences (e.g. harvesting coffee; traversing coffee fields) facilitated by cooperative members. Cooperative members could have intentionally or unintentionally concealed information from the researcher. The researcher gathered data from key informants and documents to triangulate interview and observation data. The researcher provided copies of past interviews to interviewees (i.e. member checks) to provide the interviewees a chance to clarify or change information.

Third, cooperative members had difficulty providing precise information on dates, prices, and measurements. One example of imprecise information was the conflicting information about the date that the cooperative members split from other producers in the same community. The researcher was unable to obtain primary

documents (e.g. export agreements) from cooperative members. The researcher attempted to cross-check interview data with documents and key informants. When data were in question and the researcher was unable to verify through other sources, the researcher acknowledged conflicting data in the results.

### **Basic Assumptions**

1. Study participants answered the researcher's questions truthfully.
2. Study participants did not materially modify their behavior in the researcher's presence.
3. Study participants did not materially modify physical conditions (e.g. dwellings) because of the researcher's presence.

## CHAPTER II

### LITERATURE REVIEW

#### **Coffee Production in Guatemala**

##### *Early history of Guatemalan coffee production*

Jesuit priests first introduced coffee in Guatemala in 1773, but it did not become a significant agricultural export until the 19<sup>th</sup> century (Eakin, Tucker, & Castellanos, 2006). In the 1830s and 1840s, Guatemalans began planting coffee in the western highlands for export (Fischer & Victor, 2014). Coffee went from representing one percent of exports in 1860 to 44 percent by 1870 (Woodward, 1990). In 1873, the coffee farmer and military general Justo Rufino Barrios became president. Barrios passed a series of land reform and export laws to facilitate coffee production and by the mid-1880s, Guatemala was a leading world exporter of coffee (McCreery, 1976; Prendergast, 2010). The economic and land reforms favoring the exportation of coffee under Barrios were sustained by successive Guatemalan governments. In only 20 years, coffee went from a relative unknown crop in Guatemala to a commodity dominating the country's economy, politics, and social development.

Coffee can only be grown in certain climatic conditions and its production requires a relatively large labor force (McCreery, 1976). Guatemala government policies helped increase coffee production through land appropriation and through informal and formal (i.e. legal) systems of forced labor. Nearly one million acres of Mayan collectivized land was privatized between 1871 and 1873 (World Bank, 2004). In the 1870s the government began the *mandamiento* system of forced labor requiring rural

communities to send peasants to work a certain number of days per year on public works projects or in other sectors (i.e. agriculture) that the government considered important; many were assigned to work on coffee estates (Fischer & Victor, 2014). The best land for growing high quality Arabica coffee in Guatemala was (and still is) mountain hillsides populated by the Mayan indigenous.

Initially, the *mandamiento* system was a very inefficient way to allocate labor. The indigenous Mayan would frequently flee back to their village as they had little incentive to work for wages on coffee estates when they could farm land communally in their villages (McCreery, 1976). The government gradually forced smallholder subsistence farmers off prime coffee growing lands and into bonded labor schemes on large coffee estates to shift the land to coffee production and to break the tradition of farming communal land by the Mayan indigenous (Brockett, 1990; Eakin, Tucker, & Castellanos, 2006; Fischer & Victor, 2014; Jha et al., 2011). While the government formally ended the *mandamiento* system in the 1920s, informal bonded labor of indigenous Mayans was common on large estates up through the 1960s and still exists on a smaller scale today (Fischer & Victor, 2014). The land and labor needs of the coffee industry in the 19th and 20th centuries has been cited as one of the main causes of inequality that favor and protect a small Guatemalan elite (Gallardo, 2001; Gauster & Isakson, 2007). McCreery (1976) argued, that “development’ for the ruling coffee elite necessitated the active ‘underdevelopment’ of the economic and social position of the indigenous majority” (p. 460).



*The 1999-2002 coffee crisis: How it changed Guatemalan coffee production*

Coffee's dominance in Guatemala's economic, political, and social development spheres continued unabated until the late 1980s. The International Coffee Organization's (ICO) International Coffee Agreement (ICA) in 1962 helped stabilize frequent fluctuations in coffee prices. The ICA established a quota system by country accounting for 99 percent of the world's coffee production (Fischer & Victor, 2014). However, after the agreement ended in 1989 and as economic liberal (i.e. The Washington Consensus) policies dominated many coffee producing-countries, Arabica coffee prices began to collapse. Additionally, new export countries increased production (e.g. Brazil; Vietnam went from the 17th largest supplier in 1990 to the 2nd largest in 2001), coffee consumption dropped in the developed world, and new processes improved the market for Robusta at the expense of Arabica varieties (Bacon, 2010; Eakin, Tucker, & Castellanos, 2006; Fischer & Victor, 2014). Central American coffee production was also affected by extreme weather events (e.g. Hurricanes Mitch and Stan) and an unusual dry period between 1999 and 2003 (Tucker, Eakin, & Castellanos, 2010).

Coffee prices continued to fall in the 1990s, and reached a low in 2001 of .45 cents per pound. Coffee prices dropped 50 percent from 1999 to 2001; a period of time which came to be known as the "global coffee crisis" (Gresser & Tickell, 2002; International Coffee Organization, 2014; Jha et al., 2011, p. 162). The effects were immediate and devastating for many countries including Guatemala. Central American coffee revenues decreased by 44 percent in one year (2000-2001) and Guatemalan coffee

exports fell from \$600 million to \$320 million (Eakin, Tucker, & Castellanos, 2006; Gresser & Tickell, 2002).

The global coffee crisis affected low-income Guatemalan coffee farmers through reduced incomes, threatened livelihoods, and increased food insecurity. Employment in Guatemala's coffee sector decreased by 41 percent, while across Central America, 400,000 temporary and 200,000 full time coffee laborers lost their jobs (Gresser & Tickell, 2002). International aid agencies attributed the increase in malnutrition rates in coffee producing areas, increased migration to North America, and a decrease in primary school attendance to low coffee prices (Bacon, 2010; Eakin, Tucker, & Castellanos, 2006). Scott's (2012) study of *Q'echi'* Mayan coffee laborers found many were displaced from their homes on coffee estates as owners sold their land or paid workers to leave. Gresser and Tickell (2002) found "widespread land invasions" by unemployed coffee laborers in some regions of Guatemala (p. 12). While the drop in coffee prices affected the food security and livelihoods of Guatemalan coffee farmers, it also led to a change in how coffee was produced.

Worldwide coffee production used to be dominated by large landowners, however small-scale farmers now produce approximately 70 percent of the world's coffee on farms of less than 10 hectares (Caswell, Mendez, & Bacon, 2012). In Mesoamerica there are an estimated 500,000 smallholder coffee farmers and a total of 8.5 million people are involved in the production, purchasing, transport, and processing of coffee (Baca, Läderach, Hagggar, Götz, & Ovalle, 2014; Läderach et al., 2010). In Guatemala, seven percent of the population depended upon coffee for their livelihood in

2001 (Morris, Mendez, & Olson, 2013). Tucker, Eakin, and Castellanos (2010) estimated 700,000 Guatemalans directly produced coffee or worked as hired labor in Guatemala in 2001. Since 1995, at least 50,000 new smallholder coffee growers have replaced large coffee estates in Guatemala; in the western highlands many of these growers are indigenous Maya (Fischer & Victor, 2014). After the ICA ended in 1989, coffee price volatility increased at the same that smallholder farmers (and not well capitalized estates) were shifting toward coffee production (Caswell, Mendez, & Bacon, 2012). While coffee prices reached an all-time high in 2011, so did the cost of basic food commodities and cooking fuel (Caswell, Mendez, & Bacon, 2012; International Coffee Organization, 2014)

For many smallholder coffee producers in Guatemala, coffee is just one (albeit, an important) livelihood activity. In one study, only 24 percent of smallholder coffee producers identified themselves as *cafetalero* (coffee farmer) while 51 percent identified themselves as *agricultor* (farmer); over 50 percent of the families had other income generating activities beside coffee production (Fischer & Victor, 2014). Many coffee producing households engaged in off-farm employment, migration (regional and international), and subsistence farming as livelihood strategies (Bacon et al., 2014; Fischer & Victor, 2014; Jha et al., 2011; Tucker, Eakin, & Castellanos, 2010). Coffee production is thus seen as one important strategy contributing to smallholder farmers' livelihoods in Guatemala.

### *Coffee production methods in Guatemala*

The genus *Coffea*, native to Ethiopia and the forests surrounding Lake Victoria in East Africa, has over 100 species, but only two, *Coffea Arabica* and *Coffea Robusta* are commercially grown. *C. Robusta* is typically grown in shade-free lowlands at sea level to 1000 meters, in temperatures ranging from 24-30 degrees Celsius, while *C. Arabica* is grown in various shade profiles between 500 and 1,500 meters, and thrives best at temperatures between 18 and 22 degrees Celsius (Jha et al., 2011; Toledo & Moguel, 2012).

It is believed that *C. Arabica* evolved as an understory crop and thus its photosynthetic rate is highest at relatively moderate temperatures and levels of sun (Lin, Perfecto, & Vandermeer, 2008; Nutman, 1937). Coffee trees are sensitive to drought, excessive moisture, and extreme temperatures; dry conditions must prevail for the plant to flower (Tucker, Eakin, & Castellanos, 2010). Central American countries and Colombia leads the production of *C. Arabica*, while *C. Robusta* is more common in East Africa, Southeast Asia, and Brazil. *C. Arabica* is grows best in tropical mountain forests. It yields less than *C. Robusta* and is not as hardy to pests, diseases, and weather fluctuations, but consumers prefer its superior taste profile, and thus commands a price premium over *C. Robusta* (Jha et al., 2011; Läderach et al., 2010; Luttinger & Dicum, 1999; Toledo & Moguel, 2012). In general (specific varieties and climatic conditions can affect maturation rates) *C. Arabica* takes three to five years to bear fruit and will keep producing at maximum yield for 15 years (Fischer & Victor, 2014).

After many of Guatemala's large coffee estates went bankrupt in the 1990s-2000s or converted their land to rubber, cattle, or palm oil production, an increasing number of smallholder farmers have taken up producing coffee (Fischer & Victor, 2014). As coffee prices recovered in the 2000s, consumers in North America and Europe increasingly demanded specialized "premium" Arabica coffee varieties, as well as "fair-trade" and organically grown coffee. The coffee industry in Guatemala grows *C. Robusta* and *C. Arabica*, however smallholder farmers are more likely to cultivate Arabica varieties on small plots of land in mountainous regions while Robusta is still grown on large costal estates.

Guatemala's Arabica coffee is traditionally wet-processed (as oppose to dry or natural processed where cherries are simply dried with the beans inside). Wet-processing coffee requires 24-36 hours of fermentation (leaving the cherries to sit at room temperature) after being picked, followed by separating the skin and flesh of the cherry from the bean, and "washing" the bean before it is left to dry for three to five days of full sun. Wet processing requires more labor and water, but commands a price premium for the beans' perceived superior taste (Pendergrast, 2010).

Traditionally, Guatemala has produced Arabica "Prime" or "Extra Prime" (lower quality) coffee at 2,500-3,500 feet above sea level and "hard bean" (HB) or "semi-hard bean" (higher quality) at 3,500 to 4,500 feet above sea level (Fischer & Victor, 2014). More recently, ANACAFE has supported increasing production of the "top-quality" strictly hard beans (SHB), which are grown at 4,500-6,500 feet above sea level (Fischer & Victor, 2014; Pendergrast, 2010). If given one coffee variety grown at two different

elevations in the same region, the crop grown at the higher elevation will command a price premium over the lower elevation crop. Higher elevation coffee commands a higher price because the cherries will usually take a longer to mature (because of cooler temperatures). This will cause the higher altitude beans to grow slightly larger and denser than lower altitude beans, and most importantly, the extra time spent ripening will allow for more sugars to concentrate in the high altitude beans. The more development of sugars in the bean usually lead to a perceived richer complex taste in the cup (Bertrand et al., 2006; Sridevi & Giridhar, 2013). While higher elevation beans generally enjoy a price premium over similar low elevation beans, coffee trees grown at higher elevations are less hardy.

#### *Coffee leaf rust (CLR) in Guatemala*

One of the oldest recorded diseases affecting *C. Arabica* is *Hemileia vastatrix* or coffee leaf rust (CLR). CLR is thought to have originated in Ethiopia and the Lake Victoria area of East Africa (Schieber & Zentmyer, 1984). In 1870, Ceylon (present day Sri Lanka) was the world's largest exporter of coffee. However, after CLR was introduced to Ceylon in 1875 the island went from producing 42 million kilograms of coffee each year to 3 million in four years (Schieber, 1972). In 1970, CLR was discovered in Brazil, which created a "virtual panic among producers and national level institutes responsible for production" (Jha et al., 2011, p. 146). By 1980, its presence was detected in Guatemala and by 1984 it was firmly established in all of Central America and Mexico (Schieber & Zentmyer, 1984).

CLR, also referred to as orange leaf rust, or as it is known in Guatemala, “*la roya*”, damages coffee trees by inhibiting the plant’s photosynthetic ability through premature defoliation of its leaves (Ferreira & Boley, 1991). Infection sites first appear as yellow or orange spots on the underside of a plant’s leaves. These spots increase in diameter and turn a darker yellow or orange-red as the spots begin to produce spores (Arneson, 2000). Spores are usually located on the edges of leaves; rain and wind can transfer the spores to neighboring trees. CLR causes defoliation but does not usually kill the infected coffee tree. Instead CLR weakens coffee and causes reduced yields during the infection and in subsequent years (Arneson, 2000; Ferreira & Boley, 1991). CLR typically decreases yields on average 30 percent when left unmanaged (Cristancho, Rozo, Escobar, Rivillas, & Gaitán, 2012; Monaco, 1977).

CLR can be controlled chemically with copper-based fungicides. CLR resistant cultivars and agricultural management practices such as proper pruning, shade management, and proper fertilization can also decrease disease rates (Arneson, 2000). For smallholder Guatemalan coffee farmers, CLR management is limited by knowledge and financial capabilities. In 1987, the US Agency for International Development (USAID) established the Regional Cooperative Program for the Technological Development and Modernization of Coffee Cultivation (better known by its Spanish acronym, Promecafe). Based at the Inter-American Institute for Cooperation on Agriculture in Costa Rica (IICA), Promacafe helped introduce new high yielding coffee varieties, promoted the removal of shade, and increased the planting density of trees which helped control CLR (Inter-American Institute for Cooperation on Agriculture,

1996; Jha et al., 2011). CLR breeds in low light and high moisture environments, the same environment in which Guatemalan smallholder farmers produce premium HB and SHB coffee varieties (Läderach et al., 2010). It is thought to take approximately 10 years to breed and replace new a CLR resistant coffee variety (Schieber, 1972). CLR resistant coffee varieties have been developed, however some resistant varieties have already lost their resistance as new races of CLR (over 40 have been identified) evolve (Arneson, 2000; Do Céu Silva et al., 2006; Ferreira & Boley, 1991; Muller, Berry, Avelino, & Bieysse, 2009).

CLR “burst dramatically on the scene in late 2012” infecting coffee trees from Mexico to Peru (Vandermeer, Jackson, & Perfecto, 2014, p. 210). CLR has been a constant presence in Latin America since the 1970s, however an especially damaging outbreak occurred in 2012. No rigorous studies have established the cause of this epidemic. One preliminary study suspected that the outbreak was caused in part from temporary weather conditions; La Niña brought heavy rain and sunlight reductions in 2011-2012, which are two main predictors of CLR growth (Cristancho, Rozo, Escobar, Rivillas, & Gaitán, 2012). Other preliminary studies point to more complex ecological interactions and long-term climate change is causing an increasing the risk of CLR (Ghini, Bettoil, & Hamada, 2011; Schieber, 1972; Vandermeer, Jackson, & Perfecto, 2014).

Anecdotal reports on the 2012 CLR outbreak in Guatemala have indicated that producers lost hundreds of millions of dollars, food insecurity and migration increased, and farmers shifted to other crops and off-farm employment (Agren, 8 July, 2014;



Castillo & Aleman, 31 May, 2014; Dardon, 2013; FEWS NET, 2014; Kahn, 28 July, 2014; Palencia, 4 July, 2014; Sanchez, Rizzo, & Ortiz, 20 February, 2013; Tran, 16 October, 2013; World Coffee Research, 2013). However, these reports are anecdotal in nature. One peer-reviewed study of coffee production in southern Mexico estimated yield losses from CLR would be 40-50 percent. In the study's test plot, 60 percent of the coffee trees experienced more than 80 percent defoliation and nine percent died completely (Vandemeer, Jackson, & Perfecto, 2014). As of 2014, no peer-reviewed studies have been published examining the effects of the 2012 CLR outbreak on food security and livelihoods of Central American coffee producers.

## **Food Security, Vulnerabilities, and Guatemalan Smallholder Coffee Producers**

### *Defining food security*

Food security first became a guiding concept for international development and aid agencies following the world food crisis of 1972-1974 and successive famines in Sub-Saharan Africa in the 1970s and 1980s (Maxwell & Smith, 1993). Food security remains a flexible concept that has “evolved, developed, multiplied, and diversified” (Maxwell, 1996, p. 155). Food security is most commonly defined by combining three “pillars” or constructs: availability, access, and utilization (Barrett, 2010, p. 825). Many accept the FAO’s 1996 World Food Summit definition stating 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 life” (Barrett, 2010; Caswell, Mendez, & Bacon, 2012; FAO, 1996, para. 12; Maxwell et al., 1999; Morris, Mendez, & Olson, 2013; Pinstруп-Andersen, 2009).

In the 1970s and throughout the 1980s, food security was simply defined as whether there was enough food available (Maxwell, 1996; Pinstrip-Andersen, 2009). This early definition focused solely on national food availability – that food production met caloric consumption needs for its citizens (FAO, 1983; Reutlinger & Knapp, 1980; Sahn, 1989). Sen (1981) shifted the conceptualization of food security away from availability and toward access (Barrett, 2010; Devereux, 2009; Dilley & Boudreau, 2001; Maxwell, 1996; Maxwell and Smith, 1993). Sen (1981) found that acute food insecurity during famines was not caused by a sudden food availability decline (FAD), but by the failure to “command” food which he called food entitlement decline (FED). While FED can accompany a FAD, Sen (1981) argued that acute food insecurity was caused by people’s loss of food entitlements categorized as (1) trade based entitlements allowing people to obtain food through legitimate trade; (2) production-based entitlements allowing people to produce food (or non-agricultural goods) which could be traded or sold for food; (3) labor entitlements allowing people to use the value of their labor to acquire food; and (4) inheritance or transfer entitlements allowing people to acquire food from family members or a government entity.

The third pillar of food security is utilization. Utilization focuses on whether food is biologically utilized as intended. While nutritious and abundant food may be available, people can remain food insecure if diseases and unsanitary conditions prevent their bodies from absorbing nutrients and caloric energy. Diarrheal diseases from unclean water, sanitation and hygiene (WASH) cause malnutrition (Checkley et al., 2008; Humphrey, 2009; Korpe & Petri, 2012).

Two additional constructs included in the FAO's 1996 definition of food security are distribution (i.e. "all people") and stability (i.e. "at all times"). Stability implies that people can be food secure for part of the year while other parts of the year they may suffer from acute food insecurity. One example of this is what is known as the "hunger" or "lean" season when farmers have invested all or nearly all of their financial resources in their crops, however the crops are not yet mature enough to be eaten. The hunger season can be typified as a cyclical threat to food security; it usually occurs every year during the same period. For Guatemalan coffee farmers in the western highlands, the hunger season lasts from April to August, however the period varies according to elevation, the variety of coffee grown, and other considerations (FEWS NET, 2014). Other examples which test the stability of food security are one-time disruptions caused by a natural disaster, drought, or conflict. Distribution is the final construct that is most commonly included when defining food security. Food is not always distributed equally within a household or within a community. Research has shown that food is allocated according to gender, age, and relative social position (Haddad, Peña, Nishida, Quisumbing, & Slack, 1996).

#### *Household food security*

Food security originally focused on the (a) objective measurements of (b) food availability at (c) the national level. Maxwell (1996) identified three "post-modern" food security paradigm shifts toward (a) subjective perceptions of food insecurity; (b) focusing on members of household and individuals; (c) taking a broader view of food security as one of many needs within a livelihood strategy. Barrett (2010) argued that

food security access was an “inherently multidimensional concept” which takes into account uneven inter and intra household food distribution, socioeconomic factors, and cultural practices (p. 825). Evaluating household food security can be problematic as individual members of households typically experience food insecurity differently and have different coping mechanisms (Maxwell & Smith, 1993). Pinstруп-Andersen (2009) noted that a household is food secure if “it has the ability to acquire the food needed by its members” (p. 6). Though measurement might be more difficult, examining household food security can be more reliable in understanding the household’s food security needs, changes in income, seasonal/cyclical changes, consumption patterns, the procurement, and the distribution of food across gender, age, and social position that individual food security assessments neglect (Corbett, 1988; Frankenberger, 1996; Frankenberger & Goldstein, 1990; Kennedy & Peters, 1992; Maxwell & Smith, 1993; Maxwell, 1996).

Measuring household food security usually takes into account the household size and composition, income sources, access to credit, land ownership, and understanding the flow of income and assets into not only food acquisition, but also school fees, housing, agricultural investment, and small business investment (Haddad, Kennedy, & Sullivan, 1994; Pinstруп-Anderson, 2009). Coates’ et al. (2006) meta-analysis of 22 scales of household food security across 15 countries found four valid measurement domains: (a) uncertainty and worry; (b) inadequate quality; (c) insufficient quantity, and (d) social unacceptability. The authors suggested that while culture can affect the perceptions and experiences of food insecurity, these four domains (and in addition, 12 subdomains) could be used as a valid measure across cultures for household food

security. One final issue to consider is how perceptions affect food security. Early measures of food security were objective – 24-hour food consumption recall surveys, anthropometric (e.g. height and weight z scores) measures of children, and cataloging household income. However, researchers have found that the subjective feelings of risk and the fear of becoming food insecure should be factored into food security measurements as these perceptions have been found to affect how a household reacts to challenges to their food security (Coates et al., 2006; Maxwell, 1996).

*Food security of smallholder coffee producers in Guatemala*

It is not well understood how smallholder coffee producers in Central America are affected by food insecurity, although there is evidence that changes in food security affect coffee production modalities (Bacon et al., 2008; Jaffee, 2007; Morris, Mendez, & Olson, 2013). Several studies show evidence that food insecurity in Central American coffee-growing communities is a concern (Caswell, Mendez, & Bacon, 2012; FEWS NET, 2014; Mendez, Bacon, Olson, Morris, & Shattuck, 2010). In one survey of almost 500 smallholder coffee farmers in four Central American counties, 63 percent of respondents reported being food insecure during at least one part of the year (Mendez, Bacon, Olson, Morris, & Shattuck, 2010); another study found 67 percent of households in Mexico, Guatemala, and Nicaragua were food insecure for at least three months out of the year (Fujisaka, 2007), and in another survey, 97 percent of El Salvadorian coffee farmers reported there being at least one period of food insecurity during the year (Morris, Mendez, & Olson, 2013). Bacon et al. (2010) found smallholder Nicaraguan coffee producing households experienced on average 3.15 months of food insecurity.

Central American coffee producers suffer from cyclical food insecurity. One lean season lasts from December to February when coffee is being harvested, and another from April to September when coffee competes with subsistence crops for inputs, although these times vary by region (Bacon et al., 2014; Caswell, Mendez, & Bacon, 2012; Morris, Mendez, & Olson, 2013).

Smallholder Guatemalan coffee growers face several livelihood obstacles. Coffee is usually grown with subsistence crops on steep slopes, in thin soils, which are dependent on rain (Bacon et al., 2014). Smallholder coffee farmers in Guatemala have to decide how to allocate scarce household resources between coffee and subsistence crop inputs, other household expenditures such as school fees and health care, while also forecasting weather and market prices (Caswell, Mendez, & Bacon, 2012; Morris, Mendez, & Olson, 2013; Steinberg & Taylor, 2009). Thus, coffee farmers face multiple risks. The livelihood strategies for smallholder coffee producing households are diverse. Off-farm employment, providing labor for other smallholder coffee producers, and working for wages on large coffee estates are commonly part of livelihood strategies. Coffee laborers are routinely paid \$2-\$6 per day. Pay can be based on pounds of cherries collected during harvest season. Despite regulations pertaining to child labor, Guatemalan children routinely work in the coffee fields with their parents (Gresser & Tickell, 2002; Jha et al., 2011; Pendergrast, 2010).

### *Vulnerabilities*

Guatemalan coffee farmers' vulnerability to food insecurity is one way the CLR epidemic could affect food security and coffee production. Food security-related

vulnerability consists of external risks, shocks, stresses, and the difficulty in coping the risks, shocks, and stresses (Chambers, 1989; Dilley & Boudreau, 2001; Frankenberger, 1996; Watts & Bohle, 1993). For smallholder Guatemalan coffee farmers, vulnerability can be affected by long-term climate change, weather variability, natural hazards (e.g. hurricanes), plant diseases and pests (e.g. coffee rust), the prices of agricultural inputs, consumer goods prices, and the price of coffee (Adger, 2006; Bacon et al., 2014; Eakin & Luers, 2006; Scoones, 1998). Lovendal and Knowles (2006) stressed that “Because vulnerability is linked to the uncertainty of events, everyone is vulnerable to food insecurity, but some more so than others. Vulnerability can be thought of as a continuum” (p. 4). Households with the most assets are the least likely to be vulnerable (Swift, 1989). Integrating vulnerability analyses into food security measurements helps identify causes and food security improvements (Lovendal & Knowles, 2006). Dilley and Boudreau (2001) developed a three point vulnerability analysis: (a) the possibility of events happening which cause food insecurity; (b) relative susceptibility to these events; and (c) the likelihood of harm resulting from the inability to cope.

