



CHEMONICS INTERNATIONAL INC.



LAC BUREAU: DIVERSIFICATION OPTIONS FOR
COFFEE GROWING AREAS IN CENTRAL AMERICA

TASK ORDER NO. 06
RAISE IQC CONTRACT NO. PCE-I-00-99-00003-00

Submitted to:
LAC Bureau/USAID

Submitted by:
Marsha Krigsvold, Chemonics International Inc.

March 26, 2002

TABLE OF CONTENTS

Executive Summary

I.	BACKGROUND	1
	A. COFFEE SITUATION WORLDWIDE	2
	B. CURRENT COFFEE SITUATION IN CENTRAL AMERICA	
II.	COUNTRY PROFILES	
	A. COSTA RICA	5
	1. Background Snapshot	5
	2. Coffee	5
	2a. General Description of the Industry	5
	2b. Estimations of the Impact of Current Crisis on Industry	6
	3. Agricultural Diversification	8
	3a. Description of Climatological and Topographical Conditions	8
	3b. Organizations that Implement Diversification Projects	8
	3c. Agribusiness Support Services	10
	3d. Constraints to Diversification	11
	4. Comparative Advantages	13
	B. EL SALVADOR	
	1. Background Snapshot	13
	2. Coffee	14
	2a. General Description of the Industry	14
	2b. Factors Determining Survival of Coffee Farms	15
	3. Agricultural Diversification	17
	3a. Organizations that Implement Diversification Projects	17
	3b. NGO Implemented Projects	19
	3c. Agribusiness Support Services	21
	3d. Constraints to Diversification	22
	4. Comparative Advantages	24
	C. GUATEMALA	24
	1. Background Snapshot	24
	2. Coffee	25
	2a. General Description of the Industry	25
	2b. Alternative Coffee Markets	27
	2c. Estimations of the Impact of Current Crisis on Industry	27
	3. Agricultural Diversification	29
	3a. Description of Climatological and Topographical Conditions	29
	3b. Organizations that Implement Diversification Projects	31
	3c. Agribusiness Support Services	37
	3d. Constraints to Diversification	39
	4. Comparative Advantages	40
	D. HONDURAS	40
	1. Background Snapshot	41
	2. Coffee	42
	3. Agricultural Diversification	42
	3a. Description of Climatological and Topographical Conditions	42
	3b. Organizations that Implement Diversification Projects	45
	3c. Agribusiness Support Services	45

3d. Constraints to Diversification	47
4. Comparative Advantages	48
E. NICARAGUA	49
1. Background Snapshot	49
2. Coffee	49
3. Agricultural Diversification	53
3a. Description of Climatological and Topographical Conditions	53
3b. Organizations that Implement Diversification Projects	52
3c. Constraints to Diversification	54
4. Comparative Advantages	57
III. Diversification	59
A. Introduction	59
B. Opportunities for Diversification	60
1. Fruits, Vegetables, Flowers, Foliage and Ornamentals	61
1a. Fruits and Vegetables	61
1a1. Considerations for the Export of F&V to U.S. and European Markets	62
1a2. Trends	63
1a3. Domestic and Regional Markets	69
1a4. Local Markets	74
1a5. Processed and packaged markets	75
1b. Cut flowers, Foliage, Ornamentals	77
1b1. Trends in Europe	77
1b2. Local and Regional Markets	79
2. Timber and Agroforestry	79
2a. Pure Stands	79
2b. Agroforestry	81
2c. Environmental Services	82
3. Animal Production	83
3a. Large Animals	83
3b. Poultry Animals	83
3c. Aquaculture	84
IV. STRATEGY	84
A. Fruits and Vegetables (Flowers Ornamental) Markets	84
1. Wholesale Markets	86
2. Market Intelligence	86
3. Grades and Quality Standards	87
4. Extension System	87
5. Organization Building	88
6. Physical Infrastructure	89
7. Credit	89
B. Regional Market Considerations	89
1. Phytosanitary Certificates	90
2. Customs Corruption	91
3. Tariffs	91
4. Market Intelligence	91
C. Export Market Considerations	91
1. Assistance with infrastructure	92
2. Promotion	92
3. Trade Constraints	92

D.	Agroforestry	93
	Bibliography	95
Annex A	Table 1: El Salvador	
Annex B	Table 2: Guatemala	
Annex C	Table 3: Nicaragua	

ACRONYMS

CATIE	Centro Agrónomo Tropical de Investigación y Enseñanza
CENTA	Centro Nacional de Tecnología Agropecuaria y Forestal
CDA	Centro de Desarrollo de Agronegocios
CIDA	Canadian International Development Agency
CNP	Consejo Nacional de Producción
CS	Central Standard
GHB	Good Hard Bean
GIS	Geographic Information Systems
GPS	Global Positioning Systems
IICA	Inter-American Institute for Cooperation on Agriculture
IQF	Individually Quick Frozen
HB	Hard Bean
HG	High Grown
MAG	Ministry of Agriculture and Livestock
NTAE	Non-Traditional Agricultural Export
SHB	Strictly Hard Bean
SHG	Strictly High Grown

Executive Summary

International commodity market prices for coffee rose in the middle of the 1990s to prices over \$200/cwt, attracting the attention of investors. Between 1995 and 2000, increases in the plantings of coffee, particularly in Vietnam, and Brazil's recovery from natural disasters resulted in an increase in worldwide coffee production levels between 113 million cwt to 146.52 million cwt. As a result, prices have dropped to unprecedented lows, such as \$44/cwt for "C" coffee in September 2001. Vietnam has begun to remove coffee from some production areas, however, production levels still far exceed world demand. Stock reserves are high, leading experts to predict that recovery may come many years into the future.

Coffee is a significant component of the agricultural sector of the Central American nations' economies, for many of which agriculture represents between 12 and 23 percent of the gross domestic product (GDP). Many growers in Central America are unable to raise sufficient cash to cover the cost of farm maintenance and harvesting. Indebtedness of farms has risen since 1999 when prices first began to drop and those farms, which tend to be the medium- to large-sized, are the most likely to need alternatives and assistance to cope with the market crisis. An estimated 72,370 medium- to large-sized farms in need constitute 28 percent of the estimated total 256,242 coffee farms in the five-country region – Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua. These farms provide the greatest portion of employment in coffee in the region, creating more than 800,000 jobs. This study examines country-by-country the effects the coffee price crisis has had in Central America.

Worldwide coffee prices are unlikely to result to recover soon. Under the circumstances, non-competitive farms have the options of: (1) pruning the trees and waiting 2-3 years to see if the market recovers, (2) selling or abandoning the farm, (3) losing the farm, (4) trying to differentiate the coffee to specialty coffee, and (5) diversifying crops on the farm.

The dangers of an economy's reliance on a few agricultural commodity crops has long been recognized and efforts for the diversification of agricultural economies are not new to coffee growers. Over the last 30 years, many efforts for agricultural diversification have not been sufficiently successful to balance the economies of the region. A brief summary of each country describes diversification efforts made and lessons learned.

This study discusses the global options for non-coffee agricultural diversification for these five countries. The production capabilities of the lands in the different coffee-growing regions in each country differ, which affects the choices for diversification alternatives in growing areas. Likewise the markets and individual country business climates will determine which alternatives are profitable. These multiple facets of agricultural diversification decision-making require a flexible approach to choosing alternatives to coffee and their markets. However, diversification efforts made in each country should be made with an awareness of the efforts underway in other countries to maximize efficiency through coordinated efforts and information sharing.

Assisting farmers in switching from coffee to an alternative crop is a long-term effort. Some alternatives, such as fruit, timber and agro-forestry, require several years of support to assure success. The level of experience, literacy and sophistication of the farmer-client is an important factor affecting the time and effort required for a sustainable diversification of a farm. Additionally, growers will need access to financing, as many of them no longer have sufficient disposable income to invest in diversification.

Use of market information to identify market opportunities and an appreciation for the processes and infrastructure needed to deliver different products to the marketplace, will serve as a guide in the identification of the product and resources needed to be profitable. The choice of market should be based on the product, resources required and the relative risk and profitability of the market.

At the same time, for sustainable diversification of the agricultural sector of the five-country region, the public sector services of education, marketing and production research and extension must be improved to provide the continuous support needed for growers to be informed of market trends that represent opportunities and threats. Also, infrastructure that is needed to remove barriers to marketing product should be provided. Government policies and production incentives may need to be considered to assist growers in succeeding in a new field of work. As governments of these nations face financial difficulties and do not have sufficient infrastructure and resources to provide all of the services needed by growers, means must be found to help them develop and maintain these services to the growers. Also, the effort for regional integration will be necessary to make delivery of product more efficient.

Diversification Options for Coffee Growing Areas in Central America

Introduction

I. Background

A. Coffee Situation Worldwide

Global production levels of coffee soared in the last half of the 1990s due to Brazil's recuperation from natural disasters and Vietnam's large increase in coffee production. Small producers such as Colombia, Mexico, Guatemala and Uganda further upped production levels. At the same time, world consumption of coffee has remained stable, growing slowly at an average annual rate of 1.0-1.5 percent, which is insufficient to absorb the increase in world supply. In 1997, supply exceeded demand, thus resulting in a plunge in prices. By 2000, estimated supply was at 111 million cwt sacks while demand reached only 105 million (Sánchez Solera, 2001).

More than 59 percent of world coffee is produced in the Americas. Although the American coffees have always dominated production, their production levels have been declining steadily over the last 20 years due to increasing competition from African and Asian coffees. Within the Americas, South America dominates production with 40 percent of exports. Central America has maintained a position of producing around 12 percent of world supplies and contributing 12 percent of world exports. Of the Central American producing nations, Guatemala leads in coffee exports, followed by Honduras, El Salvador, Costa Rica and Nicaragua. In 1999/2000, El Salvador's exports surpassed those of Costa Rica, which was experiencing its third year of declining exports. Costa Rica, once the third greatest exporter in the region, dropped to fourth behind El Salvador (Sánchez Solera, 2001).

The retail end of the coffee industry has a high concentration of buyers and toasters. Three major buyers – Volcafé, Neumann and Esteve – market 50 percent of worldwide coffee exports annually. The major toasters worldwide – Nestlé, Philip Morris, Sara Lee and Procter & Gamble – are large transnational food conglomerates for which coffee is just one of many products. To meet stockholders' expectations of company performance, they are more interested in returns than in the quality of coffee they sell. They can, and do, alter their coffee blends to accommodate cheaper coffee product, which allows them to increase their profit margin (Sánchez Solera, 2001). Purchases of large quantities of poor quality Vietnamese robusta at low prices caused a pronounced drop in market price for the "C" class, average type coffee. The oversupply and resulting low price is so extensive that the price of other quality and types of coffee, including the premium quality "specialty" coffees has dropped as well. Oversupply of low-priced coffee is "driving out" the better quality arabica coffees from the Americas and American producers are finding that their coffee is non-competitive at the current low prices.

The coffee market is known for its cyclical nature, experiencing price peaks and valleys every 7-10 years due to cycles of: (1) overproduction accompanied by increased stock reserves, (2)

falling prices and producers failing or bailing out, (3) underproduction, accompanied by stock consumption, (4) exhaustion of the stock reserves and high prices and (5) increased planting. At the end of the 1980s and beginning of the 1990s, a price valley occurred, which proved one of the worst and longest encountered by American growers to date. This price valley occurred due to abandonment of the International Coffee Convention in 1989. A drop in production and the establishment of a quota system led to a rebound of the price after 1993, which continued to rise through 1997. At the time, the drop in production was due to production losses in Brazil caused by natural disaster (Sánchez Solera, 2001). As a result of the restricted supply and exhaustion of stock reserves, prices recovered and rose to a peak of over \$200/cwt. High prices attracted the attention of investors worldwide who increased plantings of coffee, most notably in Vietnam. As supplies once again began to rise and to exceed demand, prices began to drop and by September 2001 the price of coffee had fallen to a new low of \$44.00/cwt.

B. Current Coffee Situation in Central America and Expectations for the Future

In Central America, prices have dropped below the cost of farm maintenance and harvesting for many farms. Many growers are carrying debt that they cannot repay at the current market prices and growers are looking for solutions.

The most commonly heard strategy to deal with this crisis is that of coffee differentiation, meaning the launching of new products different from the “traditional” product. Most coffee growers in the region believe that growers with farms at altitudes below 800-1,000 m will drop out of the coffee industry because their coffee falls into the same quality type as Vietnam, although their farms are not competitive on cost with Vietnam. Growers above 1,000 m, particularly those above 1,200 m with good “cupping” (taste) quality coffee would try for “specialty” coffee status. Specialty coffee buyers pay a premium above the “C” quality for coffees with especially good cupping characteristics. This premium might make a farm profitable.

The reason for differentiation on the basis of altitude is that the cool weather at higher altitudes improves the size, weight and hardness of the coffee bean, which are characteristic of coffees with the good cupping qualities of the specialty coffees. Therefore, the reasoning goes, the higher the altitude, the better the chances of producing a specialty coffee. However, the reality is that altitude, soil, microclimate, coffee variety, plantation management, post harvest handling, milling and selection and grading are all factors that combine to affect the taste of coffee. The only definitive means to determine whether a given lot of coffee has the cupping quality for specialty coffee is a taste test by trained experts.

For example, a recent taste test of Honduran coffees was made by specialty coffee experts during a training course arranged by Fintrac’s Centro de Desarrollo de Agronegocios (CDA). The test of a mix of 73 random and pre-selected lots of coffee, each from different plantations and different regions of Honduras, revealed that only 42 percent of these coffees had cupping characteristics that would qualify them as specialty coffees. Not all samples from production areas above 1,200 m qualified as specialty coffees, which underscores other factors besides altitude that make up a good coffee. Therefore, while altitude might serve as a rough guide for coffee quality, it is the educated palate that will make the final decision.

In reviewing reports for coffee exports for the five countries, the total volume of coffee exported in 2000/2001 typed as strictly hard bean (SHB), strictly high grown (SHG), Maragogipe (a specialty coffee), organic and gourmet was around 6.9 million cwt. Strictly hard bean and strictly high grown beans are from production areas over 1,200 m above sea level and would be expected to include coffees of specialty coffee cupping quality. In 2000, 4.29 million cwt of specialty coffee were purchased (exported) (Boot, 2002). Therefore, it would appear that in 2000/2001, Central American exports of specialty coffees (organic, gourmet) and SHB and SHG coffee types exceeded total demand for specialty coffees that same year by 52 percent. As the CDA test confirms, not all SHB and SHG will be specialty coffees. However, comparing the SHG/SHB volumes exported with specialty coffee demand, only 48 percent of the 2000/2001 export volume of SHG/SHB types would be absorbed by the specialty coffee market. This assumes that Central America would edge out all other competitors for this category (Blue Mountain of Jamaica, the Kenyan and Hawaiian specialty coffees), which is unlikely.

Coffee growers' response to this situation might be a mixed strategy of product differentiation, industry regulation, vertical integration of the farms with in-country toasters and diversification of farms. For the short term, growers with the right conditions and who can make rapid changes needed to meet the cupping quality needed to qualify their coffee as specialty coffee, should be assisted, if possible, in making changes and finding buyers. Governments, producers and consumers should unite to pressure coffee retailers to supply a good quality product, truthfully, to consumers.

In the absence of mass communications on the turn of events in the coffee industry, it will take some years for consumers to realize the impact on the taste of their morning cup of coffee. Those growers whose coffee cannot pass the taste test for at least a premium cup of coffee, which is the majority of growers, must decide what to do with their farms. Those who do not have time to wait for prices to rise must have another alternative.

In general, the majority of farms in all countries are so small that they can harvest the coffee with family labor and do not use high inputs. Coffee represents a "windfall" income, offering them little incentive to switch to an alternative crop.

The medium and large growers who must hire labor and tend to carry debt are relatively few in number but their farms provide employment for a large part of the agricultural labor pool. The fate of these farms affects the lives of many. These farms, whose financial outlook is short-term due to the debt burden they carry, will not be able to wait for the market to expand to include them and their businesses will fail or they will convert the farm to some other use.

For these farms, diversification must and will take place. If these growers can't do coffee, they will do something else. Ideally, they should choose alternatives to coffee that will not degrade the climate and environment and will provide sufficient employment to absorb their former full-time and part-time labor. Their activities should create demand for suppliers and labor. To ensure the most desirable outcome for the grower and society, someone should be there to offer them viable alternatives and assistance.

The coffee production area in much of Central America consists of broken, hillside terrain with important watersheds scattered about the landscape and medium- to large-sized farms scattered among many small farms up and down mountainsides. Given these conditions, the alternatives to coffee will have to be products that are suited to the environment: altitude, soils, microclimates, slopes, rainfall patterns and so forth. The strategies employed to meet this challenge must be flexible enough to consider a number of alternative products but structured enough to ensure that alternative products meet criteria for successful delivery to the marketplace.

The purpose of this document is to provide direction for choosing alternatives and strategies to support diversification of coffee farms. The paper is organized into three sections:

- 1) *Current situation of coffee growers in each of five Central American countries: Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua.* This information is needed for a better understanding of where the production areas are located, their growing conditions, the types of coffee producers, and the general context of the situation in which they find themselves. It also includes information on diversification programs that have worked in the past and what “tools” are in place to diversify, such as organizations, institutions and national infrastructure.
- 2) *Alternatives for diversification.* It is not possible to discuss all alternatives but we may discuss the conditions that will limit choices: goats, cattle and sheep are not appropriate for steep slopes, watersheds or forests settings. Altitude and climate preclude some crops: cacao, melons, sugarcane; the market precludes others, such as asparagus. Not discussed, due to lack of time for market research, are the markets for natural fibers and dyes, sweeteners such as Stevia and “new” crops such as nut, oil and resin trees. What we suggest are alternatives that will occupy production area and provide employment with undue damage to the environment and which have ready demand, well-developed markets and are profitable. Discussed here are the important trends in the market for the alternatives that must be taken into account before implementing any activity with these crops.
- 3) *Strategy options* that will tie the context of the country situation with the general background on diversification.

II. Country Profiles

A. Country Profile – Costa Rica

1. Background

Costa Rica, one of the smallest of the Central American countries, has a long history of stable government, equitable income distribution and land ownership. Between 1986 and 1996, the economy grew at an average annual rate of 5 percent, which allowed the government to budget for social programs, including education. Costa Rica has a literacy rate of 95 percent and the average salary in 1999 was \$2,740 per capita. Unemployment stood at 5.2 percent in 2000. The economy is dependent on agriculture, tourism and electronic exports. Industry exceeds agriculture as the leading contributor to the GDP. The growth rate for industry in 2000 was 4.3 percent. This sector produces microprocessors, textile, construction materials and plastics. Agriculture is still mainly dependent of the traditional export crops of coffee, pineapple, bananas and sugar, although it does have a strong non-traditional agriculture export (NTAE) sector (ICDF, 2001). The GDP for 1999 was \$11.1 billion and grew by 3 percent in 2000.

Costa Rica is widely known for its success in making ecotourism profitable. Agriculture comprises 12.5 percent. Of the GDP, industry is 30.7 percent and services constitute 56.8 (CIA World Factbook, 2001).

2. Coffee

Coffee has become a less important sector to Costa Rica's economy over the last five years. In 1996, coffee represented 10.25 percent of exports and in 1999, only 4.34 percent. Certainly part of this drop is due to falling prices but it is also due to falling production as land is being converted to other uses and industry is gaining momentum. The government has implicitly acknowledged the lost importance of coffee as a source of tax revenues by agreeing in 1996 to reform tax law and in 2000 by subjecting coffee earnings to the same rate as for income tax.

Agriculture represents only 20 percent of GDP. Coffee generates 20 percent of the agricultural employment and 4 percent of total employment.

2a. General Description of the Coffee Industry in Costa Rica

According to ICAFE's official statistics, the number of producers registered is 73,707 (Bendaña, 2001). However, in 2001 ICAFE conducted a coffee census using geographic information systems and global positioning systems (GIS and GPS). Results have not been reported, however, unofficially, those results will show a drop in actual producers, perhaps 25-30 percent fewer producers, as growers are thought to be subdividing their harvest and selling it under different family members' names for tax purposes.

ICAFE official statistics show that the majority of producers are small to medium in size (reported deliveries of 0-300 cwt oro/year) and represent 98.2 percent of all producers producing 65 percent of the national total coffee production. The total area planted is 110,000 ha.

ICAFFE uses seven coffee quality zones: the Central Valley (Alajuela, Heredia, San José, Cartago), Los Santos, the Southern Zone (El General and Coto Brus), Atenas-Palmichal-Puriscal, San Carlos-Sarapiquí, Turrialba-Viñas-Orosi and Guanacaste (Sánchez-Solera, 2001). The two most important zones in terms of numbers of growers and production volume are the Central Valley (40 percent producers, 51 percent production) and the Southern Zone (31 percent of all producers, 25 percent production) (Sánchez-Solera, 2001). The most important zones in terms of excellence of coffee are the Central Valley and Los Santos, which are the two zones that produce good hard bean and strictly hard bean, the better quality coffee types.

Most coffee in Costa Rica is highly technified as a result of a vigorously promoted educational program by ICAFFE and wide dissemination due to the country's high literacy rate. As a result, 65 percent of the production area has an average annual yield greater than 34 cwt oro and 25 percent of production area has a yield greater than 45 cwt/ha (Sánchez-Solera, 2001).

Though one of the smallest countries in Central America, Costa Rica is the country with the widest variety of coffee types. Costa Rican coffee is classified into types and subtypes by ICAFFE, and of those, only four types make up 90 percent of the exports. The types with a premium to specialty coffee quality are some of the hard bean (HB) and most of the good hard bean (GHB) and strictly hard bean (SHB) (Bendaña, 2001).

The coffee industry is structured differently from coffee industries in other Central American countries. It has provided a certain degree of resilience to market shocks, though there is speculation that it must change to survive.

In 1961, national law organized and regulated the commercial relationship between producers, wet mills and exporters. ICAFFE, the official regulating institution for coffee, sets minimum prices and standards for producers and millers. Each producer must pay 1.5 percent of the price paid for each hundredweight of coffee exported. One-third of that is used for the promotion and marketing of Costa Rican coffee. The remaining portion pays for the research and extension services provided by ICAFFE and for the overhead cost of operations of ICAFFE. The Board of Directors is controlled by growers (5 of the 9 members are producers). The body providing oversight is the National Coffee Congress, which is supposed to act as a marketing board to regulate national and international trade of Costa Rican coffee, is also controlled by producers, with "a traditional agriculture mentality." There is concern that this board has insufficient knowledge of the futures and commodities market to appreciate the market situation and alternatives for growers (Bendaña, 2001).

2b. Estimations of the Impact of the Most Recent Crisis on the Industry

The best quality coffee types that sell at premium prices from Costa Rica are some of the HB, GHB and all of the SHB coffees. HB is grown at 800-1,000 m, GHB at 1,000-1,200 m and SHB at 1,200-1,700 m above sea level. Generally, the Central Valley produces all three types and Los Santos grows only SHB. The lower quality types are grown in the remaining zones of El General, Coto Brus, Turrialba, San Carlos and Guanacaste. Guanacaste produces little coffee and it is a poor type.

The growers most likely to remain in coffee are the 29,758 producers in the Central Valley and another 6,719 in Los Santos. The remaining 37,230 growers in lower growing areas produce lower-quality coffees and many of these, about 50 percent of all producers, will not be able stay in coffee for many more years. Bendaña reports that some wet mills have already resorted to confiscating farms to collect debts. Some of the growers in El General have begun to convert their farms to sugar cane. Land in the Central Valley around San Jose is being converted to land development projects as the value of the land is too great to justify coffee production (Bendaña, 2001).

Gonzalez predicted in 1998 that production of coffee in Costa Rica would continue to decline in the future due to a combination of the following factors: loss of production area to land development and urbanization, high costs, low productivity, low prices and labor problems (harvest). In surveys made by ICAFE during harvest in 1992/93 and 1994/95, 90 percent of the producers replied that low returns was their most important problem. Labor cost in Costa Rica is 2.5 higher than for the rest of Central America, except for Nicaragua, making Costa Rica one of the most expensive coffee producers in Central America.

Coffee employs some 33,000 full-time field hands and 150,000 pickers for production (mostly Nicaraguan) and 4,000 permanent employees and 30,000 part-time employees in the mills.

In general, the reputation for the quality of Costa Rican coffee and the structure of the coffee industry in Costa Rica has temporarily buffered the worst effects of the market downturn. The average price of the 2000/2001 harvest was \$0.476/lb, however, growers received another \$0.188/lb from the National Coffee Stabilization Fund. That provides an average income of \$0.664/lb or \$66.40/cwt. The average cost to produce a hundredweight of coffee oro, using an average yield of 34 cwt/ha, was \$77.22 in 2001. Many growers used advances from the wet mills that they have not yet paid. The \$0.108/lb difference between income and outflow of cash may not be felt, as advances most likely covered it, but those will have to be paid back in 2002 and growers should begin to feel the effect of low prices and the unpaid loans. Growers did not cut back on maintenance of the plantation in 2001/2002 but they will in 2002 because they will not have the cash to pay for maintenance and are already in debt from the 2001/2002 harvest. The effects of this will be seen in the form of low production levels in 2003/2004 (Sánchez-Solera, 2001).

In 2002, the coffee industry will see a reduction in overall employment as growers scale back maintenance either through lower inputs or by executing a severe pruning of the plantation to reduce maintenance and avoid harvest costs for the next two years. Either of these decisions will reduce the harvest, which will by force reduce the activity of wet mills and exporters. There are 97 wet mills in all in Costa Rica as of 2000/2001. Of those, 54 are in the Central Valley (42) and Los Santos (12). The remaining 43 are in the less favored coffee zones (ICAFE, 2001). Those in the Central Valley and Los Santos may not be greatly affected by the drop in upcoming production and the outstanding debts of growers, but those in the lower areas will be affected. At best, the wet mills with lower quality coffees will experience consolidation as the financially healthier enterprises and those belonging to exporters linked to transnationals purchase their weaker competitors or allow them to fail. At worst, many of the wet mills will close and the remaining growers will have to transport their product to more distant wet mills for sale,

lowering their returns further. We can expect to lose some portion of employment from wet mill closures as well.

3. Agricultural Diversification

3a. Description of the Climatological and Topographical Conditions of the Different Coffee Growing Regions

The following information was compiled from Oscar Rojas' 1987 study of the important coffee zones of Costa Rica (Rojas, 1987).

The Central Valley, which starts at the base of the valley at 600 m above sea level and rises to 1,700 m, is generally drier than the other coffee production areas, with an average annual rainfall that ranges from 2,000 to 3,000 mm and average number of rain days of 155-160. Temperatures are cooler than for other regions, ranging from an average 19° C to 22.5° C. Relative humidity is low, 81-84 percent.

In contrast is the San Carlos Sarapiquí region, which is lower, hotter and wetter than the Central Valley. The average altitude is 200-900 m above sea level. There is an average annual rainfall of 3,000-4,000 mm for 245 days. This region is hot, 22-24.5° C, and has a high relative humidity of 87.5-89 percent.

Guanacaste is another low region but is slightly drier than the San Carlos Sarapiquí region but with a shorter, more intense rainy season. The altitude ranges from 300-1,000 m above sea level, and the average annual rainfall is 2,250 mm over 145 days. Average annual temperature is 24° C.

The remaining coffee growing areas – El General, Coto Brus, San Carlos, Sarapiquí, and Turrialba – are at intermediate altitudes (600-1,200 m, mostly 800-1,000 m), wetter, 3,000-4,000 mm of average rainfall annually, and warm, 20.5-23.5° C.

3b. Organizations and Institutions that Implement Diversification Projects

Several institutions manage project funds: the Ministry of Agriculture and Livestock (MAG), SENARA, Consejo Nacional de Producción (CNP) and PDR. Currently, SENARA is managing a rural development project with funding from the Government of Costa Rica (GOCR) and Japan. MAG administers a large number of agriculture-related projects with funding from governments of Chile, Japan, Mexico, Canada and Spain and some funding from the Inter-American Development Bank (IADB) and the Food and Agriculture Organization (FAO). The CNP is carrying out a number of projects related to market information and market report networking. Some funding is from their budget and some is from the governments of Israel, Mexico, Canada, Chile, Spain, Taiwan (ICDF) and Holland; other funding is from IICA, CDI-OEA (Canadian) and FAO (SEPSA, 2001).

NGO-Implemented Diversification Projects

In 1965, about one-third of the land in Costa Rica was used for production of rice, beans, corn, coffee, cacao, sugar cane, bananas and vegetables. In 1996, the most important crops were sugar

cane, bananas, dairy, pineapples and melons. During the intervening years, the crops that had shown the greatest growth in production were melons, mangos, papayas, oranges and bananas. Vegetable oils (soybean, sesame, linseed and palm), roots and tubers, particularly yucca; macadamia nuts, chicken meat and eggs, pork and onion exports also grew rapidly during the period (Mejía, 1998).

In the early 1980s, the external debt had spiraled out of control and a number of reforms were adopted to control debt and improve the performance of the economy. During the 1980s, USAID worked with policy makers to eliminate price controls, remove barriers to open and free trade and to privatize state monopolies. Prices on agricultural products, which had been controlled, were freed. The World Bank assisted institutional changes. MAG relinquished its role in research and outreach and passed its marketing responsibilities to CNP. The activities of IDA (Instituto de Desarrollo Agraria), which had been providing titles to campesino land parcels, stopped. Personnel were reduced by nearly half in the government (Mejía, 1998).

Banking was reformed and private financial institutions were allowed to operate. USAID support for private banks resulted in a boom in exports.

From 1976 to 1984, to provide incentives for exports, the government provided two tax exonerations for exports. The CAT (Certificado de Abono Tributaria) provided a 15 percent tax exemption on export products with 35 percent domestic value-added (VAN). CIEX (Certificado Incremento de Exportaciones) provided a 1-10 percent annual increase on the value of exports. CIEX was suspended in the 1980s but CAT was legislated in 1984 and provided a 15 percent exemption when >35 percent of the FOB value of the export was VAN and a 20 percent exemption if >50 percent were VAN (Mejía, 1998).

In 1987, Costa Rica began a program of promotion of non-traditional products. Crops that were heavily promoted were fruits (bananas, melons, pineapples and fresh plantain) and processed products such as orange juice, pineapple juice and fruit concentrates/pulps. In addition, fish and seafood were promoted and the industries for tuna, fresh fish (tilapia) and shrimp were developed (Arze et al, 1999). As a result of these projects, between 1983 and 1992, the value of nontraditional exports increased from \$90 million to \$781 million (Atwood, 1996).

CINDE implemented trade and investment programs that led to the investment of \$417 million from Asia, Europe and the United States by 1993. CINDE implemented agricultural diversification programs with USAID funding. About five years ago, CINDE ceased to offer services for the agricultural community as the economy became more oriented toward electronics and technology (Atwood, 1996 and USAID Mission to Costa Rica, 1995).

ACDI implemented the Cooperative Management Strengthening Project from 1989 to 1992 to strengthen the agricultural cooperatives and commodity producers' association with improved administration and financial security. The project had problems getting started and finding local staff; nevertheless, it had a significant impact on the processing and marketing of NTAEs by the cooperatives. ACDI chose cooperative-clients on the basis of their willingness to adopt a business-like attitude as it was felt that they would be more successful and efforts would have a greater impact on NTAE exports (USAID Mission to Costa Rica, 1995).

Several lessons were learned from these experiences:

- (1) The marketing component must be able to find buyers and export new product to buyers
- (2) Technical assistance programs must have goals that meet growers' needs and flexibility to meet unanticipated needs
- (3) Export promotion programs should target growers with the greatest business capacity and provide them with the greatest support
- (4) In the case of NTAEs, where the production package is sufficiently profitable, a "trickle down" occurs from the largest to smallest growers.

