ADAPTIVE STRATGIES IN BANANA FARMING IN JAMAICA

By

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To my entire family for their love and support

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Abstract of Thesis Presented to the Graduate School
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The closure of the export sector in Jamaica's banana industry marked the end of a century long agricultural tradition. Despite bananas being a steadily growing global commodity, the Jamaican industry has seen a steady decline in market share due to international competition exacerbated by the uncertainty of the European Union (EU)'s banana regime. Once a world leader in exports, the nation now ranks 47th in production and accounted for less than 1% of the island's total GDP in 2009. However, it was a major source of employment in the island up until the late 1990s and the closure of the sector due to the ravages of several hurricanes strikes have forced people involved in the industry to face the daunting challenge of pursuing alternative livelihood strategies.

Through interviews with farmers, former workers and support services, this study explores the various adjustments that have been taking place and their meaning in the context of an increasingly globalized world. These include changes in land management strategies, challenges to marketing in the domestic banana sector and the pursuit of alternative employment opportunities. The role of non-governmental and governmental support in restructuring the industry to focus on the domestic banana market is also examined in this study as an important factor in the response mechanisms among stakeholders. A key conclusion of this study is that

although there does not appear to be a relationship between farm size and the number of adaptive strategies pursued, the amount of available capital will influence the types of strategies farmers pursue as they and other stakeholders re-adjust to operate in the domestic market. In the context of globalization, Jamaica's forced exit from banana exports may be beneficial in the long run given the eventual impracticability of the industry. The steps taken to encourage cooperatives and developing value-added products must be continued to ensure a successful transition for each affected group.

CHAPTER 1
INTRODUCTION, BACKGROUND AND RESEARCH OBJECTIVES

Introduction

The island of Jamaica is facing a number of crises with its traditional agricultural exports. The export of bananas has been one of the two longstanding industries in the Jamaican agricultural sector for over a century. However, as the Economist Intelligence Unit (2009) notes, since 1997 banana production has declined steadily with export volumes and earnings dropping by more than 60% over the past decade, accounting for less than 1% of total GDP in 2009. This decline reflects the erosion of European Union (EU) trade preferences, a general decline in world prices and a decreased ability to compete with large Latin American producers. To complete the bevy of challenges, the island has been ravaged by several severe hurricanes over the last decade. Crop losses have been heavy – a hurricane destroyed the entire banana crop in September 2004, and in August 2007 another flattened 90% of the banana crop.

I have always been interested in the dynamics of agriculture and economic development, the theme of globalization and the differences between the concepts, declared goals and the realities people actually experience. My particular interest in banana stemmed from the announcement by the major exporter in the industry that exports were being “halted indefinitely” just months after I began this degree program. The banana industry may not have been a notable income generator but employed thousands of people directly and indirectly and the closure would impact these persons and their families. According to the Caribbean Banana Exporters Association (2009), the banana industry employed approximately 5-10% of the total employment in the island, ranking second only to sugarcane in economic significance within the agricultural sector.

After conducting background research on the nature of the problem and the reported extent of the impacts, I believed it was important to find out just how well people were coping with the loss of this market and what they were doing in the aftermath of this change. Though several major industries in Jamaica have been threatened for decades, the collapse of the banana export sector was the largest event of its kind, and without a clear idea of the way forward, the livelihood of thousands of persons would be at stake.

The broad goals of this study were to find out exactly how stakeholders in the industry were adapting to the changes in the banana industry and to use this information to provide guidelines as to the effectiveness of various diversification strategies from traditional export agriculture and how a smooth transition can be achieved from following successful examples. This is of current importance as the sugarcane industry is in a precarious position and threatens to follow the same path as the banana industry.

The specific significance of my study will be assessing the viability of various employed by the various groups, especially the often vulnerable group of farmers. They face challenges not only from their local socio-economic and physical environment but also the economic influences of the global market. Throughout this study, the reader will be immersed in the decisions that persons engaged in this area of agriculture have had to make in order to maintain their livelihood. Explored in the broader context of the globalized world economy, my study explores the significant challenges, the responses and the factors influencing their decisions.