### **Livelihoods: Coffee Farmers’ Food Security Coping Mechanisms and Adaptation Strategies**

The livelihoods model takes into account all assets, resources, and the capabilities people have to overcome food security-related vulnerabilities (Bebbington, 1999; Scoones, 1998). Scoones (1998) expanded on this definition by outlining a livelihoods framework consisting of human capital (e.g. health, education), physical capital (e.g. farm inputs, equipment), social capital (e.g. cooperatives, social networks),

financial capital (e.g. credit, savings), and natural capital (e.g. forests, water). The livelihoods approach to food security-related vulnerabilities provides researchers with a comprehensive understanding of assets, capabilities, and how those two are employed to avert food insecurity. Using a livelihoods approach can provide strategies for long-term change (Scoones, 1998).

Bacon, Läderach, Hagggar, Götz, and Ovalle (2014) noted climate change, high migration rates, and declining soil fertility threaten Arabica coffee growing areas in Central America. To decrease food security-related vulnerabilities, Central American smallholder coffee farmers diversify their livelihoods (Bacon, Läderach, Hagggar, Götz, & Ovalle, 2014; Caswell, Mendez, & Bacon, 2012; Fischer & Victor, 2014; Morris, Mendez, & Olson, 2013; Tucker, Eakin, & Castellanos, 2010). Livelihood diversification can be thought of as “the process by which households construct a diverse portfolio of activities and social support capabilities...to improve their standard of living” (Ellis, 1999, p. 2). Livelihood adaptation is the choices made to enhance security and wealth or reduce vulnerability and poverty (Davies & Hossain, 1997). “Coping mechanisms” are defined as short-term responses to acute vulnerabilities (e.g. rapid rise of food prices) while “adaptive strategies” are defined as long-term changes to livelihoods (Davies, 1993; Maxwell, 1996). Livelihoods diversification, adaptation, and coping mechanisms are the three methods smallholder coffee farmers mitigate the effects of rising food insecurity and coffee production losses.

One qualitative study of coping mechanisms in coffee producing households in El Salvador described borrowing money from family or friends, eating less, modifying



diets, seeking off-farm employment, selling livestock, using savings, and borrowing food (Morris, Mendez, & Olson, 2013). These findings are similar to Maxwell's (1996) hierarchy of food security-related coping mechanisms, which from least to most severe include: eating less preferred foods, limiting portion size, borrowing money or food, maternal buffering (where the mother eats less so that her children have more), skipping some meals, and skipping eating for whole days. Some coping mechanisms may lessen temporary food insecurity but threaten long-term livelihoods. For example, taking children out of school to work or selling seeds that would be needed for the following year's planting, may lessen short-term food insecurity, but threaten long-term livelihoods (Jha et al., 2011). Tucker, Eakin, and Castellanos (2010) found migration among coffee producers in Mexico and Central America were short-term coping mechanisms rather than long-term adaptive strategies to market and weather shocks. Another method Central American smallholder coffee farmers use to diversify livelihoods is to devote a portion of their land to grow subsistence food crops such as corn and beans (Eakin, Tucker, & Castellanos, 2006; Fischer & Victor, 2014).

## **Summary**

Coffee has dominated Guatemala's economy, politics, and social development for many years. The 1999-2001 coffee crisis served as the inflection point when coffee production changed from an activity controlled by a small number of large landowners and protected by the government to an essential crop for thousands of smallholder farmers. Many Guatemalan smallholder coffee farmers cultivate rain-fed, high altitude,

“premium” HB or SHB Arabica. These growing conditions lend to higher rates of disease.

In 2012, a CLR epidemic surprised most with its devastating effects on Guatemalan coffee production. Anecdotal reports of the 2012 CLR outbreak in Guatemala indicated that producers lost hundreds of millions of dollars’ worth of production, food insecurity increased and livelihoods were threatened. Food security remains a flexible concept, but which considers the ability to purchase food (access), food availability, biological utilization (e.g. through proper sanitation), stability over time, and distribution within and among households. Guatemalan smallholder coffee farmers were at risk of several food-security related vulnerabilities, of which the 2012 CLR epidemic appeared to have exacerbated. The livelihoods model takes into account all assets, resources, and the capabilities people have to overcome food security-related vulnerabilities. To preserve livelihoods, smallholder coffee farmers in Guatemala, and other regions of Central America, utilize short-term coping mechanisms (e.g. eating less; borrowing money; skipping meals) and long-term diversification strategies (e.g. migrating in search of work; switching production to other crops).

## CHAPTER III

### METHODS

#### **Research Design**

This research used a qualitative instrumental case study methodology to develop a grounded theory based on a rich description and analysis of how one Guatemalan coffee cooperative in the western highlands was affected by the CLR epidemic. The case provided a supportive role of understanding the issue of the CLR effects on the coffee industry (Merriam, 2009). The researcher used the instrumental case study methodology as it was specifically suited to “provide insight into an issue” (Stake, 2005, p. 437).

There is a lack of knowledge about how the CLR epidemic in Guatemala affects food insecurity and livelihoods of smallholder coffee farmers (Caswell, Mendez, & Bacon, 2012; Mendez, Bacon, Olson, Morris, & Shattuck, 2010; Morris, Mendez, & Olson, 2013). Merriam (2009) defined a case study as “an in-depth description and analysis of a bounded system” (p. 43).

The bounded system consisted of 10 producers of a coffee cooperative in one smallholder coffee farming community, *Finca Santa Anita La Union* (referred from now on as “Santa Anita”). The cooperative members served as the basis of the case study as they were a (a) social group (b) of relatively new smallholder coffee producers (c) and who were affected by the CLR outbreak. The 10 members formed the *Asociación de Productores de Santa Anita* (APCASA), or in English, the Santa Anita Coffee Producers Association. Each member of APCASA was a smallholder coffee holder with approximately 30 *cuerdas* (~3 acres) of land. The members began farming coffee in

Santa Anita in 1998. The members (or an immediate family member) participated in the organized guerilla movement that fought government forces between 1960 and 1996. The government loaned the members funds to purchase the *finca* in 1998 through a guerilla reintegration program authorized by the 1996 Peace Accords. Santa Anita is one of several smallholding coffee communities in the area which was founded by former guerilla fighters.

### **Sampling Design**

Purposive nonprobabilistic sampling was used to understand, describe and interpret data; statistical generalizability to a population was not an objective of this research. Creswell (2007) noted that case studies involve collecting multiple sources of information from observations, interviews, documents, and audiovisual material.

Theoretical sampling was used to achieve maximum variation. Maximum variation is the process by which the researcher attempts to collect data on varying instances of the phenomenon, in some cases, purposely searching for instances of incongruence with existing data (Merriam, 2009). Glaser and Strauss (1967) described theoretical sampling as “the process of data collection for generating theory whereby the analyst jointly collects, codes, and analyzes his data and decides what data to collect next and where” (p. 45). Theoretical sampling is an “evolving process,” however Merriam (2009) argued that determining sample selection criteria was essential in qualitative research (p. 80).

The sample selection criteria used to begin this research were:

1. Members of one coffee cooperative residing in one community who were
  - (a) socio-economically vulnerable; and
  - (b) who considered coffee

production as an important livelihood activity, and (c) whose coffee production was affected by the CLR epidemic in 2012.

2. Members of governmental and non-governmental organizations (NGOs) providing technical and social assistance to Guatemalans in response to the CLR epidemic.
3. Coffee researchers, scientists, and industry representatives who work or have worked in Guatemala.

The researcher attempted to collect all relevant information about the bounded case. Data were collected to reach a point of saturation. Guest, Bunce, and Johnson (2006) argued data saturation is reached quicker the more homogeneous the participants are, the more structured the data collection instrument is (e.g. an interview protocol), and the complexity of the content that is being pursued. The concept of saturation in nonprobabilistic qualitative research is when one reaches the point where no new information or themes are observed in the data.

#### *Researcher's role*

The researcher sought and received permission from Texas A&M University's Institutional Review Board (IRB) to conduct this research. The researcher had eight years of experience working, living, and conducting research in Guatemala. The principal investigator's prior research was conducted on the adoption rates of improved cookstoves (Bielecki & Wingenbach, 2014a) and social perceptions of food security in Guatemala (Bielecki & Wingenbach, 2014b). A Guatemalan professional reference put the researcher into contact with one member of APCASA. The APCASA member

invited the researcher in September of 2014 to visit the cooperative. The researcher visited the cooperative in October of 2014 and expressed an interest to the members in returning at a later date to carry out research and volunteer with coffee production. After the researcher received approval from Texas A&M University's IRB, he made three visits; each visit lasted approximately five full days in late November through December 2014. The researcher conducted research in Santa Anita while also serving as a *voluntario* or international volunteer helping APCASA members with all facets of coffee production.

#### *Case description*

Santa Anita is approximately 5 kilometers west-southwest of Colomba Costa Cuca (most commonly referred to as Colomba; sometimes abbreviated to Colomba C.C.) in the Quetzaltenango department (Figure 3).



Figure 3. Study site location. The blue star indicates the study site location. The largest towns nearest the study site are Coatepeque approximately 15 km west and Quetzaltenango 50 km northeast (Central Intelligence Agency, 2001).

The community is located on what was a privately owned coffee *finca* that been producing coffee for at least 100 years. Santa Anita produces coffee at an altitude of 1075 meters or 3,500 feet above sea level. Santa Anita is within a region known as Guatemala's "*Boca Costa*" (Figure 4), a 30 km strip of foothills that descend from the country's western highlands (*El Antiplano*) to the coastal plain. The *Boca Costa* region generally enjoys rich volcanic soils, a subtropical climate, and an attitude ranging from 2,500 and 4,000 feet above sea level.



Figure 4. Guatemala's "*Boca Costa*" region.

The *Boca Costa* region is famous for “premium” coffee cultivation. *Coffea Arabica* is the most common coffee species planted in Santa Anita which yields “hard bean” (high quality) coffee. Santa Anita is located on a paved road which has direct access to the highway connecting Colomba and Coatepeque. Coatepeque is the nearest major city, located approximately 15 kilometers west of Santa Anita. Santa Anita has

municipal electricity, water, sewage, and is served by one local bus route and shared “pickup” transport. Santa Anita was founded on February 12, 1998 by 35 families. Beside buildings used to process coffee, Santa Anita had one primary school with three classrooms, one pre-kindergarten school, several communal buildings, and a small chapel.

There were approximately 35 households and 150 people living in Santa Anita when the researcher visited. Most of the 25 households that were not part of APCASA were a part of another coffee cooperative, *Asociación Civil Maya de Pequeños Productores* (ACMPA; commonly referred to as “Association Maya”). The primary income generating activity in Santa Anita was coffee production, although the majority of households had at least one person who received income from off-farm employment. The 10 members of APCASA had no experience farming coffee prior to 1998. Several members (or their spouses) grew up on coffee *fincas*; some had provided unskilled labor on coffee *fincas* in their youth, however no one had received formal training on any facet of coffee farming until arriving in Santa Anita in 1998. Prior to collecting data, all APCASA members reported having their income and coffee production affected by CLR in 2012. Each household in Santa Anita had 30 *cuerdas* (~3 acres) of land broken up into three to four parcels, in addition to one residential lot of 150 m<sup>2</sup>.

### **Data Collection Procedures**

The researcher was the primary instrument of data collection and analysis (Merriam, 2009). Data were collected from three main sources. The majority of the data collected were during visits to Santa Anita. This data consisted of semi-structured



interviews of APCASA members, focus group interviews of one or more members of APCASA, passive and active (participatory) observation during site visits, and photographs. Second, data were collected from publically available documents which pertain to APCASA and/or coffee production in Santa Anita. The third source of data consisted of semi-structured interviews with key informants who had experience working with members of APCASA and/or extensive experience in smallholder Guatemalan coffee production.

Research instruments were developed in English and Spanish. The researcher used four instruments to collect data. Semi-structured and focus group interviews of APCASA cooperative members were conducted according to an interview protocol (Appendix A). This protocol consisted of 57 questions placed in six categories: Introduction, coffee production, livelihoods, coffee rust and food security, outside assistance, and conclusions. During most interviews, approximately 20 to 25 questions were asked from the protocol, depending on information the interviewee provided. Semi-structured interviews of key informants who were not members of APCASA were conducted using a protocol (Appendix B). The key informant protocol was divided into two sections, one section pertained to members of international organizations and the other section pertained to members of Guatemalan organizations. There were 20 possible questions for members of international organizations and 15 questions for members of Guatemalan organizations. During most interviews, approximately 10 to 15 questions were asked from the protocol, depending on information the interviewee provided.

All interviewees were fluent in Spanish and/or English; no Mayan language translators were needed. All interviewed research subjects were 18 years of age or older. The researcher transcribed what each interviewee said during the interview. Attempts were made to transcribe the interviewees word for word, however at times it was impossible for the researcher to write down the exact words of the interviewee during the interview. Interviews lasted from 20 minutes to 90 minutes for both groups. Additional questions, related to but not listed on the protocols, were asked if deemed relevant. Interviews were conducted indoors, outdoors, during periods of labor, and were sometimes interrupted by other activities.

The researcher used two additional data collection instruments: A reflexive research memo protocol (Appendix C) and a livelihoods framework analysis checklist (Appendix D). These instruments were used to collect data from passive and active (participatory) observation during site visits, documents, and photographs. The livelihoods framework analysis checklist was adapted from Scoones' (2009) sustainable livelihoods framework checklist. The checklist draws "on diverse disciplinary perspectives and [cuts] across sectoral boundaries" to analyze "complex, highly dynamic rural contexts" (Scoones, 2009, p. 183). The livelihoods framework analysis checklist (Appendix D) was used to guide data collection. Data were collected in reflexive research memos (Appendix C) and photographs taken on-site by the researcher. According to Birks, Chapman, and Francis (2008), memoing in qualitative research is useful in recording decisions such as sampling, data collection, and analysis, and making sense of data during the research process. The researcher wrote memos on-site to log

research activity reports and field notes. Field note memos were used to collect observations, thoughts, and questions for further inquiry pertaining to the data.

### **Data Analysis**

The researcher transcribed all data, except photographs. The transcribed data were reduced and given individual codes. Data were reduced by examining each stand-alone interview and memo individually. Segments of data were separated out to be coded if they were (a) meaningful (or potentially meaningful) to one or more of the research questions (Merriam, 2009); and (b) were “the smallest piece of information about something that can stand by itself” (Lincoln & Guba, 1985, p. 345). Data segments were identified according to an auditing system (Table 1). With the audit tag, data segments cited in the analysis, results, and discussion phases could be referred back its location and context in the raw data. The audit tag combined the data type and source and separated the number identifier with a period.

Table 1. Data Auditing System.

Code Category	Code	Code Explanation
Data Type	SI, KI, RR, DA	SI: Site interview (includes focus group interviews) KI: Key informant interview RR: Researcher reflection DA: Document analysis
Data Source	1-999	Data sources within each type were given a number value.
Number Identifier	1-999	The segment of data within each data source was numbered.

For example, the twelfth data segment from a site interview (SI) of APCASA member two would be coded SI2.12. The fourth data segment from research reflection (RR) memo one would be coded RR1.4.

Data were analyzed using the constant comparative method of data analysis (Glaser, 1965; Glaser & Strauss, 1967). Specifically, data were analyzed in three stages using Strauss' (1987) progressive coding scheme of open, axial, and selective coding. Tesch (1990) described open coding as analyzing data line-by-line for actions, behaviors, events, or other observations. This first stage of data analysis consisted of the researcher breaking down the data into segments and given codes. During the open coding stage, data segments were sorted into preliminary themes related to the four research questions. The preliminary themes helped answer the research questions by providing context, meaning, and information. During the second stage, axial coding was used to examine data pertaining to each theme. Axial coding was also used to make connections between the themes or to create entirely new themes. Finally, selective coding was used to form discrete themes which brought new meaning, context, and information to one or more research questions (Tesch, 1990). Open, axial, and selective coding follow a pattern of refinement and reduction, however the researcher followed Strauss' (1987) guidance to continue open and axial coding even after moving on to selective coding. The researcher wrote "theoretical memos" using the reflexive research memo template (Appendix C) during the open coding stage to induce meaning (Strauss, 1987, p. 32).

## **Establishing Credibility, Consistency, and Transferability**

Credibility (referred to as internal validity in quantitative research) was established by collecting data from multiple sources (i.e. triangulation). Data were triangulated through interviews of cooperative members, key informants, researcher observations, and document analyses (for the list of documents used to triangulate findings, see Appendix G). Respondent validation, which allows respondents to view, comment on, or revise what they said (e.g. during an interview) or did (e.g. based on observations by the researcher) was used to increase credibility (Merriam, 2009). The researcher interviewed each cooperative member at least twice. The researcher reviewed key points made during the previous interview and requested that the interviewee modify their answers if they desired. Extended engagement with the community was also used to increase credibility (Merriam, 2009). The researcher visited the community on three separate occasions, each visit lasting five full days. The researcher was fluent in Spanish and freely interacted with the residents of Santa Anita. The researcher slept in cooperative members houses and took all meals with cooperative members.

The researcher established consistency (referred to as reliability in quantitative research) through the use of an audit trail, data triangulation, and reflexivity (Merriam, 2009). The audit trail consisted of the data auditing system (Table 1) of raw data, and also included dated personal notes, instrument development information, and proposal documents (Lincoln & Guba, 1985). Reflexivity, which is the process by which the researcher reflects upon him/herself as the primary instrument of data collection and analysis, was addressed through the reflexive research memo instrument (Appendix C).

Peer checking, which is a process whereby the researcher shares preliminary findings, conclusions, and analyses with experts was used to increase credibility and consistency.

Transferability (referred to as external validity in quantitative research), was established by providing rich descriptions of the findings (Lincoln & Guba, 1985; Merriam, 2009). Rich “thick” descriptions of qualitative data are highly descriptive presentations of the setting and findings which help readers apply the findings in other contexts.

## CHAPTER IV

### RESULTS

All of the results are associated with the original four original research questions, however because this research used a qualitative case study methodology following the naturalistic inquiry paradigm, the results are holistically presented by describing how one smallholder Guatemalan coffee cooperative was affected by the coffee leaf rust (CLR). The following seven themes were found during data analysis. They are described in greater detail in this chapter.

- The 2012 CLR epidemic represented one crisis of many for APCASA.
- The CLR brought significant changes to APCASA's livelihoods strategy.
- Despite setbacks, coffee would remain APCASA's focus.
- APCASA employed a wide range of coping mechanisms to fight CLR.
- Livelihood diversification was viewed as an undesirable necessity
- Assistance from external organizations represented friendship and frustration for APCASA.
- The lure of the international market excited APCASA's producers.

Unless otherwise noted, the researcher took all photographs presented in this section from November to December 2014.

## **Theme One: CLR Was One Crisis of Many**

APCASA members perceived the CLR as one crisis of many they faced in their lives. One member recalled the early years in Santa Anita, “Our first priority was [housing]. Our other priority was coffee. And so within these priorities we had a series of crises. First, with cultivating coffee, we had crises of prices. And now we have a crisis with the *roya*” (SI.11.4). Members described the crises they faced beginning first as children of poor peasants. Later the crises continued during their time as guerilla fighters. After becoming smallholder coffee producers, members described a series of crises continually affected their livelihoods. The CLR was perceived as a crisis that devastated members’ livelihoods, but nonetheless, was viewed as “just one more” crisis to affect the community. To understand how Santa Anita’s farmers were coping with the CLR epidemic, it was necessary to understand from where and how they arrived as coffee farmers whose livelihoods were affected by the *roya* in 2012.

### *The crisis of history*

All members described their childhoods as poor peasants. Most APCASA members were from the department of San Marcos who grew up on coffee plantations. In school, as children of peasants, some recalled discrimination against Mayan descent; being called “*Indio pendejo*” (stupid Indian), getting struck by the teacher, and made to sit in the back of the classroom (SI.8.1; SI.8.2). Their families usually lived on coffee plantations and had little or no land of their own with which to grow food. APCASA’s members frequently described feeling as though they were born into a crisis. Many described having a growing sense of inequality as they witnessed how the foreign-born



or *ladino* (of Spanish descent) children of *finca* owners were treated better than the poor landless children of farm laborers.

All of the members of APCASA decided to (or a direct family member) participate as armed members of the Guatemalan National Revolutionary Unity (known by its Spanish acronym, URNG) in varying years and duration (SI.1.4). The URNG was the leftist guerilla group that fought government forces during Guatemala's 30-year civil war from 1960 to 1996. APCASA members described the difficulties of losing friends, family, and community members during the armed resistance (Figure 5). They spent their time sleeping in the mountains that overlooked Santa Anita, evading the military, concealing their participation in the movement from their family, and eventually seeking refuge in the Mexican state of Chiapas, which borders western Guatemala. For many of APCASA's members, growing up poor and participating in the armed movement were crises that later shaped their perceptions of livelihoods when they arrived in Santa Anita.



Figure 5. The entrance to Santa Anita. In the forefront a sign reads "Welcome: Museum of the martyrs fallen in combat during the revolutionary struggle." A URNG political sign (an ear of corn) is to the right. The purple building is a government-funded school.

When the 35 founding members of Santa Anita and their families arrived on or about the community's official founding date of February 12, 1998, they were immediately presented with a new set of crises. The *fincas* had been abandoned for many years, along with many other *fincas* in the area, because of low coffee prices (KI.4.9; SI.5.1). Santa Anita's coffee trees were past their producing prime and had not been pruned or otherwise cared for in many years. One mentioned that the "coffee land was almost lost, almost like how it just grows wild sometimes" (SI.9.3). The *mozos*, or permanent coffee laborers who lived on the *fincas*'s property were working on other *fincas*. The indebted absentee owner had not been paying the *mozos* for "some time" (SI.5.2). There was no improved water or sewage service, and electricity existed only in the administrator's house. There was no housing for the 35 families; only a handful of one or two room "*ranchitos*" or cottages existed (SI.13.10). The biggest crisis was lack

of water. As one APCASA woman member recalled, “With water, we suffered a lot. The women especially [suffered]. There was no water. There is no river close to us” (SI.13.2). The women had to travel long distances to streams to which they would have to carry water in buckets back to their houses. At the time of the researcher’s visit, there were two streams near the residences. Each stream was approximately 500 meters from the closest residence. The paths to the streams from the residences were rocky, uneven, and steep.

Beside the lack of infrastructure, deciding how to make a living as coffee farmers presented the second crisis for the new residents of Santa Anita. Some possessed cursory knowledge about coffee. Most APCASA members came from coffee producing areas in San Marcos, however as one said, “Some of us knew a little, because I worked a little bit when I was young in coffee. But as a process, I didn’t know anything about coffee production specifically” (SI.1.5). Some members grew up in the mountains or *tierra fria* (cold land) and had never seen coffee cultivated (SI.2.15). As one member mentioned, “Also a lot of people who worked in coffee, worked for the boss, so they didn’t know how to work for themselves. It’s very different going from being a worker to a producer” (SI.8.5). One member reported that, “Well all of us came at the same time here. We all learned how to grow coffee together. Nobody knew anything about [coffee production] before. All we knew about was how to wage war. So we came here full of ignorance” (SI.9.1).

The *Fondo de Tierras*, or Government-run Land Fund organization, was created to address land distribution inequality after the civil war ended. The *Fondo de Tierras*

helped organize the sale of the *finca* to the new residents of Santa Anita. The *Fondo de Tierras* was the first external organization tasked to help the new coffee cooperative. The *Fondo de Tierras* provided agronomists to teach the new residents how to farm and produce coffee, however many interviewed by the researcher placed little value on this early technical assistance (SI.1.6).

The first priority when members arrived in 1998 was to build the community. The members resisted calls by the government-provided civil engineers to construct homes on small lots. The engineers suggested that one area be devoted to residential lots, and each lot should be 10 meters in width and 15 meters in depth, however Santa Anita's early leaders decided on constructing three residential areas with each lot measuring 20 meters in width and 30 meters in depth (Figure 6). The deep lots allowed members to grow trees for fuel wood, fruit trees, vegetables, and to raise animals (SI.2.50).



Figure 6. Residences in Santa Anita.

The second objective for the new members was to rehabilitate the coffee and banana producing capabilities of the *finca* (SI.2.5; SI.11.3; DA.22). The third and final objective was to “develop socially” (SI.2.5). As one early leader said, “This third objective was difficult as we were busy with the first two. So we were starting a new life” (SI.2.5). Members also realized in retrospect that education suffered in these early years as schooling was perceived as having little value in producing coffee (SI.11.3).