In the 1960s there was an industry in flower, foliage and ornamental plant production already established. By the 1980s, exports in the industry boomed with green foliage as the main export. Costa Rica is now the leading producer of leatherleaf fern in the world, which is highly profitable, generating \$50.4 million in 2000. This fern is the most important non-traditional export crop in Costa Rica (Rainforest Alliance, 2000).

In reaction to the high rate of deforestation in setting up cattle ranches, a number of programs were established to provide incentives for reforestation. Four certification programs were set up: the CAF, CPF, CAFMA and CAFA. Between 1976 and 1992, over 105,490 ha of land was removed from pasture and planted as forestland.

In 1994, the new government administration, Partido Liberal Nacional (PLN), put a halt to the Programa de Ajuste del Sector Agropecuario (PASA) which was financed with \$71 million by the World Bank to run the proyecto de Desarrollo Institucional e Inversión Sectorial Agropecuario. The PLN considered the program too harsh (Mejía, 1998).

In 1996, USAID pulled out of Costa Rica as its work was considered complete. Other governments continue to provide funds for a variety of forest, watershed, and rural development projects: Mexico, Israel, Canada, Holland, Spain and Chile. The World Bank is working with GEF to provide funds for the National Forestry Financing Fund (FONAFIFO) and IADB also funds projects. ICDF (International Cooperation and Development Fund) of the Taiwan Republic of China currently has a mission in Costa Rica. It has four agriculture (fruit trees, bamboo, vegetables and flowers) and fisheries projects, three vegetable research projects, a product packaging and inspection development project and a SME consultancy in Costa Rica. It also has five investment and lending projects to improve infrastructure such as improvements to the terminal port at Limón/Moín and highways.

3c. Agribusiness Support Services

Research

Universities: University of San José (research)

CATIE: Centro Agonómico Tropical de Investigación y Enseñanza (forestry and agroforestry)

IICA: Inter-American Institute for Cooperation on Agriculture (studies and policy on agriculture-related topics)

EARTH: Escuela de Agricultura de La Región del Trópico Húmedo (research)

Financing

As of 1995, agricultural production is financed through a mix of BANCOOP (52 percent), NGO (14 percent) and the Proyectos de Desarrollo Unido (14 percent) (Mejía, 2000).

Quality Assurance/Certifications

There are a number of organic certifiers in Costa Rica. Two are Costa Rican: Eco-Lógica and AIMCOPOP. There are six international certifiers: BCS OKO Garantie, OCIA, CCOI, Instituto FOBL (Swiss), Asociación Nacional de Agricultura (ANA) of Australia and the Canadian Organic Advisory Board. Contact information for these may be found at INFOAGRO. Milieu Program Sierteelt (MPS) is certifying flowers in Costa Rica and Eco-OK is certifying through FIIT.

Marketing and Production Assistance

The CNP offers a number of market news (MERCANET) and production and agribusiness information by INFOAGRO (Sistema de Información del Sector Agropecuario Costarricense).

Promotion

CINDE ceased promotions of agricultural products over five years ago. PROCOMER does have some information on flowers and export information on its website (<http://www.procomer.com>).

Organizational and Business Development

INCAE: Instituto Centroamericano de Administración de Empresas is a business school. It has ties with the Harvard Business School. Its CLACDS (Centro Latinoamericano para La Competitividad) carries out studies related to this competitiveness.

3d. Constraints to Agricultural Diversification (Hayes, 2001)

Policies

Phytosanitary and sanitary certificates are being denied for reasons other than sanitary concerns. The COCR is accused of using them to restrict access for agricultural imports.

Institutional

State owned services that have not been privatized: telecommunications and energy distribution.

Business

The COCR has been accused of restricting the participation of foreign companies in private sector activities such as customs handling.

Cargo rates are very high for air shipments to Miami: a basic weight tariff of \$0.92/kg plus cargo handling charges. The weight tariff is nearly \$0.15 higher than for the next highest rate, that of El Salvador at \$0.77/kg and over \$0.27/kg higher than for Honduras. The cargo handling charges are in-line with Nicaragua, better than for either Guatemala or El Salvador but higher than Honduras (Bax Global, quote: TACA Airlines on February 19, 2002).

Labor costs are high and are unavailable for agriculture.

National Infrastructure

Telephone and Internet Service

Costa Rica has very good telephone service. There is sufficient service for 584,000 lines and these are not yet in use. As of 2000, 143,000 cellphones were in use and as well as three Internet services, only one of which is legal.

Electricity

More than 5.3 billion kWh of electricity are produced in Costa Rica of which 165 million kWh are exported and 69 million are imported.

Roads

Costa Rica has the highest density of roads in Central America. The roads are in good to fair condition.

Ports

Air Cargo

Costa Rica has 29 paved airports but only two international airports: Juan Santa Maria International and Daniel Odubar International. Of these two, the former is the only one with the capacity for international cargo.

Juan Santa Maria is located 2.3 miles from Alajuela. There is air cargo service by both air cargo carriers and passenger carriers. Fourteen companies offer air cargo service, of those, only four offer daily service. Also, only one company offers direct service to Europe. The most important air carriers are LACSA, Challenge/UPS, American Airlines, Fine Air and Martinair. Cargo is allowed to operate at night.

There are two cold rooms available. One is operated by the National Chamber of Agriculture and Agro Industry (NCAA) and, the other by the MAG. The Merchandized Rapid Transit Center (MRTC) provides service for palletized cargo.

Maritime Cargo Service

There are a number of maritime cargo services in Costa Rica. The most important are: SeaLand, Crowley, Seaboard Marine, American Transport, King Ocean, Dole and Maersk. There are 16 other shipping companies as well.

The two major seaports are Puerto Limón/Moín on the Atlantic Coast and Puerto Caldera on the Pacific Coast on the Gulf of Nicoya.

Puerto Limón has one Lift on/Lift off (LO-LO) terminal and two Roll on-Roll off (RO-RO) terminals. Puerto Limón/Moín has a berth for bananas and a breakwater. Puerto Limón handles 63 percent bananas, 15 percent fruits, 5 percent vegetables, 3 percent coffee and 2 percent plants and vegetables.

In 1996, stowage service was privatized and there are now seven companies providing that service. Rates are competitive.

Puerto Caldera handles mostly dry merchandize and cruise ships. Over 178 cruise ships stop there annually.

4. Comparative Advantages of Costa Rica

Costa Rica has a literate workforce, which is easier to train and provides a broader choice of employees. However, Costa Ricans require a higher salary than in other Central American countries so choice of strategy should be for high-return alternatives with high-quality requirements: for example, processed products.

Proximity to South America provides a gateway for Costa Rican products destined for both highland and tropical South American cities. The country also draws South American tourists.

Costa Rica's large tourist population provides a ready market with disposition to spend cash providing an opportunity for non-perishable, value-added items.

Costa Rica's safety and security lure foreign direct investment for its large forest product industry. Although the rest of Central America may not attract large investors in energy production and paper/pulp projects because of insecurity and instability, Costa Rica is able to do just that. The possibility of planting pine forests for future paper production plants with FDI is one example.

B. Country Profiles-EI Salvador

1. Background Snapshot

Twelve years of civil war discouraged investment in agriculture and absorbed funds that could have been invested in infrastructure. Natural disasters and peace treaty commitments have

absorbed more government funds since the war ended. The nation is basically in a period of reconstruction without sufficient funds to attack all of the problems at once.

The war forced many farmers in the northern and eastern part of the country to flee; some left the country while others relocated in areas of El Salvador with unfamiliar agro-ecological conditions. Moreover, agrarian reform carved up most of the large farms into plots of 500 ha or less. This is unfortunate, as large farms are a necessity for production of commodity products such as grains, which are only profitable when grown in large volumes. Many of those producers experienced in commercial farming left El Salvador. As part of the peace pact, ex-guerrillas and soldiers not necessarily from farming backgrounds were given land titles. The end result was the creation of a large community of inexperienced, unskilled farmers and the loss of large-sized commercial farm operations and skilled, knowledgeable farmers.

Roads, ports and airport facilities for transportation of agricultural products have not been maintained and modernized, slowing progress in diversification with perishable NTAEs. Several years of natural disasters and highly advertised criminal activities (kidnapping in particular) have discouraged direct foreign investment.

In 2000, the real growth rate for GDP in El Salvador was 2.5 percent and per capita GDP was \$4,000. The GDP is composed of 12 percent agriculture, 28 percent industry and 60 percent services. An estimated 48 percent of the population lives below the poverty line. Agriculture employs 30 percent of the work force, industry, 15 percent; and services 55 percent. Unemployment was 10 percent in 1999 (CIA World Factbook, 2002).

2. Coffee

2a. General Description of the Coffee Industry

Although coffee is grown in 10 of the 14 departments of El Salvador, the most important areas for the cultivation of coffee fall in three major regions: the Western, Central and Eastern Regions, at altitudes ranging from 400 to 1,400 m above sea level. The Western Region consists of the departments of Santa Ana, Ahuachapán and Sonsonate. The Central Region includes Chalatenango, La Libertad, San Salvador, La Paz and San Vicente and the Eastern Region includes Usulután, San Miguel and Morazán.

In terms of relative importance (in the 2000/2001 production cycle), the Western Region produces the most coffee; some 62 percent of the coffee cherry (unprocessed fruit) produced that season came from this region, mostly from Santa Ana (58 percent of region). The next most important region is the Central Region, which produces 24 percent of the cherry coffee delivered to exporters, of which La Libertad is the most important department by far (74 percent of region). The Eastern Region produces only 15 percent of the cherry coffee delivered and San Miguel is the most important of these departments (63 percent of region) (Boletín Estadístico de La Caficultura Salvadoreña, 2000/2001). Santa Ana produced 828,452 cwt of cherry coffee in 2000/2001 and represents the largest coffee producer-department in the country. La Libertad is the second most productive department, followed by Ahuachapán.

Much of El Salvador's coffee is grown under shade. Adverse government policies, civil unrest and a hot, dry climate have discouraged investment in full sun/light shade-intense production technology. The artificial forest created by the shade tree cover for coffee constitutes an important portion of the remaining forest in El Salvador.

There are 18,352 growers in El Salvador cultivating coffee on an estimated 229,921 ha. As in the other coffee-growing countries, the majority of coffee farms in El Salvador are small, less than 15 ha in size. In El Salvador, some 20,655 farms are less than 14.7 ha in size, which represents 87 percent of all growers. Due to land reform, farm size tends to be small. The large farm category establishes the lower range in size as 88 ha but does not indicate the upper limit in size. However, only 407 are over 88 ha in size. Most farms, 98.3 percent, are 88 ha or less.

Smallholders are dependent on local buyers or "intermediaries" to come by and pick up their product since they are often without transportation and have no means by which to de-pulp the coffee. Although the price received from intermediaries for cherry is among the lowest of prices paid to coffee growers, intermediaries usually pay cash upon receipt of coffee cherry. This is sure, instant cash. The intermediaries collect coffee from growers and re-sell the coffee, unprocessed, to wet mills or exporters with wet mills. Larger growers either form cooperatives to accumulate sufficient product to warrant hiring a truck or filling a cooperative truck to deliver product to a wet mill or exporter. Most mid-sized farms have at least a manual de-pulper or small wet mill. Large growers usually have their own wet mill and transportation for delivery of coffee to exporters. Some large growers export their own product.

Wet mills

Approximately 73 exporters operate wet mills (or vice versa) and 207 wet mills process the coffee cherry to the "pergamino" stage, then sell the pergamino to exporters. These mills tend to be small.

Intermediaries

Intermediary buyers link producers to wet mills and exporters. Most local buyers are small-scale operations and tend to buy the lower-grade coffees from the small holders who do not have transportation, although some local buyers might move significant volumes of coffee. Growers often complain of intermediary brokers, commonly referred to as "coyotes" in Spanish. However, these middlemen offer a service that requires daily attention to routes in rough and remote areas with vehicles. Intermediaries pay in cash and they have to invest in trucks. Their costs of operation are high due to the distance traveled to pick up the product and deliver it to the wet mill. Clearly, their margin has to be high to cover the risk and cost of operations. In many cases, independent small growers would have difficulty getting their product to the market without an intermediary to provide transportation. Around 147 local buyers were in operation in the last harvest (Pineda, 2001).

2b. Factors Determining Survival for Coffee Farms

The current thought is that survival of the Salvadoran coffee farm depends on whether the farmer can produce coffee of a quality or type that is acceptable to the market for the specialty or

premium coffee. To survive current market condition, growers need to decide on a combination of high yields of good coffee quality of a type in demand by the market (HG, SHG, gourmet, specialty), low debt load, good operation cost control, good-to-ideal growing conditions, good judgment and good luck. Anything less would probably lead to failure under current conditions. Farms without these conditions are at risk unless the farmer has recourse to additional non-farm income (remittances, off-farm employment), and a diversified farm or portfolio of businesses that generate cash.

Two factors in estimating demand for diversification are 1) inability to adopt the specialty coffee status strategy and 2) farm size. Farm size will affect the dependence on non-family labor, which determines cash outflow, and debt burden.

Coffee Quality

Based on altitude at which they are grown, there are three quality grades of coffee grown in El Salvador: central standard (CS), which is grown under 800 m above sea level, high grown (HG), grown at 800-1,200 m and strictly high grown (SHG), which is grown at altitudes above 1,200 m above sea level. Bendaña quotes PROCAFE as reporting that 55 percent of coffee grown is CS, 30 percent is HG, and 15 percent is SHG. As there are 168,000 ha registered as coffee production areas, this would indicate that 75,600 ha of high grown coffee and 92,400 ha are grown at lower altitudes. PROCAFE is recommending that coffees grown below 800 m be diversified, as the lower-valued coffees tend to grow below 800 m above sea level. The low value and volume of CS coffee exported in the 2000/2001 season supports this position (Bendaña, 2002).

The results of the 1999/2000 and 2000/2001 exports of the different types of Salvadoran coffee indicate an overall decrease in exports. Between the two years, total export volume dropped by 31 percent from 3.26 to 2.23 million cwt. A comparison of reductions in exports of the different coffee types indicates the effect of the market demand for different types of coffee. The results are as expected. The largest drops in volumes exported were for the “regular” and “central standard” (>50 percent), followed by green bean, organic and washed types (48 percent, 33 percent and 29 percent, respectively). The best types and grades of coffee, high grown (HG) and strictly high grown (SHG), experienced losses in volume of 26 percent and 27 percent, respectively. What is significant here is that they dropped less drastically than the Central standard, green bean and regular coffee types, only by 26-27 percent as compared to 52 percent, 48 percent and 57 percent, respectively. The only coffee type that gained volume exported was the gourmet type, which increased exports from 25,185 to 28,065 cwt between the two seasons, an increase of 11 percent. The “other” category is an inferior type that appears to have increased in volume in 2000/2001; in fact, this is merely a recovery of a significant drop in volume exported in the 1999/2000 to recover to a position more like the 1998/1999 season.

Neither the gourmet nor the organic types represent important export volumes in comparison to the total volume sold, 1.3 percent and 3 percent only. The Salvadoran gourmet coffee is mostly “Itzalco” brand, a Bourbon coffee grown at 1,400 m above sea level promoted by a French marketing specialist. The gourmet grade export level has held over the three-year period from 1998/1999 to 2000/2001 at around 0.8-1.3 percent total exports (Bendaña, 2002). The organic grade volume dropped from 8,895cwt oro to 6,000 cwt oro, although its overall standing at 0.3

percent total volume exported has remained unchanged. Salva NATURA reports that 4,000 cwt oro annually have been sold to a Japanese buyer as eco-friendly (and organic) over the last three years. That product may constitute part of the organic grade reported, although there are a number of Salvadoran coffee brands certified or labeled as organic, ecologically friendly, shade-grown, bird-friendly and any combination of these.

Clearly, the altitude of the farm and growing conditions largely determines an important factor for survival of a coffee farm, the quality and type of coffee that it produces. The most likely farm survivors on the basis of coffee type seem to be those farms producing the HG and SHG and the gourmet types. Farms located in the highlands of Santa Ana, Ahuachapán, La Libertad and San Miguel are the most likely to carry out a strategy of product differentiation because of their growing conditions. According to PROCAFE's 1998 statistics, over 85,059 ha produce low-altitude coffees (Bajía) (Pineda, 2001). That is roughly 52 percent of all the national coffee production area.

Farm size

Farm size is important as it will determine whether a grower will have to use contracted labor to harvest, the magnitude of cash flows, type of production technology used, whether coffee production represents supplementary income or a business enterprise to the owner. It also indicates the need for short-term debt to cover working capital, access to debt and, therefore, and indication of debt burden.

In Nicaragua and Guatemala, growers with 2 ha or less represent 79 percent and 80 percent of the growers, respectively. In El Salvador, however, 50 percent are small holders with less than 2 ha, comprising 8,072 ha scattered over different altitudes and regions and not strictly "Bajía" type coffee. Because of low inputs and harvest costs, most would not be expected to produce a good quality coffee, nor would they carry a large debt burden. The average output of such a farm is very low compared to larger farms, less than 23 cwt of oro. At this output, a grower receiving \$0.20/lb would earn \$460, an insufficient amount to subsist on, whereas at \$0.40/lb as in the past, the farm earned \$920, which is not sufficient to be considered a livelihood in El Salvador. This coffee plot will not earn the grower's livelihood, but will serve as additional income. Farmers might find more lucrative products and consider diversification if they have enough area for another product.

The remaining population of larger producers (80 cwt or more) number approximately 19,030. The largest growers number some 13,552 and produce on 90,820 ha. If the danger to loss of farmland to coffee production is indeed due to farm size and unmanageable debt, then the largest growers (13,552) and some of the less efficient medium-sized producers (5,478) would have to be considered as in peril. See Annex A, Table 1: El Salvador.

3. Agricultural Diversification

3a. Organizations and Institutions that Implement Diversification Projects

MAG – the Ministerio de Agricultura y Ganadería, develops policy for the agricultural sector. Under the Flores government, the MAG has announced its strategy to modernize and develop

competitive and sustainable agricultural, fisheries and forestry sectors in its 1999-2004 National Agrarian and Agribusiness Policy.

The MAG has two major programs of benefit to the coffee industry. The first is the “Integrated Program for the Renovation of the Coffee Grower Park” which was launched in October 2000. Supported by funding from the ANTEL (National Telephone Company) sale, the program is directed at promoting the renovation of aging plantations to improve the coffee industry and to protect forests and contribute to reforestation. Deforestation of the hillsides and mountains of El Salvador has left the country with less than 18 percent area forested and most of that is the artificial forest composed of shade trees planted for coffee culture. Deforestation and poor soil conservation practices by farmers have contributed to worsening an already hot and dry climate and have increased the susceptibility of hillsides and mountainsides to landslides. MAG recognizes the importance of shade-grown coffee to the survival of the remaining forest. The ministry is attacking two problems simultaneously: an industry with aging production “infrastructure”; and protection of the remaining shade forest associated with coffee plantations.

The Coffee Farm Park program has two components, the first of which is providing technical assistance to those growers interested in participating in the coffee farm renovation program.

PROCAFÉ, the coffee growers’ association of El Salvador, is implementing this component. This project has five areas in which it is offering assistance to the coffee producer. The first area is renovation of the coffee farm; three further areas are programs for the diversification/reforestation strategies of growing coffee in association with fruit or timber trees or other high-value crop grown with coffee (black pepper, ornamentals). The fifth area is in coffee product differentiation (specialties, gourmets, organics). The fruit tree diversification project is being coordinated with the national fruit program, however, PROCAFÉ is promoting additional types of fruit trees while FRUTAL is promoting musaceas and citrus. The timber species promoted are: Spanish cedar (*Cedrela odorata*), mahogany (*Swietenia macrophylla* King), Flor amarilla (*Tabebuia donelli-smithii*), teak (*Tectona grandis* L.), Gravillia (*G. robusta*), Australian pine (*Casuarina* spp.), Ciprés (*Cupressus lusitana*) and Laurel (*Cordia alliodora* Ruiz and Pavón). These species can be used for planting inter-aisle and row and as windbreaks, roadside shade, live fencing and pure plantations in areas where coffee is not planted on the farm (PROCAFÉ, 2002).

The second program component is the financial component designed to provide those coffee growers who qualified for credit access to 15-year loans, with 3-5 year grace periods, at a maximum annual interest rate of 9 percent. Collateral required depends upon the loaning institution (either the BMI or one of a number of IFIs, including wet mills and exporters with experience in handling credit programs) (MAG, 2001).

The second program, FRUTAL, is a national fruit program supported by funding from FANTEL, the fund created with the privatization sale of ANTEL, and the U.S. Department of Agriculture (USDA). The purpose of the program is to promote and develop a diversification program in El Salvador to contribute to the growth of the economy through the creation of employment and income, to improve the diet of Salvadorans and to improve the environment (MAG and IICA, 2001). MAG and IICA are working together to promote fruit tree cultivation in El Salvador.

Although one of MAG's services is that of research and extension, which is provided by CENTA (Centro Nacional de Tecnología Agropecuaria y Forestal), the FRUTAL program is being implemented by IICA. IICA, with the help of CIRAD, is currently developing technical packages for fruits and spices and organizing outreach activities to promote the program to growers. Currently the program is promoting three crops with export potential: cashew (*Anacardium occidentale* L.), Persian lime (*Citrus latifolia*) and coconut (*Cocos nucifera* L.); and four native fruits: avocado (*Persea americana*), nispero (or sapodilla or chicozapote, *Manilkara zapota* van Royen), anona (*Annona squamosa*) and zapote (*Pouteria sapota* (Jacq.)). The promotion has started with the first three fruits and will develop the information and program for the remaining four crops in the future. The promotional materials consist of a promotional package for the program that explains the services that the program will offer and has one-page flyers on the fruits promoted and promotional packages for individual fruits that include a technical production guide and a bulletin on the markets, fresh and processed, for the fruit. Besides technical assistance in production, the program plans to offer assistance in developing the business plans needed to interest financial institutions to get financing, post harvest assistance and, ultimately, in marketing the product. To make the program more attractive to growers, the planting materials are offered at 75 percent the cost, with the program absorbing the remaining 25 percent of the cost of their production.

As these programs are currently being launched, there are as yet no indications of their effectiveness.

To support this program, MAG plans to develop a system of quality standards and phytosanitary regulations. To encourage processing of fruits, the program, with BMI and PROESA, will seek out foreign investment as well as promote joint ventures and formation of associations.

The office for Technology Innovation and Agribusiness Services is ODE (Office for Strategic Management). ODE recognizes that currently the costs of production in El Salvador are high, a situation complicated by the recent dollarization of the economy. Much of the country has very dry conditions, which will necessitate the installation and use of irrigation systems for successful agricultural activities. Nevertheless, ODE sees an opportunity in replacing the Guatemalan and Honduras imports with Salvadoran products as well as targeting the large overseas Salvadoran communities as potential markets for traditional food products, fresh and processed, produced in El Salvador.

FUSADES, The Salvadoran Foundation of Economic and Social Development, founded in 1983, functions as a center for studies and analyses of social and economic issues of interest. Its Program for Agricultural Diversification (DIVAGRO), started in 1985, now consists mainly of a commercial pineapple and vegetable farm in Santa Ana. However, there are plans to begin experimenting with organic production on the La Colina farm in 2002. In addition to several other departments, FUSADES has an investment promotion office, which hosts a EUROCENTER. Still available to agricultural producers is the Laboratory of Integral Quality, which provides services for the analysis of soils and leaf samples (FUSADES, 2002).

3b. NGO-Implemented Diversification Projects

Throughout the 1980s and 1990s, USAID funded a number of programs for agricultural diversification with NTAEs. Among those were: (1) NTAE Promotion and Irrigation project implemented by DIVAGRO and MAG from 1985-1992, (2) the Agribusiness Development project, also implemented by DIVAGRO, 1987-1995; (3) Cooperative Production and Marketing Project, implemented by Checchi and Co. Consulting, Inc. and (4) the Non-Traditional Agricultural Export, Production and Marketing project, implemented by CLUSA (Cooperative League of the U.S.A.), 1991-1998.

The NTAE Production and Irrigation project was implemented by DIVAGRO and MAG. The public sector portion of the project was comprised of three activities: (1) training and curriculum development of irrigation management at ENA (Escuela Nacional de Agricultura) and upgrading the facilities of CENCAP (National Training Center), (2) training and technical assistance in irrigation planning and evaluation to the DGRD (Directorate of Irrigation and Drainage), the OSPA (Agricultural Sector Planning Office) and the OA (Office of Water) and (3) training of irrigation professionals, extension agents and farmers. Most of the objectives of the project were met (USAID Mission to El Salvador, 1996).

The Agribusiness Development Project had three components: (1) promotion of NTAE production, (2) marketing of NTAEs and (3) credit for farmers. Performance in the marketing area of this project was improved in 1991 when DIVAGRO adopted a market-based methodology for selecting priority crops. They dropped the number of crops promoted from 30 to 10 and concentrated on promoting and marketing those crops. Credit was underutilized as FIDEX (credit service of FUSADES at the time the project began), which managed the credit activities of the project, had a commercial bank approach rather than a development bank approach. Most of the objectives of the project had been met at the time of the evaluation, although the project had accumulated a large deficit (USAID Mission to El Salvador, 1996).

The Non-Traditional Agriculture Export, Production and Marketing Project run by CLUSA had the objective of increasing the production and export of NTAEs by cooperatives and small farmers in El Salvador. At the beginning of the project, crops were being grown conventionally but market demand shifted focus to organic production. The project was thought to have been particularly successful in terms of impact on employment, production area planted and net earnings for the farmers as well as in the reduction of the use of chemical pesticides and fertilizers (USAID Mission to El Salvador, 1996).

The Cooperative Production and Marketing Project was evaluated in 1990 for progress in the period 1988-1990. This was a pilot project to provide technical assistance and training in NTAEs to agrarian reform cooperatives. The project had impact on the cooperatives but was behind in meeting objectives due to project design flaws. It was recommended that the project be extended four years and that training in managerial skills be provided to the cooperatives (USAID Mission to El Salvador, 1990).

In general, the lessons learned from these projects were:

- 1) In project design, planners should:

- a) Adjust time line of project according to the experience of the farmers; inexperienced farmers require more time and more intensive training to learn and command the production technology and agricultural practices required for intensive agriculture;
 - b) Adjust time to take into account deficiencies in managerial skills of cooperative leaders and include education and training in projects working with cooperatives;
 - c) Analyze the strength of institutions to determine in which areas they are deficient and how much training will be required to build their capabilities so that they are able to meet their objectives;
 - d) Include flexibility in the project design to provide the agility to move away from objectives that prove to be misguided and to take advantage of opportunities;
 - e) Include enough support to project: agricultural projects require simultaneous efforts in multiple components: credit, technical assistance with all phases of production, post harvest handling; export and marketing; and
 - f) Focus on a reasonable number of products: do not dilute efforts with a multitude of products.
- 2) Personnel selection:
- a) Extension agents should have in-depth experience in production and meeting market demand for each commodity produced;
 - b) Public sector administrators do not have the time to administer complex projects and fulfill their responsibilities as public sector administrators;
 - c) High literacy in computer and integrated use of computers for information gathering, communications and report writing and reporting is a necessary skill for all personnel;
 - d) Commitment, dedication and hard work are all essential elements of character of the personnel of a project that leads to success; and
 - e) The role of an expatriate senior manager is critical factor in the success of the project.
- 3) Implementation of projects:
- a) NGOs, NPOs and private-sector companies are often more efficient than public sector implementers.
 - b) Monitoring and evaluation of projects should be frequent enough to catch problems but not so often as to constitute a distraction and major cost to the project.

3c. Agribusiness Support Services

Certifications

Organic products may be certified through OCIA (United States). Fair trade products are certified through TransFair (United States). Eco-friendly products are certified through Eco-OK. The Smithsonian Institute certifies bird-friendly products.

Financing

Grower level

Funding is available through the BMI and affiliated IFIs to growers with collateral and a business plan, particularly those who wish to take advantage of the FRUTAL and Coffee Growers' Park plans.

Project level

The Canadian International Development Agency (CIDA) reports three bilateral projects being funded in El Salvador. Of those, two are related to agricultural diversification and watershed protection (as part of an environmental program).

Fund for the Environment (FONES) was funded in 1993 with an \$8.1 million local currency fund available to local and Canadian NGOs and other groups for projects that promote sound management of natural resources, environmental protection and sustainable development.

Canada Fund for Local Initiatives supports small-scale projects for agricultural diversification and environmental programs.

Additionally, the World Bank, IADB, USAID, various member countries of the European Community and ICDF (Taiwan) all fund a variety of projects in El Salvador.

3d. Constraints to Agricultural Diversification

Availability of water

The availability of water for irrigation is an important factor for determining whether a farm should be in intensive agriculture and whether it will be competitive with farms that do have irrigation. El Salvador is very dry and hot, in general, and water is scarce on some mountains.

Agrarian reform

Agrarian reform and the substitution of single owner-agribusiness management by collective cooperative management of large tracks of land is a constraint to action. A single farmer-owner management structure is more flexible, reacts faster to problems and is easier to train than collective cooperative farm management. Cooperatives are social arrangements, not business arrangements, and their dependence on consensus for decision-making makes them slow to react to urgent business decisions. Additionally, projects working with cooperatives must deal with management and control issues in addition to training members in production and marketing. Cooperatives change leadership and the new leaders must be re-trained. If the re-training is not available, cooperatives stand to lose gains from projects rapidly. This calls into question the sustainability of a cooperative business.

Financing

Financing is the major constraint at the moment on agricultural development as many growers are carrying large debt loads and do not qualify for more credit with commercial banks.

Business

Relative unavailability and high cost of labor was created, in part, by dollarization of salaries and the absorption of labor by industrialization and large-scale emigration.

High air transport cost – the cheapest air cargo fare for San Salvador is Fine Air cargo at \$0.77/kg, which is the second highest weight tariff quote in Central America. Additionally, there are more airline charges in El Salvador for Fine Air than for other countries. Some rates are higher than for other countries: minimum fee is \$20.00 versus \$10.00 for Guatemala (Bax Global, February 19, 2002).

Sea cargo, while relatively cheap, \$2,750/reefer (refrigerated container) to Miami, only offers one sailing date – Fridays – and the shipment takes 6 days to arrive, which is 2-3 days longer than for other Central American countries.

National Infrastructure

Infrastructure is poor in El Salvador. However, the government has developed a 20-year (1999-2020) plan for the reconstruction and modernization of infrastructure to present to donors. The plan includes the construction of highways, an electrical interconnection with Honduras, hydroelectric dams, ports, roads, telecommunications, and airports (Economic Commercial Section, date unknown).

Roads

Roads are receiving high priority; however, except for major commercial roads linking coffee and sugar cane production areas, roads are in poor repair. Most farm-to-market roads are in poor condition and potentially arable land in the north and east of the country is idle due to lack of good roads. This discourages investment in agriculture on good lands and leads to overcrowding on marginal lands along highways. Freight costs are high.

Ports

Seaports

Only one port is in operation, Acajutla, but this port is non-competitive and container traffic must be routed through the Caribbean ports of Guatemala and Honduras.

The Salvadoran government has signed an agreement with the Japanese Agency for International Cooperation (JICA) for the construction of a modern seaport at Cutuco on the Bay of La Unión, 200 km east of San Salvador. The port will have a draft of 14 m and a wharf 580 m in length. The project is expected to cost at least \$147 million and will consist of two phases: The first phase – construction of the terminals for containers, grains, and passenger boats and the access canal – will begin in 2002 and should be complete by 2004 at a cost of \$90 million. The second phase – the construction of a second grain terminal – will start after phase I and should be

complete by 2015 at an additional cost of \$57 million. To finance the project, the Japanese government has provided the Salvadoran government with a loan for 75 percent of the first phase at an annual interest rate of 2.2 percent over 25 years with a 7-year grace period (AMCHAMSAL, 1999 and Mendez, 2001). After the port is completed, the Salvadoran government will invest in construction of the additional roads and an energy grid to feed the port.