Background Information

The banana is in the family Musaceae and the edible species belong to the genus Musa. They are cultivated today primarily for their fruit and also for fiber and as ornamental plants. Their main or upright stem is actually a pseudostem (literally "fake stem") which can reach a height of up to 2–8 m, with leaves of up to 3.5 m in length. Each pseudostem can produce a

bunch of fruit of varying colors depending on the variety dying and being replaced by another pseudostem. The banana fruits grow in hanging clusters with up to 20 fruits to a tier (called a hand), and 3-20 tiers to a bunch. The total of the hanging clusters is known as a bunch or banana stem (commercial term). Each individual fruit is also called a finger. There are numerous wild and domesticated varieties and each type has various places in the diets of cultures all over the world. Bananas are a valuable source of potassium and vitamins B6 and C. The fruit has a protective outer layer (a peel or skin) with a fleshy edible inner portion; both can be eaten raw or cooked. Grown in over 100 countries, and in every humid tropical region, bananas are among the top 5 crops grown worldwide. World production for 2008 was 55million tons (Nationmaster 2010), much of which is consumed locally. Latin America alone accounts for about 67% of world exports, with North America and the EU being the primary markets. Several products can be derived from the fruit, such as flour, chips and dessert dishes among many others.

It is believed that the banana was first discovered in South East (SE) Asia, specifically in the Indo-Malaysian region and extending into Northern Australia (Morton 1987) at around 500 B.C. Modern bananas are considered to be derived from the wild species *Musa acuminata* (AA) and *Musa balbisiana* (BB) – a seeded variety. After being dispersed throughout the Old World over a number of centuries, bananas started to be traded internationally by the end of 14th century. However, it was not until several centuries later that Europeans and North Americans could enjoy them as anything but an exotic luxury because of the lack of appropriate transport for bananas. The development of railroads and technological advances in refrigerated maritime transport in the 19th century allowed for bananas to become the most important world traded fruit for several years.

According to Lancashire (1997), the banana was introduced in Jamaica in 1820 and commercial production beginning in 1901. Grown initially in the parishes of St. Thomas, St. Mary and Portland, the industry has had many cycles of expansion and decline, first from diseases then increased global competition. Achieving peak production of 355,000 tons in 1936, the industry involved up to eight of the island's 14 parishes at one point in time but this has declined today to just five key parishes.

It is tacitly acknowledged that the birth of the Boston Fruit Company in 1885 marked the beginning of the modern banana business. In this initial period, most companies obtained bananas from disparate sources as few had their own plantations. According to Palmer (1932), up to the year 1900 most companies were inadequately financed and managed by people with no practical knowledge of the industry. Ports of entry into the main target market of the United States were also limited. The major problem became providing a steady supply of bananas to a growing market and the major entities realized that new areas had to be opened up for banana cultivation.

Two important periods can be highlighted in the genesis of the modern banana industry: from 1899 to 1914 was important in the establishment and organization of the banana industry, in making the industry permanent, in diversification and expansion of the sources and areas of supply, and in the sources of income to the fruit companies. The period from 1914 to 1930, however, was even more important to the fruit companies. Because of the high levels of competition, losses from natural disasters and disease had to be reduced. Irrigation, investing in widely separated locations, increased research and development and improved transportation and storage facilities were some of the by-products of these realities.

Over the decades, the banana industry has become a key export for several countries in the New World. Nearly 70% of the bananas and plantains produced in Latin America and the Caribbean are locally consumed. Throughout the region, small businesses which produce a range of processed banana and plantain products have developed in recent years, providing an increasingly important source of employment and income generation for local populations. Well known for the production of bananas for export, the region currently includes five of the top ten exporting nations (see Tables 1-1 and 1-2). The export banana industry, as well as providing a major source of foreign exchange for a number of Latin American countries, is also the backbone of the economies of many Caribbean countries. In some of the Windward Islands, this crop accounts for up to 90% of primary exports, 70% of foreign exchange earnings and 60% of agricultural employment. Production is often on steep and difficult terrain and on small family farms (as opposed to vast, undulating plains in Latin America). In this region, bananas are the only year round crop which can be viably cultivated to produce a regular weekly income for small scale farmers (Sharrock and Frison 1999).

The focus of much of today's banana industry has been the efforts to dismantle the trade agreements between Britain and the EU and the African, Caribbean and Pacific (ACP) countries – signatories of the Lomé Convention in 1975 (many of which are former colonies of the major colonial powers). This ongoing battle has been termed the "banana trade war" and has involved the great world powers of the United States, the EU, the World Trade Organization (WTO, formerly the General Agreement on Trade and Tariffs - GATT) and the developing nations that benefit from this agreement such as CARICOM (the Caribbean Community). The changes of tariff policies globally and the growth of trade entities such as the WTO, EU and NAFTA (North American Free Trade Area) have increased pressure to remove guaranteed markets and inflated

prices in favor of “Free Trade”. However, as Rich and De Los Reyes (1998) points out, small banana-growing countries in the Caribbean lack the political power and economic resources to diversify and are increasingly susceptible to the vagaries of the world market. Here we see a dichotomy in desires in the banana industry in the New World. The small islands of the Caribbean are not able to produce bananas competitively with those from Latin America, especially against nations such as Ecuador, Honduras, Colombia and Guatemala which have sizeable economies of scale advantage. In March 1997, the WTO ruled that the trade protections under the Lomé Convention were illegal and were to be disbanded. However, in response to this, there have been several rounds of negotiations and lobbies by not only the Caribbean nations but also other ACP countries that would be affected.