#### *The crisis of coffee prices*

Although APCASA members who were interviewed admitted their inability to precisely recall specific dates and figures, several told a similar story of their disastrous first “formal” coffee harvest. Initially, all adult male Santa Anita residents worked collectively to produce coffee. The community’s *junta*, or governing body, directed workers to specific coffee production tasks, and profits were shared by all equally. The first harvest netted 400 *quintales* (100 pounds is equal to 1 *quintal*) of coffee in *pergamino* (dried coffee beans ready for export, but still encased within the hard outer shell that must be mechanically removed before roasting). Although no APCASA member was able to remember the exact year of the first harvest, it was between 1999 and 2001. The price of one *quintal* of coffee was selling for approximately 600 *quetzales* in the time leading up to the harvest. The leaders decided to hold the coffee before selling it. They hoped prices would increase from Q600 to perhaps Q800. Instead, members remembered feeling shocked and depressed that the price went from Q600 to Q200 (SI.12.3; KI.1.11; SI.12.1). The cooperative finally sold their 400 *quintales* of

coffee to *coyotes* (coffee purchasing middlemen) in Coatepeque. To make matters worse, one member remembered

The coyote never even paid us half of what he owed us for the coffee we sold him! And many of us had debts with local people for the labor costs to produce the coffee. So, because of this, we had to pay these the debts and sell the coffee at this really low price. We sold the coffee to *coyotes* in Coatepeque. We lost a lot! And the *coyote* didn't pay us completely for the coffee, even today. He has never paid us completely! (SI.14.2)

Another APCASA member recalled, "To pay for the coffee workers and my food, I had to sell my crop for [Q200]" (SI.3.26). One document published in 2005, recorded Santa Anita's first harvest (of which the members were most likely recalling in the previous paragraph) as occurring in 2001. According to the document, this harvest netted 700 *quintales* and each *quintal* sold for 240 *quetzales* (DA.23.1).

Unfortunately, the new residents of Santa Anita began producing coffee during the "global coffee crisis" which reduced coffee prices to one of their lowest levels ever recorded. Before the crisis, coffee in the Colomba area sold for approximately Q1,300 to Q1,500 for a *quintal* of *pergamino*. Echoing the experience of Santa Anita's residents, one key informant who still grew coffee on his family's 500 *cuerda finca* in the same area as Santa Anita recalled, "During the crisis, coffee [sold for] Q200 to Q300 for each *quintal*. This was a serious crisis for many years. Many coffee producers suffered. They lost their *fincas*" (KI.1.11). This producer's yield went from 1,800 *quintales* to 250 during the crisis years. His family had no money to invest in fertilizers, fumigation, and

labor (KI.1.13). Fortunately, prices for Guatemalan SHB and HB coffee improved after 2002. The price for one *quintal* increased to a level between Q900 and Q1000 between 2002 and 2005 (SI.12.3). Thus, Santa Anita began their coffee production at one of, if not the worst, time for new entrants to the market.

*The crisis of money: Santa Anita's debt*

APCASA's members were given credit to purchase the abandoned *finca* in 1998 through the *Fondo de Tierras*. However this "credit" quickly turned into a debt. One member said, "The government lent us credit to purchase this *finca*. But they did not give us this land. Sometimes the government says they handed over land to us, but it's important to know that they didn't give us anything" (SI.2.2). The APCASA members that the researcher interviewed admitted they were not sure exactly how much they had originally borrowed collectively. They were also unsure of how much they owed individually. Two of those interviewed believed the debt to be between Q24,000 and Q25,000 and that the original loan was for between Q800,000 to Q900,000. Another member believed that the original loan burden for each member was Q65,000 and that the total amount owed was Q1,600,000, but that it had been reduced down to Q25,000 (SI.2.3; SI 13.3; SI.6.8). One document noted that the loan from *Fondo de Tierras* was for Q2,062,500 (DA.23.2). There was still much uncertainty about how much each member owed, because the government had been reducing the land debts of Santa Anita and neighboring smallholder coffee communities. One key informant who was a member of another local coffee cooperative reported that the government reduced their debt substantially after they joined a national political party (KI.4.7; KI.4.11). One

APCASA member thought it was possible that eventually the government would reduce the debt that Santa Anita's residents owed like the government had done with other smallholder coffee communities (SI.13.4; KI.4.8). At the time of the researcher's visit, the members reported not making any payments on the debt they owed for the *finca*.

While members perceived that the government would reduce the amount they owed, the debt represented a serious crisis for the new community, especially in the first years after they arrived. They were told that the annual interest on the loan was 12 percent and that they had to begin repayments after two or three years (SI.3.38). One APCASA member remembered those first years in Santa Anita

Before things were worse. The *Fondo de Tierras* would threaten us and tell us that you guys haven't paid anything. They told us that they were going to take away our land and that the interest on the loan had gone up and up. So we got really worried, like what the heck are we going to do? I thought that since I am with my husband, we will each pack up a blanket, leave Santa Anita, and go to my sister's house [in Guatemala City]. (SI.13.5)

After hearing these threats, Santa Anita's leaders appealed to the *Fondo de Tierras* by arguing that their improvements to the *finca* were equal to the original value of the land. There was no water, no roads, almost no electrical service, no formal housing, the coffee fields were abandoned, and all of the coffee production assets were in disrepair. They argued that a formal valuation of the land must be made before the *Fondo de Tierras* could carry out on their threats to remove them from Santa Anita. While nearly all of the APCASA members interviewed believed that the government would absolve most of the



debt they owed for the land, they were nonetheless worried in the early years that the debt burden was too much to bear. No individual member, or either of the two cooperatives in Santa Anita possessed the deeds to the land. Members could arrange the sale of their residential lots and houses through a lawyer, but not the coffee fields. One community member, who was a part of Association Maya, put his residence up for sale for Q50,000. One interviewee mentioned that the process of registering deeds had been slow not only because of bureaucratic inertia, but because in 1998 some of Santa Anita's residents originally gave false names or names closely resembling their legal names out of fear (SI.8.4).

#### *The crisis of the environment*

While the *roya* had affected Guatemala's coffee since 1984, prior to 2012, it had never been the main concern for coffee farmers in Santa Anita. Traditionally, the three most common threats to coffee production as described by members of APCASA were heavy rain, the *broca* (coffee borer beetle, *Hypothenemus hampei*), and the *ojo de gallo* (American leaf spot of coffee, *Mycena citricolor*) (Figure 7).



Figure 7. Infected coffee plant. The tree was defoliated from the *roya* and subsequently infected with *ojo de gallo* (indicated by the brown-yellow round spots).

CLR was not a serious concern for Santa Anita's farmers until 2012 when it surprised everyone. As one key informant who produced coffee near Santa Anita explained, "If we're speaking of general plagues, the *broca* is the most serious of all coffee diseases in the Colomba region...For us the *broca* was the most important plague against coffee production. It wasn't the *roya*, it was the *broca*. So, if you did not control the *broca*, your coffee production would decrease" (KI.1.4). Heavy rain also proved to be serious concern for Santa Anita's coffee producers.

One APCASA member recalled that finally in 2005, as a group, they felt like confident coffee farmers. It had taken nearly 7 years, but they were finally starting to

increase production. They went from producing 400 *quintales* of coffee in 1999-2000 to nearly 1000 *quintales* in 2005 (SI.9.22). A Catholic Relief Services (CRS) document listed Santa Anita's production at 1,100 *quintales* in 2011 (DA.2). Santa Anita's coffee farmers typically invested in their coffee trees for eight months from February to September and then harvested and sold coffee from October to January (coffee varieties ripen at slightly different periods and weather can affect harvest times). Hurricane Stan brought heavy rain and wind to Guatemala from October 1 to October 5, 2005. Hurricane Stan arrived just as harvest season was getting underway and Santa Anita's farmers were hoping to recoup eight months of investment. As one member recalled, "we didn't have a harvest because of the hurricane" (SI.14.3). Heavy rains and wind caused many of the cherries to drop prematurely. Roads and bridges were washed out which prevented seasonal migrants from arriving to help with the harvest. Even after Hurricane Stan dissipated, it rained heavily for the remainder of the month, and Santa Anita's harvest "was lost" (SI.3.34). For APCASA, the environment (i.e. weather, climate, and pests other than the *roya*) created crises for Santa Anita before the *roya* epidemic in 2012.

*The crisis of community: A fragmented Santa Anita*

From 1999 to approximately 2006-2007, all of Santa Anita's coffee producers were part of one coffee producing cooperative *Asociación Civil Maya de Pequeños Productores* (ACMPA; Mayan Civil Association of Small Producers). On August 9, 1999, 35 producers registered with this original cooperative with 980 *cuerdas* under collective production (DA.23.3). Coffee cultivation and processing was directed by an

elected group of farmers. They oversaw coffee farming activities, assigned workers to tasks, and administered funds. All producers shared profits equally.

As Santa Anita began producing more coffee and prices rose, internal rifts began forming among the 35 producers. There seemed to be no single cause for the separation of APCASA's 10 members from the *Asociación Civil Maya de Pequeños Productores* (commonly referred to as Association Maya). Of those interviewed, not one was able to articulate a single reason for the split or recall a specific event which caused the split. Most mentioned a growing sense of distrust, jealousy, and differences in opinion over leadership and strategic vision. One APCASA member recalled:

About seven years ago we [APCASA] didn't want to remain part of [Association Maya], so we became individuals. There wasn't any development. We received such a small salary from what we produced, so we demanded that each one have their own land. If someone wanted to be lazy then they could, if one wanted to work, then they could work...We were making good money [when we were united]. But when everything was going well, the Association Maya got more political influence. It became like an attraction. So, several members of the Association Maya took power from us and they threw us out. They kicked us 10 out and all that we constructed is now theirs (SI.1.11; SI.1.13).

Another member noted, "Because of problems we separated from the other group. We could never find a solution with them. Each person now works for themselves to get ahead" (SI.9.15). When one member was asked if there was a possibility of reconciliation between the two groups, the interviewee responded, "No...no...no, that will never

happen. We are happy to be free of them so we can do what we want to do and they can do what they want to do” (RR.5.1).

The split between the 10 producers of APCASA and the 25 producers of Association Maya was perhaps the most frequently spontaneously mentioned “incident” beside the CLR epidemic. Mention of the split came up in nearly every interview with the researcher, regardless of the topic or questions asked. Members of APCASA frequently mentioned that the members of Association Maya did not have the desire to work in coffee. One mentioned, “The majority of [the Association Maya producers] don’t want to work. Their land is abandoned. APCASA is the group that works more” (SI.9.15). The interviewee went on to explain that it was not fair that APCASA members were working harder than the other 25 producers when everyone was part of the same collective, “especially when [the Association Maya members] were making money outside while we’re working hard” (SI.9.16). Another explained that the Association Maya members did not have the discipline it took to produce high quality coffee for export; they felt it was too much work (SI.14.5). When the researcher asked one APCASA member if they could imagine what the Association Maya members would say about APCASA if the researcher interviewed someone from Association Maya, the APCASA member responded they would most likely claim that APCASA had been stealing from the cooperative.

The split between APCASA and Association Maya was a recurrent theme with APCASA members. They expressed happiness for being free to work together in a small, but dedicated group of capable coffee farmers. Yet, they also lamented how much

they had lost in exchange for this independence. The Association Maya retained control over nearly all means of communal coffee production, which included the large drying patio, coffee storage buildings, a professional industrial-grade coffee roaster, the “ecological” (uses less water) coffee *beneficio* or processing mill, an industrial coffee bean roaster, and several smaller internationally-donated community supplies such as ovens to bake bread, computers, and desks.



Figure 8. *Beneficio humedo* (wet coffee processing mill). Santa Anita coffee producers used this *beneficio* until 2009 or 2010 after which the ecological *beneficio* was constructed. APCASA members were considering (as of November-December 2014) using the *beneficio humedo* again, once production increased, because the Association Maya would not provide them access to the ecological *beneficio*. The channels in the lower right of the picture were used to bring water from a nearby stream so that the coffee could be “washed”. However, a recent (in 2014) storm caused a landslide, which diverted the stream away from the *beneficio*.

APCASA “surrendered” possession of these things, as they wanted to completely sever all ties with Association Maya (RR.5.2). APCASA decided to “take” control over an empty field approximately 750 meters from the residential areas. APCASA members planned that this area would be where they could re-constitute themselves as an independent coffee-producing cooperative. They were also considering re-opening the *beneficio humedo* that was used by the whole community before the ecological *beneficio* was constructed (Figure 8). An international fair-trade coffee importing group and international student groups donated funds to build a warehouse, a coffee drying patio, and a motorized coffee processor (DA.1; RR.5.3). The breakup of Santa Anita into opposing cooperatives represented an existential crisis for APCASA. One German fair-trade coffee exporter, Quijote Coffee, terminated their coffee purchasing agreement with Santa Anita because of the split. APCASA members also described the various international student groups and tourists who stopped arriving with the same frequency after the community split (Figure 9). For APCASA, they were left with no means to produce and market coffee.



Figure 9. Entrance sign to Santa Anita. As of January 2015, the website cited on the sign was functioning. APCASA members noted they did not have access to the website. The contact information listed on the website to arrange a visit do not list APCASA members' names.

#### *The crisis of (consumer) prices*

When Santa Anita's farmers began cultivating coffee in 1999-2000, prices dropped from Q600 to an all-time low of Q200 to Q240 per *quintal*. In 2002, prices began steadily rising. In November to December of 2014, APCASA members were content with the price of coffee. Coffee prices were generally Q1,000 for one *quintal* of *pergamino* although spot prices reached upward to Q1,075 if selling to the *coyotes* in Coatepeque (Figure 10) (SI.3.32; SI.5.8).





Figure 10. Weighing coffee. An APCASA member weighing *pergamino* coffee to be sold in Coatepeque.

While APCASA's farmers were happy about the price, they felt that the high price of consumer goods negated the high coffee prices. One interviewee said, "We began to suffer in the past few years because we didn't have sufficient income to match the inflation of the common food expenses" (KI.2.26). Another APCASA member recalled the era of low coffee prices in 1999-2002:

Although [coffee] prices were lower then, so were basic goods. So if the price of coffee goes up Q10, the price of meat also goes up Q3 per pound. So, I recall

when price of coffee was Q800, the price of cement was Q17 per *quintal*. But when the price of coffee went all the way up to Q1,200 and then back down to Q1,000, the price of cement is still Q73 or more. (SI.12.7)

Another APCASA member described how difficult it was to send children to the university or *diversificado* (the approximate Guatemalan equivalent to the United States' high school). He explained that *diversificado* costs were between Q380 to Q400 per month, and private universities cost Q700 to Q800 per month (SI.11.15). He said, "The farmer suffers a lot when his child leaves *basico* [middle school] for *diversificado*. Because in *diversificado* you have to pay, so for this reason we call it "el cuello de la botella" [the bottleneck]" (SI.11.13). The interviewee described that it was relatively easy to enroll your child in a local *basico* whose costs are covered by the state. However, *diversificados* were most often in larger towns and the costs were not covered by the state. Farmers must not only pay for enrollment, fees, books, and uniforms, but also transportation, which could be the costliest component of receiving an education.

Thus, while the price of coffee steadily increased since Santa Anita was formed, so had the prices of consumer goods in Guatemala. As one APCASA member said of higher coffee prices

But you know what happens? The prices of basic goods are the not the same. They go up. So, although the price of coffee has increased; the price of coffee might be good, but it's negated by the high price of food. We are blind if we just pay attention to the price of coffee and not the price of basic goods. So I feel we

are actually going back to the 1990s and 2000s [when coffee prices were low] (SI.12.6).

### *The crisis of the roya*

The latest and most pressing crisis perceived by APCASA was the *roya* (Figure 11). The *roya* had always been a problem for Guatemalan coffee producers in Santa Anita. It regularly weakened trees and decreased yields, but was seen as “a cough” instead of a “major sickness” (SI.8.21). The members would usually apply relatively cheap, but weak copper-based fungicides. If the farmers had the resources and the outbreak that year was more prevalent, they would apply stronger chemical mixtures such as *Alto 10* (with the active ingredient, *cyproconazole*). When the *roya* first appeared in 2012, nobody thought anything of it (KI.1.8). However, within a matter of weeks, the *roya* “surprised” APCASA and went from a “cough” that “always existed,” to a “major sickness” (SI.8.21). As one member described it, “All of the leaves turned orange.



Figure 11. *Roya* on a Bourbon coffee tree.

And if you entered the coffee fields with a white shirt you would end up covered in orange. So the aggressiveness of the *roya* was incredible” (SI.8.22). Members reported excessive defoliation was still prevalent in most fields (Figure 12). One key informant, and accredited agricultural engineer with a coffee *finca* near Santa Anita said, “It started burning the leaves. Our coffee was organic. This is why the rust took everything. By the time I was ready to do something it was too late” (KI.1.15). Another APCASA member said, “The *roya* made all the leaves turn yellow. I had no idea that it was going to turn into a huge problem” (SI.3.30). APCASA members described the CLR outbreak as “a knockout” (SI.2.44), “aggressive and invasive” which affected the best types of coffee (SI.2.28), “dangerous” and “criminal” (SI.1.3), and “a suicide” (SI.1.16). One member described the outbreak as “a tragedy right in front of people’s eyes” (SI.2.29).



Figure 12. Coffee plant weakened by the *roya*.

After APCASA got over the initial shock of the death of their coffee trees, they began to realize the lasting implications of the CLR outbreak. Less than two years later, as the researcher walked through the coffee fields, the coffee appeared green and healthy, however very little coffee cherries were present (Figure 13). As one member described it, “So you have seen the coffee trees around here. They have green leaves, but no harvest. These trees are only for decoration” (KI.3.29).



Figure 13. A deceptively healthy looking Arabica coffee tree. While the tree looked relatively healthy (e.g. green) and foliated, notice the small amount of cherries during harvest time.

The year of the outbreak affected the farmers’ livelihoods less than subsequent years as APCASA was still able to harvest the cherries after the leaves had fallen off. As

one member described, “That first year we were still able to harvest something, but then [in 2013] we were stuck thinking, ‘What am I going to do now?’” (SI.2.40). APCASA members were not sure what actions to take. They felt desperate, because they had no money to purchase fungicides (SI.5.16). There was panic, fear, and desperation not just in Santa Anita, but all across the *Boca Costa*, Guatemala’s southern coffee producing region (KI.1.41; SI.8.23; SI.5.21).

By the time APCASA realized the CLR was turning into an epidemic, they perceived it to be too late to do anything. One member described feeling “like I was dying myself and the future of my children was now not guaranteed” (SI.10.11). While the *roya* was affecting the coffee, world coffee prices in 2012 and 2013 dropped approximately 50 percent. According to one member, everything “*nos juntó*” (came together at us): A low harvest, low prices, and high input costs (KI.2.20; SI.4.8). When asked about what was done to fight the *roya*, one member replied, “Well, what can you do about something that has already happened?” (SI.9.9). One key informant had a similar response, “It would take too much money and effort to try and kill all of the *roya* that year, so what we did was let all of the coffee production suffer” (KI.1.9). Coffee production in Santa Anita went from a livelihood activity that brought in money, to one that lost money (SI.11.21; SI.16.8).

## **Theme Two: CLR Changed APCASA’s Livelihoods Strategy**

### *Coffee production losses*

APCASA’s main source of income was through the sale of their coffee. APCASA’s members planted five varieties of Arabica: Bourbon, Catimor, Catuai,

Caturra, and Sarchimor (SI.12.13). The *roya* had very little effect on Robusta compared to Arabica. Of the Arabica varieties, Bourbon was the most susceptible to the *roya* (K.1.3). APCASA members reported an average production decline of 73 percent attributable to the *roya* (Table 2).

Table 2. Self-reported Production Losses of Interviewees Attributable to the CLR

Source	Traditional/Expected production ( <i>quintales</i> )	Actual production post-CLR outbreak ( <i>quintales</i> )	Approximate production loss (%)
KI.16.7	36-40 <i>uva</i> <sup>a</sup>	8-10 <i>uva</i>	75
KI.16.10	N/A	“Half” of expected	50
SI.5.7	N/A	9 <i>uva</i>	N/A
SI.4.1	N/A	“50% ” of expected	50
SI.9.4	30-40 <i>uva</i>	3-4 <i>uva</i>	90
SI.3.31	10-20 <i>pergamino</i>	2 <i>pergamino</i>	86
SI.2.38	60 <i>uva</i>	6 <i>uva</i>	90
SI.1.1	120 <i>uva</i>	36 <i>uva</i>	70
SI.10.16	12-14 <i>pergamino</i>	3-4 <i>pergamino</i>	75
KI.2.15	12-13 <i>pergamino</i>	4-5 <i>pergamino</i>	67
Average Production Loss (%)			73

<sup>a</sup>Note. *Uva* (grape in Spanish) is the term used to describe a coffee cherry that has been picked, but not yet processed. Five to six *quintales* of *uva* will yield one *quintal* of *pergamino*.

Bourbon variety was perceived by APCASA members as the most worthwhile Arabica variety to cultivate, because it was thought to have the best flavor and the highest international demand. Despite the Bourbon variety being the most affected by the *roya*, APCASA's members planned to continue its cultivation into the future (SI.2.32; SI.12.13).

Interviewees noted that 100 percent of Santa Anita's coffee fields were infected with CLR in 2012. Approximately 30 percent of the trees recuperated, while 70 percent died off completely (KI.2.8). The APCASA members perceived that, while the *roya* did not necessarily kill the coffee plant directly, it allowed other diseases like the *ojo de gallo* and *mancha de hierro* (leaf spot, *Cercospora coffeicola*) to infect the coffee (KI.2.3). Many interviewees perceived that the *roya* affected their production yields in subsequent years (i.e. 2013 and 2014) more than in 2012 (SI.2.39; SI.4.6).

#### *Coffee plant losses from the CLR*

One of the biggest obstacles to overcoming the effects of the 2012 CLR epidemic was not the reduction in yields, but the permanent weakening of coffee trees. Arabica trees in the Colomba region typically required three to five years to reach the *ensayo* or the age of "first production". Many of APCASA's Arabica trees in Santa Anita were 60 years old or more when the CLR arrived in 2012 (SI.2.61). Agronomists who advised APCASA on how to combat the *roya* in 2012 and 2013 urged the cooperative to continually plant new coffee trees into their fields and to take out the old diseased varieties (KI.3.2; SI.3.37). APCASA was told that if the members did not renew their fields, then the *roya* would keep returning and could be just as destructive as the



epidemic was in 2012. Members were told that older Arabica varieties produced less and were more susceptible to the *roya* than the new cultivars. Generally, the older the coffee tree, the more susceptible it will be to disease. Although no formal quantitative survey was conducted on the amount of plants that were diseased and those that subsequently died, APCASA’s members reported that the majority of their coffee trees had been so weakened by the CLR that they effectively stopped producing. One member reported, “everything died” in his 10 *cuerdas* of coffee (SI.1.12). Another member reported 70 percent of his coffee dying (KI.2.8) and also estimated that less than 10 percent of the relatively young 70,000 saplings APCASA had planted collectively between 2008 and 2011 survived the *roya* (KI.2.61). APCASA decided to cut back or pull out the infected trees and reestablish their land with new coffee trees (Figure 14) (SI.9.6; SI.8.32).



Figure 14. A row of new coffee trees. Planted within the last three months.

The damaging effects that the *roya* had on APCASA's coffee can be traced back to what APCASA accomplished in the years prior. In July of 2009, a member of APCASA was interviewed on a Guatemalan television news channel about Santa Anita's coffee production and the recent international donations the community had received. During the interview the member noted that Santa Anita had worked for three years with Tufts University's Building Understanding through International Learning and Development (BUILD). As part of BUILD's assistance to APCASA, BUILD was donating 20,000 young coffee trees. According to the interview, the APCASA member noted that they were not only working with Tufts, but also CRS, the fair-trade importer Cooperative Coffees, and the social investment fund, Root Capital. Root Capital would donate an additional 30,000 young coffee trees. The interviewee described how it was "a very serious challenge and goal" Santa Anita had in planting 50,000 coffee trees in 2009. In 2010, he anticipated planting 30,000 young bourbon coffee trees. He described how these young trees would help Santa Anita's coffee farmers.

This is a three-year project, which is to say, 2009, 2010, and 2011. But the fruits of this project will be realized in 2012 and 2013. This is our vision for the future; to elevate production, multiply production. Here is greatest concentration of efforts in this community. Therefore, the message I would give to someone is that you have to make a community not just through organization, but also by having the initiative, vision, and strategies to see into the future. And like we were talking about before, I was commenting on how it's not enough just to have

land. You also need to know how to produce coffee, to know coffee, to plant coffee, and also how to sell the coffee (DA.12).

Five years later (in 2014), the researcher spoke with this man who had given the interview in 2009. The man reported (without any mention of the 2009 interview he gave) that of the 70,000 young bourbon coffee trees they established from 2008 to 2011, only 5,000 survived the *roya*. He stated this was, “incredibly disappointing for us” (SI.2.61).

The process of growing new coffee trees was one of APCASA’s most labor-intensive and expensive processes in coffee production. One APCASA member showed the researcher the process of starting new coffee trees (SI.12.13-SI.12.20). First, a farmer had to specially prepare three to five pounds of coffee beans (i.e. seeds). After gently air-drying them for one month, seeds were planted in a specially designed seedbed. The soil in the seedbed had to be decontaminated from weeds, fungus, and pests.

Decontamination was accomplished using several methods. The most popular method was to lay the soil out on a black tarp in full sun. Lime, ashes, and hot water mixed with the broth of cooked corn. These additives were used to further rid the soil of pests and balance soil acidity. Manure and mulch from processing coffee cherries were mixed into the soil as well. The seeds were planted, covered in a banana leaf or *costal* (burlap sack) material, and watered every two days for 30-40 days. After 40 days, the seedlings were transplanted. One plant was placed into an 8- to 10-inch tall cylindrical black bag weighing two to three pounds (Figure 15). The seedlings were left to grow in the bags

for one to two months while the fields in which to plant the new seedlings were prepared.



Figure 15. Newly transplanted seedlings. The seedling on the left is Arabica and the seedling on the right is Robusta.