If access roads and an energy grid are completed by 2015 as planned, this modern, well-protected port will enhance trade of products grown/manufactured in El Salvador, southern Honduras (Choluteca melons) and western Nicaragua. In addition to increased trade, the new port is expected to result in lower freight costs and create 10,000 opportunities in indirect employment.

Airports

The airport and the highway connecting the airport to San Salvador are being expanded and modernized. The cargo areas and number of runways are to be expanded. The airport is one of the best and busiest in the region as TACA Airlines uses it as a hub. However, cold room services for perishable goods are currently limited and unreliable.

Telecommunications

This sector was privatized in 1998 when controlling interests in ANTEL's wireline service was sold to France Telecom and wireless service was sold to Telefónica España. Both telephone and cell phone services are expanding rapidly and competition has resulted in lower rates for these services.

Energy

The energy sector is also one of the leading and better-developed infrastructure services in El Salvador in comparison to regional neighbors. Energy is generated by geothermal plants (3) and hydroelectric dams (4). The Salvadoran government is pursuing a liberal policy concerning private production and distribution of electricity. Nevertheless, power outages are not unknown in El Salvador.

4. Comparative Advantages of El Salvador

Stable economy and government
Labor has a good reputation for being hard-working

C. Country Profile – Guatemala

1. Background Snapshot

Guatemala is the largest economy in Central America with nearly one-third of the region's GDP created in this country (World Bank, 1999). Guatemala ranks 18th in trade partners with the United States, and the Northern Triangle of Guatemala, Honduras and El Salvador generate \$6.2 billion in trade, which is more than Argentina's \$4.7 billion. Agriculture accounts for 23 percent

of the GDP and 50 percent of the labor force works in agriculture-related employment. Unemployment is reported at 7.5 percent. Per capita GDP is \$3,700. Around 60 percent of the population lives in poverty. The GDP grew by 3 percent in 1999 and was expected to grow at 4 percent in 2000 but only achieved 3.3 percent.

2. Coffee

2a. General Description of the Coffee Industry in Guatemala

Coffee is grown in 20 of the 22 departments of Guatemala on an estimated 266,700 ha. 90 percent of the 331 townships and municipalities in Guatemala are dependent on income related to coffee production. The coffee-growing areas of Guatemala have been grouped by ANACAFE into seven major production zones: I-San Marcos/Quetzaltenango; II-Sololá; III-Esquintla/Chimaltenango/Sacatepequez/Guatemala; IV-Santa Rosa/Jutiapa; V-Chiquimula ; VI-Alta and Baja Vera Paz and one small, isolated island in the Petén; and VII-Huehuetenango.

The most important regions are Zones I, III and IV. Zones I, II, III and IV are located on the Pacific slopes and comprise over 72 percent of the coffee growing area and produce around 66 percent of the coffee of Guatemala. This region experiences high amounts of rainfall that is well distributed throughout the year. Zones IV and VII are located in the central part of Guatemala. Zones VII and V are located in the eastern third of the country. There are eight types of coffee recorded by ANACAFE, of those; there are four good quality coffees: well-washed, extra well-washed, prime washed and extra prime washed. The well-washed type includes robusta and arabica coffee varieties planted at low altitudes. Historically, the coffee types that are produced in the highlands have received a premium price over those grown at lower latitudes, creating an emphasis on highland coffee production.

There are an estimated 62,649 coffee producers in Guatemala, who can be grouped on the basis of production level: micro to small farms/enterprises (0-99.99 cwt oro), medium-sized farms/enterprises (100 – 1,999 cwt oro) and large farm/enterprises (2,000+ cwt oro) (IADB, 2001). See Annex B, Table 2: Guatemala.

Around 59,092 producers are micro to small producers, of which some 50,000 cultivate 1-1.5 ha of coffee and 9,092 work 10-11 ha of coffee. These small holders tend to adopt natural, traditional or semi-technified production systems, which require low inputs but, in return, only offer poor to modest yields (2.9 cwt/ha, 6.7 cwt/ha, and 11.56 cwt/ha, respectively), in comparison to the highly technified production system (20 cwt/ha). Many of the micro and very small growers harvest coffee with family labor, and do not need large cash inflow to pay labor during harvest.

They also tend to have farms that are partially diversified as they may use fruit trees, (for example, Inga spp.), with edible pods or plantains and bananas as shade for the coffee. Growers might plant corn, beans and cassava on the same or nearby lands during certain seasons of the year and these are consumed or sold for cash. Some small farm/enterprises may have access to off-farm income from family members working full- or part-time on larger farms, daughters working as domestics, or receipts of remittances.

Small holders in an area may join forces to create cooperatives and share the transportation cost for going to market. Those independent small holders who do not do so must sell their product to intermediaries, usually at the end of each day. As their volumes are low and potential buyers are limited, they have little ability to negotiate and are price takers. These growers usually get the lowest price for their product.

These growers tend not to qualify for credit from banks and financial institutions and so generally do not carry a large debt burden. However, they may have small loans from fertilizer and pesticide distributors and from NGOs, cooperatives and projects offering microcredit schemes to small growers for inputs purchased during the growing season.

In general, many micro to small producers are located in the highlands, and so have the potential of producing the specialty coffee types. This has come about as new small growers have traditionally moved into the highlands as the larger growers occupied the lowlands.

Smallholders cultivating highland coffee with highly diversified sources of cash flows are the most likely to survive this crisis, barring natural disasters and unforeseen negative events requiring large sums of quick cash. However, those small farmers cultivating low-yielding farms producing poor quality or low-grade coffee and who are indebted and have no other important source of income are in danger of losing their farms and being forced to move to population centers to look for work.

An estimated 3,557 growers are medium to large growers working an average 40 ha of land. The large grower category consists of around 213 farms comprising some 49,385 ha of coffee in all, with an average farm size of 331 ha. Medium to large growers may use the natural or traditional production systems to lower costs if the farm is located at altitudes below 1,000 m. Many opt for the semi-technified or highly technified production systems. The medium- to-large-sized farm categories together constitute around 50 percent of the coffee produced in Guatemala.

In the case of medium to large coffee farms, the coffee operation may be just one of several farms or family enterprises operated by the owner. This form of portfolio diversification has arisen as growers have sought to reduce the risk to family fortunes inherent in the cyclical nature of the coffee market. Often, different family members manage one or more of the different enterprises. In some cases, portions of coffee farms may be diversified, being planted in other high-value crops or shade crops such as citrus, banana and plantain, which provide additional income.

The majority of the highly technified farms are located in San Marcos, Quetzaltenango, Suchitepequez and Santa Rosa. These use high-yielding varieties, low shade (30-40 percent), regular fertilization and pest control and high coffee tree populations. They also use more machinery, have their own wet mill, maintain a large permanent staff and generate high demand for itinerate harvest labor. The highest levels of operation and investment costs result from this highly intensive commercial production system. Unfortunately, during times of high market prices, these farms are the most creditworthy and, therefore, most likely to carry large debt loads with banks and agrochemical suppliers. Additionally, some may have extra-banking debts in the form of advances from exporters and others. Conversely, during periods of low market prices,

they are the least likely to have sufficient cash flow from operations to pay for harvest labor. Some 12,530 medium and large farms harvesting 53,418 ha fall into this category.

Those farms large enough to require hiring harvest labor, that is, farms and enterprises larger than the micro-farm level, are estimated to have generated around 101.9 million workdays of labor in 1999/2000 (IADB, 2001). That is equivalent to some 339,666 permanent jobs. The harvest season may generate up to 500,000 temporary jobs. Permanent employment on a coffee farm may also provide the additional benefits of access to health care, schools and housing on the farm. Harvest labor, however, is temporary and generally consists of groups of indigenous Indians who migrate down to farms from their smallholdings in communities in the Altiplano. These jobs may be the only important source of income that they earn in the year although many may have plantings of corn and beans for subsistence.

2b. Alternative coffee markets

Specialty coffees, which include a number of types of good quality coffee such as regional, estate and highland do represent an opportunity for product differentiation, especially for those growers above 1,000 m with the microclimate to produce a very good coffee. ANACAFE and many Guatemalan growers and exporters have been directing marketing and technical assistance toward developing an image for Guatemalan specialty coffees.

Different groups of small farmers and some larger farmers have been certified by the organic, ecologically/shade/bird friendly (Eco-OK) and fair trade (Fair trade, Max Havelaar, TransFair) certification bodies so as to capture the higher prices that these certifications might offer. However, these markets are small currently and there is too much differentiation by the different types of ecologically and socially correct labels. Without substantial promotion, additional growth in demand from these markets will be incremental and slow.

2c. Estimations of the Impact of the Most Recent Crisis on the Industry

The cyclical nature of the coffee market is well documented and well known. This was recognized by ANACAFE in the 1960s when ANACAFE began a nearly two-decade effort to diversify Guatemalan coffee growers. Because of their effort, all coffee producers should have farms with more than one quick-cash crop (diversification) so as to offset the cyclical downturns of coffee. However, as new growers have gone into coffee during times of high coffee prices and some of the more experienced growers have forgotten the lessons of the past, crop diversification has not been as widely employed recently as it should have been to offset market risk. Also, the market has changed. Those growers with coffee types that sell in the same type as the coffees of Vietnam are now not competitive.

Of the many factors that will determine whether coffee growers survive this most recent crisis, the most important are those that affect net cash flow: (1) quality and type of coffee, (2) farm size, (3) production system technology and (4) indebtedness. To analyze the effect of the market downturn on the coffee sector, a calculation of the effect of coffee type and farm size on survival rates of farms is sufficient as factors of production system technology and indebtedness are closely related to farm size.

Grade/type

The coffee types of well-washed, extra well-washed and prime washed currently tend to earn lower prices than those of semi-hard, hard and strictly hard bean coffee. Grading and selecting affect quality and, therefore, price as well. The type of coffee that a farm can produce is closely tied to altitude as the climate at higher altitudes allows for a better type of coffee as cooler weather, in general, tends to create the conditions that produce better bean quality. In Guatemala, it has been determined that, in general, farms below 1,000 m tend to produce the lower valued types of coffee.

The coffee farms that are below the 1,000 m above sea level “line” are most concentrated along the Pacific-facing lower slopes of Zones I, II, III and IV, the lower slopes west and east of the mountain range that lies to the east of the Motagua River in Zone VII and some areas of the Alta and Baja Vera Paz, as well as the isolated patch in the Petén.

However, it would appear that a majority of the small farms are at the higher elevations and these, as a rule, do not have access to a wet mill; much small farm coffee is reportedly of poor quality due to the harvest practices and post harvest handling of the coffee cherries. Therefore, even though these farms may be above 1,000 m, they are not necessarily competitive because the coffee is not of sufficiently good quality to be specialty coffee. Many large farms are located at lower altitudes and their quality may be more competitive as a specialty coffee than some highland coffee due to local soil conditions, microclimates, cultural care and wet milling. Also, debt burden and access to more credit will determine whether medium-sized and large highland farms might survive. Given the difficulty of guessing how many farms above 1,000 m can compete and how many below cannot compete, a different approach might be more useful in estimating the number of non-competitive farms.

Farm size determines the need to hire harvest labor, total operation cost incurred for labor and inputs and debt burden. In general, small farms use family labor and expend little on inputs, thus do not need much credit and have no debt burden. Also, the small enterprise and medium- and large-farms rely on hired labor for harvest, use more intensive production technology and have more access to credit and more likely to need it and use it. Therefore they tend to have debt. Let’s examine an “either-or” situation of having to decide simply between supporting the smallest of the small (micro to small farms less than 10 ha) or the larger farms.

Suppose that the decision is taken to support only farms of 10 ha or more in size. In addition to the effect of their loss on producers, these also hire most of the temporary harvesters. In this case, we would assume that only micro to small farms and enterprises fail. Assuming that all farms in this category fail, at least 5 family members per farm would be affected by that failure, but that no temporary jobs would be lost. The result would be the loss of 50,000 farms and 56,000 ha of coffee production area, mostly of low productivity, and 250,000 livelihoods affected.

Conversely, suppose only farms of less than 10 ha because the goal is to provide food security and it is considered that these are the most vulnerable to famine and flight from poverty (emigration to cities). In this case, we accept the risk of failure of 12,536 farms in the small

enterprise and medium and large farm categories, which are fewer farms sacrificed in total than for micro and small farmers. One effect of this program might be the loss of livelihood for five family members per farm of small and medium-sized farms. Owners of large farms have other income, so we will not count the effect on their family members. Under these assumptions, the number of family members affected would be 62,680. In addition, as the medium to large farms represent those farms that are those most likely to hire temporary labor for harvest due to their large size, we must assume that the number of temporary jobs lost would be around 300,000 (the estimated total number of temporary jobs created at harvest). The total livelihoods affected would be 362,680. In addition, some 210,821 ha of land would go out of production, most of these the most productive for coffee.

Given a choice between these two extremes, it would seem that, for the greater good, the emphasis would be on helping the farms larger than 10 ha. It would allow focus on fewer farms, have the greater affect on employment and the number of hectares affected.

Deciding Factor	Farms	At Risk	
		Livelihoods	Production area (ha)
Farm size			
Risk failure <10 ha	50,000	250,000	56,000
Risk failure >10 ha	12,536	362,680	210,821

Non-farm Agribusinesses Affected by the Failure of Coffee Farms

In addition to the effect of farm closures on direct farm hire and the owners of farms and their dependents, there would also be a negative effect on labor associated with the wet mills, transportation industry, farm suppliers and exporters. These businesses are dependent on the volume of coffee that they handle during a season and so sufficient loss of production volume would put these enterprises at risk.

No data is available on the exact number of wet mills in Guatemala, although they may be around 16,000. Of these, some 12,000 are “rustic” on-farm (usually small) operations and 4,000 are commercial, semi-technified or technified. Around 600 of the 4,000 are technified. The number of employees would depend on the size of the operations, however, that information is not available.

The number of dry mills is less than 100. There are currently 78 companies registered with ANACAFE as exporters. These export around 70 percent of the coffee produced nationally. Most exporters have dry mills. Additionally, there are 125 cooperatives registered with ANACAFE as having the infrastructure for dry mills and exporting.

3. Agricultural Diversification

3a. General Description of the Climatological and Topographical Conditions of the Seven Coffee Zones

The digital maps developed in 2001 by CATIE for the Ministerio de Agricultura, Ganadería y Alimentación, Unidad de Políticas e Información Estratégica and Programa de Emergencia por

Desastres Naturales may be acquired on CD-ROM. These include maps of municipalities, temperature, rainfall, erosion risk, watersheds, relative humidity and so forth. These maps may be used to help determine what alternatives, on a broad scale, may be used in different regions. The maps are powerful tools in making broad regional recommendations, but it must be stressed that, due to the variety of microclimates, they are no substitute for farm visits by trained agronomist in making final recommendation on a farm level. The digital maps were used in providing the following information.

Zones I, II and IV – San Marcos, Quetzaltenango, Sololá, and Huehuetenango

Coffee farms are scattered along the westernmost and southwestern departments at altitudes from below 1,000 m up to 2,000 m, although mountains in the area may rise to well over 3,000 meters above sea level. These three zones have the highest minimum and maximum rainfalls (along with Zone VI, Alta and Baja Verapaz) in the nation, varying from minimums of 800-3,000 mm/year to maximums of 2,000-4,000+ mm/year, with higher amounts occurring at higher altitudes. Relative humidity in these zones is moderately high, 70 percent and higher. The average minimum and maximum temperature for these zones are among the lowest in Guatemala, ranging from less than 5-15° C. Due to the high mountains and deep valleys in the region, the slopes in these zones are among the steepest in the country. The soils in these zones have moderate to high rates of erosion, particularly in Huehuetenango.

Zones III and IV – Esquintla, Chimaltenango, Sacatepéquez, Guatemala, Santa Rosa, and Jutiapa

These central zones are distinctly drier and warmer than those to the west. Minimum and maximum rainfalls for these areas are 400-800 mm and 2,000-4,000 mm. The dry season tends to be longer, 3-6 months, and more pronounced than in the western zones. Relative humidity is around 75-80 percent in Antigua and Guatemala and somewhat lower in Jutiapa, Barbarena and Sta. Rosa, 65-80 percent. Average minimum and maximum temperatures tend to be higher than for the western zones as well, 12-18° C and 20-30° C. More moderate slopes in Guatemala have lower rates of erosion

Zone VI – Quiché, Alta and Baja Verapaz

Rainfalls in this zone may be extreme, varying from minimums of 2,200-3,000 mm to maximums of 4,000-5,800 mm. Upper extremes in rainfall, as for all other zones, tend to occur at higher elevations. Average minimum and maximum temperatures are 12-15° C and 26-30° C. Relative humidity is around 90 percent. Erosion rates range from low to moderately high. In general this area is warm and wet, with high relative humidity.

Zone VII – Zacapa

Coffee in this zone is grown in the highlands of a mountain range that follows the eastern side of the Motagua River. The zone encompasses an area ranging from south of the southwestern-most end of Lake Itzabál, east along the border with Honduras extending southwest down Chiquimula. Rainfall for this zone ranges from minimums of 600-1,400 mm to maximums of 2,000-3,000 mm

per year and the average minimum and maximum temperatures range from 18-20° and 23-30° C. This is a relatively dry zone with high temperatures and an extended dry season, particularly on the lower northwestern slopes that go down to the river.

3b. Organizations and Institutions that Implement Diversification Projects

Ministerio de Agricultura, Ganadería y Alimentación (MAGA)

MAGA is the public institution for agricultural and forest research, extension and regulation. Under the Arzu administration, various services were discontinued or folded into other offices. The Ministry of Agriculture still provides local market price information on a weekly basis for a variety of fruits and vegetables. Instituto de Ciencia y Tecnología Agrícola, ICTA, provides services in research and technology transfer. DIGESA, Dirección General de Servicios Agrícolas, once the extension network, still has offices on a departmental level but no longer provides community level extension service.

Unfortunately, MAGA is politicized and under-budgeted. There have a number of changes in the posts of minister and vice minister during the current Portillo administration. There is also a history of failure in continuity of programs when administrations change.

Nevertheless, as of November 2001, MAGA was reported as running six projects aimed at agricultural diversification in Guatemala: PROFRUTA (diversification in fruits), PLAMAR (irrigation), PARPA (direct payments forestry, food safety, competitive research), PROZACHI (credit and irrigation), PESA (marketing and diversification) and PRODERT (soil conservation). Of these, PROFRUTA, a long-lived program, is generally acknowledged as having made significant contributions to diversification with fruits.

AGEXPRONT

AGEXPRONT was founded in the 1980s as the Gremial de Exportadores de Productos No Tradicionales, now called Asociación Gremial de Exportadores de Productos No-Tradicionales. AGEXPRONT has more than 20 years of experience in non-traditional export product promotion. AGEXPRONT provides information (transportation, market price), trade promotion and training services to the Guatemalan community of exporters. Additionally, AGEXPRONT hosts a regional biennial trade fair in Guatemala City and implements specific projects related to business and trade development. AGEXPRONT has developed and evolved over the years but has kept a strong focus on diversification and service to the agricultural community. The association has developed and implemented a HACCP program with the Berry Commission in response to the Cyclospora scare and is working with growers to develop an organic fruit and vegetable industry in Guatemala.

In 1999, USAID provided over \$2 million in funding for a three-year project, Inversiones Para La Paz, to AGEXPRONT. The purpose of the project was to develop various business sectors in the 11 townships hardest hit by the internal armed conflict. As part of this initiative, AGEXPRONT:

Carried out studies to identify the areas best suited for tilapia and trout production (with the assistance of the University of North Carolina),

Developed, in conjunction with CONAP and several sawmills in the Petén, a program for the use and marketing of broadleaf timber in the Petén;

Promoted business activity between Guatemalan producers and Guatemalan businessmen resident in the United States;

Developed business centers providing services of electronic mail, Internet, website development and video conferencing to the communities of Sta. Cruz de Quiché, Nebaj, Uspantán (Quiché) and Rabinal (Baja Vera Paz).

In 2001, with funds from the IADB-FOMIN, AGEXPRONT hosted the First National Meeting for Agricultural Diversification. A product of that meeting was a book proposing a national program for diversification and the results of a two-year market analysis, made in 2000/2001, for 19 fruits, nuts, vegetables, flowers and ornamental plants.

Building on these efforts, AGEXPRONT has investigated the installation of a SureBeam plant for the post harvest treatment of fruits and vegetables in areas of Guatemala that do not qualify as fruit fly-free zones (Petén only). The USDA recently approved this new electronic post harvest treatment technology which now allows Hawaiian growers to ship previously non-admissible fresh fruits, such as papaya and litchi, into the United States.

Installation and approval of the use of post harvest treatment in Guatemala would allow Guatemala to ship exotic fruits, which are fruit fly hosts and currently non-admissible in fresh form in the United States. Also, AGEXPRONT and the MAGA are working together to provide technical assistance to small and medium-sized growers with irrigation in communities in San Marcos, Baja Verapaz, Sololá, Palencia, El Progreso, Morazán and El Jícaro.

ANACAFE

From 1964 to 1969, with funding from UN-FAO, the coffee grower's association ANACAFE promoted diversification of coffee farms throughout Guatemala. The purpose of the program was to identify areas economically marginal for coffee production and to substitute crops and livestock. Products promoted under this project were citrus, avocado, mango, rubber, cacao, macadamia, tea (Alta Verapaz) and African Palm (South Coast and Polochic), cattle fattening (Southeast) and dairy operations (Retalhuleu). In 1972, ANACAFE received further funding through the OIC and continued diversification in coffee-growing areas with citrus, mango, avocado, macadamia, guava, cashew, chicozapote and zapote. This project ended in 1980.

NGO-Implemented Diversification Projects

Not all farms needing assistance will be suited to agriculture so producers should consider diversification alternatives such as timber, agroforestry, and watershed. A review of different

projects exploiting these forms of diversification follow. Tourism and national parks are not discussed but may be options to consider.

Agricultural Products

Many conservation groups, disaster relief organizations and large NGOs are implementing projects in diversification, agriculture, agroforestry and watershed protection. The list of these NGOs is lengthy and we have mentioned a number of them below.

In the period from 1978 to 1993, USAID funded four projects for the purpose of increasing nontraditional crop production and marketing or agricultural cooperative development, with an underlying goal of an agribusiness strategy. This strategy was based upon increasing productivity and production by small holders in the Guatemala highlands, mostly indigenous, through micro-financing, mini-irrigation projects, technical assistance and introduction of crops new to the growers (diversification); improvement of the distribution system by providing infrastructure and promoting agricultural cooperatives, and the promotion of export policies and institutions.

Fox, Swanberg and Mehen (1994) reviewed the results of four projects funded by USAID between 1978 and 1992. The projects reviewed were:

- (1) Small Farmer Marketing was designed to establish a set of regional market centers with cooling and grading facilities for the purpose of stimulating small farmer production by lowering the cost of marketing. In effect, the purpose was to replace the “coyote” (middleman) system, considered to be an inefficient and rapacious abuse of the grower. The centers were to be managed by CECOMERCA, a cooperative to be owned by two coop federations and participating farmers. Of the three centers planned, only one, in Patzicia, was ever built. However, instead of lowering costs, the Patzicia center increased marketing costs because of high operation costs due, in part, to poor management by CECOMERCA. In fact, the center proved to be unprofitable, regardless of market (domestic or export). Few (50) of the growers to benefit from the project, estimated at the planning stage to be 10,000, and who had professed interest in the cooperative ever actually joined it and the project failed soundly. Fox et al concluded that the failure of the project lay in miscalculating the both the efficiency and cost-returns of the coyote system and the expected efficiency and cost-returns of the center in the conceptual phase and poor management of CECOMERCA.
- (2) Highlands Agricultural Development (HAD) began as an infrastructure development (roads)/reforestation/soil conservation project designed to promote agricultural development. The project was later expanded to include a large area and a marketing component was added. Both the Nontraditional Exporter’s Guild (now AGEXPRONT), and PROEXAG helped with this component. The authors considered this project to have been successful as at the time of the review, and many of the growers helped by the program were still doing well.
- (3) Agribusiness Development Project had three components: lending to agribusiness firms, support for cooperatives and establishment of information and support services for the

growers through the Nontraditional Exporters Guild. The financing portion of the project eventually made a number of successful loans to growers but initially was slow getting started due to management problems in the lending bank, BANDESA.

The second component of this project was to have provided technical assistance to 20 cooperatives through CLUSA. The number of clients was later renegotiated to 10. The problem lay, again, in the premises made for the design of the project: that there were many small farmer cooperatives already producing fruits and vegetables for export that were “mature” organizations that only needed guidance and some technical assistance and that providing the cold chain from farm to market would not prove to be difficult. The reality proved to be that the cooperatives were not “mature” and that growers needed more support and guidance that could be provided given the number of clients and that assistance was needed for a longer period of time than envisioned. Moreover, most of the cold chain and export infrastructure had to be developed during the project. This project was not as successful as HAD.

The third component – strengthening the Guild – proved to be a very successful use of funding as can be seen by the strength and continuing service that AGEXPRONT is providing to growers and exporters in Guatemala today.

(4) Cooperative Strengthening was to have strengthened the cooperative movement by assisting the cooperative federations. The project was composed of two phases and was implemented by FENACOAC, the principal credit union federation. The first phase consisted of providing financing to FENACOAC, which then passed on resources and technical assistance to six other federations, five of which were agricultural. This proved to work well with credit unions, whose main function was money management and whose staff was mainly from the more sophisticated middle class, but proved less successful with agricultural cooperatives, which had many other goals and capabilities besides money management.

In the second phase, focus was shifted to improving the federation cooperative services to member cooperatives and farmer associations. Services included inputs, technical assistance, credit and marketing. Assistance provided by WOCCU, comprised of COLAC, ACDI and NCBA; was rated as excellent by Fox et al.

The authors stated that the choice of supporting the Nontraditional Exporters Guild was the “decisive step in creating a dynamic NTAE export sector.” They added that PROEXAG was an important factor in the success of the Guild and the growth of the sector.

They also pointed out that the results of the projects showed that private agribusiness firms were more successful than cooperatives, with the few notable exceptions of older, more experienced cooperatives. They attributed the poor performance of campesino farmer cooperatives to two inherent weaknesses of these types of organizations: (1) a lack of flexibility, sophistication and quick response and (2) agency cost. When working with a perishable product, quick response is needed to correct problems and react to changes in the market. Cooperatives must arrive at consensus before responding to change whereas an entrepreneur only needs to make up his own mind. Also, a manager, their “agent,” runs the production and marketing operations of

cooperatives. To ensure that the cooperatives' best interests are served, and not those of the manager, cooperative members must provide supervision and control of the manager's activities without interfering with managerial performance. An agribusiness can provide this control through audits and policy reviews. Cooperative members are usually not sophisticated enough to take advantage of these forms of control. Also, management of a business with one owner is much less difficult than management of a business with many, unsophisticated, but demanding, owners.

The final evaluation for the USAID Mission to Guatemala's of the Highlands project made several observations to be considered for future such projects:

- (1) Farmers did not choose the firewood and construction wood trees for reforestation projects.
- (2) An extension of a pilot project must be initiated and processed quickly to avoid loss of momentum.
- (3) Project size should be limited and receive more intensive technical assistance.
- (4) Interagency cooperation at all levels is needed for maximum efficiency.
- (5) Micro-farms must form associations or cooperatives to be more competitive and easier to assist.
- (6) Someone locally must be trained and used to provide the marketing services needed for sustainability.
- (7) Don't over-monitor projects (USAID Mission to Guatemala, 1994).

PROEXAG (1986-1991) and EXITOS (1991-1995) were USAID-funded projects implemented by Chemonics International. PROEXAG has already been introduced above. EXITOS was a four-year extension of PROEXAG. PROEXAG started out providing technical assistance to producers of non-traditional products in the Central American region. The strategy was to select a short cycle crop with a counter-seasonal market window in the United States and train selected client businesses in all of the aspects of the production management, marketing and technology of the selected crop.

These two projects were successful in assisting businesses, many of which still exist today. Other long-lasting contributions were the importation to the region of propagation material for new varieties of exotic tropical fruits and a market price database which still operates today under the name SIMPAH and which is under the management of FHIA in Honduras (Fox, Swanberg and Mehen, 1994).

Project AGIL - Apoyo a la Generación de Ingresos Locales ("Local Income Generation Support Program"), a USAID-funded program underway in Guatemala is being implemented by Abt Associates, Inc. AGIL is designed to realize the strategic objectives of sustainable household income and food security for the rural poor in selected geographical regions by: (1) helping small farmers move into higher value crop production and marketing and (2) assist micro-entrepreneurs to expand their operations (Wingert, 2001). By achieving these two objectives, a third objective, that of stimulating the growth of market towns, should be partially achieved as well.

To meet these objectives within the short timeframe of the project, the following strategies were decided upon:

- Work only with organized producers (cooperatives) to achieve economies of scale
- Provide short-term technical assistance and training for production and marketing
- Analyze the constraints on markets, production, financial services and the viability of the organization of the target municipality
- Support improved production of existing economic activities rather than introduce new ones
- For products with high market risk, market through marketing agents experienced with the product
- Target high-value products, regardless of whether market is local, regional or export
- Work through programs of existing NGOs and undertake only those activities not undertaken by others
- Provide small donations to local NGOs for activities that fit the program and to help develop financial markets

This project is designed to complement and build on USAID initiatives implemented by a number of NGOs in selected municipalities of Alta and Baja Verapaz, northern Chimaltenango, Quiché, Huehuetenango and the Petén.

Agroforestry, Timber and Watershed Protection

Over the last 10 years several projects have been implemented by different non-profit organizations whose purpose was to promote agroforestry systems to different campesino groups on hillsides and watersheds throughout Guatemala (Urrea, 1998).

	Project Name	Agents
Agroforestal		CARE
MICUENCA		CARE/DIGEBOS/Peace Corps
Madeleña		CATIE, FINDICA, USAID
FUNDAP		CEE
Asociación SHARE		GOG and USAID
Movimiento Guatemalteco de Reconstrucción Rural		
Proyecto Piloto Palón		IAF
RECOSMO		CONAP, GOG, GEF, UNDP
Agroforestry		CHF

The systems promoted by these projects deemed most successful by Urrea were living fences (*Gliricidium*, *Erythrina*) and fruit trees, aisle-planted trees, rotations with trees (*Eucalyptus*, *Sambucus* with corn and beans), multiple-use trees, inter-plantings with trees (*Alnus* and *Sambucus*) and the Taungya system of inter-planting (*Alnus*, Pine with corn).

Reforestation with Long Rotation Trees and Multi-Purpose Short Rotation Trees

CARE and Defensores de La Naturaleza have promoted reforestation of 712 ha in the Polochic River watershed. Training and free trees (pine and mahogany) were provided to campesinos for planting and an economic incentive of two payments of Q2.50 per live tree, one payment at one month and the second at six months after planting. These trees require at least five years to be established and are long rotation (40-50 years) and there is little incentive for campesino farmers to continue caring for the trees after the second payment. It is unlikely that many of these trees will survive to an economically useful size (Wingert, 2001).

FEDECOVERA has also promoted reforestation with long rotation trees for timber.

All three of the above organizations have promoted the planting of multi-purpose, short rotation tree crops for such products as posts, poles, construction materials, stakes and fuelwood. Because of the quicker returns and usefulness of the products, this initiative seems more promising than the former as implemented.