Bananas have become a very sensitive commodity at the international level on economic, social, political and environmental grounds. As noted by UNCTAD, the last decades of the 20th century (and the beginning of the 21st century) have seen the export banana sector undergoing important structural changes as it faces challenges in trading regimes. This dynamism will undoubtedly continue indefinitely with evolving patterns of consumer preferences and food distribution channels.

Research Objectives

In the second week of October 2008, just months after being ravaged by Tropical Storm Gustav, Jamaica stopped exporting bananas. The decision, taken by the largest banana grower Jamaica Producers (JP), was the culmination of a tumultuous decade preceding 2008 with droughts in the mid-1990s and the unprecedented number of hurricanes crippling the industry from 2004-2008. Though the banana industry was again seeking to recuperate from significant damage, the announcement sent shock waves throughout the sector and signaled that a new paradigm was required in the Jamaican banana industry.

This study explores the adaptive strategies being pursued by farmers formerly involved in the export of bananas, former workers employed by the industry, and the effectiveness of policies put in place by both governmental and non-governmental agencies to address the challenges associated with loss of this critical market. The experiences of these farmers adapting to the change in market forces, the dynamics in land use changes in areas devoted to banana production and attempts to enter new markets are examined within the context of their potential effectiveness on a broader scale. This study also explores the ability of support organizations to provide effective service while adjusting to major changes. Several broader themes of geography are explored here including socio-economic issues, elements of political ecology, development studies and agricultural geography. The broader question that can be asked here is this: can even a restructured banana industry remain viable in a small producer such as Jamaica? The lessons learnt will be instrumental in refining policies and informing decision making within the sector including farmers and farmer co-operatives, employees and businesses linked to the industry. The results of this study will also be instrumental in guiding other groups involved in a variety of agricultural endeavors on the most effective strategies to pursue.

Table 1-1. World banana production in 2008 for Latin America and the Caribbean[1].

World banana production		
Country	Production (metric tons)	World ranking
India	11,000,000	1
Brazil	6,339,350	2
Ecuador	5,000,000	3
Costa Rica	2,101,450	7
Mexico	1,802,280	8
Columbia	1,570,000	10
Honduras	860,545	13
Panama	838,266	15
Guatemala	732,545	16
Dominican Republic	401,766	23
Martinique	321,454	25
Haiti	290,000	26
Argentina	175,000	32
Cuba	153,546	33
Guadeloupe	141,135	36
Jamaica	130,000	37
Nicaragua	91,636	44
St. Lucia	80,000	47

Table 1-2. World banana exports from Latin America and the Caribbean in 2008[2].

World banana exports		
Country	% of world market	World ranking
Ecuador	30.5	1
Costa Rica	18	2
Colombia	17.9	3
Panama	5.9	5
United States	5.1	7
Guatemala	4.7	9

[1] Adapted from http://www.nationmaster.com/red/pie/agr_ban_pro-agriculture-banana-production - Banana production (most recent) by country.
[2] Adapted from http://www.nationmaster.com/red/pie/agr_ban_exp-agriculture-banana-exports Banana exports (most recent) by country.

CHAPTER 2
LITERATURE REVIEW AND THEORETICAL APPROACHES

The banana industry has been the subject of numerous papers, debates and presentations, studied in numerous books and examined at all scales, from the farmer to the international trade system. The focus of most of these works have been on the economics of the banana industry, whether it be conditions for trade, competition among producers or the role of globalization in the banana industry. Closely related to the economic sphere are the political aspects of the banana industry and the social impacts of the industry in countries or regions. Key in these works has been the influences of the global political economy on the operation of the industry, the levels of social dependence on the industry, micro and macro-economic policies as well as how the industry influences decisions made by the political structure of many nations.

Several theoretical approaches have been taken in examining agricultural production at various scales. These include development theories such as import substitution industrialization (ISI), political ecology, social theory and various economic theories such as comparative advantage and trade theory. Several of these will be examined in the review and will form a base for examining the economic and political aspects of this study.