The fields were primed by preparing holes 40 cm by 40 cm with a machete. The machete was used to break up and loosen the soil. Organic matter were sometimes mixed into the soil before planting. The new seedlings in the bags were then transported from a central location to the field to be planted. Santa Anita's coffee fields began as close to as 500 meters from residences and up to what the researcher estimated as one and one-half kilometers away. It would take 30 to 40 minutes for a farmer to reach a field. Typically one worker could prepare 35 holes and plant 35 new coffee trees in one day (SI.7.9). In

Santa Anita, only one road was maintained that was wide enough for a pickup truck. This road looped from residences out 500 meters and back toward the residences.

The vast majority of Santa Anita's coffee fields had to be reached on foot using paths that were rocky, uneven, muddy, and steep. To carry the new coffee trees, a *cacaxte* was used (Figure 16).



Figure 16. *Cacaxte*.

The long back of the *cacaxte* was attached to the waist and forehead of the user with straps. The seat of the chair was used carry the coffee trees. A farmer could typically carry 30 trees, with each plant weighing two to three pounds. Thus each trip consisted of carrying an average of 70 pounds for 40 minutes through uneven, rocky, muddy, and steep terrain. In January to March 2015, each APCASA member planned to

establish 900 to 1000 trees. In 2013, each member planted 800 new coffee trees (SI.4.17).



Figure 17. APCASA member with his new coffee trees. This field was established in the early months of 2013 and was one of the first rehabilitation efforts after the CLR epidemic arrived.

The costs of cultivating new coffee trees from seeds and establishing the seedlings in the fields was perceived as a serious time and financial investment. The need to re-plant coffee fields that had been planted with new saplings only a few years before was just as much, if not more of a shock for APCASA, than the production

declines from the CLR (Figures 17 and 18). Beside the financial and time investment required to grow and establish new trees, one member reported that it took three days to remove one *cuerda* of diseased or old coffee (SI.3.37).



Figure 18. A mature diseased coffee tree. In the background are small, recently planted, 12-16 inch tall, coffee plants.

Thus, following the advice of agronomists on how to combat the *roya* required a large amount of labor and financial investment for APCASA's members. As one member explained the process of renewing their diseased coffee, "Right now we're in the first phase [of responding to the *roya*]. When the trees grow then all you have to do is prune and take care of the shading" (SI.10.19).

### *Social and economic costs of the CLR*

APCASA members perceived themselves to be trapped in a paradoxical situation with regard to coffee production, livelihoods, and the CLR. Coffee prices increased from 2013 and 2014, yet there was little production in Santa Anita (SI.4.10). Members commented that they needed a harvest so they had money to invest in the next year's crop, but if they were not able to harvest anything because of the CLR's effects, then they would be unable to invest in inputs to improve next year's harvest. APCASA members lamented that they did not have the coffee to sell while market prices were perceived to be favorable. To produce coffee, APCASA's farmers invested in inputs and labor for eight to nine months out of the year. They had to buy "medicine" (i.e. fungicide to combat the *roya*), fertilizer, and to pay laborers to clean, weed, and properly shade their coffee fields (KI.16.9). As one farmer noted, "What you make in four months [of harvests] will affect your livelihood the other eight months" (SI.4.5). Farmers also had to balance the needs of their coffee trees with the basic needs of their family (SI.5.20).

How did families cope with less income? One interviewee replied, "Well, what we have to do is eat less. Eat less food, because there is nothing left to do. Just imagine if you eat three times a day and then multiply all of your family members by three meals. Do the math. Imagine how much money that it would cost to feed all of them. So you have to eat less" (SI.4.14). The "lean period" (i.e. when there was less money for food) for APCASA's families was from January to August. This was when investment was needed in their coffee fields (SI.4.12). With international help and the little coffee they could harvest and sell, APCASA's members had the ability to buy only what was



necessary such as corn, sugar, and “maybe” some tomatoes, but not milk, cereals, or meat (SI.4.15). One interviewee shared

Around here there is poverty. There are families that only make 30 or 40 *quetzales* per day. It’s an enormous amount of poverty. We have lived on only five *quetzales* per day before. Right now, no. Right now, I live better. I work outside, so I make money, but I had to learn how to do the job first... But the majority don’t have the same thing. (KI.3.34)

A health professional in a local government-run clinic reported that the causes of malnutrition were from a lack of income and the weak coffee economy. The health professional was unable to provide statistics showing the rate of malnutrition in the area, but did note that malnutrition was a serious concern in coffee-producing communities. In Santa Anita, there was a government-funded daycare center that served approximately 30 children between ages three and five, and an elementary school for children more than age five. One APCASA member expressed gratitude for the day-care center as it allowed mothers to search for work, and most important, provided breakfast and lunch to children. When asked about the state of Santa Anita’s food security she replied, “In this community, the children don’t suffer from hunger like in other communities” (SI.5.14).

Changing labor patterns was the most common response when asked how the CLR affected Santa Anita. Nearly everyone the researcher interviewed noted that the CLR forced smallholder coffee producers in Santa Anita to search for work outside the community. APCASA’s members perceived employment outside Santa Anita as a necessity, but also as a threat to their long-term coffee production capability. When the

researcher asked one APCASA member if people were working outside of Santa Anita's coffee fields, he replied, "Oh yeah there are a lot of people working outside. The problem is when you work outside, the income you make does not go toward your coffee trees. No, it goes toward schooling, health, clothes, and food for your family" (KI.3.5). The member later continued, "When the *roya* came we had to think of alternatives like searching for work outside of the community. If a father and his sons are working in coffee, now at least a few of them have to leave to search for work" (SI.3.29).

The most frequent destinations for those working outside of Santa Anita included other coffee plantations, Guatemala City, the state of Chiapas in Mexico, the United States, and the agriculturally-productive area around Guatemala's second largest city, Quetzaltenango (SI.2.35; SI.3.18; SI.4.18; KI.1.31). Nearly all APCASA's members and/or their family members had lived or had been born in Chiapas during the civil war. Many of the children of APCASA members had dual citizenship, making it easy for them to travel in search of work in Mexico or transit through Mexico on their way to the United States (SI.2.37; SI.3.23).

APCASA members also described that the CLR caused the hastening of one particular regional labor movement. Traditionally, the Mayan indigenous from the departments of Quetzaltenango, San Marcos, and Totonicapán would descend (sometimes by force) from their mountainous subsistence farming plots to work seasonally on coffee plantations in the *Boca Costa* region. They would reinforce the *mozos*, or permanent workers, during coffee harvest times, which usually came after the mountain corn harvests ended in November. However, since the global coffee crisis

depressed prices in the late 1990s, the large coffee *fincas* in Guatemala began to go bankrupt or were converting production to macadamia, rubber, palm oil, and cattle (SI.2.27). Several of APCASA's members mentioned that the large *fincas* had been downsizing and requesting less seasonal labor (SI.3.11; SI.5.22). Since the global coffee crisis, the demand for labor from the Mayan indigenous mountain towns decreased. Instead, it was the laborers who had worked on the now defunct coffee *fincas* who were migrating to the mountains to look for work. Members reported that this pattern reversal appeared to hasten since the *roya* epidemic in 2012 (KI.1.34; SI.3.6). One key informant whose *finca* employed up to 50 people was asked if laborers still came from the mountains to work in coffee. He responded

This used to be a normal occurrence. Because there was a lot of coffee production, a lot of labor was needed. A lot of people from the mountains, after they finished their harvest of subsistence crops, would come and work on coffee plantations. Since the coffee price crisis [of 1999-2002] this ended, and the same thing [is] now [happening] again with the *roya*. So, the phenomenon is now the opposite. People from the coast now migrate to the mountains searching for work, instead of the other way around. (KI.1.34)

Some APCASA members mentioned working their friends' coffee lands while the friends were in Guatemala City or Quetzaltenango working as security guards, bus attendants, and gardeners (SI.9.13).

APCASA members were also concerned about the effects that the perceived labor shortage would have on their coffee trees. This presented another paradox for

APCASA. On one hand there was not enough work for all since the *roya* affected production so drastically. One key informant who farmed coffee with his four brothers reported that they would usually employ 50 people daily for four months, but in 2014, they were employing no one (KI.1.27). Most in APCASA reported paying other Santa Anita community members, or laborers from neighboring communities, to help tend to their coffee fields. Temporary labor, especially from young men, was sought after to help shade, fertilize, “clean” (cutting the undergrowth that would compete with the coffee), and to prepare soil and plant new coffee seedlings. So, while there was generally less labor demand because of the *roya*, there were still labor needs at certain times. However, many young men had moved to Mexico, the U.S., and areas in Guatemala. APCASA’s members expressed concern about acquiring labor because if cherries were not picked within a certain amount of time after they ripen, then they will ferment on the tree (KI.2.22). Picking cherries also facilitated the growth of blossoms in which would then produce next year’s harvest.

There appeared to be a leveraging aspect with respect to labor in Santa Anita. To buy food and re-invest in the coffee fields affected by the CLR, members needed to search for work outside of Colomba. But, once they were away from their coffee fields, it was difficult to find labor back in Santa Anita to ensure that the money they were sending was being used to improve their coffee. One member described it as, “A lot of people have to go look for work and what happens is they then abandon their land. When and if they can make money, they pay people to work their land” (SI.3.20).

APCASA members were also concerned about how the *roya* would affect the youth of Santa Anita, which they perceived as the future generation of coffee farmers. Because of a lot of Santa Anita's youth were born in Mexico, they had dual citizenship, permits, or school papers allowing them to easily search for work in Chiapas' coffee, banana, mango, and cacao plantations (KI.3.8; SI.13.7; SI.5.12). Other youth had moved to Guatemalan cities to work, and many had enrolled in high schools and universities in those urban areas. There was a perceived fear among APCASA that youth would forget about coffee farming. Members expressed the perception that once they had received a professional degree they would not want to return when coffee production improved. One interviewee pointed to the fact that youth were only paid Q20-25 per day to work on a plantation, whereas they could earn at least the official Guatemalan minimum wage of Q78, if not more, in an urban area (KI.2.25).

An additional social and economic cost of the *roya* frequently mentioned by members of APCASA was the personal loans they took out to cope with the production losses of 2012-2013. They mentioned that local branches of the *Banco de Desarrollo Rural* (Rural Development Bank, commonly known as *Banrural* in Guatemala) provided loans to APCASA members. These loans were to be invested in their coffee, however they spent it to purchase food for their families (KI.16.11). One member described how families were able to cope with a sharp drop in income because of the *roya* during a focus group meeting with the APCASA's *comité de mujeres* (women's committee).

Well the truth is we have taken out loans. The months that are hard we take out a loan from the bank. So our hope is that the coffee will allow us to pay it back

over the years. So the months of January and February...well really, all of the months are hard. Also others have sold firewood. Because you have to think where is the money going to come from to invest in the coffee? The bank is giving us money to invest in our coffee, while we spend what we have to support our family. The bank might give us Q3,000, Q4,000, or Q5,000. If the bank knows you, then it will give you Q6,000. To invest in what you need in terms of fertilizer and chemicals you need at least Q3,000 for your coffee trees. Selling firewood is one way to make money [Figure 19]. The banks might give us two years to pay back the loan. So the monthly payments are Q300 and Q400. (KI.16.12)



Figure 19. Firewood. The wood came from a member's coffee field. It could be used to fuel the owner's cooking fire or sold in the local market.

Members were apprehensive about taking out loans that were to be invested in their coffee trees, but which at least a portion being used to buy food for their families. They were fearful that they would not be able to repay the loans. They also worried about the strength of the banks as “a lot of people are in debt” which could destabilize banking in the future (SI.11.38).

APCASA’s members frequently mentioned the “coffee production chain” and how the *roya* had weakened or broken the chain. One member asserted that one coffee field could support 50 or 60 people when considering those (and the families who relied upon them) who were paid to clean, shade, establish new trees, pick (i.e. harvest), and process (SI.15.3). APCASA’s members would frequently pay other Santa Anita community members to provide labor in their coffee fields. When coffee needed to be “cleaned” or shaded (cutting the limbs of trees above the coffee), they would pay between Q30 and Q40 per day of work. Because all of APCASA’s members were selling their coffee individually in Coatepeque (some members sold their coffee to fellow members who then took the coffee to market in Coatepeque), they paid Q200 for a pickup truck to take them and their coffee to the market (Figure 20).



Figure 20. Taking coffee to the Coatepeque market. The owner of the coffee paid Q200 to the driver to take him to the town to sell his coffee. Notice the coffee in *pergamino* drying in the background on black tarps. Because APCASA had no access to the central patio controlled by the Association Maya, and the newly constructed patio was located far away from the residences, most members dried their coffee outside their homes.

APCASA members commented that the *roya* had not only affected them, but was also affecting the “people who don’t have coffee too” (SI.5.9). As one APCASA member described

Here you feel the circulation of trade. The small producer has money to spend, especially during the months of December to February. During this time of year, there is a lot of buying and trade, but this year there was not. This year the stores don’t have a lot of business, all because of coffee. Because, who buys at the stores are the small coffee farmers and laborers. The large producers export their products, and they live and purchase goods in large supermarkets in Guatemala City, while the small producer is the engine of the economy [in Colomba]. (SI.11.31; SI.11.32)



*CLR and organic to conventional coffee production in Santa Anita*

During the researcher's visit, APCASA members voiced their strategy of forgoing organic coffee production in favor of conventional. For at least seven years APCASA, and APCASA's predecessor, the community's unified cooperative Mayan Civil Association of Small Producers, grew organic coffee for export (Figure 21).



Figure 21. Santa Anita's organic brand. The coffee roasting building on the left (of which APCASA had no access) still advertised organic coffee as of December 2014. An old photograph on the right is showing Santa Anita's organic coffee for sale in Quetzaltenango.

As one member explained, “Before when we were a united community, we exported coffee to the U.S. So we all grew our coffee organically. We didn't use chemicals at all, because we worked collectively” (SI.9.19). One reason why APCASA's producers slowly decided to produce coffee conventionally (e.g. the use of synthetic fertilizer, chemical fungicides, and pesticides) was because of the loss of export agreements (SI.12.19). Local coffee buyer middlemen, often referred to as *coyotes*, did not pay producers more for organically grown coffee (SI.1.19; SI.3.32). The *coyotes*

were concerned about three aspects; from what region was (i.e. what altitude) the coffee was grown, how “clean” it was (i.e. whether it was primarily first class beans) and most importantly, whether it had the right moisture content (KI.3.21). Coffee that was warehoused with too much moisture would spoil. As one APCASA member explained, “Those *coyotes* don’t ask whether it is organic or not. They want to know its quality; that it is dried right and is clean” (SI.15.6).

APCASA’s members recalled growing organic coffee as difficult. They grew organically because international, fair-trade, importers desired organically certified coffee (SI.10.15). One APCASA member explained the difficulties of using organic fertilizer

The problem with organic fertilizer is that it takes a lot of labor to carry and apply. It’s not easy. For example, for every pound of chemical fertilizer, you would need to carry three or four pounds of organic fertilizer to be equivalent. So for two *cuerdas* of land I would need to carry six *quintales* of organic fertilizer from my house to my fields, but if it is conventional then I only need to bring one *quintal*. Also you have to think about the time involved. To spread organic fertilizer it would take me at least two days, but the conventional would take me three hours. (SI.10.14)

Another APCASA member mentioned that the cooperative members used to clean their coffee fields every two or three months, but by applying herbicides, they cleaned their fields only twice a year (SI.9.21). Even when Santa Anita produced organic coffee, there was disagreement in the community about whether it was worth the extra labor, costs,

and discipline (SI.2.12; SI.14.6). Association Maya's members dislike for the extra labor and discipline required to produce organic coffee was cited by APCASA as one reason for the split between the two groups. So, "one by one, little by little" Santa Anita's producers began applying chemicals to their coffee after the export agreements ended (SI.9.20).

The *roya* appeared to strengthen the perceptions of APCASA's members that, barring an agreement with an organic coffee importer, conventional production would continue. All of APCASA's members reported converting their land to conventional production. They noted that the *roya* had weakened their coffee so much that the only way to save it was by applying chemical fungicides and synthetic fertilizers (SI.1.17; SI.1.18; KI.3.3). One recalled his friend who had a coffee harvest in 2014 because he sprayed chemicals in 2011 and 2012, which prevented the *roya* from spreading; the interviewee was left with no harvest. In his words, "I believed in organics. Not now. I will die of hunger believing in organics. If it wasn't for chemicals we wouldn't have trees" (SI.7.20). APCASA members spoke frequently of the discipline it took to produce organic coffee for export. They also spoke about the pride they felt knowing international consumers valued their organic coffee (SI.10.20). Yet, the termination of their export agreement coupled with the *roya* had led Santa Anita's production to shift to conventional.

### **Theme Three: APCASA Utilized Varied Coping Mechanisms**

#### *Coffee farming attitudes and how attitudes shaped the CLR response*

To better understand the coping mechanisms and livelihood strategies APCASA

used to respond to the effects of the CLR outbreak, it was necessary to understand the members' attitudes about their vocation. APCASA's farmers perceived themselves to be both fortunate to have prime coffee cultivating land, but also apprehensive about the risk they were assuming as small producers. This perception seemed especially strong after the recent *roya* outbreak. Additionally, APCASA's members expressed pride of their occupation and of their coffee, but were also aware of the structural difficulties they faced as smallholder farmers.

Many in APCASA expressed a feeling of hope. All were emphatic that they would continue growing coffee, despite the *roya*, price fluctuations, and internal turmoil in Santa Anita. Several members told stories of their childhood and the time spent fighting during the civil war in San Marcos as reasons for being hopeful. All of the members came from peasant backgrounds where the most productive land was owned by large *fincas*. Their families owned very little (if any) land. Now they were proud to be smallholder coffee producers. Most rural Guatemalans dedicate themselves to some form of subsistence farming. The crops they produce are meant for local consumption. However with coffee, as one member explained, "With coffee no. Coffee is different. You can make a living with coffee. We have a market in Germany and the United States!" (SI.7.18). Coffee farming was seen as something completely different than being a typical Guatemalan farmer growing corn, beans, squash, and potatoes. Coffee was perceived to be a "global product" (SI.4.4). One of APCASA's leaders said, "We see coffee as the ambassador of our friendship with people from other parts of the world.

It's great that they say they're going to drink coffee from Santa Anita. It's coffee with a history!" (SI.2.53).

APCASA was adamant about remaining progressive coffee farmers. They felt pride and hope, because at one time their coffee had been exported. But, in another way, APCASA members perceived themselves to be like passive bystanders to economics. As one member commented, "We have always worked here in coffee. We suffer what we have to suffer, but this is where we make our living" (SI.11.20). Another noted that they had been coffee farming for 16 years, which he described as being "practically new here!" (SI.2.1).

Members also described the perceived risk of being a smallholder farmer. They pointed out that in Guatemala there were no subsidies to farmers. Credit was very hard to attain through government programs. One said, "Here, the farmer has to be an adventurer" (KI.2.18). Farming was seen as "not easy" and "complicated"; something that took quite a lot of financial and labor investment (SI.12.18). They felt the responsibility of producing coffee and providing income for their family, because as one member shared, "our country and the instability here will not generate employment opportunities" (SI.11.18).

They felt they had been given a great opportunity, an opportunity that was rare among rural low income Guatemalans with little to no formal education. One member described the opportunity this way, "God gave us the opportunity to plant coffee, but we can't wait for him to grow the crops himself. So we are lucky to have survived the war. We are also fortunate to have a bit of land" (SI.2.49). Another member felt "good",

“lucky, and “blessed” to be a small coffee producer, but that it was up to them to “dominate the knowledge of our plants. We have to be good workers, producers, and sellers of our coffee” (SI.8.6).

Therefore, one of the coping strategies that APCASA employed was a change (or reiteration) of attitudes. When asked about the *roya* and APCASA’s view of coffee farming in the future, one member replied, “Well we have hope for the future of coffee. When we plant coffee we hope for a good harvest. But someone who does not plant new coffee, well they have no hope for the future” (SI.5.5). Another referenced the large private *finca*, which abutted Santa Anita

Sometimes I think I am crazy. Why? Because I want to grow my coffee like them. I want to produce more, learn more, and improve my coffee crop. Maybe I’ll never reach their level of production, but I want to. I want to make more money...with the *roya*, all of my hopes were lost. But the coffee I have right now is growing well. So, I am doing better now than before. Getting better is my intention. (KI.3.32)



Figure 22. A comparison of *finca* growing operations. Notice the different appearance in growing environments of a private *finca* (left) and an APCASA member's coffee field (right) with private *finca* appearing to control more for extraneous vegetation.

Private *fincas* in the Colomba region were typically large (1000 *cuerdas* or more) and owned by one person or a family (Figure 22). The owner(s) usually did not oversee production, but delegated authority to the administrator, assistants to the administrator, and the field laborers. Private *finca* owners had the ability to invest in their coffee for three or four years, despite having little to harvest (KI.1.17). The private *fincas* in the area were perceived by APCASA members to be owned by foreigners or politically active Guatemalans (KI.3.30; KI.2.21). Nearly all APCASA members were asked about whether they planned to continue cultivating coffee, or whether the *roya* had been such a shock, and such a devastation to production, that the investment was not worth the risk. All responded that APCASA had decided to fully continue, if not expand, coffee production.

APCASA, nor any other farmers the researcher interviewed, recalled believing that the 2012 CLR epidemic would be such a destructive force to their coffee. It was a

crisis for APCASA, yet they viewed the crisis as an opportunity to improve. As one member explained, “The *roya* gave us an opportunity to enrich our ideas about how to grow coffee, not to cry or flee, but to stand up, think, and make decisions” (SI.8.27). The *roya* forced APCASA to generate new ideas, seek out help, and rejuvenate their coffee fields. They realized they had to design “tactics” and “instead of going backwards, we’re going forwards” to combat the *roya* (SI.4.17; SI.8.25). Many in APCASA referenced the other Santa Anita cooperative, Association Maya, and expressed doubt that the Association Maya had the right attitude about coping with the CLR. APCASA members perceived themselves as the harder workers; APCASA was the better-organized and capable cooperative. They told the researcher that many of the Association Maya members were not investing in their coffee trees after the CLR forced them to search for work outside of Santa Anita.

#### *APCASA’s agricultural response to the CLR*

APCASA’s strategy to recover from the effects of the 2012 CLR epidemic and insulate itself from future outbreaks utilized several approaches. The members realized that it would take more than one approach to control the *roya* (SI.8.31). The first approach, which was described earlier in this section, was to renew APCASA’s fields with young coffee trees. These trees were a mixture of Bourbon, Sarchimor, Catimor, Caturra, and Catuai. Bourbon, despite it being the most susceptible to the *roya*, was being planted more than the other varieties. Growing and establishing new coffee trees appeared to be the first priority for APCASA, yet this step also required the most labor and financial investment.



APCASA's renewal strategy was to focus on five *cuerdas* of land each year. They felt that if they focused their time and energy on renewing those five *cuerdas*, they would be more successful than attempting to reestablish the entire 30 *cuerdas* each cooperative member owned. As has been previously described, APCASA completely gave up growing coffee organically. In 2014, they reported fertilizing and applying chemicals to these five *cuerdas*. Their objective with these five *cuerdas*, and the five *cuerdas* they would plant each subsequent year, was "thinking long-term" (SI.2.45; SI.8.34). The first five *cuerdas* were expected to begin bearing fruit in 2018 or 2019. In 2014, APCASA established 8,000 new trees and planned to establish a further 45,000 new coffee trees over the next five years (SI.2.58). Unlike the large private *fincas*, APCASA members perceived that they did not have the resources to control the *roya* with fungicides and fertilizer (SI.3.5). APCASA members mentioned receiving a small amount of fertilizer and fungicide from the government and the U.S.-based coffee importer/NGO, De La Gente (SI.9.10).

Beside establishing new trees and applying chemicals, the other approach APCASA believed would help control future CLR outbreaks was proper shading. APCASA members described coffee shade as an important variable to *roya* control. This approach was valued because it required little financial investment. By climbing a tree with a machete, a coffee farmer would cut the tree branches growing the most vertical while leaving the more horizontal branches (Figure 23).



Figure 23. Coffee shading. A recently cut tree to provide shade for the coffee below. Shading was regarded as one of the most labor intensive and dangerous jobs in the coffee production process.

The objective was to manage the shade, thus leave the coffee trees with three or four hours of direct sun, and four or more hours of indirect sun. More shade was viewed

as retarding CLR growth, but it would also reduce production. Less shade would increase production, but increase CLR growth. A farmer could control the CLR on a full sun coffee plant, however it would require purchasing fungicide and fertilizer so the plant would be strong enough to resist the *roya* infection. With little money to spend on inputs, APCASA felt managing the proper shade was an effective method to balancing production and stopping the CLR (KI.2.1; KI.1.36; KI.2.32; SI.8.31).

#### **Theme Four: Coffee Would Remain the Focus**

Throughout visits to Santa Anita, the researcher asked members about the future. Would they continue growing coffee despite the threats of another CLR epidemic? Would they switch to other crops or search for off-farm employment? One member described their rationale.

The other reason why we are sticking with coffee is that we know how to grow it. We know coffee well – how to grow it, process it, and sell it. For example, take a lawyer who studies and becomes licensed. He loses five cases in one month. What is he going to do? Become an engineer? No, he's going to continue being a lawyer. It's the same thing for us as coffee farmers. (SI.8.29)

Despite continual crises and the threat of another CLR outbreak, APCASA's members remained wholly committed to producing coffee as their primary livelihood activity.