3c. Agribusiness Support Services

Organizational and Business Development

Many organizations listed above recognize the need for organizational and business development training for client farmer organizations. For example, AGEXPRONT provides courses, including video training for remote locations. INCAE has long had a program throughout Latin America of offering business training seminars and courses. Project AGIL includes these two activities as having priority among its strategies.

Financing

Grower-Level

The amount and type of financing that growers might need will depend on the area that they want to diversify, the crop they want to diversify with, their credit worthiness and the extent to which the lender can be convinced of the profitability of the project. Business plans should be prepared for the lender's review.

Projects have provided some funds for growers out of project money. Others seek assistance from private banks if the project and grower's situation justifies this approach. Some private voluntary organizations lend to small growers. Project AGIL is working to establish a Guatemalan Network of Micro-Financing Organizations. The following micro-lenders may be found in some townships.

Private Voluntary Organization Micro-Financers

ACT (Asociación de Cooperación Técnica) – micro-entrepreneurs

Genesis Empresarial

MUDE – Asociación Mujeres en Desarrollo

FAFIDESS – Fundación de Asesoría Financiera a Instituciones de Desarrollo y Servicio

Social (a national-level micro finance PVO)

CESIDE - Centro de Servicios Integrales para el Desarrollo

Cooperatives and Credit Unions

FENACOAC (national credit union federation)

Commercial Banks with Micro-Financing

BANCAFE

BANRURAL

Project-Level

USAID

IADB

GTZ

Swiss Development Corporation

Governments of Taiwan and Japan

World Bank

European Community members: Spain, Italy, and France

Infrastructure

The USDA has a loan program for up to \$30 million per country for infrastructure development that would improve trade between the countries.

Quality assurance/certifications

AGEXPRONT's Subcomisión de Productos Ecológicos provides training and technical assistance to growers as well as training literature such as the organic agrochemical guide.

Organic Certification

For North America

OCIA, both the international and U.S. offices

Oregon Tilth

QAI

CCOF

For Europe

Naturland

BCS OKO Garantie

MAYACERT- received accreditation with European, certifies under ISO 65000 and Rule 45011 in mid-February 2002

Environmentally friendly certifications

Eco-OK

Smithsonian Institute's "Bird-friendly"

Fair trade and Code of Practice certifications

Fairtrade

Max Havelaar

3d. Constraints to Agricultural Diversification

Lack of credit - the most important constraint to diversification in Guatemala

High airfreight costs – while the weight tariff to Miami is the lowest in the region, \$0.64/kg (Fine Air), several airline-handling charges are high. The highest is the handling charge with is \$0.03/freight value with a minimum charge of \$70.00. The handling charges for Honduras, Nicaragua and Costa Rica are a flat rate of only \$20.00

Land values – Land is becoming increasingly more valuable and in high demand for housing, especially within a reasonable commute of Guatemala City or along the route to Lake Atitlán

Very poor electrification and unreliable electrical service increases costs of operations and can be crippling to try to assure reliable electrical service

National infrastructure

Ports

Air freight

While Guatemala City's La Aurora airport is the only airport with well-developed air cargo service in Guatemala, it suffers occasionally from closures due to smog, fog and weather. The airport has a large, modern air cargo handling and storage facility, COMBEX-IM, which has large capacity for cold storage.

COMBEX-IM is a non-profit, private institution. It is the product of a coalition of businesses that form its Board of Directors: Chamber of Industry, Chamber of Commerce, AGEXPRONT, Guatemalan Cargo Agency Association, Association of Cargo Airlines, Association of Passenger Airlines and the General Warehouse and Deposit Guild.

Maritime ports

Guatemala has five seaports: Santo Tomás de Castilla, Puerto Barrios, Puerto Quetzal, Puerto San José and Champerico. Two are Atlantic ports: Santo Tomás and Puerto Barrios and the other three are on the Pacific. The old ports, Puerto Barrios, San José and Champerico, have piers and the new ports, Santa Tomas and Puerto Quetzal, are marginal ports. Puerto Quetzal has an artificial dock protected by breakwaters.

Santo Tomas, Quetzal, and Barrios have freight handling equipment. None have gantry cranes for loading and unloading containers from ship to land. Most of the load/unload operations in containers in Santo Tomas and Puerto Quetzal and all of the operations in Barrios are done by the ships' cranes.

Santo Tomas moves 43 percent of cargo in containers and trailers and 42 percent of the bulk liquid. More than 66 percent of the cargo handled at Puerto Barrios is bananas, which is moved in containers, the rest of cargo handled is liquid or general goods. Puerto Quetzal is used for bulk products such as sugar and fertilizer.

Roads

Under the Arzu administration, many new roads and bridges were built between major cities, the ports and borders. Major highways into Guatemala were widened and improved as well.

Electrical service

Electrical service is available in the larger cities. It is not reliable and back-up electrical systems are advisable.

Telecommunications

Cell phones and beepers are widely used. Internet is available in most large cities.

4. Comparative Advantages of Guatemala

The comparative advantages of Guatemala are:

- Favorable climate and fertile soils for wide variety of horticultural and silvicultural activities
- Large, cheap labor pool
- Favorable history of successful diversification among coffee growers
- Large economy – the largest in the region
- Relatively good infrastructure for handling perishable goods near Guatemala City

D. Country Profile - Honduras

1. Background Snapshot

Honduras is one of the poorer countries in Central America. The rate of growth for GDP was 5 percent in 1999. GDP per capita is \$2,700. GDP is comprised of 16.2 percent agriculture, 31.9 percent industry and 51.9 percent services. Agriculture provides around 29 percent of employment and generates nearly two-thirds of exports (ICDF, 2001). Over 52 percent of the

population is below the poverty line. The rate of unemployment is 28 percent and many are under-employed. Twenty-nine percent of the labor force is employed in agriculture. In 1999/2000 Honduras exported \$345 million of coffee, equivalent to 27 percent of the country's foreign exchange earnings.

2. Coffee

In 1999, coffee formed 27 percent of the agricultural sector and provided 4.4 percent of GDP. In 2000, this participation dropped to 19 percent of the sector and 2.5 percent of GDP. The value of export sales dropped by just over 50 percent between 199/2000 and 2000/2001, from \$345.2 million in 1999/2000 to \$167.6 million in 2000/2001 (Banegas Espinoza, 2001).

The Distribution of Coffee and Description of Coffee Growing Region

Coffee is grown in some 15 of the 18 departments of Honduras. As of the 2000/2001 season, approximately 71,134 producers were registered with IHCAFE and reported as having plantings of coffee totaling 190,427 ha.

According to the 2000/2001 statistics from IHCAFE, the greatest concentration of growers occurs in the western highlands of Santa Barbara (11,479), La Paz (5,639) and Copán (7,026) and in the mountainous areas of the central departments of Comayagua (7,346) and Olancho (7,841) and the southwestern department of El Paraíso (11,257). The six departments with the largest area of land dedicated to coffee production are: El Paraíso (38,627 ha), Santa Barbara (32,997 ha), Olancho (23,757 ha), Comayagua (19,196 ha), Copán (16,166 ha) and La Paz (13,195 ha).

Departments with the highest average production levels were: Ocotepequez, Copán, and Lempira where 62.5 percent, 52 percent and 23 percent, respectively, of the municipalities of those departments were reported as having average production levels (total production reported/total area reported planted) greater than 14 cwt oro/mz. The Honduran department of Lempira and slices of southwestern Guatemala and western El Salvador comprise a coffee-growing area popularly called "El Trifinio." IICA reports the Honduran region of El Trifinio as the most highly technified coffee-growing region of Honduras, with the largest area in the country of sun-grown coffee. Yields are high, between 28 and 60 cwt oro/ha on full sun farms, in comparison with the rest of the country (IICA-PROMECAFE, 2000).

About 80 percent of the coffee production is under shade, mostly under Inga spp. Average growing conditions are on slopes of more than 30 percent, with temperatures ranging from 23-26 C in the low areas and 21-23° C in the higher areas. Annual rainfall ranges from 800 to 1,200 mm.

The last coffee sector census was made in 1993. In that year, 92 percent of the producers were small holders with farms less than 7 ha, 5 percent had farms of between 7 and 35 ha and only 3 percent had farms of 35 ha or larger. Banegas states that the same composition of growers still holds true today (Banegas, 2001). Some 26 percent of growers report yields as low as 7.9 cwt/ha. Only 9 percent of growers report yields of 33-54 cwt/ha. If the larger farmers, those with 7 ha or

more run risk of debt or non-competitiveness, then some 8 percent, or 5,690 growers may be at risk.

Exporters

There are 42 exporters registered with IHCAFE. More than 60 percent of the exports are concentrated in the hands of 10 exporters. Some of those are transnationals that represent large buyers. The remaining exporters market 40 percent of the coffee. Their principal suppliers are the intermediaries.

3. Agricultural Diversification

3a. Description of the Climatological and Topographical Conditions of the Different Coffee Growing Regions

On average, the coffee growing areas of Honduras are found at 600 to 1,500 m above sea level on land with steep slopes of 40 percent or more. The soils found in these areas are variable but most are not very fertile. The road infrastructure is fair but the farms are isolated and there is no electricity in many areas. Availability of water is very variable (FHIA-IICA, 2001).

El Paraíso

There are 11,000 producers in this department on 39,160 ha. Yields of coffee are low, only 16 cwt/ha. Most farms in this area are at 600-1,300 m, mostly on steep slopes, which would be a problem for developing other crops. Nevertheless, the majority of these farms are planting Gros Michel banana and plantains for shade, selling the fruit in the town of Danlí. Some growers pasture beef and dairy cattle as well. In spite of this, for most growers coffee is the only source of income. There are good water sources for irrigation in the area but irrigation is not used.

These growers are far from a market and have no intermediaries to help them market product. They show no interest in diversification or differentiating their coffee as “specialty” coffee.

Comayagua and Marcala

Comayagua has around 8,000 growers and 19,580 ha in coffee production. These growers, who are near the Valley of Comayagua, which is a horticultural center, have begun diversifying their farms. Growers in Varsovia have inter-planted coffee and mandarins. Others have tried between-row plantings of vegetables, fruits (musaceas, mandarins, strawberries, litchi and peaches) and cut flowers (roses, gerberas and bromeliads). However, the growers report problems with marketing their product although there are plenty of buyers in the zone.

In Marcala, there are nearly 7,000 producers on 16,783 ha. In this area there is more dependence on coffee and almost no effort to diversify at all. Some growers have tried to plant apples, strawberries and potatoes but, as there is no market for these crops, they have not increased the planting sizes. The area is very distant from both San Pedro Sula and Tegucigalpa. Nevertheless, the soils and climate are good and the growers are interested.

Santa Bárbara

There are 9,000 coffee producers with 25,175 ha of land in Santa Bárbara. Average yields are low, about 10 cwt/ha. Altitude in the area ranges from 800-1,300 m above sea level. In general, there are limitations for irrigation. However, some townships do have access to water. In Trinidad, growers have tried plantain, papaya, cardamom, tomato, ginger root (*Zingiber officinale*) and chayote (*Luffa cylindrica*). However, they had poor results in sales of their products. An advantage of this town is its proximity to San Pedro Sula. In San Luis, however, producers have had a lot of experience in alternative crops. The growers believe that their biggest problem with diversification is their lack of experience with the market (FHIA-IHCAFE, 2001).

3b. Organizations and Institutions that Implement Diversification Projects

There are many organizations and consulting groups that offer services in implementing projects in Honduras. Below are listed a few of the larger NGOs that implement such projects.

FHIA

This organization's services are discussed under Agriculture Support Services and NGO Implemented Diversification Projects.

DED

DED is an institution financed by the Federal Republic of Germany for providing assistance to development projects through providing technical personnel. Their focus is on poverty reduction, participation management, sustainable development and gender issues. In the area of agriculture and natural resource protection, DED works with NGOs, organizations and townships to produce and market products and to foment adequate agricultural development to those people living in protected areas (DED, 2001).

ICDF

ICDF is the technical aid mission of the Republic of Taiwan. Today a mission with 12 technicians work on three projects in animal husbandry, aquaculture and fisheries. Another three projects in Honduras work in investment and lending for agriculture. The Central America Five Countries Re-Lending Project helps SMEs by providing a line of medium- and long-term credit. More than \$10 million is available per country. The Small Farmer Credit Project is to assist the rice development program. The Quimistán Valley Irrigation Project will construct two diversion weirs over the Blanco and the Chiquila rivers; concrete lined canals, drainage canals and roads along the canals in the irrigation system areas. It is developing a demonstration farm for farmer training (ICDF, 2001).

CARE

CARE has been in Honduras since 1959. Projects include agro forestry, irrigation and micro-watershed protection. Project DIPPAC promotes sustainable agricultural production to ensure food security. The project seeks to accomplish this objective by strengthening community

groups, promoting agro forestry practices and introducing new crops. The project also privatizes technical extension services to ensure technical assistance on a sustainable basis. Project HAM is providing 19,600 small-scale farmers with improved agricultural technology (CARE, 2002).

Zamorano

Escuela Agrícola PanAmericana ,or “Zamorano,” is a private agricultural college in Honduras. Zamorano has implemented USAID funded projects using professors and students. Most recently the school implemented several small projects under post-Hurricane Mitch funds. They designed a multi-faceted project that allowed students, working under the guidance of professors in different programs, to acquire hands-on experience applying classroom knowledge in the field. There were programs to improve barnyard poultry stock, re-establish the beekeeping industry, dairy and pork production on small-scale and re-planting plantain farms.

NGO-Implemented Diversification Projects

FHIA

From 1999 through 2001, FHIA implemented the REACT Project, a USAID funded project. The purpose of the project was to rehabilitate and modernize Honduran agricultural production. The project had four components: (1) transfer of agriculture technology, (2) training, (3) recuperation of markets lost due to interruption in services and (4) improvements in processing and storage facilities.

The major crops targeted were bananas and plantains and cool climate and warm climate vegetables. FHIA assisted growers with training and marketing assistance. By the end of the project, over \$180,000 of vegetables were marketed for producers. Other products that FHIA assisted growers with were: carnations, ginger (organic and conventional), rambutan and blackberries. FHIA also hosted the EXPHONDURAS agricultural fair in San Pedro Sula, Honduras.

CDA - Fintrac

Fintrac, Inc. implements the USAID funded - Center for Agribusiness Development (CDA) project, part of the post-Hurricane Mitch rehabilitation program for the development of the Honduran agribusiness sector.

The overall objective of CDA was to increase small farmer incomes and employment. Fintrac CDA farmer-clients achieved results as a result of a market-driven approach of planting what the market wants, when it wants it and with the quality it needs. The project activities were designed around this by starting with market research, implementation of the required production systems, improvement of infrastructure, development of processing outlets and expansion of required marketing opportunities. Two crops were introduced to the growers, a white variety of cassava from Costa Rica and jalapeno peppers. Project activities were not limited to particular crops or markets. Although the project was designed for small growers, support was provided to a wide

range of companies, from very small growers and processors to large-scale producers, processors and exporters.

As the project has just ended, it is not known whether the results of CDA will be sustainable, although there are expected to be so. In general, the project was successful and appreciated.

Proyecto de Modernización de Servicios de Tecnología Agrícola (PROMOSTA)

PROMOSTA, funded by IADB in 1992, is a \$17 million project to promote modernization of the agricultural practices in Honduras through the services of private providers with a focus on SMEs. The project is composed of two components: Consolidation the National System for Research and Technology Transfer (SNITTA) and the Competitive Fund for Financing Projects for the Generation and Transfer of Technology (FONDO).

SNITTA should consolidate the new institutional structure for generation and transfer of technology with those of DICTA, which are the promotion, regulation and supervision of those services.

There are approximately 40 projects underway at the present time in 10 departments of Honduras. They promote improved technology for the production of everything from vegetables and cashew nuts to milk, beef cattle and shrimp. The implementers are mostly private consulting firms and NGOs that offer technical assistance to small growers and cooperatives (PROMOSTA, 2002).

3c. Agribusiness Support Services

Research, Services and Extension

Secretaría de Agricultura y Ganadería (SAG) is the Honduran government agricultural research and extension service. The SAG is composed of a research and extension section, DICTA, and an agricultural service section, SENASA. The Minister of Agriculture creates policy and strategy.

SAG is headquartered in the capital city of Tegucigalpa and has extension farms in El Progreso, Comayagua and La Esperanza. The Sta. Catarina farm in La Esperanza, Intibucá, is currently managed by FHIA.

Unfortunately, SAG is highly politicized and under-budgeted.

Fundación Hondureña de Investigación Agrícola (FHIA), located on the North Coast of Honduras in La Lima, Cortés, is a non-profit private foundation dedicated to the generation and transfer of agricultural technology with the purpose of the expansion and improvement of the agricultural sector for the benefit of producers and to the Honduran economy. FHIA was founded in 1984 by USAID and the government of Honduras, and operates on an endowment fund.

Agricultural services provide laboratories for soil and leaf analysis, pesticide residual and food safety testing, agricultural mechanization, local, regional and international market price

information; planting materials nurseries, an extensive agricultural library and training courses. In addition to these services, FHIA provides training and seasonal services in quality control in post-harvest processes to growers such as the Choluteca melon growers.

FHIA operates demonstration and research farms in Comayagua, La Masica, La Esperanza and Olancho where variety trials and agricultural technology research are conducted. FHIA has operated a vegetable and fruit packing house operation with marketing services to San Pedro Sula and Tegucigalpa supermarkets and fast food chains for the smallholder growers of Intibucá out of its Santa Catarina Farm in La Esperanza, Intibucá and the Comayagua station.

FHIA also operates the La Masica watershed project for the purpose of watershed protection and agro forestry research and extension. The Canadian government-funded Proyecto de Desarrollo de Bosques Latifoliados (PDBL) chose FHIA to develop this project and as the guardian and developer of its extensive fruit tree germplasm bank.

Escuela Agrícola PanAmericana (Zamorano) has a large agricultural reference library.

Financing

FONAPROVI provides financing to the agricultural sector, as well as other sectors. Growers have up to seven years to pay back their loan and a two-year grace period. Interest rates are up to 21 percent for the producer. Loans of up to \$31,040 are available. The loans are made through local commercial banks selected by FONAPROVI. There are several different loan instruments available depending on the project's purpose.

There are a number of micro-financing programs through NGOs. ICDF, for example, has a financing program for selected small growers

Education and Training

The following institutions regularly offer seminars and training in agribusiness and technology transfer.

INCAE – oriented at business skill development
DICTA – technology transfer and diversification promotion
Zamorano – educational institution and training center
FHIA – technology transfer and diversification promotion

Quality assurance/certifications

Organic certification

Currently, FHIA has organic inspectors for certification under the German organic certifier, BCS OKO Garantie. FHIA has carried out inspections for cacao growers for IHCACAO and ginger growers.

Other organic certifiers:

Biolatina
OCIA
Oregon Tilth

These require bringing inspectors from Costa Rica and Guatemala.

Eco-OK certification

FIIT – through their offices in Guatemala.
Marketing assistance
Currently, the CDA project offers some marketing assistance to its client-farmers.

3D. Constraints to Agricultural Diversification

Honduras has made many changes since the 1980s that have improved the trade environment. However, bureaucracy is slow and not always sure. The most serious constraints to agricultural diversification are a lack of credit and high interest rates. Electricity is not reliable, particularly in the summer months (April-June). Communications can be unreliable.

National Infrastructure**Ports****Air freight**

Honduras has two major airports, one located in San Pedro Sula and the other in Tegucigalpa. Neither airport has adequate cold storage for perishable cargo. There are no regularly scheduled commercial air cargo direct air routes to Europe or any other non-U.S. destination from Honduras.

The La Mesa Airport in San Pedro Sula offers daily air cargo service to Miami through Challenge/UPS. American Airlines also offers daily cargo service.

TACA airlines has very recently terminated its air cargo service and is now offering cargo service only through its passenger routes. Air shipments through TACA may require stops in Tegucigalpa and/or San Salvador, TACA's hub before departure for the final destination. Cargo services for passenger flights give passengers and luggage first priority, followed by frozen seafood and other frozen items. Fresh fruits and vegetables have low priority and may be bumped.

Despite many inaugurations, promised cold storage facilities have never been installed at the airport. The only "cold room" is a 40-ft container in which all products are stored at the same temperature. Service is poor and it is recommended that perishable products be delivered in refrigerated trucks just prior to departure and that the air cargo be directly loaded from the truck into the aircraft.

Airfreight rates from San Pedro Sula are relatively high due to high charges for fuel, permits and insurance that the air cargo provider must pay. These charges are passed on to the shipper and result in high airfreight rates, which reduce competitiveness. As there are few air cargo providers and their costs are high, there is little incentive for rate discounts unless frequent high volume shipments can be assured.

Tegucigalpa's Villa Morales airport is not a secure airport for cargo service of perishable products. This airport has a short runway inconveniently and precariously located in the capital city, in a narrow valley with a major highway at the end of the runway. In order for airplanes to land, traffic on the highway must be stopped. These conditions have contributed to a number of commercial and military airplane accidents. Air service is frequently interrupted for fog, inclement weather and from smoke in the sugar cane burning season. Additionally, the airport does not have cold rooms for handling perishable commodities.

Maritime ports

Honduras has two ports on the Atlantic coast (Puerto Cortez and Trujillo) and one on the Pacific coast (San Lorenzo). Of the three, the Atlantic port at Puerto Cortés offers the best service although Dole does offer limited service through its Trujillo port. Cargo to be sent out the Pacific coast is usually sent to Guatemala's western port as it has more frequent service.

Most perishable cargo is shipped in 40-ft refrigerated containers. Until recently, 20-ft refrigerated containers were unavailable. However, recently, some cargo service providers have offered to provide 20-ft reefers if they receive assurances that

Roads and Bridges

The road system in Honduras is extensive but has fallen into disrepair. Many mountainous areas do not have service and many villages in remoter areas are accessible only by horseback and/or long hikes from the nearest roads. This is particularly true for many of the more isolated coffee growing regions.

Many roads and bridges destroyed by Hurricane Mitch have been replaced. However, some have not. During the wettest part of the rainy season, some roads and bridges are impassable, isolating communities or requiring long circuitous detours to the ports.

4. Comparative Advantages

Honduras has relatively low transportation rates for both air transport from San Pedro Sula and sea transport on the North Coast.

There is a large underemployed labor pool and labor is relatively cheap, Lps.60.00 (\$3.75)/day. Honduras has both air and sea transportation capability. For sea shipments, Honduras, Guatemala and Costa Rica are the only countries with the capability of shipping directly from national shores to both the Pacific and Atlantic Oceans.

E. Country Profile: Nicaragua

1. Background

Nicaragua is one of the region's poorest countries. Per capita GDP is \$466. Adult literacy is 65.7 percent and over 50 percent of the people live below the poverty line. It ranks as one of the countries with the highest debts in the world, \$6 billion. Around 42 percent of the population are employed in agriculture, which is the main source of export commodities. Agriculture constitutes 60 percent of total exports and coffee is one of the most important components of agriculture (CIA World Factbook, 2001 and The U.S. Commerce Service, 2002).

Nicaragua has the largest area of remaining forest and greatest biodiversity. This is probably due in part to the history of the colonization of Nicaragua, decades of civil and political strife, inept and corrupt government and natural disasters. These circumstances have resulted in a disinterest in developing infrastructure connecting the eastern and western halves of the nation. The new millennium has started off with a coffee price crisis, which threatens the single most important export crop of Nicaragua, a source of income and employment for many.

2. Coffee

General Description of the Coffee Industry

Much of the information in this section comes from two sources, the 2001 IADB report and Roberto Bendaña's 2002 report.

There are four major coffee-growing regions: Jinotega, Matagalpa, the Pacific/Boaca and Las Segovias. These regions are comprised of the departments of Jinotega, Matagalpa, Estelí, Nueva Segovia, Madriz, Carazo, Granada, Managua, Boaco and Chontales.

Of these 10 departments, Jinotega and Matagalpa together produce 76 percent of the total national production. This area of mountainous, broken terrain reaches an average altitude of 1,200 m above sea level. These mountains receive up to 2,000 mm of rainfall annually. Carazo, Granada and Managua produce only 7 percent of the total coffee production and do not have the favorable coffee growing conditions of Jinotega and Matagalpa as they are too dry and/or too low for good production.

In all, there are an estimated 30,400 coffee growers in Nicaragua, of whom 29,666 are small growers who produce less than 500 cwt each. As a group, small farms represent between 96 percent and 98 percent of the farms in the four major growing areas. On an average, small growers represent 97 percent of the total number of growers nationally. The greatest concentration of small growers in the nation is found in Jinotega and Matagalpa, 38 percent and 32 percent, respectively. See Annex C, Table 3: Nicaragua.

Small farms producing less than 500 cwt oro number range in size from 1 to 20 ha on average and are found at lower altitudes. The small farm group is comprised of two categories, A1 and A2, depending on farm size and total production level. Farms in category A1, some 27,235, produce less than 50 cwt of oro on less than 1.48 ha. Another 2,431 farms are an average size of

20 ha and produce 51-500 cwt oro (A2). Small growers tend not to be wholly dependent on their coffee production as they have off-farm income and their farms are often diversified with plantings of fruit trees and basic grains. While most of these use traditional production practices and rely on family labor, some farms in category A2 may be semi-technified and use contract labor. Small farms are reported to produce poor (A1) to good (A2) quality coffee. Growers in category A1 generally have no means to de-pulp coffee on the farm and no transportation to get it to a buyer or wet mill. They are not members of a larger organization that can assist with processing and marketing the coffee and so they are dependent on intermediaries as buyers. As a result of their dependence on intermediaries, they are “price takers.” These growers also tend to be the least educated, most isolated and most distant from the market. Category A2 may have a manual de-pulper and mules to transport product to buyers. Although they have generally limited access to the local market and intermediaries, some are associated with a cooperative that allows them better negotiating power and access to the market. The small farm category, A1, relies on family labor, which represents some 14-15 percent of the temporary labor required at harvest nationally. Category A2 requires an estimated 21-22 percent of the temporary labor required for harvest, of which at least some portion may be contract labor.

Medium farms, designated as category A3, those producing 501-1,500 cwt oro annually, average 50 ha in size and are located at intermediate altitudes. Coffee on these farms is cultivated using traditional or semi-technology agricultural practices. Medium-sized farms have some form of transportation with which to deliver coffee to buyers, either mule or truck, and tend to produce excellent quality coffee. In general, these growers rely on cooperatives, the local market or intermediaries to market their coffee and on family members and contract labor to harvest. As a group, the medium growers have more widely diversified farms than the small growers, with fruit trees, timber and small livestock, as well as basic grains on-farm.

Large farms (categories A4 and A5), those producing more than 1,500 cwt oro annually, are located at higher altitudes. These farms cultivate coffee using full technology agricultural practices. There are roughly 163 growers in this category, of which some 130 farms are an average size of 86 ha (A4) and 33 are farms of an average size of 284 ha (A5). These farms are usually at higher altitudes and use high inputs in their cultivation, which produces excellent quality. These farms usually have their own fleet of trucks and a wet mill. They are able to deliver product to the exporter. The largest growers, those producing 6,000 cwt annually, may export their product themselves. The large producers may also have livestock and/or other businesses. These growers market their product through exporters or export their product themselves and have had access to credit through banks and/or their exporters.

Although medium- and large-sized farms represent a minority of 3 percent of the farms in Nicaragua, they produce 59.5 percent of the coffee in Nicaragua and control 35.8 percent of the coffee production area. Medium and large farms usually employ the most intense production technology. Although in the 1990s the fad was to remove all shade, many of those farms starting out with no shade now have at least light shade cover. New plantings made since have been made with light shade. As for the small farms, most of the medium and large farms are located in Jinotega and Matagalpa, 66 percent and 78.5 percent, respectively. Over half (88) of the large coffee farms are located in Jinotega. The next largest concentration of large farms, 40, is in

Matagalpa. As a group, medium and large farms contract most of the temporary labor used to harvest coffee, which represents roughly 64 percent of the harvest labor.

Exporters

More than 70 companies are registered as exporters in Nicaragua, out of which only 30 are actually in operation.

Estimate of the Impact of the Most Recent Crisis on the Industry and Diversification

As in Guatemala, farm size, quality of coffee product (farm altitude above 1,000 m), proximity to cities, opportunities for earning off-farm income, growing conditions, farmer's production and marketing capabilities, access to credit and debt load and are the determinant factors in farm survival.

However, since we do not have all of the information needed to assess the possible direct farm losses on these bases, we will have to use proxies. The two most important factors that we can use are coffee cupping quality as represented by altitudes above 1,000 m above sea level of which farm size seems to be an indication (smaller farms in general at lower altitudes with farm size increasing as altitude increases) and growing conditions (sufficient rainfall, altitude) in different growing areas.

Coffee Quality, Altitude and Farm Size

Coffee quality is an important determinant for survival as a coffee farm as it offers the opportunity for coffees with good cupping qualities to differentiate the farm's coffee product as a specialty coffee. Specialty coffee is a segment of the coffee market that is a relatively small portion of the coffee market at the present time. It is, however, experiencing increasing growth in demand and still offers a higher price than for commercial grade coffee. The definitive test for the quality for a given farm's coffee product is a taste test.

Although it is reported that some 85 percent of coffee grown at altitudes above 1,000 m above sea level have good cupping qualities, reports on taste tests indicate that some coffees grown at lower altitudes have special characteristics that make them potential candidates for specialty coffees. Therefore, altitude may not be a reliable indication of future competitiveness of farms. Many of the coffee growers interviewed for this report did not agree that altitude of a farm was a good proxy for determining whether the coffee produced by a farm would qualify as specialty coffee.

In any case, although many of the medium-sized and large farms are located at the higher altitudes and have the greatest opportunity to be able to differentiate their coffee as specialty coffee or high-quality commercial "C" grade coffee, they tend to be highly technified and require working capital. They are more likely to rely on credit from banks and exporters and to have a larger debt burden. Moreover, the newest of these may carry debt from the original investment in the farm and new technology. So, they are still susceptible to failure in the short run due to inability to pay debt off and invest in differentiating the coffee product.

Failure of all the farms in these two categories, A4 and A5, would result in the loss of perhaps around 100,000 temporary jobs and a large percentage of the 40,000+ full-time jobs. Many of which might be jobs held by small farm owners; which, in turn, might have a secondary effect on the survival of small farms through loss of off-farm income.

Very small farms of less than 1.5 ha (A1), or around 24,220, represent 79 percent of all of coffee growers in Nicaragua. These farms are on the lower slopes and produce poor quality coffee. Coffee was planted as a diversification crop on many of these, particularly the newer ones, to provide additional income to subsistence basic grains producers.

These farms are cultivated using traditional agricultural practices, have low/no agrochemical input requirements and may be harvested entirely by family labor. They also tend not to have debt because they have not been considered creditworthy. Therefore, all cash inflow from coffee sales is “profit.” Other crops are grown on the farm for consumption or local market sales and some member(s) of the family may work elsewhere and send remittances. With an average production of 50 cwt oro and market price of \$0.15/lb, these farms would be earning around \$750 instead of \$2,000/year (at \$0.40/lb) as in previous years. Those farms producing the upper limit of 100 cwt would be earning \$1,500/year. These earnings, even at these prices, still represent income considerably more than the national average income (\$466 per capita). Along with off-farm income and farm income and food produced for consumption, these earnings would still allow these families some security except for major disasters (loss of off-farm income plus loss of crop for own consumption). Incremental improvements in those efforts in diversification underway on the farm would tend to buffer shocks from coffee market price fluctuations. For example, farm income would increase if fruit trees were grafted with higher-yielding or higher-value varieties onto the existing rootstock. Another option is the improvement of output of small livestock to increase farm income from sales in the local market, as seen in the Zamorano poultry project.