There have been several other areas of focus such as the impacts of natural disasters on the industry, the study of banana diseases and the social impacts of the banana industry. Though the focus will be on the two largest areas, economics and politics of the banana industry, these sub-foci will also be interwoven throughout this literature review. At the end, it is shown that though there are several broader articles addressing issues in this area of agriculture, there is a gap in the literature with regards to examining major changes in small island agriculture, how smaller famers adjust to significant market changes in the globalized economy and the need for this

study in creating a more complete body of work on Jamaican and Caribbean agriculture as well as adaptations to market forces.

Theoretical Approaches Related To Agriculture

The general context of this study focuses on the socio-economic implications of the close of the Jamaican banana industry as well as the effects on social and political structure of the affected areas. With this in mind, I will present a brief overview of some of the pertinent theoretical approaches that have been associated with agriculture which are useful to this study.

Development Theories and Globalization

Development theories have traditionally been used to explain how societies and their economies have evolved and examine how desirable change can be effected in a society, particularly positive economic change. These theories draw on several disciplines across the social sciences with support from the natural sciences and the arts. In relation to agriculture, most incorporate the movement from an agrarian based society to a primarily tertiary services society as the best means of achieving development. Historical narratives such as colonialism and dependency have also been incorporated in explaining and prescribing development options for countries (Preston 1996; Pieterse 2001).

Some, such as modernization theory state that the development can be achieved through following the processes of development that were used by the currently developed countries. Models created in this vein of thinking tended to be linear and stated that every country must go through each stage. One classic model of this kind is Rostow's Stages of Growth Model which describes five stages of economic modernization that each country would generally go through (Leys 2005). Characteristics such as high education levels and the use of technology were also thought of as key components in spurring and developing economic growth. According to Leys (2005), a key factor in Modernization Theory is that in order for developing countries to

experience development, assistance from developed countries is necessary. In addition, it was believed that the lesser developed countries would develop and grow faster than developed countries. Thus, this theory is built upon the theory that it is possible for equal development to be reached between the developed and lesser developed countries.

Unlike modernization theory, that saw developmental differences being the result of internal conditions, dependency theory saw a relationship between development and underdevelopment. This is based on the argument that resources flow from a "periphery" of poor and underdeveloped states to a "core" of wealthy states, enriching the latter at the expense of the former. It is a central contention of dependency theory that poor states are impoverished and rich ones enriched by the way poor states are integrated into the "world system". Influenced by various aspects of the Marxist theory (Leys 2005), this theory was very popular in Jamaica and the Caribbean in the mid-20th century along with its successor, World Systems theory, which added a “semi-periphery”. This “semi-periphery” lay between the “core” and “periphery”, being exploited by the former and in turn exploiting the latter. Jamaica was among several developing nations that pursued ISI as a means of reducing foreign dependency. This was accompanied by a decreased focus on agriculture as an economic strategy and increased focus being placed on producing secondary products such as alumina and textiles.

Neoliberalism, although not a theory in itself, has often been identified as a driving force behind the increased drive for modern globalization (Harvey 2005). Another label for economic liberalism, the term was coined in 1938 but came into use in the 1960s and is influenced by the neoclassical theories of economics. These economic theories focus on determining prices, outputs, and income in markets through supply and demand, often assuming perfect knowledge that choices are made to maximize benefits and minimize costs as posited in rational choice

theory. One such example is the field of agricultural economics which applies economics to the production of livestock and crops (agronomics). The focus on maximizing yield while maintaining good production conditions has fed into many initiatives surrounding agriculture worldwide, particularly in commercial operations. Neoclassical economics dominates microeconomics, and together with Keynesian economics forms the neoclassical synthesis, which dominates mainstream economics today.

In general neoliberalism focuses on privatizing much of the economy with the belief that it will produce a more efficient government and improve the economic health of the nation (Peet and Hartwick 1999). With the failure of ISI and other government-focused initiatives and mounting debts, the mandate of neoliberalism was embraced by several countries, including Jamaica as a means of achieving economic growth. This has extended beyond country borders to international trade. Combined with advances in communication and transportation, modern globalization is largely the result of planning by political leaders to break down barriers hampering trade to increase prosperity and interdependence. These barriers have been considerably lowered through international agreements. The WTO was founded on GATT and is the primary organization through which trade homogenization is being pursued. As will be discussed further in the literature review, globalization has had major impacts on the local, regional and international banana trade, with far reaching implications.