APCASA recently built a coffee storage building, a concrete patio for drying coffee, and had a coffee demucilager (cherry fruit de-pulper) donated to them. They had also built a shaded nursery for coffee trees, which during the researcher's visits, was full of young coffee trees. Zion Coffee Company of Massachusetts donated the fruit de-

pulper, whose donation was facilitated by De La Gente (DA.1). The young coffee trees were donated by De La Gente (Figure 24).



Figure 24. Recent international donations. Clockwise from top left: A hand crank de-pulper (not donated, but presented for comparison purposes), the demucilager meant to replace the hand cranked de-pulper, the warehouse, and new coffee plants.

The coffee storage warehouse and patio had been constructed in 2013, prior to the nursery and fruit de-pulper donation. De La Gente and an unidentified Rotary club

donated the warehouse, while the patio was part of a university student service-learning course. These donations would give APCASA the ability to grow, process, and store coffee in an area separate from Association Maya. When the 10 members of APCASA decided to split from Association Maya, they lost their rights to use the community's patio, storage, and ecological *beneficio*.

These relatively recent donations, meant to help APCASA's farmers through the CLR crisis, were aimed at helping APCASA's future ability to continue with coffee as their primary livelihood activity. As one of APCASA's leaders stated, "Coffee will remain the main source of income here" (SI.2.51). Despite the disunity with Association Maya and the subsequent loss of export agreements, APCASA members were optimistic about the future. During a focus group meeting with APCASA's women's committee, one explained their organization.

I believe that a good group will get ahead more than just a big group. A small group can work with harmony and love, even though it's a small group. With a big group, a lot do not attend [meetings] or participate, so for me this small group is getting along good. (KI.16.3)

Another APCASA reiterated this sentiment by stating, "To be 10 and strong is more important than to be many, but not work well" (SI.2.54).

For APCASA members, the cooperative had both advantages and disadvantages. Creating a cooperative provided the members with a method to legitimize themselves to the outside world. They pointed to the researcher's presence and noted that anyone could publish a solicitation on the Internet and accept visitors, but by forming an association, it

enabled the members to project their work out and give legitimacy to external audiences (SI.16.4). The members also perceived that to be able to export coffee to the United States, Canada, or Europe, they needed to form a cooperative (KI.16.1; SI.8.18; SI.10.7). Beside coffee, forming APCASA also provided a feeling of security for the members. A cooperative could help manage social and community projects or provide scholarships to students (SI.8.17). The disadvantage of APCASA as described by the members was that it was a small association (SI.10.8; KI.16.2) APCASA officially had 10 producers, but one producer was “not active” and one producer was recuperating from a serious car accident, leaving only eight active producers.

#### **Theme Five: Forced to Diversify Livelihoods**

APCASA members reported that the CLR forced those living in Santa Anita to utilize multiple short-term coping mechanisms. Taking out loans, eating less, and searching for off-farm employment opportunities were the most frequently mentioned coping mechanisms. While APCASA members agreed that they would remain coffee farmers, they noted that the CLR caused them to consider long-term livelihood diversification strategies. Members perceived these diversification strategies as necessary, but destructive to the overall focus on coffee production.

Many of the short-term coping strategies previously described as reactions to the *roya* were also perceived to possible long-term coping mechanisms. Santa Anita’s coffee farmers had used these coping mechanisms before the 2012 CLR outbreak, and reported that they would most likely continue to in the future, even if the CLR’s threat diminished. Therefore, there was an overlap between what members considered short-

term coping mechanism and what was perceived as a long-term livelihood diversification strategy. Off-farm migration in search of employment was the most frequently mentioned livelihood diversification strategy that also served as a short-term coping mechanism. The months of January to August were the most common time coffee farmers or their family members migrated in search of off-farm employment (SI.4.19). Migrants traveled to Mexico, Guatemala City, Quetzaltenango, and the United States. Quetzaltenango was a favored destination as it was less than two hours away by bus and offered urban and agricultural employment. Guatemala City was six hours by bus and offered migrants jobs such as a construction laborer. Several APCASA members reported having family members living in Guatemala City, facilitating a move there. Mexico appeared to be the third most frequent destination (the bordering state of Chiapas especially). Members traveled to Chiapas to work in mango, plantain, banana, coffee, and cacao plantations. This destination appeared to be favored by youth of Santa Anita. Many youth had been born in Chiapas and had the necessary permits (including citizenship) to work and travel freely in Mexico (KI.3.8; KI.3.10; SI.3.23; SI.5.12; SI.5.13; SI.5.11; SI.5.12).

Employment in coffee *fincas* was not perceived to be a long-term livelihood diversification strategy. Coffee laborers were paid a minimal salary of between Q25 and Q40 a day, although Q30 was the average rate (KI.3.11; KI.3.12). APCASA members and their families decided they would rather devote the time and labor investment to their own coffee fields and forgo payment for the eight months until harvest time instead

of working for another coffee *finca*. Maintaining coffee and harvesting was accomplished almost entirely by hand in the Colomba region (Figure 25).



Figure 25. The researcher harvesting coffee.

Machines were sometimes used during processing, however the bulk of jobs required the use of two hands and one machete.

The most common jobs available to coffee laborers were cleaning, shading, pruning, fertilizing, establishing new coffee trees, and harvesting. An adult male coffee laborer was expected to be able to harvest at least one *quintal* of *uva* in one day of work typically lasting from 6:00AM to 2:00PM. The researcher assisted APCASA members in harvesting and cleaning coffee and recorded reflections of the work (RR.3.1-RR.3.5).



Cleaning coffee was difficult, “back breaking”, sweaty, and exhausting work. To clean coffee, a worker would have to crouch and cut horizontally with a machete. After the brush was cut from a height of two or three feet, the worker had to then swing the machete at or below ground level into the soil (Figure 26). It was exhausting work.



Figure 26. “Cleaning” coffee. An APCASA member showing the researcher the proper way to cut away vegetation growing around a coffee sapling.

A machete weighed five to six pounds, but felt much heavier when used to cut horizontally (e.g. like a lawnmower blade) instead of vertically (i.e. chopping). The most exhausting part of cleaning coffee in Santa Anita was that it was shade grown on steep mountain inclines. Moving around on steep, sandy, and uneven land was very difficult and dangerous with a machete in one hand. There was little preventing one’s accidental

descent, so keeping a careful foothold on the slope was essential. The coffee farmer with whom the researcher helped clean coffee noted that the most dangerous work was shading. To shade coffee one must climb a tree and hack away branches with a machete. Another member recalled a time he almost died after cutting himself while shading. He was shading and his machete got caught in a branch above his head, which changed the trajectory of his downswing. The machete hit his hand and wrist creating a deep cut. He reported that it took more than an hour to reach a hospital at which time he was nearly dead of blood loss. It took him nearly nine months to recuperate to begin working in his coffee fields again. Another member noted that it was not unusual to hear about a coffee farmer falling from a tree while shading and being impaled by a coffee tree stump upon landing. Cultivating coffee was difficult work and this was one reason why APCASA's members desired to work in their own land instead of laboring on another's.

APCASA members used a wide variety of livelihood diversification strategies inside the Santa Anita community. The most common strategy was to grow other crops in their coffee fields or in their residential lot. Members had banana, orange, lime, *pacaya* (flower of the date palm), avocado, *guisquil* (squash-like; also known as chayote), *camote* (sweet potato), *malanga* (a cousin of the taro root), beans, corn, rambutan, plantain, and other fruits and vegetables growing in the back of their residences. In their coffee fields, the researcher saw banana, corn, beans, *guisquil*, and sugar cane being cultivated (Figure 27).



Figure 27. An APCASA member's banana tree.

Banana was the most frequently cultivated crop in the coffee fields, even though members reported production was limited by disease and the *tuza* (a species of gopher). APCASA utilized the common land around the warehouse and patio to grow beans, corn, and sugarcane (Figure 28). One APCASA member also had an apiculture (bee keeping) project on his land (Figure 29).



Figure 28. Food crop cultivation. An APCASA member's beans growing in the commonly-held campo (open field).



Figure 29. A member's apiculture project.

Members reported that diversifying into food crops like corn, beans, and guisquiles helped them provide food for their family to eat since the 2012 CLR epidemic. However, as one member noted, corn and beans did not grow well in the

heavily forested and poor soil of Santa Anita (SI.9.11). One member explained, “I can plant corn and beans, but that will not guarantee me anything. I think of my kids. What can I do to guarantee their future? I am getting older now” (SI.10.12). One farmer had planted macadamia within 10 *cuerdas* of his coffee fields, but only one *cuerta* each of banana and beans (Figure 30) (SI.2.48).



Figure 30. Macadamia sapling. The plant is approximately 24 inches tall; planted one year prior within coffee fields.

APCASA members were not convinced that corn and beans would contribute to their livelihoods. As one member explained, “If we all plant corn and beans, the problem is that if you planted five *cuerdas* of each you will make very little money while with coffee you can make money in the international market” (SI.7.16).

The destination for non-coffee agricultural produce was the local market in Colomba. Members reported selling two items in Colomba, banana and *guisquiles*. *Guisquiles* could be sold in town for Q0.75 each while banana could sell for between Q2 and Q4 for a dozen of the “*manzana*” variety. However, members reported that selling produce in the local market was generally not profitable. Many times when they arrived with *guisquiles* or bananas there were other small producers who were also trying to sell these products. Sales were difficult to obtain (SI.4.2; SI.6.1). Chickens were also being raised in many of APCASA members’ residences. These chickens were consumed by the family, sold to other Santa Anita families, or sometimes sold at the Colomba market (Figure 31).



Figure 31. Chicken coop in the back of a member’s residence.

Some families operated *tiendas* (stores) out of their houses which would sell candy, margarine, bread, or soft drinks. One APCASA member operated two *molinos* (corn milling machines). Residents would begin arriving before 5:00AM to mill their corn to make *tortillas*. The member who had the *molinos* reported that he had recouped his investment of the purchase of the machine in one year, six years ago. He charged between Q0.75 and Q1.25, depending on the amount of corn to be milled. The *molinos* provided him with “six years of making money” (SI.10.1).

Prior to 2012, international donors helped Santa Anita create non-agricultural income diversification projects. Santa Anita’s women’s committee were given sewing machines and training on how to use the machines to make textiles for sale in Quetzaltenango. They were also provided ovens and training on how to make banana bread to also sell in Quetzaltenango. A chicken farm and egg production was a third project that Santa Anita was involved in prior to the 2012 CLR outbreak. During the researcher’s visits, these projects all appeared to be non-existent. The APCASA women’s committee reported that they thought the banana bread and sewing operation had ceased after group split. They also reported that egg production was no longer ongoing, although Santa Anita’s entrance sign still advertised fresh eggs (Figure 32).



Figure 32. On-farm income generation. The sign to the right of Santa Anita's entrance advertised, "For sale: Fresh eggs, small and large purchases."

Association Maya controlled these three aforementioned projects after the groups split, thus APCASA had no access to those resources.

Diversification was seen by some in APCASA as difficult and a distraction to coffee production. Both banana *and* coffee used to be cultivated in Santa Anita. When the 35 original families arrived in 1998, banana trees were growing and there were plans to make the production of banana a commercially viable option (DA.23.2). One document from 2005, noted that Santa Anita had approximately nine banana trees in each of the 650 *cuerdas* of coffee (DA.23.2). However during the researcher's visits members noted that banana was no longer cultivated in Santa Anita. "A disease" came and killed much of the banana (SI.3.36; SI.1.10). While some banana trees did exist in Santa Anita, the researcher noted that they were being attacked by *tuzas* (gophers) or



affected by diseases. It was labor intensive to search for the *tuzas* and one APCASA member reported that the poison used to control *tuzas* was expensive (Figure 33).



Figure 33. A field of bananas. The holes were created by the *tuza* and the farmer attempting to locate the animal.

One member described the problem Santa Anita had attempting to diversify production into more than one cash crop.

One decision was to take 10 *cuerdas* of each member and plow it all under and grow banana instead. But I will tell you I have bananas and they are full of all kinds of plagues and bugs. So this is the problem with diversifying. If we grow

avocado, the trees will start rotting with sicknesses. Or mangos, oranges, and others. The [coffee] *roya* needs a spray control, just the same as bananas, oranges, and mangos. So to diversify just creates more problems. But one thing we did was diversify into consumer crops. This means we should have one principal crop for the market and then other diverse products to consume like corn, beans, or bananas. Or for example cilantro, peppers, *guisquiles*, or green beans. So diversity is a good idea for things that we will consume ourselves as these trees don't require chemicals. If we lose the crop it's not a big deal.

(SI.8.28)

Another member noted that several coffee *fincas* in the Colomba area had converted their land to macadamia over the past few years. However, they noted that macadamia would create a problem for Santa Anita. Macadamia trees required full sun and they did not grow as broad trees that could shade coffee. Instead, the members explained that the macadamia competes with coffee for the sun, so that diversifying one's coffee fields with macadamia would only create more problems (KI.3.13).

One member described the problem with diversifying in their fields, "Right now for us to diversify; it's difficult because in the middle of coffee you can't grow vegetables. The vegetables compete with the coffee" (SI.7.14). The only evidence the researcher saw of APCASA's members cultivating another crop for sale outside (i.e. a crop with international demand) of Colomba was cacao. One member noted he had 12 cacao trees, which yielded two *quintales*, of which he received Q1,100 for each *quintal* (Figure 34).



Figure 34. A member's cacao tree.

Diversification into other export crops would be difficult for APCASA. They attempted to balance coffee and bananas, however the bananas had their host of diseases and pests. One member disparaged diversification stating, “You need to buy a completely new infrastructure of work and you need a new culture of work. So, imagine starting a brand new method of agriculture” (SI.2.18).

### **Theme Six: External Assistance**

External organizations had been involved with APCASA throughout its 16 year history. These organizations included the Guatemalan government, local political organizations, Guatemalan NGOs, North American NGOs, North American fair-trade coffee importers, and North American civil society organizations (e.g. rotary club).

APCASA was generally frustrated by the (or lack of) help provided to them by Guatemalan organizations. APCASA perceived the greatest value was in North American-based NGOs and fair-trade coffee importers. They perceived North American organizations as the most likely to help APCASA ameliorate the lingering effects of the 2012 CLR epidemic and help them develop as high quality coffee producers. When the researcher asked direct questions of APCASA interviewees if they had received help in the aftermath of the CLR epidemic, all interviewees stated that they had not. However, ample evidence of help emerged during interviews pertaining to other subjects. The researcher also observed evidence of outside support and found documents referring to financial and technical support from external organizations.

Two themes emerged regarding APCASA's frustration with external organizations. These frustrations were directed at Guatemalan organizations. The first theme was that APCASA was not interested in capacity building with no financial support. They noted that they had attended trainings provided by ANACAFE, *Fondo de Tierras*, and the *Ministerio de Agricultura Ganadería y Alimentación* (MAGA; in English, the Ministry of Agriculture, Livestock, and Food) about how to combat the *roya* (K.2.23). The trainings suggested farmers use inputs, however without the economic ability to purchase these inputs, APCASA members perceived they received little benefit from these trainings. One member stated, "What we need is not words but money for inputs" (SI.8.13). Another member remembered a course he received on how to combat the *broca*. He said, "They tell me how to do it, but if I don't have the ability to purchase the inputs, then what good is the training?" (Figure 35) (SI.10.22)



Figure 35. A *broca* trap. The pest would be attracted to the dropper bottle filled with a particular type of alcohol. They would hit the dropper and fall into a soap and water mixture below, trapping them. APCASA members reported difficulty purchasing the alcohol attractant.

They perceived these trainings as superficial ways for the government and ANACAFE to utilize farmers (SI.3.22). They perceived that the money was “spent on economists who go and visit *fincas*” but never do anything. One member alluded to the training logs which attendees were required to sign, and noted that the farmer’s “signature [on a training log] is worth millions” (SI.11.29; SI.8.15; KI.2.6).

The second frustration that APCASA had with Guatemalan external organizations was their perception that as a small cooperative they would not receive assistance. Several members perceived ANACAFE as only being interested in helping large producers (KI.2.9; KI.1.44). When one member was asked by the researcher if

Guatemalan organizations had assisted APCASA, they replied, “From MAGA and ANACAFE, no. We appear disappeared to them. We want ANACAFE to visit APCASA, but they have not responded to our request. MAGA is the same problem” (SI.14.8). ANACAFE’s training calendar for 2012 showed that four courses would be offered at “*Finca Santa Anita La Union*” on January 24, September 4, July 17, and June 28 (DA.19.1).

During two of the three researcher’s visits, the *Fondo de Tierras* was observed meeting with members of the Association Maya. Members told the researcher that since the community split, government agronomists and representatives met with Association Maya members, but not APCASA. Members of the APCASA women’s committee made similar comments, with one saying, “The problem with us here in APCASA is that we are few so they don’t pay attention to us” (SI.16.14). The members were frustrated that MAGA was neglecting part of their duties. MAGA was responsible in Guatemala for improving food security and agricultural extension. However, one APCASA member noted of MAGA, “They give out food and the people are happy, but they know here that the coffee is still sick” (KI.2.11).

Most APCASA members mentioned receiving assistance from foreign organizations. None mentioned received assistance from foreign governmental organizations such as the U.S. Agency for International Development (USAID). Since splitting from the other Santa Anita producers, APCASA created an initiative called, “*Caminos de Amistad*” (Paths to Friendship). This initiative had three objectives to create an interchange with farmers, create links with international institutions that could

help APCASA, and commercialization to be able to export their coffee abroad (SI.2.16). During interviews of other subjects, APCASA members mentioned receiving help from their “friends in Canada”, CRS, As Green as it Gets, Quixote Coffee, Cooperative Coffees, Tufts University, and Root Capital. CRECER was the only Guatemalan NGO that APCASA mentioned receiving assistance from.

Approximately four years ago, Santa Anita received assistance from CRS’ CAFE Livelihoods (Coffee Assistance and Enhanced Livelihoods) project, which appeared to be partially funded by the Howard G. Buffett Foundation. In CRS’ final report to the Howard G. Buffett Foundation, Santa Anita was mentioned one time. The report stated that Santa Anita’s business audit rating increased from 34 to 42 percent and its credit rating remained a C during the initial and final rating periods (Catholic Relief Services, 2011). CRS’ involvement with APCASA was perceived to be beneficial for the members. Several favorably recalled the assistance they received from CRS, especially from the Guatemalan agronomist CRS hired to work with APCASA (SI.1.12; SI.1.18 SI.11.25; KI.2.28; KI.3.33). After the CRS project ended, the Guatemalan agronomist who managed the project continued to provide technical assistance to APCASA *pro bono*.

APCASA members received advanced coffee production training by international organizations. CRS assisted Santa Anita’s producers with how to manage the cooperative’s administration, “financial culture”, and commercialization (SI.11.25). Cooperative Coffees assisted APCASA with coffee cupping (i.e. coffee tasting) and the organization also paid for one member to travel to the United States to learn coffee

roasting (SI.11.27). Quixote Coffee trained APCASA members in financing and managing coffee projects. APCASA members brought the researcher to the coffee nursery, which they noted was donated by De La Gente, a fair-trade coffee importer based in La Antigua, Guatemala. Members reported that De La Gente donated the nursery, fungicide, and portable sprayers because of the CLR epidemic (SI.5.17; SI.14.9).

### **Theme Seven: The International Market's Lure**

APCASA's members had exported coffee to the United States and Germany in the past. For approximately eight years, beginning in 2002 and ending in 2010 or 2011, Santa Anita exported coffee (KI.3.35). When the researcher visited, APCASA members were selling their processed coffee to *coyotes* in Coatepeque (SI.15.2). APCASA's members did not believe that the Guatemalan market was the best destination for their coffee. As one member explained, "Our future vision is to export coffee, organic or conventional, but we have to export internationally" (SI.9.23). They perceived there to be no future in the Guatemalan market. Exporting to the international market would be the best way to make profits from their relatively high quality HB Arabica coffee. One member said that for him, "coffee is an ambition" (SI.15.4). In their view, only second-class coffee was bought and sold in Guatemala. They perceived the international market as offering them something different than they could receive in Guatemala. As one member explained, "You can make a living with coffee. We have a market in Germany and the United States" (SI.7.18) while Guatemala's economy was perceived as "spontaneous and disorganized" (SI.8.9).



Building international partnerships, contacts, and increasing international visibility was perceived by APCASA to be the primary vehicle for eventually entering into an agreement to export coffee to North America or Europe. APCASA members reported entering into several types of export agreements. The most beneficial export agreements were formal contracts APCASA signed with relatively small scale North American and German coffee wholesale purchasers who then sold APCASA's coffee to ten or fifteen local coffee houses or food markets. These agreements were in effect from approximately 2009 to 2011. These agreements outlined the quality, quantity, and selling price of coffee and provided APCASA with anticipatory funds once a sample was received and deemed acceptable by the wholesale purchasers. APCASA members also described entering into informal agreements with small scale "fair- or direct-trade" coffee exporters based in Antigua, Guatemala. Since 2011, with no formal contracts in effect, informal agreements were the only way APCASA was able to reach North American or European markets. Informal agreements were one-time agreements between certain APCASA members and the small scale "fair- or direct-trade" coffee exporters.

APCASA was not capable of exporting coffee during the researcher's visits. One member, who others cited as having the most production of any of the cooperative members in 2014, reported that De La Gente wanted to purchase his coffee. He was unable to sell his processed coffee, because they told him he would be responsible for the transportation costs to San Miguel Escobar, near La Antigua, a five-hour ride by automobile from Colomba. The member said he would also be responsible for the

processing and selection costs (KI.3.27). The members hoped that in subsequent years, when they were able to collectively harvest and process more coffee, APCASA would sell their coffee to De La Gente (SI.9.24; SI.2.4; SI.5.17). One member described the positive experience of exporting coffee in the past.

Coffee in the United States is sold in 14 ounce bag for \$16 or so. I know, because I went to the United States, so I know at what price they sell it. One time a foreigner I knew, came to me and said, that it's horrible... He said, "Look they're selling your coffee for \$16, but look how little you sell it to them for." So, he wanted to fight for us. But, I told him, "Wait, they send us plants, inputs, and other help. They give us also \$5 per *quintal* [above the market rate]. The bags were also specially made by them. The bags said "Coffee from Santa Anita, from the Mountains of Quetzaltenango, Colomba, Costa Cuca." They also paid the fees for exportation, taxes and everything else. They helped us quite a lot, but the foreigner didn't understand. He thought we were getting ripped off. (SI.7.19)

The "ultimate objective" for APCASA, as expressed to the researcher, was to export coffee (SI.3.35). The two largest obstacles to exporting coffee as perceived by APCASA members were production discipline and licensing. To export coffee, APCASA had to ensure their processed (i.e. *pergamino*) coffee was free of *nata* or flawed coffee beans. Only ripe cherries had to be harvested and the cherries had to be fermented and cleanly washed (Figure 36) (SI.14.4).



Figure 36. Recently harvested coffee. Notice the green unripe cherries were picked along with the ripe dark red to purple cherries.

One member explained APCASA's first experience exporting coffee, "The international market is very particular. Every day it demands a specific and demanding product. We were accustomed to selling whatever" (SI.2.11). Another explained, "The custom is to cut coffee and take it straight to the market, but with exporting it you have to store it, and then sell it all at once. Cooperative Coffees wanted a lot of coffee from us, but we couldn't deliver [after the *roya* affected our production] and communication with them was lost" (SI.14.7). Licensing was the other obstacle to exportation. APCASA's members were unable to furnish documents to the researcher pertaining to past export agreements. To export coffee from Guatemala, the members perceived themselves as having two options. One option was to sell it to a fair-trade coffee cooperative/NGO in Guatemala who would then arrange for the processing and

transportation to North America or Europe. This would have been difficult, because their production was so low after the *roya* that they were unable to produce enough for the fair-trade coffee exporters. The other option would be apply for an export license themselves, however this would have to be done through ANACAFE. Members had little confidence this option would work.

Although there were several obstacles to exporting coffee, APCASA was uniformly in agreement that it had to remain the ultimate objective. This was a point of contention with members of the Association Maya, and cited as one reason why APCASA split and formed their own cooperative. Association Maya members were perceived as not interested in the export market and they did not want to invest time and labor into their coffee fields.

## CHAPTER V

### DISCUSSION AND CONCLUSIONS

#### **Introduction**

The discussion is presented in the context of the study's five research objectives:

1. Describe the effects of the CLR epidemic on the cooperative members' food security.
2. Describe the effects of the CLR epidemic on the cooperative's livelihoods (e.g. employment, social networks, health, and education).
3. Describe and analyze coping mechanisms that the cooperative members employ to preserve their livelihoods from the CLR's effects on coffee production.
4. Develop a grounded theory to explain how the food security and livelihoods of the cooperative are affected by the CLR epidemic.
5. Develop a smallholder coffee producer vulnerability framework that could be used to forecast how the food security and livelihoods of smallholder coffee producers may be affected by future production disruptions.

#### **CLR's Effects on APCASA Members' Food Security**

Results indicated that the CLR epidemic increased APCASA members' food insecurity. For the purpose of this study, food security was defined as the economic access (ability to acquire through trade, production, purchase, and transfer) to food. APCASA's members' food insecurity was caused by the loss of production and labor-based entitlements. APCASA members experienced coffee production losses ranging

from 50 to 90 percent, which made them at-risk of food entitlement decline (Sen, 1981). APCASA members reported ameliorating the effects of food insecurity by eating less food, skipping meals, eating less desirable foods, searching for off-farm employment to make money to purchase food, and borrowing money to purchase food. Members reported difficulty in allocating financial resources between food and other household expenses such as education, transportation, and healthcare. Interviewees described feelings of uncertainty, risk, and fear about meeting food needs while still being able to invest in coffee production.