There are around 2,431 coffee farms in the larger small-grower category, A2 (100-500 cwt annual production and ~ 20 ha in size), and 571 farms in the medium-sized farm category, A3 (produce 501-1,500 cwt, average area of 40 ha). These two categories of farms tend to be located in the intermediate altitudes for coffee production with average to good rainfall and have some form of transportation for accessing the local market, intermediaries or cooperatives. They are more likely to be organized in local marketing cooperatives or belong to a coffee growers’ guild. Access to credit may be limited but is not barred. These farms are transitional in terms of degree of dependence on more intense forms of production technology and the production technology used may range from traditional to semi-technified. As the farms are larger, 20-50 ha, they are more likely to be more extensively diversified than A1 farms and have basic grains, fruit trees, wood species and small livestock.

These two categories would benefit from a gradual withdrawal from conventional coffee production into other high value products if there were water available for irrigation for other activities, such as horticulture, aquiculture and small animal husbandry. The total number of farms from these two categories is around 3,000 and their loss of competitiveness would result in the loss of employment for an estimated 85,173 and remove 76,467 ha from coffee production.

If we anticipate that all growers who hire labor for their farms and have been creditworthy have incurred debt and are now non-competitive will seek help with diversification, then the estimated number of farm clients might be as high as 3,165. Some of those are already producing specialty coffees and others may be financially sound, so the actual demand may not reach this figure. Some of the very small growers will seek help, though, and although the number that may need help in that category is unknowable, the possibility of their interest in diversification should be taken into account in planning.

3. Agricultural Diversification

3a. Description of the climatological and topographical conditions of the different coffee growing regions

According to AIDB, 2002, the most appropriate conditions for growing coffee occur in a band that runs northwest to southeast in the middle of Nicaragua. The most appropriate coffee-growing conditions are found in the middle of Nueva Segovia, the easternmost tip of Madriz, the western end of Jinotega, north central Matagalpa and a small area in central Boaca. There are a few islands of land appropriate for coffee production in central Chontales and around Jinotepe in Northeastern Carazo.

Analysis of maps from the Instituto Nicaragüense de Estudios Territoriales of the Republic of Nicaragua for altitude, average annual rainfall (1971-1990), average annual temperature (1971-1990), annual rainfall deficit in an El Niño year (1971-1995) and most common rainfall level in El Niño years (1971-1995), corroborate these findings. Average conditions in these areas are an average annual temperature of 20-23° C in normal years, which is a little high for coffee and precipitation of 750-1,250+ mm/annually in El Niño years and 1,000-1,700 mm in normal years. In these areas, the average rainfall deficit during an El Niño “event” is only 10-20 percent, as compared to 40 percent in a band around the lower slopes west, south and east of these mountains.

Granada, Estelí and most of Boaca and Chontales are marginal for coffee production. In Estelí, average annual rainfall is around 800-1,200 mm, low for optimal coffee growing conditions. In an El Niño year the most common rainfall in Estelí is 250-1,000 mm and the rainfall deficit in an El Niño year can be as much as 20-40 percent.

Very little area in Granada is above the 1,000 m mark and it is very close to Managua and unlikely to survive urban expansion for much longer. Except for around Mombachito and Serranías Amerrisque, which may rise to 1,000-1,500 m above sea level, most of Boaco and Chontales is too low and dry (1,000 – 1,800 mm of rainfall annually in normal year and 750-1,600 mm in El Niño years) for coffee production.

3b. Organizations and Institutions that Implement Diversification Projects

Ministerio de Agricultura, Ganadería y Forestería

The Ministry of Agriculture, Livestock and Forestry is the government agency whose function is to develop and improve the three segments of the agricultural sector, agriculture, livestock and forests. MAGFOR is generally seen as inactive due to under-budgeting.

The Instituto Nicaragüense de Tecnología Agropecuaria

The Nicaraguan Institute of Agricultural Technology was created by the Nicaraguan government in 1993 to do research and extension of agricultural technology. Most of INTA's work has been with grains and other commodity crops. However, it does have a fruit tree production program and has produced production guides for less typical products that have export potential such as maracuyá, pitahaya and quequisque (a type of taro). INTA has several good experiment stations but apparently has budgetary restraints.

APENN

The Asociación Nicaragüense de Productores y Exportadores de Productos No Tradicionales (The Nicaraguan Association of Producers and Exporters of Non-Traditional Products) is a nonprofit organization that provides organization, representation, technical assistance and export promotion to the producers of fresh fruits and vegetables in Nicaragua. APENN is the Nicaraguan counterpart to AGEXPRONT in Guatemala and FPX of Honduras. Through an arrangement with FHIA, APENN houses SIMPAH's Nicaraguan reporter and in return receives regional market price information, which APENN disseminates to its members.

APENN is not as active as it has been due to funding shortage. Recently, APENN implemented the PILA project, one of the Project ARAP efforts, to develop light agriculture-related industries. The PILA project developed a small industry in handcrafted paper, "ECO-PAPER," made from natural fibers by women's groups in Estelí, Posoltega and Totogalpa.

In collaboration with CCI (International Commerce Center), APENN is implementing EXPORTPYME, a program that provides training on international commerce to small and medium entrepreneurs. The purpose of the program is to introduce these businessmen to export and market study techniques.

APENN has a packing station for fresh fruits and vegetables in Sebaco. It also owns and manages APENN FRIGORIFICOS, a center for perishable cargo at the international airport in Managua. Infrastructure includes cold rooms, freight handling equipment and refrigerated trucks. An office of CETREX (Centro de Trámites de Las Exportaciones) is on the premises and offers "Ventanilla única" ("one-stop") export service.

CEI

Centro de Exportaciones e Inversiones (The Center for Exports and Investment) provides export information and reports. It has a library of information pertaining to export products, both traditional and non-traditional.

NGO-Implemented Diversification Projects

The Agricultural Reconstruction Assistance Program

ARAP was a two-year project funded by USAID and implemented by Chemonics International to assist in the reconstruction of the Nicaraguan agricultural sector after Hurricane Mitch (the Nicaraguan counterpart to Project REACT in Honduras).

The project was market-led and focused on diversification of agricultural products produced for both domestic and export markets, with particular emphasis on those with high income potential. Additionally, the project executed sector studies to identify constraints and opportunities for increased production of selected crops and advised on policy framework needed to create a more productive agricultural sector.

One of the long lasting outcomes of this project was the creation of a market price reporting service for tracking daily prices in the Managua wholesale market as well as establishing the same service in El Salvador. These are the SIMPAH reporters for El Salvador and Nicaragua. Market reports from these services are provided to both APENN and MAGFOR and disseminated by radio to the public

Another legacy of ARAP are the exotic tropical fruit and spice propagation materials, which were given to World Relief, who established plantings of the materials in three separate germplasm banks (farms) in Nicaragua.

UPANIC

The Unión de Productores Agropecuarios de Nicaragua (Nicaraguan Agricultural Producers Union) was organized in 1979 by directors of various commodity products to integrate growers into private enterprise and to strengthen the agricultural sector in exports. In 1990, the organization began activities to strengthen organizations and to reactivate agricultural production through programs designed to promote better production alternatives.

From 1993 to 1999, UPANIC received funding from USAID to implement the Proyecto de Fortalecimiento Institucional (Institution Strengthening Project) for the purpose of strengthening associations representing the different producers in Nicaragua.

In 2000, UPANIC contracted with USAID to implement a project to ameliorate the effects that Hurricane Mitch had inflicted on the Nicaraguan agricultural sector. UPANIC sub-contracted 24 organizations to carry out a number of small projects that included a diversity of activities from

road and bridge repair to reforestation and soil stabilization and conservation. These were implemented in selected communities in eight northern departments along the Honduran-Nicaraguan border.

While none of these projects is directed at diversification per se, they are worth mentioning because they demonstrate that UPANIC is capable of managing projects of different types and funding on a large scale in Nicaragua.

World Relief Nicaragua

World Relief, a nonprofit Christian relief organization, received a grant from USAID to implement projects designed to re-establish and improve agricultural services in areas affected by the hurricane in Estelí Madriz, Nueva Segovia and Jinotega. In order to recover agricultural production in the target area, WRN employed a strategy of introducing improved agricultural practices and crop diversification. This was accomplished by working with agricultural suppliers, post harvest service providers and market links interacting with the farms. Activities included clearing farmland of debris deposited by the hurricane, installing irrigation, improving access from markets to farms and stabilizing land and river courses and critical watersheds. To meet these goals, WRN provided training, technical assistance, extension, credit and construction services and established farm resource centers to support diversification efforts (World Relief Nicaragua, 2002).

Several significant accomplishments were achieved through WRN efforts. The one that is of most interest to this review is the establishment of three Agriculture Resource Centers (Las Sabanas, Cruz Laguna and San José de Bocay). These centers serve as demonstration/extension stations to promote, test and multiply new crops and as a place for practical training of growers in the agricultural practices being promoted. They are also the sites for the exotic fruit and spice germplasm banks. Also, their work at these farms in promoting soft fruits, fruit and spice trees and pejobaye palm (a source of heart of palms) provides us with useful insight into acceptance of these by the small farmers with whom they worked. WRN observed in its final report that farmers were slow to adopt these crops in plantings of commercial size. This was attributed to:

Significantly higher investment costs than for short cycle field crops (corn and beans)

Relatively long period before investment cost recovery can begin, 3-4 years

Insufficient information on agricultural practices and cost and returns.

As a result of the slow adoption rate and low numbers of trees/plantings, the time to develop an industry in these products would be greatly extended. WRN recommends that when working with these crops it will be necessary to take great care in matching the crop with each farm's growing conditions for best yields and quality and that both road access and a fully developed and functioning cold chain from farm to market must be in place to achieve successful sales.

The Cooperative League of the U.S.A

CLUSA is administering an agricultural diversification project under the USAID Sustainable Growth in Small Producers Employment and Income Program to help improve the production and marketing of organic and traditional coffee, cacao, sesame and soybeans by farmers. CLUSA is providing assistance to farmers in crop production and post harvest handling and in business skills such as business record keeping, credit management and marketing. Organic production was targeted as a market opportunity as organically produced crops tend to earn a higher price on international markets than do conventionally grown crops.

WINROCK International

WINROCK received USAID funding for a \$4.5 million, five-year project (1998-2002), which is still ongoing, to increase the income and productivity of small growers by improving their access to credit, technology, marketing, and farmer-to-farmer training. The project provides grants to local associations, cooperatives and NGOs to carry out activities designed to increase production and adopt better environmental practices. Special focus of the project is nontraditional crops.

3c. Constraints to Agricultural Diversification

There are several constraints to growth in agriculture in Nicaragua:

- Unpredictability of contract enforcement
- Arbitrary, corrupt and slow bureaucracy
- Land tenure issues
- The highest operation costs in the region
- Electricity
- Telephone
- Sea cargo is \$600-\$1,000 more per reefer than competitors
- Lack of credit
- Poor infrastructure for transporting perishable products by sea
- Illogical, counterproductive policy
- Small pool of well-trained lower level supervisors and field technicians

The first three constraints will be discussed for other countries and these problems are fairly universal in nature in the region. However, the last three constraints in the list merit some discussion.

Credit for Agriculture

Banking and credit represents a constraint to agribusiness and related industries. In 1990, 391,960 ha were financed for agriculture when BANADES still operated. This figure dropped to 155,300 ha in 1993 and by 1999, financing of agriculture had dropped to 86,860 ha (Santa Cruz, 2000).

A banking crisis is underway in Nicaragua, partly due to problems in the coffee sector. Credit will be difficult to acquire through the commercial banking system. Government assistance is

unlikely as Nicaragua's external debt, on a per capita basis, is among the highest in the world. Recent negotiations by the government with the IMF for structural adjustments and spending cutbacks are unlikely to allow for much assistance from the public sector (U.S. Commercial Service, 2002).

National Infrastructure

Under the Sandinista government there was little investment in Nicaragua's infrastructure in the 1980s. Since the 1990s, donors have concentrated efforts on rehabilitating damage to roads and bridges caused by Hurricane Mitch and on improving and building rural roads. Lack of infrastructure, limited number of air and sea routes and high transportation costs are serious barriers to the export of NTAEs. Nicaragua is currently concentrating on improving the roads to ports but many major roads are in poor repair. The road that connects Managua with Honduras via El Paraíso is in very bad condition and this is a major border crossing for container traffic going to the Atlantic coast port, Puerto Cortés, in Honduras.

Ports

Seaports

Nicaragua has six seaports, all operated by government's Empresa Nacional Portuario (ENP). However, the only one with commercial operations is that of Corinto. Corinto is 160 km from Managua on the Pacific Coast. It has a banana and liquid terminal, refrigerated warehouse and is capable of handling containerized traffic. The port is reported to be in good condition, with adequate equipment. However, despite dropping port fees by 40-50 percent to make port fees more competitive, few shipping lines stop in Corinto. Many years of high fees and poor infrastructure has discouraged traffic through this port. Most containers and reefers (refrigerated containers) leaving the Atlantic coast must be taken to Puerto Limón in Costa Rica or Puerto Cortés in Honduras. This costs four times more (800-1,000\$/shipment) than shipping through Corinto and is frequently cited as a major obstacle to investment in Nicaragua (U.S. Embassy-Nicaragua, Economic Section, 1997).

Airports

All major air passenger and cargo traffic enters and leaves Nicaragua through the international airport "Las Mercedes" in Managua. The airport is currently undergoing remodeling. Through APENN's refrigerated warehouse service the airport is able to offer service for perishable fruits, vegetables and frozen fish, seafood, fruit and vegetables. These services include three cold rooms capable of handling refrigerated and frozen cargo. Capacity of the rooms is 15,600 cu.ft. and 150,000 lb for storage and ice production. The units have a generator back up. At present, these units are under-utilized and little air cargo moves through Managua.

Roads

Despite much donor investment, many important commercial roads in Nicaragua are in disrepair. The road to the Honduran border is in a deplorable state and is heavily used for sending containers to the Honduran ports and for transit to El Salvador. Long lines at the border and informal costs for crossing delay traffic and increase transportation costs.

There are not enough paved roads in the country. There is no paved road linking the Atlantic and Pacific regions.

Telephone service

Attempting to call into Nicaragua can be a frustrating endeavor. Attempting to get a telephone line installed by ENITEL (La Empresa Nicaragüense de Telecomunicaciones) can be even more frustrating. The average number of lines per capita were projected to have been 4.6/100 in 2000 (Santa Cruz, 2001). This would discourage investors and buyers, particularly those working with perishable items such as fruits and vegetables.

Electricity

Nicaragua buys electricity from neighboring countries, as its own generation is insufficient to meet demand. There are frequent power outages.

4. Comparative Advantages of Nicaragua

Large, cheap labor force: the cheapest in Central America

Well educated managerial class

In the coffee growing area in Jinotega and Matagalpa, the weather is appropriate to supply fresh cool-climate produce for Managua and to ship north to El Salvador.

III. Diversification

A. Introduction

Coffee growers who have lost competitiveness in the coffee market have four strategy options: (1) abandon or sell the farm, (2) keep the farm but find a livelihood other than farming, (3) if conditions are right, attempt product differentiation with specialty coffee, or (4) try other income-generating activities for the farm. The last strategy is what we will call “diversification.” This report is restricted to non-coffee agricultural diversification so we may consider any agricultural activity(ies), other than those related to coffee production, in any practical combination, that will generate positive net income on the farm.

The primary goal for concerned governments is to provide alternatives for those growers in the five Central American countries who will not be competitive in coffee that will allow them to keep the farm as an agricultural enterprise. We must also choose alternatives that meet the secondary goals of: (1) employing displaced coffee labor, (2) being self-sustaining when projects end; and (3) offering profitable and sustainable land use.

Any single or combination of agricultural-based alternatives that can be produced and transformed into multiple products should be considered. This allows the formation of clusters of agribusinesses that will absorb labor freed up from coffee culture and support farm activity, thereby providing employment to coffee growers and making the best use of land.

Alternatives to coffee for diversification are many; however, this report will consider the following:

Fresh fruits and vegetables
Flowers and ornamentals
Timber, agroforestry and watershed protection
Spices
Poultry
Fish

The grower can profitably sell his product in domestic, regional and export markets.

During interviews in the five countries, growers and their representatives expressed the view that specialty coffees are the salvation of the Central American coffee farms at altitudes above 800-1,000 m above sea level. However, some growers above that magic line will not be able to grow specialty coffee due to lack of credit, high debt burden, uneconomical farm size, inability to produce the quality of coffee required for specialty coffee status and poor growing conditions for coffee. Provisions should be made to assist these growers as well. Even those who successfully make the switch to specialty coffee should consider some form of on-farm diversification, if they haven't already done so, on which they might fall back to weather the next downturn in the market for coffee.

B. Opportunities For Diversification

This section discusses categories of agricultural products to target and trends for each category in the export, domestic and regional markets. This discussion will provide the context needed to understand the commitments required by alternative agricultural products. Some of these, such as fruit trees and timber, require a long-term commitment from the donor to ensure that the project's goals are achieved. In the case of fruit trees, a 5-7 year commitment might be necessary to assist the growers through the first two years of sales and for project evaluation. In the case of timber, some form of follow-up must be planned for 20-30 years after plantings have begun to assist in sales and marketing of these products.

Projects may be planned globally but at the moment of implementation, the final decision on which product to cultivate depends on the:

Farmer's timeframe and resources
Terrain of farm
Proximity of farm to roads and infrastructure
Climate and soils of farm
Determination that there is a buyer in an appropriate market for the product
Determination that the price offered will provide a reasonable profit to farmer.

It is extremely important that the alternative product chosen be well suited to the altitude, weather, soil and growing conditions of the farm. In planting a new crop, market behavior must be observed in order to schedule planting so that the product arrives the market on time and leaves the market when more competitive growers will be coming into harvest. The volume of production should be planned to ensure that sufficient product is grown to fill buyer orders on time and take advantage of economies of scale for transportation and packaging costs. Otherwise, the likelihood that the project will fail will be high. Planting the wrong thing in the

wrong place at the wrong time results in missing the target market window, which frustrates the buyer; low yields and high costs (losses) frustrate farmers and clients (non-sustainable). Digital information maps are under development for five countries under the PROCIG project and some are available while others are still in progress. These maps will be useful for planning a project and selecting products or geographical areas, however, at the farmer's final decision-making stage, there is no substitute for a farm visit by an experienced, well-prepared and well-trained field agronomist.

One of the more successful approaches in developing agricultural capacity has been to select a crop that has been grown in the area and require familiar agricultural practices and post-harvest handling. The crop may be known to the grower, but may be a different variety. Growers need some knowledge base of the crop and must be aware of unsuccessful product sales due to glitches in agronomic practices, field conditions, product quality, wrong market planning, lack of infrastructure, lack of a marketer with good sales ability. Adding the missing ingredient may make the product commercially successful.

B1. Fruits, Vegetables, Flowers, Foliage and Ornamentals

B1a. Fruits and Vegetables, including Roots and Tubers

Fresh fruit and vegetables have a short payback period and low initial investment cost in relation to timber, fruit and vegetable (f&v) processing and livestock. Fruits and vegetables are within the reach of most growers with little start-up money and a short timeframe. Fresh vegetables, because of their short production cycle of 3-4 months, are quick cash crops for growers. Many roots and tubers, such as potatoes, the malangas, ginger root and cassava, may require several months for full development but might still be considered short-cycle in comparison with the fruits and nuts which require 4-5 years of growth before bearing. These provide good alternatives for most growers whose farms have the appropriate conditions for these crops. Fruits and vegetables are particularly for those who need quick cash turn-around, a crop that is less demanding and may provide food security for small growers. Small growers, whose ability to tie up cash in longer-cycle "investment" crops is very limited, need at least one short-cycle crop(s) in their "portfolio" of farm activities to provide them with quick cash. Credit is extended for working capital on a crop cycle basis and, generally, lending institutions in Central American limit loans for periods of less than one year. Loans for longer time periods, such as for investing in planting fruit trees, are not readily available from lenders.

One strategy that would be very successful in improving production technology of fresh vegetables is "staggered planting." Irrigation allows growers to practice staggered planting (also called, "calendar-ized," or "scaled planting" or "siembras escalonadas"), which is the practice of subdividing the farm into plots and planting one or more crops in a few plots at regular intervals throughout the year. Eventually, the entire farm would be fully planted, with product continuously planted and harvested throughout the production season. Staggered planting requires the use of both irrigation (for the dry season) and protected agriculture (for the rainy season). Protected agriculture is the use of cover such as plastic row covers and tunnels and screenhouses to protect the crop from too much rain. This combination of practices contrasts with the traditional practice of planting a crop, such as corn, once or twice a year in synchrony with historical rainfall patterns. The practice of staggered planting, with irrigation and rain

protection allows growers to produce crops over a longer period of time and, therefore, provides a longer period of cash flows instead of reliance on one or two points of cash inflow during the year. Staggered planting smoothes out the risk of low returns from a market downturn with the cash flows from catching a market upswing. In the case of small farmers, staggering reduces the risk of complete loss of a crop and, by using food crops rather than cash crops, provides some measure of food security. The greater benefits are that use of this practice employs more farmers, reduces risk of sudden periods of oversupply of a product followed by under supply and provides constant employment year-around; thus achieving the goal of consistent, steady levels of food supply throughout the year. Nevertheless, year-round cropping also increases disease and pest pressure and requires more management, such as the use of crop rotation and fallow crops for soil conservation and pest control, which incur additional cost and may reduce yields.

Fruits, spices and nuts from trees generally require a 4-5 year or more investment period before the first commercial harvest can be made, although grafting superior varieties or races onto existing rootstock may shorten this period to 3-4 years. At least in the first year or two after planting, a short-cycle crop might be inter-planted with fruit trees without detriment to the trees. Many fruit trees are susceptible to wind damage when in full fruit. Heavy winds may cause crop loss and damage to branches, so windbreaks are a necessary investment. Many tropical fruits are biennial; that is, they have alternate bearing years with light harvests alternating with heavy bearing years. Planting more than one type of fruit tree would serve to offset the effect of alternate bearing on cash flow. Tropical exotics will be discussed more fully in the local/regional market section.

B1a(1). Considerations for the Export of Fresh Fruits and Vegetables to the U.S. and European Markets

There are some limitations as to what fresh products that can be exported. First, of course, is to determine whether there is a good market for the product; that is, whether the price and volumes are sufficiently high to be profitable as imports. In the case of seasonal vegetables, the most successful products for Central America have generally been counter-seasonal products so as to avoid direct competition with domestically grown products. Additionally, there are legal limitations as products that may be exported to the United States are restricted by regulatory agencies to those that are admissible. Admissibility is conferred upon products on a country-by-country basis. The USDA/APHIS lists of admissible products, by country, may be found on the USDA website at <http://www.aphis.usda.gov/ppq/manuals> in the Reference Section of "The Complete Fruit and Vegetables Manual." In general, Europe has not been very restrictive on the basis of phytosanitary issues but the European Communion is very strict concerning pesticide use. The United States also has strong restrictions concerning pesticide residues and will put repeat offenders and products that it considers at high risk for pesticide contamination on automatic detention and have the product tested for residues.

NTAE products, particularly the fruits and vegetables, are more appropriate for medium to large farms with moderate slopes, climate and soils appropriate for growing the product(s). Farms should be near a road in good repair and near a secondary city with good infrastructure (telecommunications, water and electricity), where a packing station can be built and, in time, a processing industry might develop. A well-designed, clean packinghouse is a requirement. Larger growers are better able to invest in packing stations than smaller growers. The large

growers may act as intermediaries or contract smaller growers or cooperatives to produce additional product to increase the volume of product moving through the packing shed, thus reducing packinghouse overhead costs. This arrangement is usually beneficial to smaller growers so long as the larger grower/intermediary is fair with grades and standards and pays fair prices based on market price behavior. Larger growers outsourcing part of the shipping volume are able to provide advances to small growers as well. Alternatively, intermediaries may be selected to work with growers to move product. Providing assistance to intermediaries to increase their level of training and professionalism would serve to increase the number of market channels available to growers.

Small growers, including most cooperatives, tend to lack literacy and managerial skills to organize production and post harvest schedules and enforce product quality at the same time. They lack language and written communication skills, do not have a complete understanding of product markets, are not familiar with how to organize packaging materials, control transportation logistics, or track shipments and arrivals. In a possible dispute with the receiver over the condition of an arrival or failure to make payment, shippers need good communications skills, knowledge of their legal rights, and the alternatives and means (money and time) to defend their rights. As exporting becomes more complicated due to increasing quality requirements, certifications, food safety assurances, the exporter must have more organizational, managerial, information gathering and communications skills. Moreover, an exporter must be agile and able to react quickly to problems. This is a facility that cooperatives do not have due to the democratic, consensus-based decision-making process they must use as an organization. In the case of cooperatives, there is additional issue of agent cost and finding a mechanism to ensure that management is acting in the best interests of the cooperative.

In the past, most projects for NTAEs have targeted the United States, Canada and Europe as the final destination of products. However, for some products South American markets may be options. Certainly Argentina would not be on the list this year, but large cities in Colombia, Chile and the Andean countries could be markets for certain exotic tropical fruits, which have great promise for fresh markets in Europe, Canada and the United States. Transportation logistics and identification of buyers must be determined in seeking out these markets.

B1a(2). Trends in the Markets for Fresh Fruits and Vegetables

There is concern that overproduction and consolidation are problems that will have long-term effects on the market in terms of competition and shrinking options for producers and consumers. Other trends affecting exporters of fruits and vegetables to the United States are food safety's two issues: bioterrorist attacks and accidental microbiological and pesticide contamination. Also, consumers, particularly Europeans, are increasingly concerned with environmental and fair trade issues. There is increasing pressure for consistent high product quality and supply and consolidation of buyers in both the U.S. and European markets.

Overproduction

Overproduction of many fruits and vegetables is worrisome, causing a drop in prices and a reduction in growers' returns (Giles, 2001). Average market prices for many products have declined over the last three years due to oversupply. Almost all categories are over-mature and have become mainstream and there is over-production and over-abundance of almost everything imported. To improve sales, retailers are looking for new items, new varieties to replace old varieties and products with new flavor or color. Central American farmers now have an opportunity because of increased interest in ethnic items such as Hispanic foods. Growers have shown interest in Asian food items, particularly in Honduras, with production underway in this category. The January 2002 issue of Produce Business has an interesting short article reporting on the maturation of several of the big products coming out of Central and South America (asparagus, melons, mangoes, snow peas) from the retailers and brokers perspective (Slott, 2002). Oversupply is a very real problem in mainstream products and commodities and this fact should be kept in mind as the effects of decisions taken at national levels are accumulative and will affect the market, subsequently boomeranging to hurt the farmer and industry.

Consolidation of buyers and the effect on producers

The retail end of the industry, supermarket chains mainly, is consolidating through mergers, acquisitions and closings. This is true not just for the United States but also for Europe. Europe, in fact, now has the largest food chains in the world. Carrefour of France had 1998/1999 sales of \$60.4 billion, followed by Metro Ag of Germany, with \$49.8 billion. Kroger and Wal-Mart are third and fourth, at a mere ~\$45 billion each. These large transnationals are making incursions in the Latin American retail industry. Ahold has purchased an interest in Paiz supermarkets of Guatemala.

This narrowing of customer base is expected to have several effects on the producing end of the industry:

- Increased power of retailer to demand additional services and lower prices from suppliers
- Retailer-supplier contracts/partnerships
- Short run: Fragmented supplier end will increase the competition to capture a shrinking number of buyers
- Long run: Consolidation of shippers
- More joint ventures and horizontal and vertical integration in the industry
- Decline of the spot market
- Increased emphasis on a supply of perfect product year-round, delivered on time, every time

In sum, large retailers will look for producer/suppliers who can supply them, reliably, with large quantities of a variety of products of high quality at the lowest possible prices all year around. Smaller suppliers will become increasingly marginalized if they try to supply brokers occasional shipments of small lots of just-adequate quality produce. Brokers are not interested in this type of

arrangement anymore because of the pressure on them to provide retailers with shipment lots according to orders year-round and with high product quality. However, new market niches are opening up in the ethnic markets, convenience store markets and the catering and food industry that offer alternative sales opportunities. Also, a large grower or an intermediary for a group of growers might seek out a broker/distributor supplying supermarkets and form a partnership that allows growers to export product selected according to private grades/standards. The grower, or intermediary, could market the other grades according to other markets' grades and standards.

Consistent Quality, Reliable Delivery – Absolute Market Requirements

Because of the large volume of produce and large number of suppliers, competition is not only on a cost basis but also on providing superior quality and service. This refrain will be repeated throughout this section and the strategy section.

Food Safety

As a result of the destruction of the New York World Trade Center and the subsequent anthrax attacks, a flurry of new legislation will be proposed to deal with the fear of bioterrorist attacks on the food chain of the United States. Most of this legislation will more directly affect domestic production of food as the proposals center on increasing the authority of the federal government in monitoring food quality, movement and processing and increasing the authority of the FDA to make seizures. Imports are already subject to inspection and seizure by FDA and USDA upon arrival and so these legislative changes should be non-issues for imports. However, the industry should keep track of this development to avoid being unpleasantly surprised.

New regulations increasing air travel security will directly affect importers. Increased security costs will be passed on to air cargo users in the form of increased transportation cost. Central American shippers using air transport to the United States may expect an increase in the security tariff for all airlines in March 2002 as a direct result of the increased cost of security at airports.

Food safety from microbiological contamination and pesticide residues is an important issue for the end consumer, retailers and importers. Compliance with market requirements and government regulations concerning food safety increases the cost of initial investment and, therefore, the capacity of the operation required.

Assuring food safety through developing and implementing an HACCP program, monitoring and making adjustments to production, post harvest and manufacturing processes and providing trace back services, may become key for sales for some products. All of these require managerial and supervisory skills and capital for investment.

The cyclospora outbreaks in the United States and Canada in 1996 and 1997 were attributed to Guatemalan raspberries and highlight the importance of food safety and especially the effect the outbreaks had on the sales of all soft fruit (berries) from Guatemala. In 1998, after the second outbreak in 1997, the United States put out an import alert for Guatemalan raspberries. In 1998, after an outbreak in Toronto, the Canadian government banned the import of Guatemalan raspberries. Although the United States lifted its ban in 1999, the demand for Guatemalan

raspberries is only one-third of pre-1996 levels and is unlikely to improve as Mexico has filled the gap. At the same time, Guatemalan blackberries, never implicated in any disease outbreak, suffered declining demand.

To save the Guatemalan berry industry, AGEXPRONT and the Berry Commission made a concerted effort with the FDA and U.S. Food Marketing Institute (FMI) to install a nationwide program called the “Model Plan of Excellence” to ensure the healthiness of Guatemalan berries and to provide trace-back services. Nevertheless, in 2000 only six out of the estimated 85 raspberry farms in operation before the first outbreak in 1996 are still operating. This incident underscores not only the importance of planning for food safety assurance before going to market and the need to address that issue at the production and post harvest level, but also the need for strong grower/exporter organizations to address industry-wide issues of self-policing to preserve export markets. Sensitivity to this issue and prior planning may avoid a lifetime of automatic detentions or loss of import permit for a promising export product (Buzby, 2000).

Use of SureBeam technology presents an opportunity to provide the market with pasteurized fresh fruit and vegetables, which would assure food safety for the consumer. Not only would it offer food safety from microbiological contamination or bioterrorism at the farm level but also would kill pests that currently make many fruits not admissible into the United States. SureBeam Technology, which uses an electron-beam to sterilize products, has installed an APHIS-approved treatment facility in Hawaii to treat various tropical fruits so that Hawaii can ship these products to the United States. The electronic beam kills microbiological pathogens and kills or sterilizes insect pests and represents an alternative to methyl bromide, hot water and vapor treatments. SureBeam is now being used to “clean” mail of anthrax by the U.S. Postal Service.

Environmental-Friendliness of Food

Food production activities have an increasing effect on the environment and production-associated social issues, such as fair pay to the growers and fair treatment of laborers. The interest shown by consumers, particularly in Europe, in these issues is creating a demand for agricultural products that are labeled or certified as environmentally-friendly, bird-friendly, shade-grown, Fairtrade, Max Havelaar, Eco-OK, and organic. The category of environmentally friendly foods has not become important in the United States as quickly as in Europe.

Competitors

The three large competitors of the future are Brazil, China and India. All three have a goal of self-transformation from a net importer to a net exporter of agricultural products. Because of their large resources and their potential capacity to over-supply fresh produce, they could have large negative impact on diversification programs and agribusinesses in developing nations (Giles, 2001). Since 1999, China has been exporting ginger root to the United States and, in 2001, began shipping apples to the United States. The effect on the ginger root industry was to push prices down in the first year, chasing out of the market many of the small Central American growers who are producing a mediocre product. The growers who consistently grow good ginger root have no problem selling their product. The ability of the government of China, like that of Vietnam, to make investments in large-scale projects and to produce large volumes of cheap

product should be a source of concern and their intentions and activities should be monitored. Brazil has an ambitious planting program to increase production of a number of crops, among them papaya, coffee and black pepper. India has also increased its efforts to export a number of products, including cut flowers. Neighboring countries in Central America are both allies and competitors and, as mentioned above, their activities and plans should be kept in mind while planning.

Which Products?

A product is any farm-produced item a producer is willing to invest in growing, which is an item that requires an import permit to the market and a buyer who will pay a price that exceeds the cost-insurance and freight (CIF) value of the product by a sufficiently high margin. The product may be conventional, organic or otherwise certified. To determine whether the product is appropriate for the grower, the grower must know and understand CIF costs. This is an area where all new growers will need help, in determining what costs, expected yields and returns will be with a new crop(s).

Niche markets might offer a safe haven for beginners given the difficulty in starting out in competition in the mainstream market with competitors that have more resources and experience. Niche markets generally are small markets with limited demand at the beginning. However, with time the base of consumers might be widened, increasing demand. Promotion is an important component of success in niche marketing.

Specialty Markets

The specialties market pays higher prices than the mass merchandizing market and requires that product is of very high quality and that supplies are reliable and consistent. Retailers of specialty items may require food safety assurances through the implementation of Good Agricultural Practices (GAPs). Buyers such as Melissa's will require field audits to verify the implementation of GAPs. They also encourage growers to acquire certification of compliance with pesticide tolerances (Getz, 2001). Opportunities in specialties include: ethnic foods, gourmet items and exotic tropical fruits.

Ethnic foods include, for the most part, foods preferred by the Asian, Hispanic, Indian and Caribbean communities in the United States and Europe.

The 2000 Census indicates that the Hispanic community now numbers around 35 million in the United States and constitutes over 12 percent of the population (U.S. Bureau of the Census, 2001). This group has increased by over 50 percent since 1990 and continues to grow. It has been projected that by 2020 one in five Americans will be of Hispanic origin. Hispanic households tend to spend 40 percent more for fresh fruit than the average American household and \$20 more per market basket (Getz, 2001). A study by Bartres-Marquez, Jensen and Brester (Bartres-Marquez, Jensen and Brester, 2001) of food consumption preferences of the Salvadoran immigrant population in Houston and Los Angeles indicated that there is opportunity for sales of ethnic Salvadoran food products such as: loroco (*Fernaldia pandurata*), chipilín (*Crotalaria longiristrata*), hoja de mora (*Solanum americanum*), verdolaga (*Portulaca oleraceae* L.), flor de

izote (*Yucca elephantipes*), pito (*Erythrina berteroana*) semilla de paterna (*Inga* spp.), red beans, and queso (white cheese).

Organic products continue to be the largest growing segment of the fruits and vegetables market in the United States and Europe. Results of a recent survey of 2,000 consumers conducted by The Natural Marketing Institute in partnership with the Organic Trade Association indicates that retail sales of organic products in the United States have grown for the past 10 years at a compounded annual growth rate of 22.74 percent. They projected, based on an average growth rate of 20 percent, that U.S. retail sales of organics would be \$9.3 billion in 2001 and \$20 billion by 2005 (Organic Trade Association, 2002). The ITC has made a rough estimate of retail sales for 2000 for the United States, Europe and Japan that suggests that 2000 retail sales of around \$7.5-8.0 billion in the United States, \$7.0-7.5 billion in Europe and \$2.0-2.5 billion in Japan (Intracen, 2002). According to these estimates, the organic segment represented 1.5-2.0 percent of the total food industry in the United States in 2000.

In the Latin American and the Caribbean regions, Argentina, Chile, Brazil and Mexico have the largest and most advanced organic agricultural sectors. Other important countries in the region are Bolivia, the Dominican Republic (bananas) and Guatemala (coffee, fruits and vegetables). China has become interested in organics and shows great potential for exports. China's organic product range is similar to that of India (fresh and processed foods and vegetables, nuts, oils, grains, coffee, sugar cane, herbs and spices and organic tea). China has established the Organic Food Development Center (OFDC) which is developing standards, certifying and researching organic agriculture (Kortbech-Olesen, 2000).

Organic products, both fresh and processed, are appearing rapidly on mass merchandizing retailers shelves. This is a desirable development, as mass merchandisers tend to promote products very successfully to increase demand for produce. However, to succeed with organics in mass supermarket sales, the organic produce must have good quality, as good as its conventional counterpart. More producers, attracted by the higher prices, are beginning to supply organic produce in increasing quantities and with better product quality. Some organic produce is seasonal, which puts a downward pressure on prices at certain times of the year when supplies of some products are more plentiful. Organic pineapples, for example, tend to produce naturally in the summer months, when pineapples must compete against all of the domestic fruits that are present in the market. Pineapples may be scarce at other times of the year when the fruit would receive a better price. Growers who master the flower induction technology should do well, however.

Also, very large retailers are beginning to offer organic produce to the public, and the presence of these retailers in the market will tend to lower price levels as they push prices down to increase sales volume. Tesco, a large European chain, has already announced its intentions to lower prices for organics to the conventional product level. The extent of Tesco's success at this strategy will determine how many other retailers follow suit. Large supermarkets will not likely succeed with this strategy, as suppliers will not be able to accommodate them. Organic production generally incurs higher production costs and lower yields than conventional production methods. Also, organic production incurs costs that conventional production does not incur, i.e., the cost of inspection, organic certification and transaction certificates.

For the time being, organic produce still commands higher prices than do conventionally grown produce. In general, having the large supermarket chains interested in organic foods will increase demand more rapidly than previously because of their greater ability to promote the organic category and larger customer base than the traditional natural food stores.

Eco-friendly certified (a U.S. term for production process certification, not product quality certification; the term in Europe is Fairtrade or Max Havelaar) foods do not have a very large market as yet in the United States. These products are grown under conditions considered to be sustainable and less damaging to the environment than for conventional production. Unlike organic production, eco-friendly production does not absolutely preclude the use of chemicals where needed to save a crop. Tropical products sold in the United States may be certified as “Eco-OK” by the Rainforest Alliance.

Eco-friendly produce has not yet received sufficient promotion in the United States to attract large demand. The eco-friendly thrust has come from the Sustainable Agricultural Network, which is a coalition of conservation non-profit organizations (NPOs), including the Rainforest Alliance (Rainforest Alliance, 2001). The promulgators of guidelines and standards for this concept believe that there is a sufficiently large population of consumers in the United States who care about the environment (especially bird watchers), who are not organic devotees, who would create large demand for this category. However, this is unproven as yet due to the newness of the concept and low level of promotional marketing. This niche market has a long way to go before it becomes important but, then, so did the market for organics before it.

Specialty grocers are interested in exotic tropical fruit and are actively sourcing product where possible (mostly Hawaii and Mexico). Exotic tropical fruits may have uses other than for eating. Results of a study by the University of Texas indicate the red pitaya (*Hylocereus undata* Britt. & Rose) has promise as a food colorant for a variety of products, including dairy products and fruit drinks. Unfortunately, many exotic tropical fruits are not admissible to the United States from Central America as they are considered to be hosts for fruit flies. Installation of a SureBeam treatment plant in Central America would greatly benefit the development of a regional exotic tropical fruit program for export to North America. Guatemalan exporters are looking carefully at this option and are already discussing this option with SureBeam.

B1a(3). Domestic and Regional Markets for Fresh Fruits, Vegetables, and Flowers

There are several disadvantages to targeting the export markets of the United States and Europe instead of the domestic and regional markets. First, transportation logistics and costs to send products to the more distant markets may preclude shipment altogether due to lack of a route, prohibitively high transportation cost, lack of refrigerated transportation inland and/or adequate cold room storage. Second, spot market shipments in the United States and Europe are soon to be a thing of the past and brokers are beginning to refuse to handle one-time-only shipments except for trial shipments. They want constant supplies of great quality product. This is very difficult to achieve from the start with new growers, particularly cooperatives and small growers with limited production area. Third, the cost and time required to install all of the infrastructure needed for export is appropriate only for the more sophisticated medium and large growers, or intermediaries, with capital or access to financing.

Transportation alternatives exist and distances are shorter for regional and domestic sales. Growers are more likely to visit the buyer and communications are much easier and cheaper. The context of the sale is more familiar for most small growers and, therefore, sales to these markets are more likely to continue as the grower can build up a marketing network and find alternative products. Growers may also find surprisingly innovative alternative markets for their products on their own. Starting off a new program by producing on a small scale is a means of building up knowledge and experience in a less-demanding market. Growers may develop safety nets for product that can't be shipped due to missed shipment dates and sudden downturns in the export market. This is the low risk, low initial investment option.

There is considerable movement of agricultural product within and among the countries of Central America. Exact volumes of product moved across borders are not known due to the considerable informal trade and large number of "blind" frontiers. However a report on the imports and exports between Nicaragua and El Salvador, Honduras, Guatemala and Costa Rica for 1999 provide insight into the movement of agricultural goods.

In 1999, Nicaragua's most important sources of agricultural products were Costa Rica and Guatemala; of animal products, Panama, followed by El Salvador; and of agroindustrial goods, Costa Rica and Guatemala. In all, Nicaragua imported 70,190 mt, 8,749 mt and 108,736 mt of agricultural, animal and agro industrial products, respectively, in 1999. The total value of these imports was \$137.2 million. On the other hand, Nicaragua only exported a total volume of 177.5 million mt with a value of \$104.5 million, a net deficit balance of payments of \$32.7 million, or 31 percent. In all three categories, Honduras and El Salvador were Nicaragua's major receivers (Chemonics, 2001). In general, Nicaragua has a rather underdeveloped domestic market in comparison to Guatemala and El Salvador but this is an indication of the minimum volume of products that may be moving across frontiers of a given country in the region. Anecdotal reports and observations on the oranges entering Guatemala from Honduras indicate a brisk movement of this product during the season in 2001/2002.

El Salvador has long been a net importer of food items from the rest of Central America. Both Honduras and Guatemala send large volumes of product to El Salvador. Honduran plantain and pineapple growers rely upon Salvadoran intermediaries to purchase their product at the farm gate. Honduras imports large volumes of Guatemalan cool-climate fresh produce. Volumes will increase in 2002 as Paíz supermarket, a Guatemalan chain, has opened a store in San Pedro Sula and is importing produce for its store from Guatemala.

As people leave rural areas to go to cities in search of a livelihood, market demand in cities in the Central American countries will increase. Eating habits are changing, as well, as there is an increasing demand for "fast foods." Increased, concentrated demand from cities will provide market opportunities for well-prepared producers with good growing conditions, the right crop, irrigation and the will to succeed.

Markets and Distribution Channels

All five countries have active, important wholesale or terminal markets in their capital cities. Most have wholesale markets in their more important secondary cities, although many of these may be entirely open-air markets. Wholesale markets in Central America need more physical infrastructure. In some cities, the wholesale markets have spilled out of outdated facilities and are gradually consuming the surrounding residential and industrial neighborhoods. Project AGIL in Guatemala is helping small upcountry towns build new markets.

The FAO's Marketing Group has experience with the development of infrastructure for wholesale markets worldwide. Seidler's report at the September 2001, 22nd Congress of the World Union of Wholesale Markets recounts factors that the FAO has observed to contribute to the success or failure of wholesale market development (Siedler, 2001).

Supermarkets in Central America are increasing in number and offering more items, better shopping conditions and more variety. Significantly, the quality and variety of fresh produce has improved as well, although some supermarkets have better produce sections than others. Some supermarkets also sell wholesale to restaurants and hotels. There are an increasing number of roadside stands for fresh f&v in some neighborhoods. Guatemala has long had a number of street vendors in well-to-do neighborhoods in the capital. In Honduras, there are certain points of sale for particular seasonal fruits along roads and streets and stoplight sales are well exploited throughout Central America. Recent cutbacks in shipments of bananas have created the development of the "carreta" trade, or the delivery of bananas to neighborhoods by horse-drawn wagons. Ferias de Agricultores (farmers markets) are common. These are growing in size in Honduras and their importance is increasing to the point where some may need to be relocated to rescue streets from the vendors.

Intermediaries are important to the distribution chain, although they are often maligned for abusively aggressive pricing tactics. Growers will readily sell their crop to intermediaries who offer not only cash purchases and farm gate pick-up service but also may harvest the product from the field. These may be indispensable services for an isolated producer with no transportation and insufficient labor or cash to pay for labor to harvest the crop. The relative ease, immediacy and certainty of payment, even though the price may be low, of selling product to an intermediary may undermine initiatives by cooperatives and projects to develop an independent, grower-controlled marketing and distribution program (i.e., cut out the middle-man). These programs are often not able to match the ease, low cost and quick cash payment of sales to an intermediary and growers gradually return to the intermediary for quick cash.

Intermediaries have a network of supply and markets. They may have multiple outlets for a product. They understand the domestic and regional markets well. Many are educated and have a good understanding of the basics of costs and returns. Their knowledge and business sense may offer an opportunity to better market products if they were provided with training to be more professional, for example on how to improve their post-harvest handling of produce to reduce spoilage. There are intermediaries for export markets who tend to be more professional in their commitment to the growers. These might be selected for training to handle domestic, regional

and export sales for growers, which would provide a wide range of alternative markets for products. Assisting intermediaries in developing infrastructure to amass product and prepare it for shipment would be necessary. CDA in Honduras is working with a broker in Comayagua to improve his packing facilities for export of oriental vegetables. This intermediate broker also sells product in local markets. FHIA has been providing technical assistance in quality control of ginger root for local intermediaries who export for small growers. This approach has proven very successful for small cooperatives without the resources to market their products.

Shortcomings of the Existing Market Structure

There are several problems commonly encountered by farmers of all of these countries: finding a buyer for their product, establishing a fair price, establishing the quality expected for that price, and planning planting. In one long-term project, FHIA assisted small growers in La Esperanza by selling their fresh fruits and vegetables to retailers in San Pedro Sula. FHIA picks up product from the growers, packs it in a packinghouse in La Esperanza and distributes the product by refrigerated truck to San Pedro Sula buyers with whom they have fixed price contracts. The quantity of shipments and quality of product is guaranteed by FHIA to the buyers. FHIA technicians assist growers to organize and plant different products in staggered plantings to assure quantity and a wide offering of products to the retailers. Quality is regulated at the packinghouse. The project has been underway for a number of years and volumes of sales for this single project with its limited number of buyers have grown progressively. Between 1999 and 2001, the volume of product sold in San Pedro Sula grew from 386,552 lb to 459,500 lb, an increase in volume of 19 percent over the three-year period. The continued growth of sales and benefits have encouraged the growers to organize crop committees and begin investigating the cost-return of taking over the packing operations and distribution of their products. In 2000, CIMA, the marketing arm of FHIA, conducted promotional marketing of sweet onions grown by producers in Comayagua to supermarkets and restaurants in San Pedro Sula. In a few weeks, CIMA moved 2,420 cwt of onions, despite an apparently full market.

Producers venturing into new markets most often requested assistance with finding buyers, establishing prices and transportation. The most often encountered problems with “new” producers involved failure to meet specifications for product size and quality, improper post harvest handling and packing that caused deterioration or poor acceptance of the product and product that was too mature or too immature (harvested at the wrong time). Promotion at the supermarket level in San Pedro Sula, using more attractive packaging (rambutan) resulted in better sales, which suggests that promotion is useful in moving products that may be new to the consumer. These problems underscore a need for a system of grades and standards for products, established on a national and regional (because many of these products go to markets in other countries in the region) basis. There is no doubt, from experience of CIMA, that good quality f&v can command a better price in domestic markets provided there is buyer discrimination on quality basis.

Market price and Shipping Point Report Network

There are national efforts to establish fair prices. SIMPAH, based in Honduras, maintains a database of Honduran terminal market prices and, in 2000, received an endowment fund for a reporter in Managua, Nicaragua. SIMPAH has also had a reporter in San Salvador for about a year, but as no endowment fund has been established for this reporter and the project funding the reporter has ended, the future of that reporting office is uncertain. Guatemala's MAG maintains a weekly report of terminal market prices and Costa Rica's MERCANET maintains a market price database that reports terminal market prices, farm gate prices and production volumes of selected products. Currently, IICA's CORECA project, in cooperation with SAG's market price reporting systems of each country, provides regional market prices for selected strategic products to the ministers of agriculture of the region. This information is provided once every two weeks. The public does not benefit from this system. A regional effort to tie these reporting facilities together and vigorously promote them to the public would provide information needed by all participants in the distribution chain to establish reference prices. However, a regional system of grades and standards to tie to these prices is needed to establish fair prices.

One of the greatest inefficiencies in agriculture in Central America is the wasted effort and investment stemming from unfortunate coincidence of mass planting of a crop, which results in overproduction of a product at a certain time. This is particularly a problem where the product is grown without staggered planting times or when it becomes the favorite item of project planners who do not communicate their activities and plans with each other. Another problem has been planting without a market set up beforehand, counting on generally good wholesale markets to absorb product. The result is the harvest of a perishable crop but no clear destination for it and no alternatives if the wholesale market scheme doesn't work out. The outcome is that the producer is forced into a price-taking position, often at prices below break-even, or dumping the product when the producer is not willing to sell the product at the offered price or cannot find a buyer quickly enough. A system of reporting planting activity, production volume estimations, volume movement at the major terminal markets and shipping point volumes for specific products at regular intervals would tie supply levels to market prices. Growers and project planners could then better avoid losses associated with overproduction by identifying alternative markets instead of running the risk of pushing product into a flooded market.

An effective national network of extension and research services for each of these nations would be a great asset. Presently, a number of organizations (private, governmental and donor), each of which has a different agenda and vision, are attempting to provide extension services (outreach, technology transfer) piecemeal to different sets of farmers in different geographic regions from year-to-year.

Progressive national and regional improvement requires ongoing coordinated teamwork with long-term, but flexible planning with specific short-term goals as mileposts. Ideally, the public sector can best serve in this coordinating role. Unfortunately, these services require long-range planning, steady funding from reliable and adequate budgets year after year. Vision and management is needed, but must not be re-directed every four/five years with new governments. Budgets depend on tax base, which requires that the citizenry pay their taxes and that the public sector collect taxes and administer their use with long-term planning and good stewardship. The

alternative is to rely on donors to step in and play the role of the public sector. Well-administered endowment funds set up to run these services, kept out of the control of governments and private individuals, seem to be the most successful, long range investment that donors can make to fill the gap in public services.

B1a(4). Opportunities in Local Markets Fruits and Vegetables

Many opportunities lie in extending seasons with new varieties of familiar fruits and vegetables and the use of irrigation, staggered planting dates and screenhouses (“protected” agriculture). The use of screenhouses provides an opportunity to grow produce in areas where viral diseases have chased out production, particularly of tomatoes, peppers and cucurbits, due to low yield, poor quality and/or high pest control costs. Also, large-scale production of low cost plugs would increase the success of small farmers. Learning to produce high-quality produce for the local market and screenhouse production is the first step towards the regional market, then, hopefully, a wider market as volumes increase and production costs decrease. Also, use of water barriers such as plastic tunnels during the rainy season would extend production and harvest through the rainy season.

Several groups (AGEXPRONT, ODE, PROCAFE) in the region have recognized the opportunity in marketing and promoting native fruits and have introduced exotic tropical fruits. Unfortunately, little breeding and selection has been done to extend the seasons and characteristics of the native fruits: nance (*Brysonima crassifolia*), jocote (*Spondias purpurea*), zapote (*Mammea americana*), chicozapote (*Manilkara zapota*), the annonas, such as cherimoya (*Annona cherimola*), guanabana (soursop – *A. muricata*), atemoya (sugar apple - *A. squamosa*). Production of native fruits has certain advantages in that their natural range is well known. They are well adapted to the climate and tend to be drought hardy. Unfortunately, their fruiting habit, adapted to the climate, tends to overlap with many fruiting within the same season, between November and April. Nevertheless, local microclimate differences and selections of these fruits will stretch out the season locally. Also, as a fruit goes out of production in one area and supplies become scarce in the market, production in another zone or country may make up the volume, extending the sale season a little longer. Worth noting are the many tropical fruits in harvest during the same season as coffee, November to April. The need for harvest labor for many tropical fruits may replace the lost demand for coffee picking labor to some extent and at a time of the year that is in rhythm with the rural life that has developed around coffee. Also, as discussed in an earlier section, Hispanic foods are an opportunity in the United States. Eventually, food products made from these fruits (juices, ice cream, candies) will represent an opportunity for processors to produce for the domestic, regional and export market.

More attention has been given in the past to collecting and developing the Asian exotic fruit introductions: mango (*Mangifera indica*), rambutan (*Nephelium lappaceum*), litchee (*Litchi chinensis*), longan (*Euphoria longana*), pulasan (*Nephelium mutabile*). Their climatic requirements might range from the temperate to sub-tropical or tropical. Some prefer dry conditions, other wet. The exotic fruits vary in their tolerance of altitude as well. Langsat (*Lansium domesiticum*) is a shade-loving understory tree that prefers altitudes of 0-700 m above sea level and average annual rainfall of 2,000 mm. This tree would fit in well in an agroforestry system mixed with taller trees. Longan, on the other hand, prefers higher altitudes of 800-1,400

m above sea level, with 1,500-2,000 mm rainfall a year. Therefore, there is a range of fruits that may be planted according to the growing conditions of the production area of interest. At the present time, availability of a wide selection of varieties is limited but there are germplasm banks scattered around the region. As mentioned in previous sections, FHIA (CADETH germplasm bank, courtesy of the Canadian project PDBL and USAID's PROEXAG); Lancetilla Botanical Garden, Zamorano and World Relief/Nicaragua have planting materials for a number of exotic tropical fruits. Litchee, rambutan, mangosteen ("the Queen of Fruit" - *Garcinia mangostan*), durian (*Durio zibethinus*) and breadfruit (*Artocarpus altilis*) are well liked regionally and sell well in many local markets. These have excellent prospects for export sales to both Europe and the United States as well.

B1a(5). Markets for Processed Fruits and Vegetables

The processing industry should grow along with a fresh f&v industry, as it is a synergistic complement to fresh produce. However, caution should be exercised before taking the decision to invest in a processing plant. The initial investment and the working capital cost is high. It may take time to develop good products and attract buyers and so additional investment capital will be required to cover several months of operations without income. Processing plants require large volumes of very good quality product, delivered on time at a reasonable price. Most processing requires contract farming to assure product availability at a pre-established price. Relying on the spot market can be fatal in processing, due to inconsistent quality between lots and the high cost of spot markets.

Domestic Processors

Instead of seeking out investors in new processors, a better alternative would be to improve the capabilities of the domestic processors. Domestic processors sell products to the domestic, regional and, for some products, the export market. Some only sell to export markets. These processors are looking for more and different products. Processors in Honduras have been experimenting with sales of fried chips made from malangas, bananas and the new FHIA plantain hybrids. CIMA (Centro de Información del Mercadeo Agrícola) received requests from processors for help in finding producers of cassava, plantains (for export as peeled frozen plantains), strawberries, apples, pink guava and malanga and helped arrange contract farming for plantains, malanga and other products for processors. In order to meet the health and safety requirements for export markets, many processors need help with their processes: replacement of old and inefficient equipment; more efficient plant layout; marketing their products and contacts with buyers and promotion of their products. Direct foreign investment might be needed to carry this out.

Market Trends for Processed Fruits and Vegetables in the Us, Europe and Japan

Processed products may be fresh or frozen pre-cut vegetables, juices and concentrates; individually quick-frozen (IQF), freeze-dried, canned, bottled, dehydrated f&v and, ultimately, whole frozen meals. Product may be packaged in consumer packs or bulk packed.

The U.S. imports significant volumes of canned products that it cannot grow domestically, such as bamboo shoots and water chestnuts. However, imports of most canned vegetables are low as they are not competitive with United States canned goods because the U.S. domestic canneries

are highly mechanized and are low-cost operations. In Europe demand for bottled goods is falling because consumers are turning away from bottled foods in favor of frozen because canned food is perceived as less flavorful and nutritious than frozen food.

On the other hand, frozen vegetable exports continue to increase to both the United States and Europe. Imported frozen vegetables, except for potatoes, are now about 20 percent of United States consumption, up from 14.1 percent in 1990. Broccoli is the most important vegetable, 42 percent of total frozen imports. Around 90 percent of frozen broccoli consumed in the United States is imported. Most frozen broccoli comes from Mexico, followed by Guatemala. This is due to the labor-intensive task of cutting the broccoli into florets (ERS/USDA Briefing Room, 2002). According to a 2001 FINTRAC survey of frozen vegetable importers, most importers expressed the greatest need for broccoli, cauliflower and brussels sprouts and the least need for sweet corn and carrots. They generally discouraged frozen asparagus as having too high production costs and uncertain market demand. The same holds true for frozen okra (FINTRAC, 2001).

Frozen mixed vegetable and sweet corn imports to Japan grew by an average annual rate of 5 percent and 8 percent, respectively between 1990 and 1998. Sweet corn imports rose from 35,402 to 51,878 tons and those for mixed vegetables rose from 18,618 to 35,446 tons. These represent the most important frozen vegetables for imports. In the past, the most common mix of vegetables was sweet corn, carrots and peas, for use in salads. More recently, mixes have included potatoes, carrots, bamboo shoots and taro, and are used in other presentations besides salads (Honda, 2001).

Imports of dehydrated fruits, particularly grapes, persimmons and peaches rose between 1998 and 1999. Imports of fresh tropical fruits rose 12.7 percent between 1998 and 1999. Imports of temperate climate fruits rose by 23.2 percent in the same time period while citrus imports declined by 6.5 percent.

Imports of frozen fruits rose by 31.2 percent to 64,228 tons in 1999. The largest category of imports by volume is the fresh fruits, which rose to 1.66 million tons in 1999 (Honda, 2001).

Both the United States and Europe import frozen melon balls. The United States relies on imports from Mexico and Central America to supplement domestic production and demand for imported frozen melon fluctuates according to domestic supplies. Europe, on the other hand, is much more dependent on imported frozen melon balls, which are principally imported from Guatemala. Both markets are “mature” and no increases in demand are anticipated in the near future.

However, the demand in the United States market for IQF tropical fruit is increasing. Increasing demand for tropical fruits for smoothies, shakes, ice cream and other frozen food and beverages, desserts and bakery items has increased the demand for IQF tropical fruit. The reason for this is that processors have discovered that frozen fruit is easier to handle and has more reliable and consistent quality than fresh fruit. In the United States, there are a few large distributors and some smaller ones who import this product. Some companies have their freezing operation at the production source. Other distributors and retailers work closely with their producers (FINTRAC,

2000a). European imports of IQF tropical fruit are also increasing as importers have begun repackaging bulk packs into mixes for direct sales to supermarkets. Germany is the leading consumer and Mexico and Central America are the leading export suppliers (FINTRAC, 2000b).

Guatemala has been a leader in IQF processing in Central America. One plant runs a 1.5-ton/hr operation 24 hours daily, 11 months out of the year. Over 8,000 small growers are required to grow enough produce to keep the plant running at capacity and another 400 employees run the plant. Out of 10 such operations in business six years ago, only four are in business today. Reasons for failure include poor management decisions, a competitive market, high operating costs (electricity) and high maintenance costs and poor product quality due to old machinery (Morales, 2002).

B1b. Cut Flowers, Foliage and Ornamentals

In the 1990s, the cut flower, foliage and ornamental industries in Guatemala and Costa Rica developed rapidly. El Salvador, Honduras and Nicaragua, however, have yet to develop significant industries in these products. Large-scale commercial export cut flower and foliage operations require large initial investment in buildings, stock plants and packinghouse infrastructure, so this is an option for growers with access to large sums of capital. In these three countries, there is not significant production of cut flowers and ornamentals to meet domestic demand. In Honduras, many flowers are imported from Guatemala, Costa Rica and the United States. Both Honduras and Nicaragua export some ornamentals and cut foliage to Europe.

Developing countries provided Europe with 6 percent of the ornamental and young pot plants imported in 1997, 1998 and 1999. In 1999, 46 percent of imports were shipped through the Netherlands. In Central America, Costa Rica and Guatemala lead in exporting cuttings, semi-finished plants, finished outdoor and indoor plants and plants and young plant materials to Europe. Major competitors in this industry are Brazil, China, South Africa, Sri Lanka, Kenya and Uganda.

A recent study of the European market showed that the trend for potted plants and plant materials is for continued growth, particularly in the United Kingdom and Spain, followed by Italy and Denmark. The market for cut flowers and potted plants is expected to increase by 20 percent and 11 percent, respectively, between 1998 and 2003.

1b1. Trends in Europe

Europeans show a preference for year-round availability of plants, the use of decorative containers for plants, environmentally friendly plants and flowering pot plants that smell good or are edible (CBI, 2001). The trends for year-round availability of plants and for environmentally friendly and fresh flowers and herbs, provide Central American growers with opportunities as Central America has weather conditions favorable to supply Europe with many plants all year around at a relatively low cost. The use of eco-labeling would add value to the product as well as help market products in Europe. Also, the trend for purchases of plants in decorative containers provides not only an opportunity to add value to ornamental products but to develop an industry in supplying decorative pots.

Due to European consumers' increased interest in the environment, buyers look for assurances that the products that they purchase are produced in a manner that is "environmentally friendly."

This is a certification based on codes of practice used in production. Typical codes of practice/eco-labeling certifications used in Europe are Milieu Program Sierteelt, MPS (Dutch “Environmental Production of Ornamentals”), and Vlaams Milieuplan Sierteelt, VMS (Belgian “Flemish Environmental Plan for Ornamentals”). These programs ensure that the product was grown in an environmentally friendly way and that the company uses practices of which they approve. MPS has over 5,000 members in 24 countries worldwide and most of the flowers sold in the Dutch auction are MPS-certified. Other codes that provide assurances of the use of integrated pest management practices and good agricultural practices are: LEAF (British), FARRE (French), FNL (German), ODLING I BALANS FILL (Swedish) and Agricoltura che Vogliamo (Italian) (Petitjean, November 2001).

1b2. Flowers and Ornamentals In the Domestic and Regional Markets

Guatemala and Costa Rica both have well-developed domestic flower and ornamental industries. There are well-established distribution channels for cut flowers between Guatemala and El Salvador and Honduras wholesale markets for flowers. There has been little interest until recently in Honduras to compete with Guatemalan flowers, although some florists in Tegucigalpa have produced flowers for their retail business.

There is some ornamental and cut flower production in Honduras for local sales as well as exports of palm and other ornamentals. Siguatepeque is a well-known stopping place between Tegucigalpa and San Pedro Sula, and a number of cottage industry-scale nurseries there sell ornamental plants. Honduras is benefiting from a FIDE/CBI program that seeks to help domestic and export ornamental producers develop export capability for young pot plant and plant materials for the European market. They have assisted growers in organizing and developing a professional association.