Data collected on APCASA's struggle for food security agree with research revealing chronic food insecurity in Central American smallholder coffee producing communities (Caswell, Mendez, & Bacon, 2012; Fujisaka, 2007; Mendez, Bacon, Olson, Morris, & Shattuck, 2010; Morris, Mendez, & Olson, 2013). APCASA members reported a history of difficulty in meeting food needs. Prior to the 2012 CLR epidemic, APCASA members described a history of crises affecting their livelihoods and food security. The CLR epidemic affected APCASA members' food security, yet it was not perceived as more threatening than the crises they previously experienced ranging from severe harvest losses after Hurricane Stan to low coffee prices of the early 2000s. The CLR epidemic caused APCASA members to balance scarce financial resources between food, other household expenditures, and coffee production inputs. The difficulty of balancing resources supports previous research of smallholder coffee farmers in Central America (Caswell, Mendez, & Bacon, 2012; Morris, Mendez, & Olson, 2013; Steinberg & Taylor, 2009).

Members reported the most difficulty in meeting food and household expenditure needs for eight months, lasting from January to August. The data suggested a longer “lean period” when food and household expenditures competed with farm investments than Bacon et al. (2010) that found smallholder Nicaraguan coffee producers experienced an average of 3.15 months of food insecurity. Some members mentioned January as an especially stressful month to meet expenses and acquire food. January is when the Guatemalan school year starts, thus a time when enrollment fees, uniforms, and books are bought for children. January usually coincided with the end of harvests (i.e. profits for coffee farmers), but members reported this month was spent repaying debts to laborers and banks which left less money for household expenses. Others mentioned January through March as being the most difficult, because these months were when APCASA members had to invest the most in their fields by purchasing new coffee plants, soil amendments, fertilizer, and fungicide. The CLR epidemic killed (or weakened) the majority of APCASA members’ coffee trees, forcing them to invest even more than what was normally required during the January to March coffee planting season. These findings are different than the Famine Early Warning Systems Network’s (FEWS NET) report (2014), noting that Central American coffee producers’ “lean season” was from April to August.

There was no evidence of acute food insecurity in Santa Anita. Acute food insecurity can be demonstrated by destructive coping mechanisms (e.g. selling productive farm assets or jewelry), the presence of severely underweight children, a high infant mortality rate, and/or nutritional oedema (World Health Organization, 2006). The

researcher did not observe outward signs of these conditions and interviewees could not recall these acute food insecurity conditions existing in Santa Anita. Members reported having sufficient support through APCASA's social safety net for themselves and their families. The government-run pre-kindergarten and elementary school was viewed as a buffer against hunger, because it provided APCASA's children with food during the school day. The regional coordinator of the Guatemalan Ministry of Health's food security program ("*Pacto Hambre Cero*" or Zero Hunger Challenge) noted that while chronic food insecurity was present in many smallholder coffee communities like Santa Anita, acute food insecurity cases were nearly all located in more geographically remote communities than Santa Anita. The coordinator did not have, and could not recall in the past, any cases of acute food insecurity in Santa Anita. Though APCASA members reported there had never been a state of "*hambruna*" (severe hunger) in Santa Anita, they did describe experiencing chronic food security.

### **CLR's Effects on APCASA Members' Livelihoods**

Livelihoods are defined as a "portfolio of activities and social support capabilities" to improve standards of living (Ellis, 1999, p.2). Beside coffee production, members reported off-farm employment as the most important livelihood activity. Members increased their off-farm employment activities after the CLR epidemic arrived. Dramatic drops in coffee production in 2013 and 2014 led APCASA members to search for work outside of the *Boca Costa* region. Santa Anita farmers, and neighboring coffee producing communities in the region, offered less short-term labor opportunities (e.g. harvesting) for APCASA members because of the coffee rust. As the rust decreased



production, so did the demand for laborers in the region. APCASA members' perceived their best option was to search for employment in commercial zones of Guatemala City, Quetzaltenango, or on banana, cacao, and coffee plantations in Chiapas, Mexico.

APCASA did not report on-farm small business ventures, such as raising chickens, selling eggs, or roasting coffee, as contributing to members' livelihoods. Receiving visitors was reported as the most beneficial on-farm business opportunity for APCASA. Visiting international tourists and Guatemalan students provided APCASA members with additional income through room, board, and paying for *charlas* (talks) on coffee production or the members' experiences during the civil war. International tourists were especially valued for their potential to provide donations or being able to possibly organize direct/fair trade coffee sale agreements. The CLR epidemic did not have an effect on these livelihood activities. However, APCASA members reported a decline in these on-farm business ventures after they split with Association Maya.

APCASA members used their social and financial capital to stabilize livelihoods after the 2012 CLR epidemic. Members reported taking out short-term loans from local banks set up by the government to serve agricultural communities. While the money was loaned to members on the pretense that it would be invested in the coffee fields, the money was sometimes spent to purchase food. APCASA represented a powerful social force. Social capital is a multi-dimensional concept that is frequently defined as a people's trust that the social networks available to them can be used for productive purposes (Grootaert, Narayan, Nyhan Jones, & Woolcock, 2004). Being a part of APCASA provided members with coffee production and social benefits. Members

perceived an increasing usefulness in the cooperatives' functions after the CLR epidemic first appeared. Members reported feeling bewildered about how to combat the CLR; the cooperative helped them form a unified strategy. The cooperative allowed members to make long-term plans and to provide legitimacy when searching for fair-trade coffee exporting partners or international donors for small-scale development projects (e.g. constructing the warehouse). APCASA represented a valuable livelihood strategy for members despite them having to transfer some individual autonomy to the group dynamic.

#### *Santa Anita's cooperatives*

APCASA members might have been especially responsive to forming a cooperative, because of their prior history of taking part in political and paramilitary organizations. APCASA's coffee producers chose to join the leftist URNG guerilla group in their youth or young adulthood. While most members reported not being active politically, they still self-described themselves as belonging to the "*izquierda*" (the left). Thus Santa Anita's community members might have been inclined to form a coffee cooperative when they arrived together in Santa Anita in 1998. However, APCASA members described feeling disillusioned with how the first unified Santa Anita cooperative was organized to share land, labor, and profits equally.

APCASA members recalled that producers who were now a part of Association Maya avoided working in Santa Anita's coffee fields and would search for work outside of Santa Anita or attach themselves to the cooperative's administrative office. APCASA members perceived themselves as more industrious workers, while reporting those in the

Association Maya were more concerned with off-farm employment than coffee production. While the information on production efficacy between groups was influenced by interviewing only APCASA members, it appeared that *some* members were unfairly reaping the rewards at the expense of others. In or around 2007, the community decided to remain a producers' cooperative, but to end collective farming and hold a lottery and parcel out an equal amount of land to each producer. Producers would be responsible for working their own land, but harvests would be processed and sold together. Profits would be distributed according to how much each producer had harvested.

The 2012 CLR epidemic presented a defining moment for APCASA. Members could decide to leave the cooperative, remain within a relatively small 10 member (eight active producers) cooperative, or choose individually or together to reunify with the other 25 Santa Anita producers of Association Maya. APCASA members chose to remain a small cooperative. It was surprising that even in the wake of the CLR epidemic and its effects on food security and production, APCASA made no apparent move to reunify with Association Maya. No members of APCASA expressed a desire to reunify with the Association Maya, despite reporting the benefits of (a) being part of a larger cooperative, (b) being able to use the community's means of coffee processing (e.g. the ecological *beneficio*; professional coffee roaster), and (c) making themselves a larger unified group, and thus a more desirable fair-trade export partner.

## **APCASA Members' Coping Mechanisms**

The 2012 CLR epidemic, and lingering effects on coffee production to December 2014, caused APCASA members to employ coping mechanisms consisting of changes to (a) coffee production methods, and (b) livelihood strategies. These findings are similar to studies documenting livelihood and production changes in food insecure Nicaraguan and Salvadorian coffee producing communities (Bacon et al., 2008; Jaffee, 2007; Morris, Mendez, & Olson, 2013). APCASA members narrowed their coffee cultivation focus from the 30 *cuerdas* of land each member owned to five. The purpose of this change was for members to be able to use limited financial means to rehabilitate their coffee fields and protect against future rust outbreaks.

Members reported converting coffee production from organic to conventional as another coping mechanism. Santa Anita's move away from organic production and toward conventional occurred when their most recent export agreement ended in 2010-2012. The CLR epidemic hastened the community's move toward fully conventional production. The rust was perceived to be a greater threat to organically grown coffee than conventionally grown coffee. Crop management techniques that prevent coffee rust are "not well documented and remain controversial" (Avelino, Willocquet, & Savary, 2004, p. 541). Environmental variables, including the effects of microclimates, shade, weather, soil acidity, and precipitation have made it difficult to generalize about the best methods for preventing and managing coffee rust (Arneson, 2000; Avelino, Willocquet, & Savary, 2004). Members perceived copper-based fungicides and conventional fertilizer as the two best coffee rust management methods available, given the members'

knowledge and financial resources. Chemically-based fertilizers were applied to strengthen the plants' resistance to future rust outbreaks. Copper-based fungicides have a "tonic effect" that increases yields while also controlling the coffee rust (Arneson, 2000, para 20). Organic coffee demanded more labor than conventional coffee in the form of additional cleanings (i.e. weeding), fertilizing, and the labor required to transport bulkier organic materials to the coffee fields. Members received no price benefit from the local Guatemalan market to produce organic coffee, thus APCASA perceived conventional production as a better way to recover from the CLR epidemic than organic production.

APCASA members perceived off-farm employment as the most effective coping mechanism to the CLR epidemic. At least one family member of the eight producers (or the producers themselves) interviewed had worked outside of Santa Anita. The money made from off-farm employment was used for three purposes: coffee investment, household food purchases, and school fees. Members perceived off-farm employment as an ambiguous livelihood strategy. Off-farm employment provided much needed income for household expenses when the CLR took away the primary means of income. However, off-farm employment also took members away from caring for their coffee fields. In Santa Anita, members reported *jornaleros* (day laborers) were paid Q35-Q40 per day. APCASA members' own labor in their coffee could be similarly valued at this rate. A laborer in Quetzaltenango or Guatemala City could make Q75-Q100 per day, however they would have to pay transportation, room, and board. While members could make considerably more money in off-farm labor (especially the longer they were employed) than as coffee laborers, there remained the problem of how to care for their

coffee fields. Most frequently, members paid *jornaleros*, from Santa Anita or a neighboring community, to perform the necessary cleaning, shading, and fertilizing tasks while the owners were away working off-farm jobs. But these workers had to be paid Q35-Q40, thus reducing the profit APCASA members made from off-farm employment to Q60-Q65, before room and board expenses were factored. Thus, while off-farm employment remained an essential short-term coping mechanism, APCASA members perceived coffee cultivation as promising greater rewards.

APACASA members used agricultural diversification as a coping mechanism, however with one caveat. Despite the threat of another rust outbreak, APCASA members were convinced in the future of their coffee production. Diversifying their coffee fields into producing another cash crop was perceived as an unnecessary distraction. This finding might contradict research of Central American smallholder coffee farmers that argued that farmers shift to lower risk subsistence food crops when faced with coffee production challenges (Baca, Läderach, Hagggar, Götz, & Ovalle, 2014; Bacon et al., 2014; Eakin, Tucker, & Castellanos, 2006; Fischer & Victor, 2014; Tucker, Eakin, & Castellanos, 2010). While all APCASA members did report cultivating food crops, members did not report increasing cash or food crop production by reducing investments in coffee production.

APCASA members believed in the profitability of exporting their coffee and had enjoyed profits in the past through profitable export agreements. While the rust devastated their coffee production capabilities, they perceived no benefit from other cash crops, such as banana or macadamia. These other cash crops were perceived to be

equally susceptible to diseases, plagues, and pests. Thus switching from coffee to another cash crop would only expose members' livelihoods to production problems requiring a different set of mitigation strategies and/or chemical remedies. Agricultural diversification was used as a coping mechanism, however only if it did not interfere with members' coffee production capabilities.

APCASA members perceived growing subsistence food crops as an essential coping mechanism as long as it did not take away from coffee production. They could consume what they produced or take produce to the local market. Growing food crops was done in their residential lots or communally held land. Rarely did members plant food crops within their coffee fields. Members reported that their staple food crops (e.g. corn, *guisquil*, and beans) did not grow well in Santa Anita's soil and profits were rarely made in Colomba's central market. Thus, while growing food crops was a coping mechanism to fight food insecurity and a decrease in income, it was not perceived to be long-term livelihood diversification strategy.

#### *External assistance*

There appeared to be a divergence of perceptions and realities pertaining to the external assistance provided to APCASA. The researcher observed a gap between how much assistance members reported that they received and the amount of assistance from external organizations that they did receive. APCASA members appeared to underreport the amount and type of assistance they received to the researcher. The assistance referred both to recent help provided to combat the rust and general assistance before and after the rust epidemic. When members were asked the three questions (Appendix A) during

interviews pertaining to receiving (a) non-governmental assistance, (b) Guatemalan governmental assistance, or (c) technical assistance from any entity, members nearly always answered that they had not received assistance.

However during interviews of other topics, members repeatedly referred to receiving assistance from a host of entities including non-governmental organizations, fair-trade coffee exporters, the Guatemalan government, ANACAFE, *Fondo de Tierras*, small North American civic organizations (e.g. rotary clubs), North American universities, and international tourists. The researcher observed evidence of this assistance in the form of donations that included the warehouse, the concrete patio for drying coffee, a mechanized coffee demucilager, 900-1000 young coffee plants, and portable pesticide sprayers. APACASA members openly described these items as being donated by various international “partners”. Despite what appeared to be ample external assistance by the research, the donations may have been perceived by members as not being sufficient to sustain production, food security, or livelihoods.

When the researcher interviewed a key informant who was also a small producer in the Colomba area, he perceived that only “special” groups of coffee producers received help from international organizations. According to him, organizations that received help were managed or founded by women, indigenous Maya, or were ex-guerilla fighters like Santa Anita. “Normal” small producers, especially those who were not part of a cooperative, had no chance of acquiring international assistance. The researcher submitted multiple Internet searches using the terms “Santa Anita Guatemala,” “APCASA,” “APCASA coffee,” “Santa Anita La Union,” “APCASA



*cafe*,” and several other variants of these terms. The searches returned dozens of articles specifically mentioning (or alluding to) technical and financial assistance Santa Anita’s farmers received from others (Appendix G). It remains unknown why members appeared to give minimal weight to the external assistance received. One possibility was that interviewees wanted to appear deprived when faced by a foreign visitor (i.e. the researcher) who could provide them with assistance. However, it is more likely that the assistance was perceived as not effective and/or insufficient to sustain livelihoods. One member mentioned that, while assistance from foreigners was valued, it merely provided the cooperative the ability to “breathe a little” (KI.2.28).

One final point to consider with respect to external assistance was that despite the support Santa Anita received, they appeared just as vulnerable to the CLR as other smallholder-producing communities. The researcher observed members over the course of three weeks. Most member households had no televisions, no members had a vehicle, and no member households had washing machines. Most homes lacked basic furniture other than one dining table, chairs, and beds. Members did not appear to have personally benefited from external assistance. It appeared that prior support to the unified Santa Anita community cooperative was negated, first by the split in the community, and then by the CLR epidemic. Santa Anita could provide a cautionary tale to external organizations intent on helping coffee-producing communities in developing countries. Despite assistance from dozens of Guatemalan organizations, international NGOs, fair-trade exporters, and individuals, Santa Anita appeared to be as vulnerable as other communities that had received minimal or no external assistance.

## **A Grounded Theory**

### *Introduction*

The CLR epidemic increased APCASA's food insecurity and threatened members' livelihoods. The CLR epidemic forced members to use coping strategies that changed coffee production and livelihood strategies. APCASA's members' food insecurity was caused by the loss of production and labor-based entitlements. Members reported that the CLR intensified symptoms of chronic food insecurity including not having enough food to eat, eating less desirable food, borrowing money to purchase food, skipping meals, and having feelings of worry about acquiring food in the future. There were no outward signs of acute food insecurity in Santa Anita. APCASA members experienced coffee production losses ranging from 50 to 90 percent which made them at risk of food entitlement decline. Decreases in coffee production from the CLR epidemic in Santa Anita, and other coffee-producing communities in the region, increased the need for APCASA members to search for off-farm employment in urban areas in Guatemala and on Mexican plantations in the state of Chiapas.

APCASA remained committed to Arabica coffee production (specifically the Bourbon variety) even though Arabica (and specifically Bourbon) was at most risk to future rust outbreaks. Members did not intend to diversify their coffee fields to produce food crops or cash crops. Diversification was perceived as diverting attention away from the main goal of producing high quality HB Arabica beans for export. Members reported planting more food crops behind their residences and in communally-held land as a response to income losses from coffee infected with CLR.

### *Grounded theory*

The purpose of this study was to develop a theory about how the CLR affected the food security and livelihoods of members from one Guatemalan coffee cooperative. The data and analysis revealed that the CLR increased chronic food security by decreasing coffee production which resulted in less income for the cooperative's households. The CLR had an even more dramatic effect on the farmers' livelihoods as they were forced to search for off-farm employment, borrow money, and intensify their investment in their coffee fields affected by the CLR. However, despite the threat posed by the CLR to members' food security, livelihoods, and coffee production, APCASA members were committed to producing high quality Arabica coffee for export. In summary, the grounded theory of how the CLR affected the food security and livelihoods of APCASA members is that "Despite the CLR's devastating effects on food security, and even more so, livelihoods, cooperative members perceived coffee to be their only hope out of poverty."

### **Smallholder Coffee Producer Vulnerability Framework**

It is suggested that the smallholder coffee producer vulnerability framework be used to understand and analyze future livelihoods disruptions of smallholder coffee producers. The smallholder coffee producer vulnerability framework was developed during the course of this research and is partially based on a modified version of Scoones' (2009) sustainable livelihoods framework checklist (Appendix D). The smallholder coffee producer vulnerability framework consists of three stages. The first stage involves analyzing the producers' context, resources, and the institutions and

organizations that influence the producers. The second stage analyzes the vulnerabilities that threaten food security, production, income, and/or livelihoods. The third stage analyzes the response to vulnerabilities by examining coping mechanisms, diversification, and external assistance. The smallholder coffee producer vulnerability framework could be used to evaluate smallholder coffee producers' livelihoods and predict production and livelihoods outcomes. A visual conceptualization of the framework is presented (Figure 37).

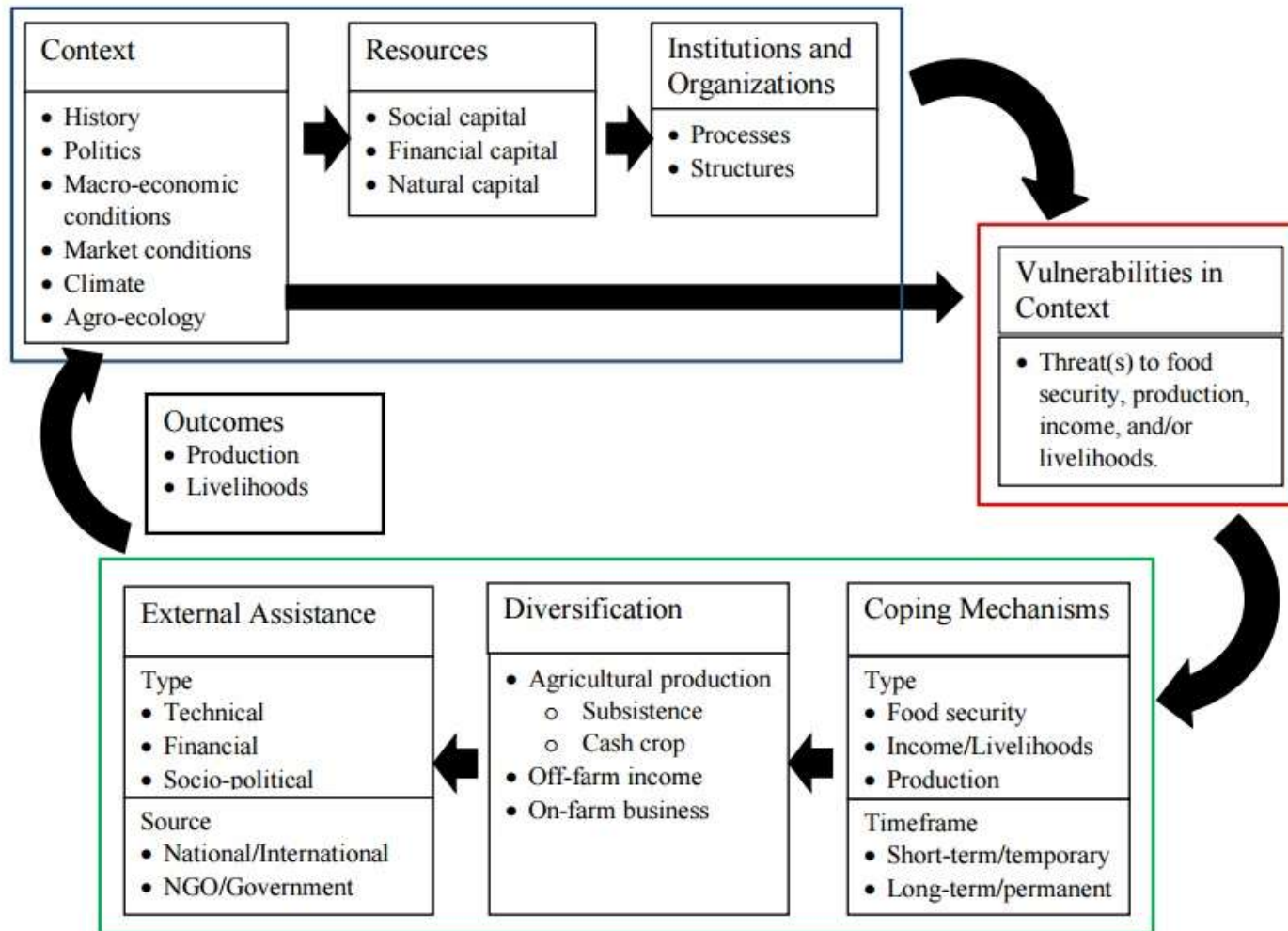


Figure 37. Smallholder coffee producer vulnerability framework.

## CHAPTER VI

### RECOMMENDATIONS

#### **Introduction**

The results and recommendations of this case study are primarily intended for two audiences: International development organizations (IDOs) and international agricultural extension organizations. Caution is advised in generalizing this case study to other populations, unless they share Santa Anita farmers' characteristics, challenges, and hopes as food insecure smallholder farmers in developing countries.

The recommendations are organized into three categories: (a) Practical recommendations for organizations working specifically with Central American smallholder coffee farmers affected by the CLR; (b) Policy recommendations for IDOs and international agricultural extension organizations working with vulnerable smallholder coffee producing communities; and (c) Recommendations for future research.

#### **Practical Recommendations to Mitigate CLR's Effects on Food Security and Livelihoods**

IDOs and international agricultural extension organizations should treat the CLR as one, but not the only, challenge confronted by smallholder coffee farmers. While the CLR received considerable attention in the media, plagues and crises were not new to Santa Anita's farmers. IDOs and international agricultural extension organizations should understand that traditional coffee pests can be just as damaging to coffee

production as the CLR. Additionally, coffee production losses resulting from climate change, low prices, and labor scarcity can compound losses from the CLR. Thus, CLR mitigation projects/programs should be built into a larger livelihoods approach that mitigates the CLR, but also reduces traditional threats to coffee production. In summary, CLR mitigation projects/programs should be designed holistically not diagnostically.

Coffee production assistance should be prioritized over food aid to coffee-producing communities affected by the CLR. APCASA members requested technical and financial assistance to recover from the CLR. While Santa Anita suffered from chronic food insecurity, acute food insecurity was not present. Members specifically stated they did not desire food assistance. Food assistance was perceived by members as an inexpensive tactic used by Guatemalan political parties and the government to gain support from the populace. APCASA's coffee farmers believed in the future profitability of their coffee. They specifically stated they did not desire "handouts"; what they needed was CLR recovery assistance. Thus, coffee cooperatives should be provided temporary technical and financial assistance to renew their coffee fields with rust-resistant cultivars. Food aid should only be provided to communities facing acute food insecurity.

IDO and international agricultural extension organizations should establish CLR-related farmer-to-farmer exchanges. APCASA members reported feeling devastated in 2012-2013, perceiving that the CLR had only affected their community. Their outlook improved after they realized it had affected nearly all smallholder producers in Guatemala and Southern Mexico. Farmer-to-farmer exchanges, could bring together coffee farmers from different countries and regions to share knowledge about

possible coffee rust control techniques. Farmer-to-farmer exchanges, geared specifically toward strategies to mitigate the CLR, could (a) help farmers experiment with new mitigation strategies; (b) provide farmers with socio-economic support from other farmer groups; and (c) provide an established network to which research centers (e.g. PROMECAFE; CGIAR) can disseminate extension advice.