The quality of the nurseries in the region is improving. Nurseries of ornamentals abound in Guatemala City. In Honduras, nurseries are beginning to offer better quality and a wider selection of ornamentals and there are more nurseries than previously. There is a noticeable lack of attractive decorative pots and this is an opportunity for pottery to fill this unmet demand.

FHIA has worked with a nascent carnation production industry in La Esperanza to develop their production capacity for domestic sales. A demonstration plot of colored calla lilies at the Sta. Catarina Experimental Station in La Esperanza has attracted a great deal of attention and these flowers warrant promotion on the local market.

The domestic markets for cut flowers and ornamentals in Honduras, El Salvador and Nicaragua are markets with promise and a good starting point for developing export capabilities for a limited number of good producers for some cut flowers and ornamentals.

B2. Timber and Agroforestry

The use of trees in this strategy should be very extensive to include timber, fruit production, agroforestry and watershed protection. Trees are essential to hillside farming, which is where most coffee production occurs. Trees provide shade for coffee and other understory crops. They may be used as a rotation/fallow crop to improve poor soils between cropping cycles. Trees provide fruit and wood. They also protect and preserve watersheds. There are a number of agroforestry

systems that have been developed for use with small-medium farms and large farms might consider timber for the lumber and chip industry.

Besides their value for pulp, chip, veneer and lumber, forests may someday provide income to owners due to their inherent and great value in conservation services (carbon sequestration and preserving water, hillsides and a temperate environment). However, until these non-commercial values of forests are widely recognized and communities are willing to pay forest owners for those services and a means of fairly valuing for these services can be devised, forests will continue to be undervalued (Davies and Richards, 1999 and Curtis, 2000).

B2a. Timber – Pure Stands for Reforestation, Investment

In 2000, a team of scientists prepared an evaluation of the change in distribution of mahogany for PROARCA/CAPAS. That study concluded that the original distribution of mahogany (*Swietenia macrophylla* King) had been reduced from some 41 million ha to around 15 million by the mid-1990s, an area approximately 35 percent of its original distribution. Percent loss of broad-leaf forests containing mahogany appears to be: Costa Rica (84 percent), El Salvador (81 percent), Mexico (76 percent) and Panama (74 percent). Most of the exploitation of the broad-leaved forests has been selectively for Spanish cedar and mahogany. Commercial cutting of mahogany no longer exists in either Costa Rica or El Salvador, as there is not enough remnant forest to sustain a commercial operation. Panama does have some commercial activity but it is minimal. Most of the commercial activity is in Nicaragua, Guatemala, Honduras and Belize.

The authors were unable to assign an exact rate of loss or an estimation of actual remaining resources, but using educated guesses, arrived at the conclusion that reserves could run out within a broad range of 10 to 180 years, with an average depletion within 30-90 years. The results of the study were to be used in a discussion of whether mahogany should be completely prohibited from commercialization by placing it in Appendix I of CITES or allow its exploitation under the condition that it be grown under a carefully monitored management plan. In which case it would be classified as Appendix II CITES (Tropical Science Center, 2000).

Spanish cedar (*Cedrela odorata*) and mahogany are the most frequently requested species by campesinos for reforestation purposes (Urrea, 1998). Considering the above information, they may be making a very good retirement investment for themselves or their children... or their grandchildren. Teak (*Tectona grandis* L.) is also one of the preferred pure timber stand species (mostly by large investors), particularly for large plantings. In consulting with foresters and forest economists about the market and cost-benefits of planting these species, the following points arose:

Mahogany and teak are very fast growing as juveniles but long-term studies indicate that their growth slows after 10-15 years. Models using straight-line rates of growth based on juvenile growth rates will underestimate the time to harvest (20-30 years is often quoted, although these studies would indicate a better commercial value at 50+ years) and overestimate returns.

The most valuable part of teak is the heartwood, which is valued for its deep color and density. Most of the growth of teak is a softer outer, lighter-colored, layer of wood. Teak may be large and harvestable at 40 years for small width lumber, but it really does not reach its commercial maturity until much later, 50 + years, depending on soil and climatic conditions.

The greatest value for mahogany and teak wood is for veneer. However, this process requires a large diameter log, meaning, an older tree. There is less wastage with a large log.

Mahogany is very hard to grow in a pure stand owing to its susceptibility to the *Hypsiphylia* moth whose larvae bores down through the apical meristem. This kills the primary bud, causing a side shoot to replace the main shoot, resulting in a crooked bole and reducing its value. The moth is widespread in Central America. Also, mahogany is a favorite food of the leaf-cutting ant.

Are the risks associated with land invasion, theft, fire and legislation prohibiting cutting in the future or allowing their import and sale in the planned market being used in cost-benefit studies? How can they be estimated?

This information is provided not to discourage plantings with these species but to make some important points to be considered in strategy development:

Thoughtful, disinterested, wise legislation is important to encourage landowners and governments to invest in forests and preserve them.

Use cost-benefit studies that include risks factors that take these issues into account.

Mahogany should be inter-planted with compatible tree species to “hide” it from the insect pest. Pure stand plantings, even in windrows, should be discouraged due to the high failure rate of such plantings.

Perhaps other native species with good wood properties should be promoted to take the pressure off of mahogany and Spanish cedar. CUPROFOR has been working on this in Honduras.

Pine, in the right conditions, would attain commercial size at 35-40 years and has an excellent market demand, especially in the Caribbean.

Make sure that the species is planted in appropriate conditions for fastest possible growth and shortest payback period.

Some pine species in Central America have very good properties for chipping, pulping and construction lumber. As early as 1961 pine appeared an interesting investment, particularly in El Salvador (Alergia, 1961). It is unlikely that a pulp mill would be built in Central America with direct foreign investment due to the high investment cost, uncertain business environment and corruption (the idle pulp mill in the Motagua River Valley of Guatemala notwithstanding). However, a small mobile chipper could do a fair business chipping stumps, wastage (up to 50-60 percent of wood is wasted in the primary processing in the field) and wood for chipboard and plywood operations. Chipping operations, moreover, do not require large diameter logs.

The effect of emerging markets on future sales should be considered in analyzing the market for wood products. China’s growing housing industry has increased its imports of wood. China imports significant volumes of pine from New Zealand (132,000 cu.m. in November 2001) and

large diameter high-quality larch and pine from Russia (International Tropical Timber Organization, 2002). The Asian market could be reached via Pacific ports of the five countries.

B2b. Agroforestry

Agroforestry projects may be quite diverse and include combinations of timber or fruit trees with native medicinal plants and food plants, spice plants, cacao, ornamental palms and wild mushroom culture. These might be carried out with groups of small growers (UNDP/GEF, 2002). A number of books have been written on the subject and CATIE and FHIA have worked in this area.

Coffee, cardamom, black pepper and cacao planted under shade trees have been the most successful long-term (sustainable) agroforestry associations. These crops have been mentioned in interviews as alternatives for growers on lower slopes with appropriate growing conditions. Grown as a monoculture crop, these commodity products all suffer the same cyclical market price behavior as coffee because their product is easily stored and they are relatively easy crops to get into and out of.

Unfortunately, black pepper has also been targeted by larger producing countries (Brazil and Vietnam), which are currently upsetting the balance in that market. Although Brazilian pepper has not been of the best quality and has been on automatic detention in the U. S. borders for salmonella contamination, it sells at a low price attractive to cost-conscious spice processors in other markets. Cardamom has a small market and over-supply results in lower prices, which is true for all of these storable commodities.

Cacao in Central America is under the menace of a fungal pathogen, *Moniliophthora roveri*, which causes moniliasis on the cacao pod. This disease is spreading northward and has recently appeared in Honduras. Production losses in the largest producer nation, Côte d'Ivoire (due to government regulation), and in Ghana (due to moniliasis), are currently causing prices to increase slightly above the very low 2000/2001 prices due to slightly lower supplies. However, at the same time producers in Brazil, the Dominican Republic and Ecuador increased output (11 percent, 29 percent and 5 percent, respectively). So, while the price has recovered somewhat in 2001, it remains relatively low. The four major producers of Africa (Cameroon, Côte d'Ivoire, Ghana and Nigeria) are discussing a scheme to destroy 250,000 tons of cacao beans in 2002 to improve world prices (FAO International Commodity Prices, 2001).

Low prices and the prospect of increased future competition do not make these commodity products an attractive investment. However, all of these crops may appear more attractive if a precious wood or fruit tree were used as shade and the net income flows from their cultivation figured into the cost-returns on the land. A Canadian project, PDBL, in Honduras has developed a computer-based cost-return analysis system, AGROFORESTERIA, to analyze the returns on agroforestry associations (PDBL II, 1997). This cost-return tool will be updated in 2002 and used as a tool to estimate returns under different combinations of trees and crops.

Cinnamon, allspice, nutmeg, cardamom and vanilla are all spice crops compatible with forest/glade growing conditions. The cloves and allspice trees are interesting as shade trees for the cacao and lower growing understory commodity crops. Local markets and regional market development might lead to possibilities for greater demand. There might be some merit to

exploring the profitability of organic or eco-friendly products made from organic natural chicle (chewing gum), perhaps with “tropical” fruit flavorings (mango, orange, lime) and cinnamon grown organically. Some might be used in value-added coffee flavorings.

B2c. Environmental Services of Forests and Watersheds

Forests have value to society beyond the value of the wood and land that it occupies. Forests provide clean, fresh air, preserve water, stabilize land and provide habitat for a diversity of plant and animal life, refuge for the soul and beauty for the eye. However, how can owners of important forests be recompensed for not exploiting their property for the greater good of society?

Attempts to determine a means of placing a value on the environmental services provided by forests have been made to help guide planners. One study (Davies and Richards, 1999) is a technical review of different economic models that might be used to assess stakeholder incentives in participatory forest management (PFM). Another study deliberated the means of establishing the value of a watershed in the western Highlands of Guatemala for use by a government program, PINFOR (Curtis, 2000).

Davies and Richards examined nine methods that are variations on cost-based, surrogate markets and non-market price models and concluded that the best approach to valuation would be the development of methods that are combinations of neo-classical and participatory methods. However, they do point out that before developing such a model, the decision of whether to assess the value of a forest is required first. This would require that the criteria used by people in making decisions on such issues be determined and then decide whether the model can be constructed around that context.

Curtis explores the factors involved in developing a means of payment for “environmental services.” He first points out that for a watershed to be left intact over the long-term that: (1) the owner must be convinced not to exploit the watershed and (2) alternate income must be provided to the owner to replace income not realized due to that decision. He then concludes economic theory and analytical tools cannot provide good estimates of the unknown and unknowable future and that the most equitable and efficient means of arranging the payment for environmental services would be for a donor(s)/government to establish a “Forest Bank Fund” and hold an auction in which the forest owners place bids for the value of their land. The most attractive bid would be accepted by the funding agency. In the case of public lands, administrative costs are the most important issue. Traditional land management patterns of indigenous peoples in the region were a good model for local organizations to harvest from the forest yet leave the forest intact. An interesting study of such a model can be found in House’s “Red Forestal para el Desarrollo Rural” (“Forest Network for Rural Development”) which describes the Tawahka Indian communal system of good land stewardship along the Patuca River in La Mosquitia, Honduras (House, 1997).

Another alternative is “land swapping,” meaning acquiring forest land through a land swap with agricultural land. This tool might incur high implementation costs as the cost of acquiring the land for the swap might be more than the value of the forest, might require some means of coercion (another cost) for acceptance of such a swap and, after the land has been acquired,

additional costs for protecting the newly-acquired forest from invasion by squatters (or the return of its former inhabitants) and illegal cutting.

This last alternative requires moving people off the land and is not yet viable in most of Central America in light of this study's findings that governments have provided few solutions to protect public forests and watersheds. Officials have not successfully addressed low appreciation of migratory campesino farmers and illegal timber operations for "idle" forest land. A sense of personal ownership by people occupying land full-time is needed to provide an incentive for protecting forest land against predatory interlopers. Moreover, the rights (and lives) of forest owners must be protected by the government when they choose to exercise them.

A serendipitous field trip to CADETH for a watershed rehabilitation project funded by USAID and managed by DAI revealed a powerful motivator for watershed rehabilitation and protection for isolated rural communities. While touring the CADETH agroforestry project for training and orientation, a group of campesino farmer-clients was shown the hydroelectric generation plant that provides power for the station. The group was impressed and expressed the desire to install a micro turbine in their watershed to provide their small community with electricity. The farmer-clients were trained in the importance of maintaining water flow through the watershed to generate electricity and the importance of protecting the forest cover to protect the water flow. Although the installation of a micro turbine had not been contemplated for the project, DAI received approval for its inclusion in the project. Now eight communities enjoy electricity and have a powerful motive for protecting their watershed.

B3. Animal Production

B3a. Large Animals

Large animal production is not appropriate for hillsides with slopes of 30 percent or more. However, on gentler slopes (and isolated from water sources), dairy and beef cattle and black-bellied sheep might be considered. Grazing sheep (and geese) under well-established, tall fruit and timber trees provides a low cost option for weed control. Maintaining pasture usually implies use of burning for weed control by campesino farmers; however, for growers who can afford mowing equipment, noxious weeds can be kept under control without resorting to fire. Overgrazing may occur in the dry season, which may increase erosion. Care must be exercised in controlling the size of the herd in areas prone to long dry seasons.

A good demand for cheese exists in the local, regional and in the U.S.-Hispanic specialty food markets.

B3b. Poultry

Projects around the region encourage small farmers in distant farming communities to raise fowl and other small animals. One of the REACT projects that Zamorano administered was a program for replacing common barnyard chickens with more robust rustic races of chickens. Results were promising and, besides the obvious food security benefits, some women's groups were able to start cottage industry supplying fresh eggs to local markets. A secondary business to this is small breeding operations to provide replacements and intermediates to provide distribution.

Other domestic birds for such a program include geese, ducks and turkeys. While turkeys are not popular in Honduras, they are very popular in Guatemala.

B3c. Aquaculture

Tilapia is an aggressive and successful fish introduced as a commercial fish to Honduras. It has been in the local commercial industry for some years. FHIA has a small tilapia demonstration pond for training use that attracts the attention of small growers. Tilapia, as a commercial enterprise and as a cottage industry, has proven to be a success in Honduras. The tilapia is an herbivore and small farmers apply chicken manure to the pond water to encourage vegetable growth in the water, upon which the tilapia feed. Chicken production on the farm or a neighboring farm is needed for cheap production of tilapia. Tilapia, on the cottage industry scale, provides food security and an alternate source of income from sales of fish and fish products.

IV. Strategy

The agricultural sector represents an important pillar of the economy of Central America, with the exception of Costa Rica. Coffee is one of the most important components of the agricultural sector. Coffee is also a mature industry and will become more competitive and less profitable as time goes by. The heavy reliance of these economies on coffee renders them vulnerable to the downturns and the consolidation that will eventually occur in coffee. Costa Rica, which has already evolved into a more diversified economy, has grown beyond dependence on agriculture, and on coffee within the agricultural sector, and so is not experiencing the full effect of the coffee crisis. Increasing diversification of the agricultural sector would provide a buffer to protect the economy, agricultural sector, livelihoods and land from the inevitable changes that are to come for coffee and other traditional agricultural exports.

Development of strategy for agricultural diversification must be a systems approach, attacking both the agricultural and business environment constraints at the same time. In analyzing the factors that have combined to make strong agriculture sectors in developed nations, the following formula stands out:

- Stable, pro-business government
- Research and extension
- Credit: reasonable rates or available capital
- Infrastructure
- Educated farmers/labor
- Direct and indirect subsidies
- Market intelligence and regulation
- Strong agricultural sector

Unfortunately all of the elements may not be in place or may not fall in place at the same time. The more factors present at a given moment, the greater the chances for a successful agricultural structure. Costa Rica is among the more successful countries in the region because it has commanded more of these factors at a given time since the 1980s.

Because agriculture is risky and has relatively low returns, credit institutions are not quick to lend to farmers. High interest rates reflect the magnitude of inherent risk of an agricultural project. Agriculture, however, is necessary to society to provide both food and employment. The public should appreciate the need to support farmers and support the agricultural sector through

public funding. However, when the public sector fails to support agriculture with education, research, extension, good roads and ports, then donors must step in to provide food security and employment to prevent violence, undesirable illegal activities, national and regional instability and massive migration.

What donors do, in effect, whether their goal is sustainable agriculture, agricultural development or on-farm poverty reduction; is provide the elements that the public sector is failing to provide, through technology transfer, micro-credit schemes, infrastructure development and marketing assistance. However, the objective of a viable, sustainable agricultural sector is not achieved because efforts devoted to different projects are not coordinated, sustained long enough or are insufficiently funded. Neither are all necessary elements provided (education, meaningful government support).

The primary goal of non-coffee agricultural diversification is to provide alternatives for Central American growers to keep their farms as an agricultural enterprise, although they are no longer competitive in coffee. To achieve that goal, the underlying global strategy should be to find some mechanism to coordinate efforts on a national and regional basis to create the conditions needed for agriculture to be successful in Central America.

Fruits and Vegetables (Flowers and Ornamentals) Markets

Most of this section discusses f&v but since the logistical requirements for cut flowers and ornamentals are very similar, much of what is discussed for f&v would apply to the cut flowers and ornamentals.

Domestic and Regional Markets

One part of a strategy for diversification would be to develop domestic and regional markets for fresh f&v and processed food products. Staggered plantings of irrigated, protected f&v is a good short-cycle production option for growers. Also, growing f&v, instead of cash crops, provides more food security and nutritional options for small farmers. For the grower to realize a profit, however, many problems marketing product need to be addressed to lower transaction costs, transportation costs and unnecessary spoilage of food products.

Domestic markets need improved wholesale market physical infrastructure, increased market intelligence and more coordination among different agricultural projects. Regionally, there is a great need for a “harmonized” system of grades and standards, abolishment of “invisible” trade barriers and more regional market intelligence. Some of this work is underway as part of PARLACEN and other bilateral agreements. These efforts should be moved forward more aggressively.

Market Structure on the National Level

Basic market system structure, regulation and enforcement are missing in the produce industry in most of Central America. This is causing inefficiencies and abuses that make produce farming less profitable and more risky than it should be. To increase the effectiveness of a diversification program based on domestic and regional sales, these constraints must be removed.

A1. Wholesale Markets

The physical infrastructure of wholesale markets in most countries is overwhelmed or nonexistent. A case in point is the wholesale market “city-within-a-city” in Managua that is spilling over into residential and business areas. Emphasis on improving wholesale markets should not only be on major cities but on secondary cities that serve as “hubs” for transportation of products.

Cities need help in upgrading their wholesale markets, both at the planning stage and with the financing and construction of the market. Planning for upgrades or the construction of new markets requires expert assistance. Building a market on a site that is inconvenient to buyers/sellers, failing to assure that the market is on the route of cheap public transportation, and designing a facility that is too expensive or too small are common mistakes of inexperienced planners.

A2. Market Intelligence

Reporting organizations need to diffuse timely reports on market prices to the public. Every country in this study currently has an organization gathering and reporting wholesale market prices; however, many of them lack sufficient resources for wide dissemination of the information and for self-promotion. These networks need to add to their capabilities a system of reporting farm gate prices and estimated production volumes for selected products, with updates throughout the season, as well as a system of tracking and reporting the movement of products across borders. The first two activities would require reporting organizations to add manpower and equipment to the existing system to track and report the new information. MERCANET

(Costa Rica), already provides regularly updated reports for some of this information. The movement tracking reporting capability might be added by expanding the reporting responsibilities of customs officers or through statistics reporting institutes (such as INE) already reporting these data.

The system of reporting provided by the USDA's Agricultural Market News Service (AMS) would be a good model for developing a market news reporting network. Many of the elements for such a system are already in place: database systems, reporters, national customs agents at ports and frontiers and national statistics services; the challenge is in organizing and strengthening the system, finding funding to assure long-term services and tying it together both nationally and regionally.

A3. Grades and Quality Standards

Grades and standards should be developed for all important f&v sold on the domestic market or exported. Differences of opinion, misunderstandings and abuses involving "sizes" and "quality" and the price that should be paid accordingly are not uncommon. Establishing official grades and standards and training for growers and buyers would provide less subjective ground rules for produce sales. Costa Rica has a program to set up grades and standards for products such as ginger and tiquisque blanca (*Xanthosoma* spp.). This information is available on the MERCANET website (Estrade, date unknown). Other countries should do likewise for crops, regardless of the market.

A4. Extension System

Depending on the country, the MAG/SAG either controls or has oversight responsibilities for the nation's research and extension network. Unfortunately, due to the enormity of the task, the difficulty of providing adequate coverage in some rural areas, the high cost of their delivery to few end users, budgetary restraints and a high degree of bureaucratization and politicization of government services, national extension services tend to be ineffective.

Many agriculture programs funded by donor money are mainly efforts to replace the national extension services that the government is failing to provide to farmers: technology transfer, introduction of new varieties, or model farms. Most donor projects are independent and short-lived (2-5 years) and once a project is over, the donor jumps on a new bandwagon and abandons the growers, taking away all assistance and guidance, technical, financial and marketing in mid-stride of diversification efforts. The farmers, in particular the less educated and poorer ones, who have gotten into a new product and who have barely learned to grow by the time the donor leaves, lose the continued guidance and technical assistance they need to overcome new problems. It doesn't take them long to encounter a disease or pest problem or problem with the buyer that they do not have the resources to overcome and so they fail. This is an inefficient use of donor funds because it fails to meet the end goal of sustainability and requires returning to the area with yet another project. Extension services are perennial services in the United States and Europe.

Ideally, donor groups should plan projects according to the time it takes for growers to achieve sustainability. Rather than rush them forward and cut them off before finishing the job in order to meet some pre-determined cutoff point, the donor's internal time clock or a change in government direction, the donor should give sufficient support until the grower has enough

experience to succeed on his own. If this is not possible, some mechanism should be left behind to provide intermittent assistance. Growers accept a great deal of personal risk in working with a diversification crop. Growers need support in more than just production. Post harvest handling, grading and selecting product, packing, marketing and sales are all part of succeeding as a farm. These have to be brought to the farmer as well.

There are different ways to provide long-term support. One approach would be to try to work through the existing extension services and resolve their organizational problems, wean them from a state to a peristatal entity and begin rebuilding the institutions so that they serve the purpose for which they were intended in a more efficient manner. The MERCANET services and SIMPAH are examples of peristatal organizations formed from previously state services. Both appear to be functioning reasonably well. Strategic plans with short-term and long-term goals would be decided upon on a country-by-country basis but within a framework of regional cooperation.

Another approach would be to increase the capabilities of research institutions, adding a formal extension responsibility. Many of these, such as FHIA for horticulture and agroforestry in Honduras, and CATIE for agroforestry and forestry in Costa Rica, already provide some technology transfer of their research results. These capabilities are limited due to funding restrictions. In other countries, private universities (The Panamerican School of Agriculture for animal science and Universidad del Valle or Landívar in Guatemala) might be asked to provide offices and management of extension activities on their agricultural campuses. The benefits to the extension programs are access to agricultural libraries and research results and the benefit to the organizations would be the opportunity to disseminate the outcomes of their research programs and provide hands-on experience to students through apprenticeship programs with the extension service.

If the first two approaches are not feasible, a third approach that might be used to organize the different donors' activities in agricultural diversification efforts within a given country to work to provide as wide a coverage of extension services as practical. This would raise project organization to a higher level. Currently, at the project level, the donor may hire a large international NGO or an NPO to manage a project. The NGO/NPO subcontracts parts of the project to other NGO/NPOs, local or not, to implement portions of the project so as to provide the best coverage possible. Various projects of different donors would be organized to meet certain, pre-determined strategic objectives.

On the other hand, it is important to recognize when farmers are not making genuine efforts on their own behalf and to cut them off quickly and move on.

A5. Organization Building

Growers in some countries still need assistance with developing their growers' associations for their products. Growers' associations provide the organization needed to assist large numbers of growers at a time, reducing the cost of providing technical assistance and marketing service. It is much easier to organize technology transfer workshops, or field days through organizations than to try to contact and visit growers individually, especially where growers are dispersed and communications poor. Growers of all sizes benefit from the better bargaining position just as a "large grower" would have with a large buyer: strength matching strength. As a single, large

force they are more effective in lobbying for change in government legislation when needed. Moreover, as a group they have the resources to pay for services such as promotion of their crop or their organization to potential buyers and consumers to increase demand for their product.

A6. Physical Infrastructure

Inadequate infrastructure is still a problem. Inadequate/no telephone service, unreliable/no electrical services, terrible roads, river crossings, roads and bridges that are impassable during heavy rains and no/insufficient cold room facilities at airports (Honduras, El Salvador) are all fetters to sending perishable goods to market. Coffee, grains and root crops can wait a few days until the weather improves or the buyer shows up, but a head of lettuce cannot. Distance from a good metalled road should still be a consideration when evaluating farmers for eligibility for a project in fresh f&v because of ease of access to farms and ease of getting product out to the market in good condition.

A7. Credit

Credit is the major constraint on agriculture in the region. Many farmers are carrying a lot of debt that they have incurred in attempting to stay afloat in the face of natural disaster, normal operating activities, investments in improvements in their farms and market downturns caused by external factors beyond their control. Agriculture does not make the returns that can support a high interest rate on a loan. On the other hand, agriculture is a very risky enterprise. Donors should find a mechanism of providing low rate loans to producers participating in diversification projects. Schemes for credit that have been used are: lending cooperatives, micro-credit financing by NPOs, grower advances by intermediaries and buyers, bank loans and partial or outright funding by projects.

B. Market Structure on the Regional Level

The need for integration of the Central American countries has been a point of discussion since Simon Bolivar's day. Lack of integration is holding back the entire region as each country independently pursues its own strategy for trade and commerce. A starting point for integration could be with diversification project planning and the regional produce market as coordinated planning and regulation would be to everyone's benefit.

For example, there are already several initiatives for proposals of nationwide diversification programs and programs to help the coffee growers in some of the countries under study. AGEXPRONT, ANACAFE and MAGFOR have proposals for diversification in Guatemala under which the coffee growers might benefit. In El Salvador, PROCAFE, IICA and ODE have a fruit-tree based diversification project they are heavily promoting already to growers nationwide, including the coffee growers. IHCAFE and FHIA made a proposal for assistance to coffee growers in 2001, which is under study. IICA-PROMECAFE in Honduras also has made a proposal to IADB to help the coffee growers. FHIA has a second diversification proposal that is under study by the new government, which is considering using it as a model for two other projects.

The strategy of each of these initiatives should be considered for incorporation in the regional planning and each should be examined as it would appear that many of these propose to fill unmet domestic demand, followed by replacing imported products from neighboring countries and, lastly, as production levels increase, export their excess product regionally. Since some of

the products that they are going to promote are the same product (avocado, for example), there is a chance that some part of this strategy might fail due to regional over supply, if the seasons overlap and export is not possible. By having a centralized market reporting service that could review historical data on expected regional production levels and volumes moving through markets for these crops, availability of a crop would be known. Nevertheless, if sufficient product could be amassed in certain regions to be exported, perhaps this situation would provide sufficient regional supply to develop an industry in exports of the product. Planning now to avoid large periods of overlap in product supply in the same market or to include safety nets (alternate markets) in the strategy will help sustain prices at higher levels.

For planning to occur on a regional level, an effective planning committee of representatives of the programs should be formed and clear lines of communication established so that the representatives can plan and share program activities. Perhaps it is a utopian ideal to hope that these representatives could agree on how programs should share activities so that all of the countries might help their growers and consumers. Nevertheless, at least they could share their plans, successes and failures to improve each individual program. Leadership from an independent, knowledgeable person with good mediating skills would be useful in holding such a planning committee together.

A number of behaviors hold back intra-regional commerce in perishable food products. At the very least, the issues of phytosanitary certificates, corrupt customs agents and tariffs should be addressed effectively to remove some of these official and unofficial trade barriers.

Integration of Markets

B1. Phytosanitary Certificates

Certificates of plant health issued out of government offices for products never seen by the issuer is a farce. Governments with a protectionist policy wield the certification system as a tool to discourage imports. Phytosanitary certificates are a legitimate need of countries with pest-free zones for assurances that an imported product is clean of any of the pests of concern. However, where hurricane winds and rains sweep over the region and informal movement of product across borders move products around uncontrolled, potentially moving pests widely through the region render such documents useless in providing phytosanitary protection. Phytosanitary certificates increase the transaction cost of transporting food to the market, thus increasing the cost of food to consumers. They also serve as another opportunity for corruption at the border. The production areas that should be protected are those that have fruit fly-free status with USDA/APHIS and for those areas, which have been “developed” for export agriculture, border inspections using seizures of inappropriate products should be made.

B2. Customs Corruption

Corruption at the border is open and rampant. Long waits of perishable food products at borders is costly. For the shipper, the wait runs up the cost of transportation and delays delivery, which could result in having to dump a load of ruined product and does nothing to improve the quality or shelf-life of the food about to be delivered to the market and the consumer. The unofficial tariff that has to be paid to corrupt customs officials increases the cost to the consumer as well and spreads the disease of corruption into the agricultural sector. A desperate grower has three

options: (1) dumping a product that needs selling, (2) paying a bribe or (3) moving it across the border clandestinely.

B3. Tariffs

Tariffs between Central American countries are slowly being reduced. However, we have the notable exception where it is being used by Nicaragua to punish Honduras for a maritime treaty that Honduras made with Colombia. Honduras has responded, of course. These activities serve political purposes and personal interests but they also hurt both consumers and agribusiness by driving up food prices for consumers and restricting trade. Removal of tariffs to allow free access to markets will lower the cost of food.

B4. Market Intelligence

A regional market price system should be made available to the public for planning by project managers, growers, retailers and consumers. Such a system could be developed by tying MERCANET, SIMPAH and MAGA-Guatemala services together through a central data collating and reporting agency. SIMPAH would be the most logical agency as it is already reporting for three countries, Nicaragua, Honduras and El Salvador. SIMPAH uses the CPD system developed by Chemonics under the PROEXAG project. In the past, AGEXPRONT housed a reporter using this system but apparently has lost that capability. The CPD is in DOS and should be updated in WINDOWS XP format for more compatibility and ease of use, but CPD is an excellent, reliable database for market price storage and reporting. For ease of price storage, those database systems in other countries could be changed to CPD format once the update has been installed.

Reporting price information to the public could be done through the existing reporting agencies. SIMPAH might act as a central clearinghouse and storage depot for prices from all countries as well as continue its existing reporting and information dissemination programs. Also, at this level, price information for the European and U.S. markets may be kept for other agricultural crops such as the commodity crops (cacao, coffee, spices) and cut flowers and ornamentals. The cost could be shared among the several agencies, thus providing more information at a lower cost to all of the institutions than any one of them could afford independently.

In addition to market price information, the system should be expanded to include volumes of product movement at borders. The information might be gathered by weekly communications with customs agents at the borders or through the statistical information institutions that track exports and imports.

Expanding existing reporting information to include product volume movements would allow the comparison of production volumes with market price information in all of the countries, which would create an invaluable information tool for market analyses of seasonality of products from different regions to identify market windows and opportunities to lengthen the season. Also, historical reports can be used to examine the market price trends and seasonal changes in production of f&v throughout the region.

C. Export Markets

Improving conditions in local and regional markets will improve conditions for export marketing. However, there are a number of constraints to exporting.

C1. Assistance with Infrastructure

Secondary cities and production areas are not receiving the attention needed to create agribusiness industries. Ideally, processors should be located within a production zone for lower transportation and spoilage costs. However, telecommunications services to most rural areas are poor and electrical service erratic and unreliable. For example, processing operations are forced to install very expensive diesel power plants to run their operations, which increase operating costs and the cost of initial investment. Their profit margin is reduced and they are more vulnerable to failure. This is true for almost any type of processing operation. They need good communications, reliable water and electrical services and good roads in order to be competitive. Cheap labor is not a competitive advantage if overhead costs are a competitive disadvantage.

C2. Promotion of Agriculture and Marketing and Sales

Promotional marketing of products has mainly consisted of sending growers and project employees to trade fairs, mounting a booth at one or more fairs and occasionally hosting a trade fair when money is available. Promotion is an integral part of marketing that should be a continuous effort not an effort that is made in discrete, widely dispersed bursts. Promotion distinguishes marketing from sales but is part of sales.

A more efficient and effective approach to make trade fairs more important and self-sustaining would be to combine trade fairs into one regional trade fair that rotates host countries. Rather than have multiple fairs in one year in two or more countries where one sees many of the same faces, consolidating fairs and creating a large fair that would include all of the countries simultaneously, along the concept of the PMA, and would create a larger single participation and stimulate more regional trade in a single trade fair.

Brand development and increasing logo recognition require investment in graphics and promotional activities and are important to increasing awareness of new products and brands. One broker recently commented that he no longer worked with shippers who could not provide him with point-of-sales promotional materials. Such materials may include product packaging, leaflets, videos and product displays. For new products that consumers may not recognize, that same broker's company would be willing to help the shipper develop the point-of-sales materials. Using marketing consultants to developing promotional materials for agricultural products for the intended market will have better results than having producers do it in Central America. They know their consumer and what attracts their attention. These services are expensive, as is the cost of printing glossy materials with attractive colors and graphics. However, this type of promotional activity helps move a truly attractive, high-quality product in the market.

C3. Assistance with Trade Constraints

Poor transportation and lack of admissibility into/through the United States are the two important constraints to developing a European export industry in fresh exotic tropical fruits in Central America. These fruits are not allowed entry into the United States through the port of Miami and all cargo service to Europe leaves out of Miami. The alternative route that is allowed is a burdensome, expensive, risky route. The purpose of the quarantine at the southern ports is to protect important fruit industries in those areas. An accommodation should be made to protect the industry without withholding the opportunity to trans-ship fresh fruit to Europe, such a

special packaging or bonded freight forwarders handling the cargo. Perhaps some research universities could work on finding solutions in packaging materials or post harvest treatment. Perhaps SureBeam technology would be an alternative. Resolving this trade barrier would be a boon to exotic tropical fruit growers who want to go to market in Europe with fresh fruit.

D. Agroforestry

A farm practicing agroforestry is the truly diversified farm, with a mix of short- and long-cycle crops (timber and agriculture) being grown for different markets. If farmers have enough room to achieve the volumes required and yet control and manage all the products that they are producing, then farms should be more financially secure than many monoculture farms. As this is a combination of f&v and timber, the strategy of this production option is a mix of strategies for f&v and timber. How these are combined to arrive at a final strategy depends on the planting decisions: separate plots of each product on farm (plots), intercropping, fallow/rotation of trees with f&v.

Watersheds and Non-Renewable Forests

There will be farms, or sections of farms, which are not suitable for agroforestry or agriculture. These may be more suited to timber, although trees, like f&v, tend to perform the best on fertile, deep soils with good drainage. Nevertheless, timber is an option.

Land with the following characteristics should be considered non-arable:

Characteristic	Possible Uses
>20 percent slopes	timber, watershed, farm bank concept
Poor soils, thin, highly subject to erosion	timber only with selective cutting
Watersheds	farm bank
No water for irrigation	timber
Forest for wildlife	farm bank

Solutions to these problems would be uses that are not agricultural in the traditional sense. Reforestation or protection of the existing tree cover would be the best land use alternative. If the property is large enough or has sufficiently interesting landscape or wildlife, it might be developed for tourism such as ecotourism or as a game park. Both enterprises require logistical support, which would spin off secondary cottage industries (food products, transportation, restaurants, lodging, entertainment, tour guides, game fish and bird rearing).

Tourism requires trained management and staff and well-maintained, attractive and clean facilities to keep the tourists happy. Hotel and restaurant training can be provided in universities and trade schools, but these institutions would need the budget required to hire foreign/foreign-trained staff to teach local students how to manage tourists, particularly in some areas where experience with foreigners is limited. Language schools are also needed. A training hotel would be an asset to provide experience.

In the case of ecologically important forests and watersheds, the Farm Bank scheme might be an opportunity to safeguard important watersheds and forests, if the funding could be found for a

Forest Conservation Service Fund. The fund would have to be sufficiently well funded to protect the forests for reasonable periods of time. Some sort of contractual arrangement with severe incentives not to renege on the agreement and sufficient funds for monitoring and auditing the program would be required. It would have to have the full support of the legal, security and political system. With several large donors backing up the Farm Bank Fund, sufficient pressure should be available to ensure support from the political system.

Timber

Pure stands or mixed stands of precious hardwoods and pine for wood products are very long-term investments with a high degree of risk. The risk arises from government failure to assure land tenure security and security of ownership of the use of the trees at the day of harvest. Government services fail to protect the trees from thievery and loss due to fire. Some governments do not have a rational policy on the rights of the owners of forests. Some legislation is counterproductive to increasing interest in planting forests as investments. Also, some government officials pervert legislation and undermine efforts to change the industry for personal interests.

Government will is required to remove these constraints. Perhaps this is the opportunity to provide incentives and apply pressure on the new governments who, just setting up their new administrations, are still in a position of making a real difference by setting rational forest use policy and selecting officials who will carry out their policies. After policy making there is administration, regulation and regulation enforcement. Training of forest protection and enforcement personnel and committed, strong government support are needed to help enforcement agencies carry out their duties.

Employment is created by the timber industry at the beginning (planting, weed control and thinning stages) and toward the end of forest projects. At the end is when the labor-intensive, value-added activities occur: felling trees and transport, sawmill employment and employment in manufacturing of plywood, paneling, veneer, flooring, construction lumber and furniture. There is a period in which, once the trees are sufficiently tall to create shade that discourages weed growth, there is little need for labor. So, as an alternative for coffee employment, the timber industry in the mid-term will not be important. However, they do require skills that must be developed in new regions and are the result of experience and training activities are an investment that should be considered. There are a number of programs that fund environmental protection and forest management projects. The GEF provides funds for forest management. Financing for forest industry investments may be channeled through government programs such as PINFOR in Guatemala. If a government program is not a viable option, then NPOs with good track records of managing funds might be an alternative. Attracting direct foreign investment is only a possibility if the investor can be shown how his investment is going to be protected or reimbursed if there is failure due to loss of the forest or failure to meet contractual obligations. Given the poor image for a number of country's business environment, it will be difficult to overcome these fears without widely communicated positive results of an effective new administration's efforts to provide such an environment and some means of assuring that these achievements will not be squandered by the next administration.

Bibliography

Introduction

Sánchez- Solera, Luis Diego, 2001. Crisis Internacional del Café y Su Impacto en Costa Rica: Informe Final, Inter-American Development Bank, p. 58.

Costa Rica

Arze, José, Henry Benavides and Victor Umaña, 1999. “Dinamismo y Transformación de la Agricultura Centroamericana,” CEN 503: Proyecto Agroindustrial, CLACDS, INCAE, p. 64.

Atwood, Brian, 1996. “50 Year Partnership Between USAID and Costa Rica,” press release of administrator of USAID-Costa Rica at closing of mission.
<http://www.usaid.gov/press/releases/960723.htm>.

Bendaña, 2002. untitled draft, Coffee crisis, IADB, p.18.

CIA World Factbook, 2001. “Costa Rica.”
<http://www.ocdi.gov/cia/publications/factbook/geos/NI.html>

González, Armando J., 1998. “Diagnóstico de la Competitividad de la Industria del Café en Costa Rica,” CEN 550: CLACDS, INCAE, p. 101.

Hayes, Rita A., 2001. “Statement by Ambassador Rita De Hayes: Costa Rica Trade Policy Review,” p. 2. <http://www.us-mission.ch/press2001/0509costarica.htm>.

ICAFFE, 2001. “Informe Sobre La Actividad Cafetalera de Costa Rica,” p. 74.

ICDF, 2002. “Costa Rica.” <http://www.idcf.org.tw/english/country-latin2.htm>.

Mejía, Hernán González, 1998. “Balance de las Reformas Económicas para El Sector Agropecuario: 1983-1997 y Perspectivas.”
[http://www.infoagro.go.cr/sectordocs/Balance percent20reforma.html](http://www.infoagro.go.cr/sectordocs/Balance%20reforma.html).

Rainforest Alliance, 2001. “Flowers & Foliage Farming in Latin America: An Environmental and Social Analysis,” p. 44.
<http://www.rainforest-alliance.org/programs/cap/flowers-foliage-farming.pdf>.

Rojas, Oscar, 1987. “Zonificación Agroecológica para el Cultivo del Café (Coffea arabica) en Costa Rica. IICA, PROMECAFE-AID-ROCAP-596-0090, p. 84.

Sánchez-Solera, Luis Diego, 2001. “Crisis Internacional del Café y Su Impacto en Costa Rica: Informe Final, Inter-American Development Bank,” p. 58.

SEPSA, 2001. <http://www.infoagro.go.cr>.

USAID Mission to Costa Rica, 1995. “Evaluation Summary: Non-traditional Agriculture Export Technical Support project (NETS),” p. 106.

USAID Mission to Costa Rica, 1995. “Final Evaluation Report: project assistance completion report: Cooperative Management Strengthening, No. 515-0248,” p. 7.

El Salvador

AMCHAMSAL, 1999. “Puerto Cutuco” Breve Resumen “Construcción del Nuevo Puerto Cutuco en el Departamento de La Unión” Descripción General del Proyecto.
<http://www.amchamsal.com/business/cutuco-es.htm>.

CIA World Factbook, 2001. “El Salvador” <http://www.ocdi.gov/cia/publications/factbook/geos>

Fundación Salvadoreña para Investigaciones del Café PROCAFE, 2001. Boletín Estadístico de La Caficultura Salvadoreña, Año 2001.

FUSADES, 2002. http://www.fusades.com.sv/html/I_contactenos.html.

MAG and IICA, 2001. “Programa Nacional de Frutas de El Salvador FRUTAL ES,” promotional package.

Mendez, Lourdes, October 26, 2001. “Cutuco arrastra más inversiones,” El Diario de Hoy.
<http://www.elsalvador.com/noticias/2001/10/26/NEGOCIOS/negoc1.html>.

Ministerio de Agricultura y Ganadería, 2002.
<http://www.mag.gob.sv/html/servicios/redes/rededs00.htm>

Pineda, Ana Elena Guadeloupe Escalante, 2001. “Crisis Internacional de Café y Su Impacto en El Salvador.” IADB, p. 81.

PROCAFÉ, 2002. “Proyecto Cultivos Asociados al Cafeto,” promotional package.

U.S. Embassy-El Salvador, Economic and Commercial Section, 2002. “El Salvador’s Reconstruction and Infrastructure Modernization Plans, 1999-2020,” p. 7.
<http://www.usinfo.org.sv/econreconsinfra.htm>.

USAID Mission to El Salvador, 1990. Final Evaluation Report: Project Assistance Completion Report of the ‘Non-Traditional Agricultural Export, Production And Marketing Project,’ No. 519-0392, p. 11.

USAID Mission to El Salvador, 1996. “Project Assistance Completion Report: Project USAID No. 519-0303—Water Management-GOES,” p. 12.

USAID Mission to El Salvador, 1996. "Final Evaluation Report: Project Assistance Completion Report of the Agribusiness Development Project No. 519-0327, p. 130.

USAID Mission to El Salvador, 1996. "Evaluation Summary: Cooperative Marketing and Production Project," p. 44.

Guatemala

Anonymous, 2001. "Transición Competitiva del Café Centroamericano: Informe Final del Caso de Guatemala," p. 59.

Friely, Juan Carlos Granados, 2001. "Marco Estratégico para La Participación de Programas de AID en La Diversificación Agrícola del País," p. 17.

Friely, Juan Carlos Granados, 2001. "Coalición de Organizaciones para la Diversificación de Productos Agrícolas del Paralelo 15.5 a 17," p. 16.

Fox, James W., Kenneth Swanberg and Thomas Mehen, 1994. "Agribusiness Assessment: Guatemala Case Study," USAID Working Paper No. 197, Center for Development Information and Evaluation, p. 72.

Ministerio de Agricultura Ganadería y Alimentación y Asociación de Exportadores de Productos No Tradicionales, 2000. "Resumen: Programa Fomento de Las Exportaciones Agrícolas No Tradicionales," p. 62.

Urrea, Otto Samayoa, 1998. "Informe final: Sistemas Agroforestales en La Región del Proyecto RECOSMO," p. 38.

USAID Mission to Guatemala, 1994. "Evaluation Summary: Highlands Agricultural Development Project Phase II," p. 194.

Wingert, Steve, 2001. "AGIL Program Implementation Strategy, Working Draft," p.78.

Wingert, Steve, 2001. "Options for Income Generation in the Polochic Watershed," p. 22.

World Bank, 1999. "Country Brief: Guatemala." <http://wbln0018.worldbank.org>.

Nicaragua

APENN, 2001. "Nicaragua Exportando," Year 1, No. 4.

Bendana, 2002. Title Unknown, IADB, p. 18.

IADB, 2001. Draft: "Transición Competitiva para el Café Centroamericano: Crisis Internacional del Café Su Impacto en Nicaragua," No. TC 01-09-01-4, p. 29.

Santa Cruz, 2001. Title unknown, Nicaragua Market Analysis, Programa de Asistencia para la Reactivación Agrícola en Nicaragua: ARAP, p. 77.

U.S. Embassy in Nicaragua, Economic Section, 1997. Transportation Infrastructure: Challenges and Commercial Opportunities, p. 6. <http://usembassy.state.gov/managua/wwwhe39.html>.

The CIA World Factbook, 2001. "Nicaragua."
<http://www.ocdi.gov/cia/publications/factbook/geos/NI.html>

The U.S. Commerce Service, 2002. "Nicaragua: Country Commercial Guide, FY 2002."
<http://www.usatrade.gov/Website/CCG.nsf>.

UPANIC, 2002. "Union de Productores Agropecuarios de Nicaragua (UPANIC), p. 14.

World Relief Nicaragua, 2002. "Final Report: Hurricane Mitch Agricultural Reconstruction Project," p. 41.

Diversification

Alergia, Carlos A., 1961. "Estudio forestal de la FAO-El Salvador," In de Rosayro, R.A., 1967. "Diversification forestry in coffee-producing countries," p 11.
<http://www.fao.org/docrep/76067e/76067e03.htm>.

AMERICAFRUIT, December/January 2002, "SureBeam technology puts safety first," p.24.

Batres-Marquez, S. Patricia, Helen H. Jensen and Gary W. Brester, 2001. "Salvadoran Consumption of Ethnic Foods in the United States," Working Paper 01-WP 289, Center for Agricultural and Rural Development, Iowa State University, p. 22.

Buzby, Jean C., 2000. "Effects of Food-Safety Perceptions on Food Demand and Global Trade," WRS-01-1, Economic Research Service/USDA., p. 12.
<http://www.ers.usda.gov/publications/wrs011/wrs011i.pdf>.

Center for the Promotion of Imports from Developing Countries (CBI), 2001. "EU Market Survey 2001: Plants and Young Plant Material," Volume II, p. 91.

Chemonics, 2001. "Programa de Asistencia para La Reactivación Agrícola en Nicaragua-ARAP, Final Report," USAID.

Davies, Jonathan and Michael Richards, 1999. "The Use of Economics to Assess Stakeholder Incentives in Participatory Forest Management: A Review," Overseas Development Institute, funded by the European Commission, p. 51.

ERS/USDA Briefing Room, 2002. "Vegetables and Melons: Trade."
<http://www.ers.usda.gov/briefing/vegetables/trade.htm>.

- FAO International Commodity Prices, December 2001. "Cacao Commodity Notes."
<http://www.fao.org/waicent/faoinfor/economics/ESC/ESCE/CMR/CMRNOTES/cmrcoce.htm>
<http://apps2.fao/servlet/org.fao.waicent.ciwp.CIWPQueryServlet>.
- FINTRAC, INC, 2000. "CDA Market Information Series (Survey #10): The US Market for IQF Tropical Fruits," p. 12.
- FINTRAC, INC., 2000b. "CDA Market Information Series (Survey #11): The WU Market for IQF Tropical Fruits," p. 7.
- FINTRAC, INC., 2001. "CDA Market Information Series (Survey #14): The US Market for Selected IQF Vegetables," p. 23.
- Getz, Bill, 2001. "Expectations of Specialty Produce Buyers," seminar at AGRITRADE, 2001, Guatemala City, Guatemala.
- Giles, John, June/July 2001. "The Fruit and Vegetable Industry: at A Crossroads?" AMERICAFRUIT.
- International Tropical Timber Organization, January 16-31, 2002. "Topical Timber Market Report," p. 28.
- Intracen, January 2002. "Overview World Markets for Organic Food & Beverages (estimates)." <http://intracen.org/mds/sectors/organic/overview/pdf>.
- Kortbech-Olesen, Rudy, 2000. "Export Opportunities of Organic Food from Developing Countries," seminar presented by Sr. Mkt. Development Advisor for ITC/UNCTAD/WTO at World Organics, 2000, London, United Kingdom, 2000.
- Morales, Carlos, 2002. "Operaciones IQF, La Experiencia de Guatemala," presentation at CDA Seminar "Oportunidades de Inversión para Honduras en Frutas y Vegetales Congelados" (IQF) de Exportación."
- Organic Trade Association, 2002. "Organic Consumer Trends 2001." http://www.ota.com/consumer_trends_2001.htm.
- PDBL II – Proyecto de Desarrollo del Bosque Latifoliado, Programa Forestal Honduras/Canada, 1997. "Guías Técnicas y Análisis Económico Financiero de los Cultivos y Sistemas Agroforestales de Producción para Zona de Ladera del Tropicó Húmedo de Honduras," Vols. I, II and III.
- Petitjean, November 2001. "Quality and Eco-Certification: How to Find Your Way?" Floraculture International, p. 26-30.

Rainforest Alliance, date unknown. “The Sustainable Agriculture Network: Latin American Groups Raising The Standard for Export Agriculture.”
<http://www.rainforest-alliance.org>.

Siedler, Edward, 2001. “Wholesale Market Development – FAO’s Experience,” Paper prepared for the 22nd Congress of the World Union of Wholesale Markets, Durban, South Africa, p.8. <http://www.fao.org/waicent/faoinfo/agricult/ags/AGSM/ingrastr.htm>.

Slott, Mira, January 2002. “Central/South America Re-positioning Exports,” Produce Business, p. 18, 20, 22-23.

Tropical Science Center, 2000. “Evaluation of Mahogany (*Swietenia macrophylla* King) in Mesoamerica,” PROARCA/CAPAS and USAID, p. 25.

UNDP/GEF Small Grants Programme, 2002.
http://undp.org/sgp/cty/LATIN_AMERICA_CARIBBEAN

U.S. Bureau of the Census, 2001. “The Hispanic Population: Census 2000 Brief.” C2KBR/01-3. Washington, D.C., <http://www.census.gov/prod/2001pubs/c2kbr01-3.pdf>.

Strategy

Estrada, Luis Rodriguez, date unknown. Normas y Certificación Tiquisque (*Xanthosoma* spp.).
http://www.mercanet.cnp.go.cr/Calidad/Normas_y_Certificación/Normas/normatiquisque.htm.

Contacts

Name	Institution
Costa Rica	
Mr. Mark Flaming	IADB
Mrs. Arlyne Alfaro Araya	CNP/MERCANET
Mr. Chris Wille	Rainforest Alliance
Mr. Cameron Griffith	Rainforest Alliance
Dr. John Beer	CATIE
Mr. Jorge Gallegos	Consultant to IADB
Ing. Marco Araya	ICAFE
Ing. Luis Zamora	PROCOMER
Mr. José Carlos Arze	IICA-Costa Rica
Ms. Erika Ruiz	CINDE
Mr. Carlos Homberger	VOLCAFE
Dr. Julio Guzmán	Consultant, IADB
Dr. Echeverria	Consultant, IICA
El Salvador	
Ing. Elmer Antonio Milón Barrera	PROCAFE
Mr. Mariano Olazábal	IICA
Mr. Victor Mencía Alfaro	Small Coffee Grower Coop representative
Mr. Roberto Escobar Pacas	UCAFES de RL
Ing. Guillermo E. Belloso	Salva NATURA
Lic. Mercedes Llort	ODE/MAG
Ing. Albert L. Merkel	Crisis Corps
Mr. Luis Obertí	IADB
Ing. Hector Montalvo	FUSADES
Mr. Rafael Cuellar	USAID
Guatemala	
Ing. Karl Ufer	Independent coffee grower
Mr. Brian Rudert	USAID
Mr. Adin Barrientos	USAID
Ing. Arturo Villena	ANACAFE
Ing. Rudoldo Estrada	AGEXPRONT
Ing. Agr. Eduardo Calderón	AGEXPRONT
Mr. Mike Schwartz	Chemonics International
Mr. Richard Frohmader	Chemonics International
Ing. Claudio Saito	Chemonics International
Dr. Henry Tschinkel	Consultant, Forestry
Ing. Oscar Orozco	Consultant, FAO
Mr. Rick Clark	Proyecto AGIL, Abt Assoc.
Ing. Javier Siliezar	Proyecto AGIL, Abt Assoc.

Name	Institution
Ing. Oscar Nuñez	Defensores de la Naturaleza
Honduras	
Dr. Adolfo Martinez	FHIA
Mr. Ray Waldren	USAID
Mr. John Dorman	USAID
Hugo Zacarias	IADB
Dr. Ron Curtis	RECAP
Ing. Juan José Osorto	IHCAFE
Lic. Ruth Peralta	DED
Ing. Mario Jimenez	MAG
Ing. Fredy Maradiaga	DICTA
Ing. Miguel Nolasco	SIMPAH
Dr. Andy Medicott	FINTRAC-CDA
Ing. Ricardo Pineda	FINTRAC-CDA
Ing. Medardo Galindo	FPX
Ing. Edgar Ibarra	IICA-PROMECAFE
Ing. Matamoros	Zamorano
Dr. Raul Espinoza	Zamorano
Ing. Mario Bustamante	Zamorano
Ing. Odilo Duarte	Zamorano
Mr. Marty Schwartz	Zamorano
Ing. Mario Moreno	Zamorano
Sr. Hector Madrid	FONAPROVI
Sr. Marcos Lopez	FONAPROVI
Mrs. Karen Luz	Nature Conservancy
Nicaragua	
Mr. James Johnson	Chemonics International
Mr. Roberto Bendaña	Consultant, IADB
Mr. Ray Baum	USAID
Mr. Tomás Membreño	USAID
Mr. Roberto Brennes	APENN
Ing. Henry Hueck	Large coffee grower (IICA-PROVIA)
Mr. Clemente Poncon	Coffee, leatherleaf grower (IICA-PROVIA)
Mrs. Claire Kreegan	USDA
Mr. Kevin Sanderson	World Relief
Mrs. Mary Jane Salinas	UPANIC
Mr. Alejandro Raskosky	UPANIC
Mr. Amilcar Navarro	UNICAFE
Ing. Jaime Baldizon	UNICAFE
Mr. Eugene Miller	Winrock International
Mr. Brian Muggeridge Anderson	UN/PNUD
Mr. Donald Morales	UN/PNUD

Name	Institution
Washington	
Ms. Carol Wilson	USAID/LAC Bureau
Mr. Ari Skromne	IADB
Ms. Bente Christensen	IADB
Mr. Juan Carlos Martinez	IADB
Mr. Kleber Machado	IADB
Other	
Dr. Gerald Schreuder	U. of Washington, Forestry Dept.
Ms. Sabrina Vigilante	Rainforest Alliance, Ecomarkets
Mr. Robert Rice	Smithsonian Institute's Migratory Center
Mr. Willem Boot	Boot Coffee

Table 1
The Relative Importance of Different Types of Coffee to Total Coffee Exports
For El Salvador For the Seasons 1999/2000 and 2000/2001.

Quality	1999/2000 (cwt oro)	2000/2001 (cwt oro)	% Growth	% of Exports 1999/2000	% of Exports 2000/2001
High quality grades					
Central Standard (Low)	539,309	261,303	-52%	16.6%	11.7%
High Ground (Medium)	1,223,370	895,808	-27%	37.5%	40.1%
Strictly High Ground	1,042,593	775,335	-26%	32.0%	34.7%
Gourmet	25,185	28,065	11%	0.8%	1.3%
Organic	8,895	6,000	-33%	0.3%	0.3%
Inferior grades					
Washed	220,862	156,453	-29%	6.8%	7.0%
Unwashed	1,125			0.0%	0.0%
Green bean	180,300	94,425	-48%	5.5%	4.2%
Regular	2,625	1,125	-57%	0.1%	0.1%
Other	14,040	15,951	14%	0.4%	0.7%
Annual Total	3,258,304	2,234,465	-31%		

Source: Table B.5, IADB report: "Crisis Internacional de Café y Su Impacto en El Salvador, 2001.

Number of Farms and Production Area by Farm size and by Department for Each Coffee Production Zone in Guatemala.

Zone	Department	Micro		Small		Medium		Large		Totals	
		# Farms	Area (ha)	# Farms	Area (ha)	# Farms	Area (ha)	# Farms	Area (ha)	# Farms	Area (ha)
I	Quetzaltenango	1,818	2,909	318	3,176	117	4,680	8	2,800	2,261	13,565
	San Marcos	7,341	11,746	580	5,800	222	8,880	14	4,900	8,157	31,326
	Subtotal	9,159	14,655	898	8,976	339	13,560	22	7,700	10,418	44,891
II	Suchitipequez	1,027	1,643	330	3,300	122	4,880	9	3,150	1,488	12,973
	Sololá	5,342	8,547	310	3,103	115	4,600	8	2,800	5,775	19,050
	Retalhuleu	1,421	2,273	116	1,160	45	1,800	3	1,050	1,585	6,283
	Subtotal	7,790	12,463	1,478	7,563	282	11,280	20	7,000	8,848	38,306
III	Guatemala	3,607	5,771	462	9,242	171	6,327	12	4,200	4,252	25,540
	El Progreso	228	365	45	891	16	592	1	350	290	2,198
	Sacatepéquez	880	1,408	161	3,227	60	2,220	4	1,400	1,105	8,255
	Chimaltenango	2,322	3,715	386	3,862	143	5,720	10	3,500	2,861	16,797
	Escuintla	1,841	2,946	381	3,811	141	5,640	10	3,500	2,373	15,897
	Subtotal	8,878	14,205	1,435	21,033	531	20,499	37	12,950	10,881	68,687
IV	Santa Rosa	5,932	9,491	1,786	17,856	660	26,400	35	10,250	8,413	63,997
	Jalapa	1,147	1,835	307	3,073	114	4,560	8	2,800	1,576	12,268
	Jutiapa	815	1,304	202	2,022	75	3,000	5	1,750	1,097	8,076
	Subtotal	7,894	12,630	2,295	22,951	849	33,960	48	14,800	11,086	84,341
V	Huehuetenango	6,561	10,498	1,601	16,008	562	22,480	31	8,850	8,755	57,836
	El Quiché	771	1,234	120	1,197	44	1,760	3	1,050	938	5,241
	Subtotal	7,332	11,732	1,721	17,205	606	24,240	34	9,900	9,693	63,077
VI	Baja Verapaz	1,210	1,936	41	408	15	600	2	700	1,268	3,644
	Alta Verapaz	5,808	9,293	618	6,183	229	9,160	16	5,600	6,671	30,236
	Subtotal	7,018	11,229	659	6,591	244	9,760	18	6,300	7,939	33,880
VII	Izabal	163	260	159	1,598	59	2,360	4	1,400	385	5,618
	Zacapa	981	1,570	439	4,387	162	6,480	11	3,850	1,593	16,287
	Chiquimula	785	1,256	730	7,300	272	10,880	19	6,650	1,806	26,086
	Subtotal	1,929	3,086	1,328	13,285	493	19,720	34	11,900	3,784	47,991
	Total	50,000	80,000	9,814	97,604	3,344	133,019	213	70,550	62,649	381,173

Source: AIDB, 2001. "Transición Competitiva del Café Centroamericano: Informe Final del Caso de Guatemala.

Micro producers: <99 cwt

Small enterprises: 100-1,999 cwt

Medium producers: 2,000-5,999 cwt

Large producers:> 6,000 cwt

Composition of Nicaraguan Coffee Producers, by Region and by Production Levels

Production cwt oro	A1		A2		Category Total	A3		Category Total	A4		A5		Category Total	Regional Total		
	< 50	51-100	Small			Medium			Large		1501-3000	3001-6000			6001-12000	>12000
			101-250	251-500		501-750	751-1500									
Las Segovias																
No. Producers	4,720	590	295	167	5,772	59	56	115	8	5	0	0	13	5,900		
% Total Participants	80%	10%	5%	3%	98%	1%	1%	2%	0.1%	0.1%	0.0%	0.0%	0.2%	100%		
Production cwt oro	9,440	30,090	29,795	41,917	111,242	29,559	42,056	71,615	12,008	15,005	0	0	27,013	209,870		
Jinotega																
No. Producers	9,600	1,200	540	354	11,694	118	100	218	50	20	10	8	88	12,000		
% Participation	80%	10%	5%	3%	97%	1%	1%	2%	0.4%	0.2%	0.1%	0.1%	0.7%	100%		
Production cwt oro	19,200	61,200	54,450	88,854	223,704	59,118	75,100	134,218	75,050	60,020	60,010	96,000	291,080	649,002		
Matagalpa																
No. Producers	8,000	1,000	500	300	9,800	110	50	160	15	10	9	6	40	10,000		
% Participation	80%	10%	5%	3%	98%	1%	1%	2%	0.2%	0.1%	0.1%	0.1%	0.4%	100%		
Production cwt oro	16,000	51,000	50,500	75,300	192,800	55,110	37,500	92,610	22,515	30,010	54,009	72,000	178,534	463,944		
Pacifico/Boaco																
No. Producers	1,900	225	175	100	2,400	60	18	78	22	0	0	0	22	2,500		
% Participation	76%	9%	7%	4%	96%	2%	1%	3%	0.9%	0.0%	0.0%	0.0%	0.9%	100%		
Production cwt oro	3,800	11,475	17,656	25,100	58,031	20,060	12,518	32,578	33,022	0	0	0	33,022	123,631		
National																
No. Producers	24,220	3,015	1,510	921	29,666	347	224	571	95	35	19	14	163	30,400		
Ave. % Participation	79%	10%	5%	3%	97%	1%	1%	2%	0%	0%	0%	0%	1%	100%		
Production cwt oro	48,440	153,765	152,401	231,171	585,777	163,847	167,174	331,021	142,595	105,035	114,019	168,000	529,649	1,446,447		
Average size of farm (ha)	1	1	20	20		50	50		86	86	285	285				
Total area per category (ha)	35,846	4,462	29,792	18,171	88,271	17,322	11,182	28,504	8,212	3,025	5,413	3,988	20,638	137,414		
Average # temporary labor/ha	1.13	1.13	1.13	1.13		2.77	2.77		4.89	4.89	4.89	4.89				
Total temporary labor per category	40,506	5,042	33,665	20,534	99,747	47,983	30,974	78,957	40,156	14,794	26,467	19,502	100,919	279,623		

Source: IADB, 2001. "Transición Competitiva para el Café Centroamericano: Crisis Internacional del Café y su Impacto en Nicaragua.