IDO should facilitate market familiarization programs between producers and buyers. The program(s) should constitute two interconnecting functions, (a) information sharing, and (b) producer-buyer exchanges. There is a significant amount of doubt and uncertainty among coffee wholesale buyers about Arabica coffee availability in Central America. Smallholder farmers many times also lack the knowledge and abilities to connect with foreign buyers. Market familiarization programs should share production information with buyers, so they are aware that despite production losses from the CLR, high quality Arabica coffee is still being produced in Central America. Producer-buyer exchanges could bring producers to destination markets in the United States, Canada, and Europe to facilitate export agreements and/or increase understanding of how coffee is marketed and sold to consumers. The exchanges could also bring buyers to coffee-producing regions in Central America that are producing coffee despite being affected by the CLR epidemic.

### **Policy Recommendations for Improving the Livelihoods of Vulnerable Smallholder Coffee Farmers**

DOs and international agricultural extension organizations should continue promoting cooperatives as a powerful tool to empower farmers, but they should also



protect against the possibility of the cooperatives fragmenting communities.

Cooperatives are frequently promoted as a logical “easy win” strategy to improve farmers’ livelihoods. Cooperatives can empower farmers, allow them to negotiate for higher prices, and facilitate knowledge exchange and social support between members. They can also serve as *de facto* political organizations that divide communities. The cooperative (or its leaders) can choose to exclude the use of resources to certain people, as was the case in Santa Anita. IDOs and international agricultural extension agents should design cooperative training programs that include topics such as (a) increasing community inclusiveness; and (b) transparent administration. The purpose of these cooperative training programs is that they would focus on strengthening the cooperative from a socio-political institution standpoint instead of as a technical, market-oriented entity.

IDOs and international agricultural extension organizations should promote crop diversification only after receiving input and buy-in from farmers. Agricultural diversification is frequently endorsed as a way to protect livelihoods against a plague like the coffee rust. However, from the APCASA members’ point-of-view, diversification had significant disadvantages. Organizations promoting crop diversification among smallholder coffee farmers should seek input, and if diversification is deemed feasible, buy-in from farmers and/or cooperatives.

Finally, the CLR epidemic showed that there was no single institution responsible for providing research-based policy advice to stakeholders and/or an institution responsible for disseminating this advice to producers. Research-based policy

advice is disseminated by country-specific agricultural ministries, NGOs, large international development organizations (e.g. USAID), international research centers (e.g. CGIAR; PROMECAFE) coffee industry-supported research (e.g. Keurig Green Mountain), and research centers supported by a combination of public, private, and industry funds (e.g. World Coffee Research).

These organizations/centers/foundations should collaborate to promote one international coffee research and development center to promote worldwide coffee production. While research and development should be supported and conducted by a combination of stakeholders, the lack of coordination between stakeholders created a muffled and fragmentary response to the CLR epidemic. An organization, modeled after CGIAR's research centers or USAID's Feed the Future Innovation Labs, could serve to coordinate responses to the CLR and future challenges to coffee production. While coffee is not a food crop, it is a globally-traded product desired by millions of consumers that contributes to the food security and livelihoods of millions of people in developing countries, and thus worthy of better coordination between stakeholders.

### **Recommendations for Future Research**

#### *Future research related to this study's objectives*

APCASA members were interested in diversification only if it did not divert resources away from coffee production. Future research should further explore the perceptions of crop diversification, coffee production, and the CLR. Members also appeared committed to planting the Bourbon variety because of its superior flavor, despite being the Arabica variety most susceptible to the CLR. Future research should

explore reasons why members preferred planting a) Arabica more than Robusta; and b) Bourbon more than other Arabica varieties, despite their relative fragilities to the CLR.

Research should also follow-up on the study's objectives in future years. How will the 2012 CLR epidemic be perceived in two, five, or 10 years? How did the coping mechanisms that the researcher described ultimately contribute or detract from APCASA's food security and livelihoods? A comparative case study could compare Santa Anita with similar Guatemalan smallholder coffee-producing communities to understand how each community perceived and reacted to the CLR. It is suggested that a comparative case study be completed in *Finca Blanca Flor* in the *Chuva* region of the Colomba municipality. *Finca Blanca Flor* is considered by Santa Anita to be a "sister community" because it is also a smallholder coffee farming community founded by ex-guerrilla fighters in the late 1990s. Several communities in the *El Palmar* and *La Florida* municipalities of Quetzaltenango consist of smallholder coffee farmers. A case study similar to this one could explore questions of food security, livelihoods, and the CLR in these communities.

*Future research tangential to this study's objectives*

The case study illuminated several interesting questions that were not connected to the CLR epidemic's effects on food security and livelihoods. Additional research could examine the community-power dynamic between APCASA and Association Maya. Community disunity came up repeatedly throughout the research, although it did not appear to be related to, or affected by, the CLR epidemic. What were the reasons why Santa Anita community members decided to split into two cooperatives? Did the

disunity between cooperatives affect coffee production, market linkages, or livelihoods?

If so, how?

APCASA members described changes to Guatemalan coffee labor practices during their lifetime. Coffee plantations have largely stopped employing *mozos*, or full-time workers who live permanently on the property, in favor of temporary wage labor. What are the implications of this change for rural communities who derive the majority of their income from producing or laboring in coffee production? Did the change in labor modify coffee production in Guatemala? If so, how?

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## APPENDIX A

### SEMI-STRUCTURED INTERVIEW PROTOCOL FOR COOPERATIVE MEMBERS

#### **General Introduction**

Thank you for receiving me today. I appreciate you being able to spend some time speaking with me. I would like to hear about how you got started growing coffee.

1. Could you tell me about your life on this *finca* (coffee plantation)?
  - a. How did you come to be here? How did you get started growing coffee?
  - b. What kinds of work do you and your family engage in on this *finca*?  
What kinds of crops (or agricultural products) do you produce?
2. What is life like as a \_\_\_\_\_ (smallholder coffee producer, coffee laborer, member of a coffee cooperative etc.) on this *finca*?

#### **Coffee Production**

Thank you for telling me a little bit about your life on the *finca*. I would be interested in hearing more about how you produce coffee (or work in coffee production).

1. Can you discuss with me about how you grow (or how this *finca* grows) coffee?  
Could you describe:
  - a. The techniques you/this *finca* uses to grow coffee?
  - b. The types of varieties planted? Why are these varieties planted?
  - c. How is the coffee processed?
  - d. How is the coffee sold?
  - e. Any recent challenges to how coffee is grown on this *finca*?
  - f. Any recent changes to how coffee is grown on this *finca*?

#### **Livelihoods: Social and Economic Aspects of Coffee Production**

Thank you for helping me understand how coffee is grown on this *finca*. Now that I understand a little bit more about how you are involved in the production of coffee, I

would like to understand the social and economic aspects of coffee producers/laborers like you.

1. Can you tell me about how you make a living producing (or laboring in) coffee?
  - a. What are the costs you incur? How do you make money? What are the risks you face?
  - b. Are there ways that a coffee farmer (or laborer) is able to make money outside of coffee? For example, cultivating other crops or working other jobs.
2. How has the way people make a living (producing or laboring) in coffee changed during your lifetime?
  - a. Can you tell me about experiences you have had in other regions?
  - b. Can you tell me about your experiences on different types of *fincas*, such as large privately-owned *fincas*?
  - c. Can you tell me about the coffee crisis in Guatemala in the 1990s and early 2000s? Did it affect you or your family? If so, how?
3. How are smallholder coffee farmers treated in Guatemalan society? How are coffee laborers treated in Guatemalan society?
4. Are there ways that people like you who are engaged in coffee production organize for economic purposes? Could you describe these organizations and how they operate?
5. Are there ways that people like you who are engaged in coffee production organize for political or social purposes? Could you describe these organizations and how they operate?
  - a. Are you (or others in this *fincas*) part of a coffee cooperative? If so, can you describe how it operates? What benefits does it provide? What are (if any) drawbacks to being part of the cooperative?
6. Do you have any thoughts about your work as a coffee farmer/laborer and how it interacts with the natural environment?

- a. Can you describe how the environment affects your work? Can you describe how your work in coffee production affects the environment?

### **Coffee Rust: Food Security and Livelihoods**

Nearly every person I have spoken with in Guatemala about coffee mentions that the *roya* (coffee leaf rust) has deeply affected people like you who depend upon coffee for their livelihood. I would like to ask you a few questions about how the *roya* has affected your income and your ability to provide for your family.

1. How has the *roya* affected your economic income?
  - a. Have you had difficulty meeting the needs of daily spending on such things as food, education for children, transport, and health care over the past few years because of the *roya*?
2. If you have had difficulty purchasing food for you and/or family, can you describe this more?
  - a. If you have had difficulty providing food in the past few years because of the *roya*, how have you tried to improve the situation?
3. Have you or anyone else in your household made decisions to try and improve the economic situation since the *roya* started affecting coffee in this region? For example, migration, looking for other types of work, reducing certain expenses, or changing the way you produce (or work in) coffee.

### **International, National, and NGO Assistance**

1. Have you (or others in this *finca*) received help from any international organization? This can include NGOs, or foreign governments like the European Union, United Nations, and the US Government)
  - a. If so, can you describe the help received?

2. Have you (or others in this *finca*) received help from the Guatemalan government?
  - a. If so, can you describe the help received?
3. Have you (or others in this *finca*) received technical assistance in coffee production from agricultural engineers, extension agents from MAGA, or international volunteers?
  - a. If so, can you describe the help you received?

### **Conclusion**

Thank you for taking the time to speak with me about your life as a smallholder coffee producer. I had many questions, and I appreciate you being patient in answering them. If there is anything else you would like to speak about please let me know.

1. Is there anything else we did speak about that you would like to add more to?
  - a) Would you like to clarify any answers or information you provided me such as:
    - a) How you grow coffee? The effects of the *roya*?
    - b) Your community? The cooperative you are part of?
    - c) How you provide for yourself and your family?
    - d) Assistance you have received from others?
  - b) Is there anything that I did not mention, but which you think is important?

## APPENDIX B

### SEMI-STRUCTURED INTERVIEW PROTOCOL FOR KEY INFORMANTS

#### **International Organizations (e.g. USAID, CRS and other INGOs)**

Thank you for being able to spend some time with me today to discuss coffee production in Guatemala. I would like to discuss your organization's work in Guatemala's coffee production chain, current challenges, and the effects (if any) that these challenges have had on smallholder coffee producers.

1. Can you describe your organization's work with Guatemalan coffee producers?
  - a) What are the current priorities of this work? Why are these priorities?

I am currently researching the effects that the *roya* (coffee leaf rust disease) has had on a cooperative of smallholder coffee producers in the Guatemalan western highlands. It appears that the *roya* has affected nearly every coffee producer in Guatemala to at least some degree.

2. Can you tell me about what experiences you have had with the *roya* in the context of your organization's work?
  - a) How has the *roya* affected the coffee producers with whom you work?
  - b) In your experience, has the *roya* affected the food security of coffee producers (with whom you've worked directly, or in general)? If so, can you describe how their food security has been affected?
  - c) In your experience, has the *roya* affected the livelihoods of coffee producers (with whom you've worked directly, or in general)? If so, can you describe how their livelihoods have been affected? By livelihoods, I am referring to how coffee producers make and sustain a living which

includes outside employment, education, health, and belonging to social networks such as cooperatives.

3. I know the *roya* is just one potential challenge to coffee production. In your experience are there other challenges facing smallholder Guatemalan coffee producers? Possible challenges could include coffee market prices, pests, political conditions, etc. If so, can you describe these challenges?
4. Is your organization specifically working to ameliorate [the challenges mentioned]? How so?
5. Beside your interventions/assistance, have you noticed smallholder coffee farmers using their own coping mechanisms to preserve their livelihoods from the CLR epidemic's effects?
  - a) If so, can you describe them?
  - b) In your own experience and opinion, do these coping mechanisms positively contribute to livelihoods, negatively contribute, or do they have no net effect?

Thank you for your information. At this time, I believe we have covered everything that I had planned to ask you. However, if you feel that we missed an important point of discussion, or if you would like to clarify a point, please feel free to do so.

1. Is there anything else we did speak about that you would like to add more to?
  - a) Would you like to clarify any answers or information you provided me?
  - b) Is there anything that I did not mention, but which you think is important?

**Guatemalan Organizations (e.g. health ministry, agriculture ministry etc.)**

Thank you for being able to spend some time with me today to discuss [coffee production, food security, malnutrition, agricultural extension]. I would like to discuss

how your organization's work affects smallholder coffee producing communities in the Colomba region.

1. Can you describe your organization's work in the Colomba region?
  - a) Are there current priorities? Why are these priorities?
2. For agriculture organizations: What can you tell me about the current state of coffee production in the Colomba region?
3. For health organizations: What can you tell me about the current state of health for children age five and under in the Colomba region?
  - a) Have you noticed any changes in their health status over the past 2-3 years?

I am currently researching the effects that the *roya* has had on a cooperative of smallholder coffee producers near Colomba.

1. How has the *roya* affected [agricultural production, food security, malnutrition] of coffee producers or communities with whom you work?
  - a) Are you aware of ways communities are changing the way they live or produce coffee in response to the *roya*? If so, can you describe them?
  - b) In your own experience and opinion, are the ways in which communities are changing helping, hurting, or having no effect?
2. For health organizations: Did you notice any increase in stunting or malnutrition among children age five and under in the Colomba region over the past 2-3 years?

I would be interested in seeing any documents you have pertaining to your work with coffee producing communities and/or any specific interventions or assistance you provided to communities in response to the *roya*. I am most interested in any information you may have pertaining to the Colomba region.



1. Do you have, or can you lead me to, any publically available documents which could improve my understanding of [food security, malnutrition, coffee production] in the Colomba region?

Thank you for speaking with me. At this time, I believe we have covered everything that I had planned to ask you. However, if you feel that we missed an important point of discussion, or if you would like to clarify a point, please feel free to do so.

1. Is there anything else we did speak about that you would like to add more to?
  - a) Would you like to clarify any answers or information you provided me?
  - b) Is there anything that I did not mention, but which you think is important?

## APPENDIX C

### REFLEXIVE RESEARCH MEMO TEMPLATE


Type (check all that apply)	Research Activity Report Data Analysis Peer/Member Check Field Note
Date and Time	
Location	

Possible Topics (Birks, Chapman, & Francis, 2008):

- Decisions relating to any phase of the study, such as sampling, data collection, and analytical procedures.
- Articulate, explore, contemplate, and challenge interpretations of data.
- “What is actually happening with the data?”
- Understand perspectives and decisions.

APPENDIX D

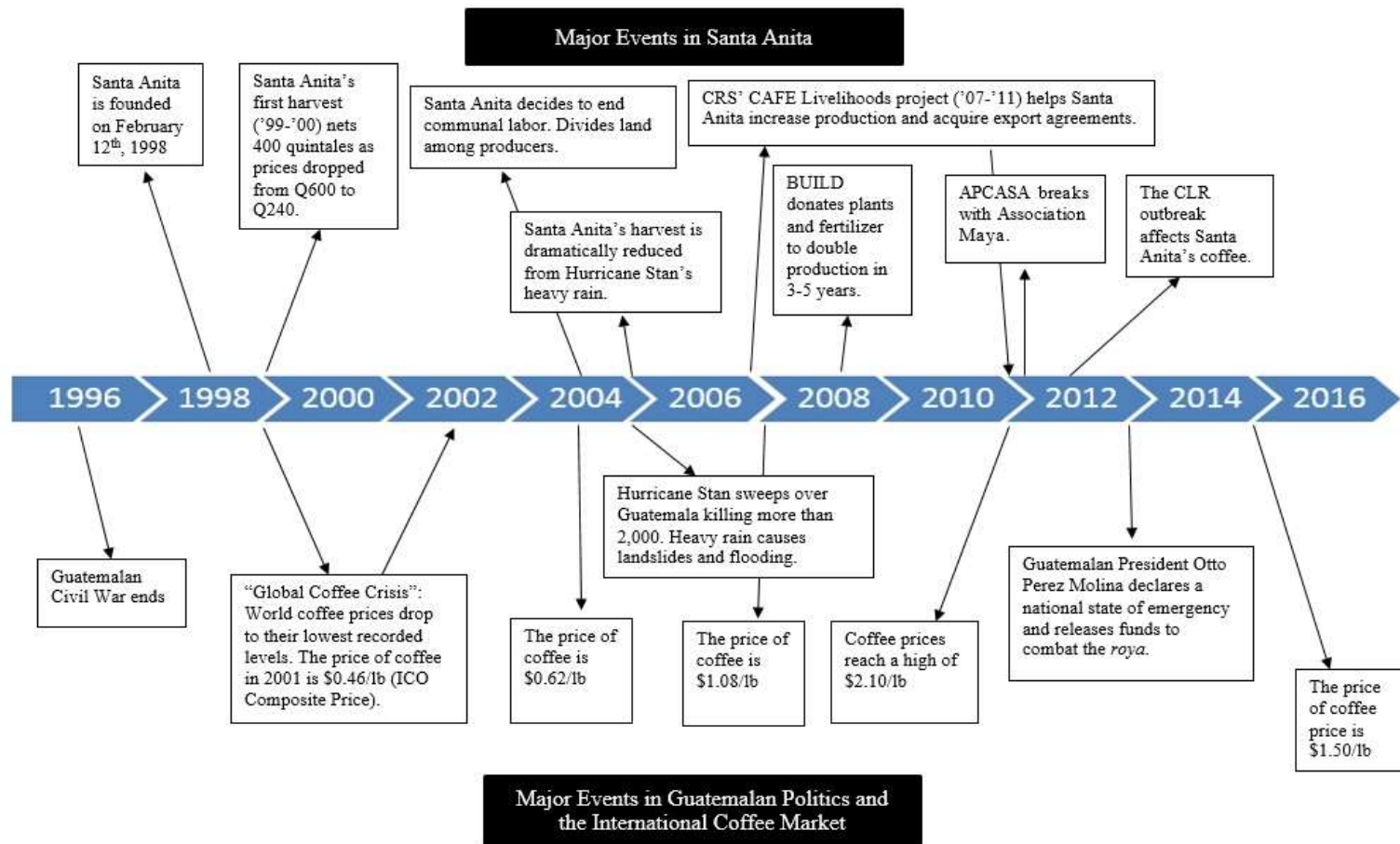
LIVELIHOODS FRAMEWORK ANALYSIS CHECKLIST FOR SITE VISITS, DOCUMENT ANALYSIS,  
OBSERVATIONS, AND REFLEXIVE RESEARCH MEMO

Describe the context, conditions, and trends which affect the coffee cooperative.	Identify the livelihood resources to which the coffee cooperative has access.	Analyze the influences that institutions and organizations have on livelihood resource access.	Construct livelihood strategies which members of the coffee cooperative use to access resources	Evaluate livelihoods	
					
<b>History</b>	<b>Social Capital</b>	Describe the <b>institutional processes</b> which influence the community. How do these processes influence livelihood resource access?	<b>Pathways:</b> Simple coping strategies to access resources.	Analyze livelihood <b>outcomes.</b>	
<b>Politics</b>					
<b>Macro-economic conditions</b>	<b>Economic/financial Capital</b>		Describe the <b>organizational structures</b> present in the community. How do these structures influence livelihood resource access?		<b>Portfolios:</b> A collection of coping strategies to access resources.
<b>Terms of trade</b>					
<b>Climate</b>	<b>Natural Capital</b>	Describe the <b>organizational structures</b> present in the community. How do these structures influence livelihood resource access?	<b>Holistic interactions:</b> Connections between coping strategies and resource access.	Analyze <b>trade-offs</b> to different resources.	
<b>Agro-ecology</b>					
<b>Demography</b>	<b>Human Capital</b>				
<b>Social differentiation</b>					
<b>Food Security</b>	<b>Other Resources</b>				

Note: Adapted from Scoones' (2009) sustainable livelihoods framework checklist

## APPENDIX E

### TIMELINE OF MAJOR EVENTS IN SANTA ANITA, GUATEMALAN POLITICS, AND THE COFFEE MARKET



## APPENDIX F

### NOMENCLATURE/SPANISH LANGUAGE TRANSLATION

ANACAFE	<i>Asociación Nacional del Café</i> (Guatemalan National Coffee Association)
APCASA	<i>Asociación de Productores de Santa Anita</i> (Producers Association of Santa Anita)
<i>Beneficio</i>	Literally “benefit”. In Guatemala’s coffee-producing areas it referred to coffee processing and storage centers.
<i>Bodega</i>	Literally “warehouse”. A place to store processed coffee.
<i>Broca</i>	Literally “drill”. The colloquial name used for the coffee borer beetle ( <i>Hypothenemus hampei</i> ).
<i>Cacaxte</i>	Mayan language term for a wooden-frame that is strapped to one’s back and used to carry goods on foot.
CAFE Livelihoods	Coffee Assistance and Enhanced Livelihoods
CLR	Coffee leaf rust ( <i>Hemileia vastatrix</i> )
CGIAR	Consultative Group on International Agricultural Research
<i>Costal</i>	A burlap or nylon sack used to carry and store coffee.
<i>Coyote</i>	Literally “coyote”. A term used to describe Guatemalan coffee purchasing middlemen.
CRECER	A Guatemalan fair-trade association that provides technical and advisory services to small agricultural producers/cooperatives.

CRS	Catholic Relief Services
<i>Cuerda</i>	An inexact land measurement used in Guatemala. In the <i>Boca Costa</i> region (i.e. Santa Anita) 1 <i>cuerda</i> = 25 x 25 <i>varas</i> = 1/16 of a <i>manzana</i> . 1 <i>cuerda</i> = 1/10 acre (approx.).
De La Gente	Literally “from the people”. A Guatemalan-based, North American-owned fair-trade coffee purchaser/NGO.
<i>Diversificado</i>	Literally “diversified”. Equivalent to the U.S.’ high school.
Extra Prime	Lower quality coffee grown at 2,500-3,500 feet above sea level.
<i>Fondo de Tierras</i>	Literally “Land Fund”. Also referred to as <i>FONTIERRAS</i> in Guatemala. A government organization created after the civil war to address land inequality.
<i>Finca</i>	Literally “estate”. Used to describe medium to large coffee holdings in Guatemala.
HB	Hard Bean. High quality coffee grown at 3,500 to 4,500 feet above sea level.
IDO	International Development Organization
Indigenous	In Guatemala, indigenous “ <i>indigena</i> ” refers to people from the 23 (21 Mayan) recognized ethnic groups that identify with their pre-Colombian cultures.
<i>Jornal</i>	Literally “wage”. Coffee producers typically refer to one full day (8 hours) of labor as a “ <i>jornal</i> ” (i.e. “It will take three <i>jornales</i> to harvest the coffee.”).

<i>Jornalero</i>	A “wage laborer”.
<i>Junta</i>	Literally “board”; “assembly”. A decision making group.
<i>Ladino</i>	In Guatemala, being of mixed indigenous and European (Spanish) ancestry. Ladinos typically speak Spanish and dress in “western” clothing.
<b>MAGA</b>	<i>Ministerio de Agricultura Ganadería y Alimentación</i> (Ministry of Agriculture, Livestock, and Food)
<i>Mozo</i>	Literally “porter”. In Guatemala, the term refers to coffee laborers who were provided permanent housing on the <i>finca</i> , certain social/health benefits, and sometimes, retirement benefits.
<i>Nata</i>	Literally “cream”; “scum”. The second-class beans and other materials that float up to the surface when wet-processing coffee.
<b>NGO</b>	Non-governmental Organization
<i>Ojo de Gallo</i>	American leaf spot of coffee ( <i>Mycena citricolor</i> )
<i>Oro</i>	Literally “gold”. Coffee “in <i>oro</i> ” refers to green coffee that has no outer parchment shell and that is ready to be roasted.
<i>Pergamino</i>	Green, dried coffee beans still enclosed in the outer parchment shell.
<b>Prime</b>	See Extra Prime. Lower quality coffee grown at 2,500-3,500 feet above sea level
<b>PROMECAFE</b>	<i>El Programa Cooperativo Regional para el Desarrollo Tecnológico y Modernización de la Caficultura</i> (the Regional

Cooperative Program for the Technological Development and Modernization of Coffee.

<i>Quintal</i> (QQ)	A weight measurement used in Guatemalan agriculture. In coffee production, a <i>quintal</i> can have several meanings depending on the context and region. In Santa Anita, and in this study, 1 <i>quintal</i> = 100 pounds.
Quetzales (Q)	Guatemalan currency.
Semi-washed	A method for processing coffee beans. In Santa Anita, refers to beans that were washed immediately and not left to ferment for 24-36 hours.
SHB	Strictly Hard Bean. The highest quality coffee, grown at 4,500-6,500 feet above sea level.
<i>Tierra Caliente</i>	Literally “hot land”. In Guatemala, the term refers to costal/low elevation land that can support cultivation of tropical crops such as sugar cane, coffee, and bananas.
<i>Tierra Fria</i>	Literally “cold land”. In Guatemala, the term refers to high elevation/mountain land that can support cultivation of temperate food crops such as corn, beans, and squash.
URNG	<i>Unidad Revolucionaria Nacional Guatemalteca</i> (Guatemalan National Revolutionary Unity)
USAID	U.S. Agency for International Development



<i>Uva</i>	Literally “grape”. Used to describe a coffee cherry that has recently been picked.
Wet Process	A method for processing coffee beans. The sugar coating on the beans (mucilage) is left to ferment for 24-36 hours. The mucilage is then removed by washing it repeatedly with water or allowing the beans to soak in specially designed tanks. Produces “fully-washed” beans.

## APPENDIX G

### LIST OF DOCUMENTS USED IN THE CASE STUDY PERTAINING TO SANTA

#### ANITA'S HISTORY, APCASA, AND EXTERNAL ASSISTENCE

The following list of documents was built and used by the researcher throughout the data analysis stage. The documents were not used during the pre-data collection or data collection stages. The documents helped guide data analysis and were used to triangulate the primary data collected from interviews and observations during site visits. All Internet links listed functioned as of February 16, 2015.

<b>Code</b>	<b>DA.1</b>
<b>Description</b>	De La Gente: APCASA receives coffee fruit de-pulper
<b>Source</b>	<a href="http://www.dlgcoffee.org/news/2014/3/31/apcasa-receives-coffee-fruit-de-pulper">http://www.dlgcoffee.org/news/2014/3/31/apcasa-receives-coffee-fruit-de-pulper</a>
<b>Code</b>	<b>DA.2</b>
<b>Description</b>	CRS: Description of Santa Anita, APCASA, production, founding date. Dated April 7, 2011.
<b>Source</b>	<a href="http://coffeelands.crs.org/2011/04/apcasa-a-revolutionary-approach-to-coffee/">http://coffeelands.crs.org/2011/04/apcasa-a-revolutionary-approach-to-coffee/</a>
<b>Code</b>	<b>DA.3</b>
<b>Description</b>	<a href="http://members.coopcoffees.com/producer-photos/santa-anita-guatamala">http://members.coopcoffees.com/producer-photos/santa-anita-guatamala</a>
<b>Source</b>	Cooperative Coffees: Images of Santa Anita coffee production, people, land.
<b>Code</b>	<b>DA.4</b>
<b>Description</b>	Personal Blog: Visitor stayed with Santa Anita
<b>Source</b>	<a href="http://bensampsonite.blogspot.com/2012/01/courage-coffee.html">http://bensampsonite.blogspot.com/2012/01/courage-coffee.html</a>
<b>Code</b>	<b>DA.5</b>
<b>Description</b>	LUSH Handmade Cosmetics: Donate to De La Gente to help APCASA Community Development Program in Santa Anita.
<b>Source</b>	<a href="http://www.lushusa.com/on/demandware.store/Sites-Lush-Site/en_US/Charities-Charity?cid=de-la-gente">http://www.lushusa.com/on/demandware.store/Sites-Lush-Site/en_US/Charities-Charity?cid=de-la-gente</a>
<b>Code</b>	<b>DA.6</b>
<b>Description</b>	DESGUA: NGO collaborates with Santa Anita. Has held funding drives and organized farmers' trip to NY and NJ.
<b>Source</b>	<a href="http://desgua.org/santa-anita-la-union/">http://desgua.org/santa-anita-la-union/</a>
<b>Code</b>	<b>DA.7</b>
<b>Description</b>	De La Gente Blog Post: Joined student group from Southern Oregon University.
<b>Source</b>	<a href="http://www.dlgcoffee.org/news/2014/8/6/guest-post-santa-anita-la-union">http://www.dlgcoffee.org/news/2014/8/6/guest-post-santa-anita-la-union</a>

<b>Code</b>	<b>DA.8</b>
<b>Description</b>	Santa Anita La Union Blog: Last updated January 10, 2010. Information about community, members, and production. Appears like it was/is a semi-official blog.
<b>Source</b>	<a href="https://santaanitalaunion.wordpress.com/">https://santaanitalaunion.wordpress.com/</a>
<b>Code</b>	<b>DA.9</b>
<b>Description</b>	EntreMundos: Information about becoming a volunteer in Santa Anita. Updated June 6, 2014.
<b>Source</b>	<a href="http://www.entremundos.org/Projects/db/DisplayListing.php?p_listing_id=180">http://www.entremundos.org/Projects/db/DisplayListing.php?p_listing_id=180</a>
<b>Code</b>	<b>DA.10</b>
<b>Description</b>	Viajero Sustentable: Information about community, production, and how to visit.
<b>Source</b>	<a href="http://viajerosustentable.com/2011/09/11/finca-santa-anita-la-union/">http://viajerosustentable.com/2011/09/11/finca-santa-anita-la-union/</a>
<b>Code</b>	<b>DA.11</b>
<b>Description</b>	YouTube Video: "Proyecto Cafe de BUILD, CRS, y Santa Anita la Union" BUILD's project, Canal 3 interview with Santa Anita's members.
<b>Source</b>	<a href="https://www.youtube.com/watch?v=ihl_T_0h9Uk">https://www.youtube.com/watch?v=ihl_T_0h9Uk</a>
<b>Code</b>	<b>DA.12</b>
<b>Description</b>	YouTube Video: "SANTA ANITA LA UNION: Transitions to Agricultural Development.wmv". BUILD Project. Uploaded by Molly Ferrill.
<b>Source</b>	<a href="https://www.youtube.com/watch?v=WM6A__5iGZM">https://www.youtube.com/watch?v=WM6A__5iGZM</a>
<b>Code</b>	<b>DA.13</b>
<b>Description</b>	Possible official and current website of Santa Anita. Contact, community, and production information.
<b>Source</b>	<a href="http://www.fincasantaanita.org/">http://www.fincasantaanita.org/</a>
<b>Code</b>	<b>DA.14</b>
<b>Description</b>	Red de Turismo Comunitario de America Latina: Information about visiting community. Updated 10/23/2009
<b>Source</b>	<a href="http://www.redturs.org/nuevas/articulo.php?ar_codigo=503&amp;ca_codigo=32&amp;ca_padre=">http://www.redturs.org/nuevas/articulo.php?ar_codigo=503&amp;ca_codigo=32&amp;ca_padre=</a>
<b>Code</b>	<b>DA.15</b>
<b>Description</b>	Voice of a Mountain Movie: Explains Santa Anita's history, production, and future aspirations of members. Interviews of members.
<b>Source</b>	<a href="http://www.voiceofamountain.com/">http://www.voiceofamountain.com/</a>
<b>Code</b>	<b>DA.16</b>
<b>Description</b>	CRS Voices Blog Post: Ex-guerillas Build Coffee Cooperative. Posted 3/25/2009.
<b>Source</b>	<a href="http://crs-blog.org/ex-guerillas-build-coffee-cooperative/">http://crs-blog.org/ex-guerillas-build-coffee-cooperative/</a>
<b>Code</b>	<b>DA.17</b>
<b>Description</b>	Tufts' BUILD Program for Sustainable Development. Community

	Development Plan. July 2010
<b>Source</b>	<a href="http://www.tuftsgloballeadership.org/sites/default/files/images/resources/BUILD%20Guate%20Community%20Development%20Plan.pdf">http://www.tuftsgloballeadership.org/sites/default/files/images/resources/BUILD%20Guate%20Community%20Development%20Plan.pdf</a>
<b>Code</b>	<b>DA.18</b>
<b>Description</b>	Maddabout Coffee Blog post: Information about Santa Anita
<b>Source</b>	<a href="http://www.maddaboutcoffee.com/maddwebsite/wordpress/santa-anita-la-union-coffee-cooperative/">http://www.maddaboutcoffee.com/maddwebsite/wordpress/santa-anita-la-union-coffee-cooperative/</a>
<b>Code</b>	<b>DA.19</b>
<b>Description</b>	ANACAFE's 2012 training calendar
<b>Source</b>	<a href="http://www.anacafe.org/glifos/images/c/c7/APCM_calendario_RI.pdf">http://www.anacafe.org/glifos/images/c/c7/APCM_calendario_RI.pdf</a>
<b>Code</b>	<b>DA.20</b>
<b>Description</b>	ANACAFE blog post: German cooperative came to Santa Anita interested in buying coffee. 2/7/2014.
<b>Source</b>	<a href="http://www.anacafe.org/glifos/index.php?title=13NOT:Alemania-compra-cafe-organico">http://www.anacafe.org/glifos/index.php?title=13NOT:Alemania-compra-cafe-organico</a>
<b>Code</b>	<b>DA.21</b>
<b>Description</b>	Research Project, San Carlos University, Guatemala: "Experiencias Alternativas y Tendencias Socio-Productivas Actuales en el Área Rural del Occidente de Guatemala Un estudio comparado en cuatro comunidades." December 2005
<b>Source</b>	<a href="http://digi.usac.edu.gt/bvirtual/informes/puiep/INF-2005-012.pdf">http://digi.usac.edu.gt/bvirtual/informes/puiep/INF-2005-012.pdf</a>
<b>Code</b>	<b>DA.22</b>
<b>Description</b>	MA Thesis, Omid Madjidi, University of Calgary "SUSTAINABLE COFFEE CERTIFICATION PROGRAMS AND COFFEE COOPERATIVES IN GUATEMALA: A SMALL-SCALE PRODUCER PERSPECTIVE" 2011. One brief mention of Santa Anita by an interviewee.
<b>Source</b>	N/A
<b>Code</b>	<b>DA.23</b>
<b>Description</b>	Research Project, San Carlos University, Guatemala: "Experiencias Alternativas y Tendencias Socio-Productivas Actuales en el Área Rural del Occidente de Guatemala Un estudio comparado en cuatro comunidades." December 2005
<b>Source</b>	<a href="http://digi.usac.edu.gt/bvirtual/informes/puiep/INF-2005-012.pdf">http://digi.usac.edu.gt/bvirtual/informes/puiep/INF-2005-012.pdf</a>
<b>Code</b>	<b>DA.24</b>
<b>Description</b>	Thesis, San Carlos University, Guatemala: "El impacto de la cooperación de la Unión Europea y el Gobierno de Guatemala, en el desarrollo socioeconómico de los desmovilizados del país, después de la firma de los Acuerdos de Paz, Estudio de caso, proyecto PAREC II en la finca Santa Anita, Colomba Costa Cuca, 1998 a 2002" by Gloria Ester Avila Avelar. June 2007.
<b>Source</b>	N/A
<b>Code</b>	<b>DA.25</b>

<b>Description</b>	Operation Groundswell blog post: OG Guatemala goes off the grid for work and a fiesta.
<b>Source</b>	<a href="http://operationgroundswell.com/guatemala/guatemala-volunteer-fiesta/">http://operationgroundswell.com/guatemala/guatemala-volunteer-fiesta/</a>
<b>Code</b>	<b>DA.26</b>
<b>Description</b>	Operation Groundswell: Fair Trade Adventure to Guatemala information guide. Briefly described APCASA split with Association Maya. Summer 2013.
<b>Source</b>	<a href="http://operationgroundswell.com/wp-content/uploads/2013/02/Guatemala-Fair-Trade-.pdf">http://operationgroundswell.com/wp-content/uploads/2013/02/Guatemala-Fair-Trade-.pdf</a>
<b>Code</b>	<b>DA.27</b>
<b>Description</b>	Revue (Guatemala's English Language Magazine): "Ex-guerilla entrepreneurship". Description of Santa Anita and information about how to visit. July 2011
<b>Source</b>	<a href="http://www.revuemag.com/2011/07/ex-guerilla-entrepreneurship/">http://www.revuemag.com/2011/07/ex-guerilla-entrepreneurship/</a>
<b>Code</b>	<b>DA.28</b>
<b>Description</b>	Foros Guate: Public forum posting "Santa Anita La Union: Agroecoturismo Diferente". August 10, 2013. Information about Santa Anita and how to visit.
<b>Source</b>	<a href="http://www.forosguate.com/showthread.php?t=18195">http://www.forosguate.com/showthread.php?t=18195</a>
<b>Code</b>	<b>DA.29</b>
<b>Description</b>	Prensa Libre "Ex combatientes se vuelven productivos". Article mentioned planting plans, plant nursery, organic compost project, and CRS involvement. 12/23/2009.
<b>Source</b>	<a href="http://www.prensalibre.com/noticias/Ex-combatientes-vuelven-productivos_0_176382458.html">http://www.prensalibre.com/noticias/Ex-combatientes-vuelven-productivos_0_176382458.html</a>
<b>Code</b>	<b>DA.30</b>
<b>Description</b>	Prensa Libre: "De las armas al agroecoturismo". Description of community, exporting coffee to the US, ecotourism, selling banana bread in Quetzaltenango, and using the ex-administrator's house as a hotel. 08/28/2010
<b>Source</b>	<a href="http://www.prensalibre.com/noticias/armas-agroecoturismo_0_325167526.html">http://www.prensalibre.com/noticias/armas-agroecoturismo_0_325167526.html</a>
<b>Code</b>	<b>DA.31</b>
<b>Description</b>	Tufts' BUILD external links: Mentions Santa Anita being the programs 2008-2009 partner community.
<b>Source</b>	<a href="http://tiglarchives.org/programs/build/external-links">http://tiglarchives.org/programs/build/external-links</a>
<b>Code</b>	<b>DA.32</b>
<b>Description</b>	University of Wisconsin, Whitewater: Guatemala Service Learning information sheet. For travel Summer 2015.
<b>Source</b>	<a href="http://www.uww.edu/Documents/colleges/coeps/counseled/Guatemala%20Info%20Sheet.pdf">http://www.uww.edu/Documents/colleges/coeps/counseled/Guatemala%20Info%20Sheet.pdf</a>
<b>Code</b>	<b>DA.33</b>

<b>Description</b>	University of Toronto: Operation Groundswell partnership for Summer 2013 trip to Santa Anita.
<b>Source</b>	<a href="http://www.utm.utoronto.ca/student-life/sites/files/student-life/public/users/memmesar/UTM%20Custom%20Program%20Handout.pdf">http://www.utm.utoronto.ca/student-life/sites/files/student-life/public/users/memmesar/UTM%20Custom%20Program%20Handout.pdf</a>
<b>Code</b>	<b>DA.34</b>
<b>Description</b>	XelaWho: "Cool trips. Close by". Description of community, visit, and volunteer opportunities. July 2008.
<b>Source</b>	<a href="http://xelawho.com/?p=1067">http://xelawho.com/?p=1067</a>
<b>Code</b>	<b>DA.35</b>
<b>Description</b>	Periodismohumano: Despues de La Paz blog post. Description of Santa Anita and the members' experiences of the civil war and making a new life. Accompanied with video. 2012.
<b>Source</b>	<a href="http://despuesdelapaz.periodismohumano.com/2013/03/31/guatemala-la-vida-despues-de-las-armas/">http://despuesdelapaz.periodismohumano.com/2013/03/31/guatemala-la-vida-despues-de-las-armas/</a>
<b>Code</b>	<b>DA.36</b>
<b>Description</b>	Pellmel (personal blog). "Beautiful images from Finca Santa Anita". Brief description of community with visit's photos. March 4, 2009.
<b>Source</b>	<a href="http://pellmel.com/2009/03/04/beautiful-images-from-finca-santa-anita/">http://pellmel.com/2009/03/04/beautiful-images-from-finca-santa-anita/</a>
<b>Code</b>	<b>DA.37</b>
<b>Description</b>	Turismo Comunitario En Guatemala (University of Mariano Galvez) personal blog. Description of Santa Anita and how to visit. July 5, 2012.
<b>Source</b>	<a href="http://turismocomunitarioguate.blogspot.com/">http://turismocomunitarioguate.blogspot.com/</a>
<b>Code</b>	<b>DA.38</b>
<b>Description</b>	Velocidad Maxima public forum. Description of Santa Anita and how to visit.
<b>Source</b>	<a href="http://www.velocidadmaxima.com/forum/archive/index.php/t-444466.html">http://www.velocidadmaxima.com/forum/archive/index.php/t-444466.html</a>
<b>Code</b>	<b>DA.39</b>
<b>Description</b>	Personal blog: A tourist's recounting of visit to Santa Anita.
<b>Source</b>	<a href="https://chrisandgemma.wordpress.com/2008/03/07/la-finca-santa-anita/">https://chrisandgemma.wordpress.com/2008/03/07/la-finca-santa-anita/</a>
<b>Code</b>	<b>DA.40</b>
<b>Description</b>	Personal blog: Visit to Santa Anita. July 10, 2011
<b>Source</b>	<a href="http://pan-am.info/?p=2295">http://pan-am.info/?p=2295</a>
<b>Code</b>	<b>DA.41</b>
<b>Description</b>	ILO: Listing of a worker union in Finca Santa Anita
<b>Source</b>	<a href="http://www.ilo.org/public/spanish/region/ampro/mdtsanjose/worker/sindi/gt.htm">http://www.ilo.org/public/spanish/region/ampro/mdtsanjose/worker/sindi/gt.htm</a>
<b>Code</b>	<b>DA.42</b>
<b>Description</b>	Personal travel blog. Recounting the experience visiting Santa Anita.
<b>Source</b>	<a href="https://www.travelblog.org/Central-America-">https://www.travelblog.org/Central-America-</a>

	Caribbean/Guatemala/Western-Highlands/Quetzaltenango/blog-430599.html
<b>Code</b>	<b>DA.43</b>
<b>Description</b>	Professional practicum, UNIVERSIDAD RAFAEL LANDIVAR “ESTABLECIMIENTO DE MECANISMOS ORGANIZACIONALES Y GERENCIALES A LA JUNTA DIRECTIVA DE LA ASOCIACION CIVIL DE MUJERES DEL AREA RURAL “AMARC” by Gloria Edelmira Barillas de Leon. Description of Santa Anita and a women’s leadership project.
<b>Source</b>	<a href="http://biblio3.url.edu.gt/Tesario/2012/04/06/Barillas-Gloria.pdf">http://biblio3.url.edu.gt/Tesario/2012/04/06/Barillas-Gloria.pdf</a>
<b>Code</b>	<b>DA.44</b>
<b>Description</b>	ANACAFE publication, “Caficultores son capacitados sobre el tratamiento de aguas residuales”. Description of training in Santa Anita. No date.
<b>Source</b>	<a href="http://www.anacafe.org/glifos/index.php?title=13NOT:NT_Caficultores_tratamiento_residuales">http://www.anacafe.org/glifos/index.php?title=13NOT:NT_Caficultores_tratamiento_residuales</a>
<b>Code</b>	<b>DA.45</b>
<b>Description</b>	York University, Canada new publication: ”Business students venture to Guatemala for first-hand look at coffee business” January 10, 2014. Description of student visit to Santa Anita.
<b>Source</b>	<a href="http://yfile.news.yorku.ca/2014/10/01/business-students-venture-to-guatemala-for-first-hand-look-at-coffee-business/">http://yfile.news.yorku.ca/2014/10/01/business-students-venture-to-guatemala-for-first-hand-look-at-coffee-business/</a>
<b>Code</b>	<b>DA.46</b>
<b>Description</b>	De La Gente List of Projects: Description of support provided to Santa Anita.
<b>Source</b>	<a href="http://www.dlgcoffee.org/our-projects/">http://www.dlgcoffee.org/our-projects/</a>
<b>Code</b>	<b>DA.47</b>
<b>Description</b>	MinnPost news article “Will coffee prices climb with climate change?” Describes weather changes and heavy rain affecting Santa Anita harvest. September 17, 2009.
<b>Source</b>	<a href="http://www.minnpost.com/global-post/2009/09/will-coffee-prices-climb-climate-change">http://www.minnpost.com/global-post/2009/09/will-coffee-prices-climb-climate-change</a>
<b>Code</b>	<b>DA.48</b>
<b>Description</b>	La Comisión Interinstitucional de Comercio Justo y Solidario (quasi-Guatemalan governmental organization): Publication “Mapeo del comercio justo y solidario en Guatemala”. Lists Santa Anita as a FLO certified association, made up of 35 families and 51% women. Lists the institutions name as “Asociación civil Maya de Pequeños Productores (ACMPA)”. Nov 2007-May 2008.
<b>Source</b>	<a href="http://www.encadenamientoempresariales.com/portal/documents/imglinks/2008-09/6119/mapeo-2008.pdf">http://www.encadenamientoempresariales.com/portal/documents/imglinks/2008-09/6119/mapeo-2008.pdf</a>

<b>Code</b>	<b>DA.49</b>
<b>Description</b>	Café Campesino fair-trade coffee importer publication: “Challenges at Santa Anita”. Mentioned raising \$10,000 for Santa Anita. Describes Santa Anita producers as having “tough times” and poor harvests. Mentioned member visiting the US and presence of a “social change intern” from the US who was living and volunteering in Santa Anita. Mentioned Hurricane Stan having a large negative effect on production. Mentioned the challenge of investing in coffee vs spending money on food for family. April 2007.
<b>Source</b>	<a href="http://www.fairgroundsnewsletter.com/0704/santaanita.html">http://www.fairgroundsnewsletter.com/0704/santaanita.html</a>
<b>Code</b>	<b>DA.50</b>
<b>Description</b>	Big World Magazine article, “From Guerrilleros to Cafeteros”. Description of Santa Anita. Mentioned problem of low income, changing weather patterns, low coffee prices, and the debt owed by Santa Anita - \$300,000 at 12% interest. Mentioned land being portioned out by lottery. No date, but article cites 13 years after founding = 2011.
<b>Source</b>	<a href="http://www.bigworldmagazine.com/from-guerrilleros-to-cafeteros/#">http://www.bigworldmagazine.com/from-guerrilleros-to-cafeteros/#</a>
<b>Code</b>	<b>DA.51</b>
<b>Description</b>	CRS Coffeelands blog: “The water (not) in your coffee”. Mentioned the ecological beneficio in Santa Anita. March 12, 2010
<b>Source</b>	<a href="http://coffeelands.crs.org/2010/03/the-water-not-in-your-coffee/">http://coffeelands.crs.org/2010/03/the-water-not-in-your-coffee/</a>
<b>Code</b>	<b>DA.52</b>
<b>Description</b>	As Green As It Gets Facebook photos. December 2013. Photos show rust effects and production of video by APCASA members.
<b>Source</b>	<a href="https://www.facebook.com/asgreenasitgets/photos/a.696309790392965.1073741861.213674481989834/696310123726265/?type=3&amp;permPage=1">https://www.facebook.com/asgreenasitgets/photos/a.696309790392965.1073741861.213674481989834/696310123726265/?type=3&amp;permPage=1</a>
<b>Code</b>	<b>DA.53</b>
<b>Description</b>	As Green As It Gets July 2013 Newsletter: Mentions coffee rust affecting Santa Anita. Provides \$250 microloans for banana, plantain production, and bee keeping. Provided 3,850 roya resistant coffee seedlings. Mentioned 80% crop loss in 2012-2013.
<b>Source</b>	<a href="http://www.asgreenasitgets.org/component/acymailing/archive/view/listid-2-agaig-newsletter/mailid-37-july-2013-newsletter/tmpl-component?Itemid=166">http://www.asgreenasitgets.org/component/acymailing/archive/view/listid-2-agaig-newsletter/mailid-37-july-2013-newsletter/tmpl-component?Itemid=166</a>
<b>Code</b>	<b>DA.54</b>
<b>Description</b>	De La Gente: Description of coffee sold/bought. Brief description of APCASA.
<b>Source</b>	<a href="http://www.dlgcoffee.org/antigua-coffee-1/">http://www.dlgcoffee.org/antigua-coffee-1/</a>
<b>Code</b>	<b>DA.55</b>
<b>Description</b>	Operation Groundswell fundraising page: “Guatemala ‘Fair’ Trade Team. Team hopes to raise \$5000 for APCASA and a community



	development organization in another region. Funds intended for Summer 2015 trip. \$1530 raised as of February 13, 2015.
<b>Source</b>	<a href="http://fundraising.operationgroundswell.com/team/guatft">http://fundraising.operationgroundswell.com/team/guatft</a>
<b>Code</b>	<b>DA.56</b>
<b>Description</b>	Operation Groundswell Fundraising report 2013: \$751 donated to APCASA for partial construction of patio, depulping equipment, storage lockers, and fermentation tanks.
<b>Source</b>	<a href="http://www.slideshare.net/OperationGroundswell/operation-groundswells-fundraising-report-2013">http://www.slideshare.net/OperationGroundswell/operation-groundswells-fundraising-report-2013</a>
<b>Code</b>	<b>DA.57</b>
<b>Description</b>	Movie “Voice of a Mountain”. Movie produced in Santa Anita by international filmmakers. Movie depicts history of Guatemalan conflict, Santa Anita’s community members’ involvement, and their coffee production and livelihood activities. Production began in 2006. Released in 2008. Re-released (?) in 2014.
<b>Source</b>	<a href="http://www.voiceofamountain.com/">http://www.voiceofamountain.com/</a>
<b>Code</b>	<b>DA.58</b>
<b>Description</b>	Cafe Campesino “Santa Anita”. Mentioned representing 32 families, about 170 people, and 28 farms were organic. All coffee was organic by 2003. Joined FLO register in 2001. Mentioned coffee and banana production. Mentioned working collectively. USDA certified organic by Mayacert since 2003. No publication date.
<b>Source</b>	<a href="http://www.cafecampesino.com/Articles.asp?ID=259">http://www.cafecampesino.com/Articles.asp?ID=259</a>
<b>Code</b>	<b>DA.59</b>
<b>Description</b>	Fair Trade Wire (news from the front lines of fair trade coffee): Producer profile: Santa Anita. Same language as DA.58. Includes an Update: Visited as part of CRS’ CAFE Livelihoods delegation. Tufts’ BUILD program. Donations and technical assistance. “Written by Cafe Campesino on Aug 4, 2009”.
<b>Source</b>	<a href="http://www.fairtradewire.com/producer-profile-santa-anita/">http://www.fairtradewire.com/producer-profile-santa-anita/</a>
<b>Code</b>	<b>DA.60</b>
<b>Description</b>	Example of a coffee export contract between Cooperative Coffees and an Ethiopian coffee cooperative.
<b>Source</b>	<a href="http://justcoffee.coop/files/ETS%20123.pdf">http://justcoffee.coop/files/ETS%20123.pdf</a>