Trade Theory: Comparative Advantage and Economies of Scale

According to Ruffin (1999), standard trade theory involves trade in homogeneous products; hence, with perfect competition there is only inter-industry trade. David Ricardo (1817) introduced standard trade theory when he formulated what is now called the theory of comparative advantage; the core of the theory was that goods are more mobile across international boundaries than are resources (land, labor, and capital). Such assumptions still

characterize some theories of intra-industry trade. Comparative advantage deals with all those causes of international trade that are generated by the differences among countries and can be defined as the ability of a party (an individual, a firm, or a country) to produce a particular good or service at a lower cost than another party (Hardwick, Khan and Langmead 1999). The ability to produce a product more efficiently than others has been the basis of the location of several industries, including bananas. This macroeconomic principle is related to economies of scale, a microeconomic principle which explains the cost advantages obtained by expansion. It is a long run concept and refers to reductions in unit cost as the size of a facility, or scale, increases. However, following along with these concepts tend to result in a "natural monopoly" (Linux Information Project 2006). It is posited that it is always more efficient for one firm to expand than for new firms to be established, so the natural monopoly has no competition. Because it has no competition, it is likely the monopoly has significant market power.

A similar trend has been seen in the evolution of the Jamaican and world banana industry with larger firms increasing their market power and discouraging or eliminating other competitors. In Jamaica, there were thousands of smaller farms across the island producing bananas for export. With initial trade beginning in Jamaica, Cuba and Panama, these countries had a comparative advantage and along with the lack of refrigeration on marine transport, only areas close to the United States could viably enter the market. Technological improvements in storage and transport, along with investments in establishing new plantations in Latin America saw the Caribbean losing both comparative advantage and also economies of scale as the new production areas exceeded the capacity of initial producers. Jamaica sought to increase its economies of scale by privatizing the industry between 1983 and 1984. Hundreds of smaller farms were coalesced into three large estates and for a brief period, the production efficiencies

improved. However, decreased economic returns and limited increases in efficiency in the Caribbean islands and the continued investment in Latin America saw those countries solidifying their position as world leaders in production as economies of scale prevailed.

Political Economy and Political Ecology

The literature has also examined issues surrounding the banana industry within various social and political frameworks. Among the myriad of existing contexts, three will be explored briefly.

Merging both economics and political studies, political economy was originally concerned with studying production and sales and their relation with law, custom and the government (Black 2002) but now refers to the interdisciplinary approach to studying economic and political behaviors, drawing on law, political science and economics to explain how they influence each other. Political ecology on the other hand, is the study of the relationships between political, economic and social factors with environmental issues and changes. Political ecology differs from apolitical ecological studies by politicizing environmental issues and phenomena and differs from political economy by focusing on environmental issues such as degradation and land use change (Robbins 2004). The influence of political actors have long been recorded throughout history; throughout much of the Caribbean sugarcane was grown under the directives of the British colony and only the initial brown sugar could be exported (refined white sugar was heavily taxed and thus discouraged). In 20th century Jamaica, coastal development took place for the tourism industry amidst conflicts over the environmental sustainability of several of these projects. These two lenses may provide a useful perspective on the adaptive strategies being taken. The article discussed below by Grossman (1993) provides an excellent example of examining the banana industry from such a perspective.

The Economics of the Banana Industry in the Caribbean

Several papers approach the economics of the banana industry by giving an overview of the world industry, then narrowing down to the area(s) of interest, whereas others reverse their order of approach. Kasteele (1998) provides a comprehensive example of the former approach. His approach to examining the macro economics of the banana trade starts with an overview of the worldwide importance of bananas both currently and historically. In presenting a contrast with the Caribbean banana industry, the dominance in trade by a few select companies was highlighted. Caribbean farmers have long been noted for being smallholders involved in exports and Kasteele (1998) makes the contrast between types of growers with the region, starting with an analysis of the high production costs and exploring some factors leading to such high costs. The theme of challenges to traditional Caribbean agriculture is picked up by Ahmed (2001) and Meindertsma and James (2007). The costs to produce bananas in the Caribbean are at least twice the world market price due to several factors such as the high costs of labor, utilities and farm inputs, the lack of investment in research and development and low levels of technology in production. The slow pace of crop diversification and the focus on short-term survival were also cited as limitations on the Caribbean's ability to compete. The high prices received through preferential trade agreements (the Lomé Convention and the Cotonou Partnership Agreement) have been the crutch holding up the industry; the constant challenges on these agreements by the USA and their Latin American banana allies meant that these benefits were under dire threat. With the benefit of the Cotonou Agreement scheduled to end in 2008, Caribbean governments were urged to arrive at pragmatic (if difficult) decisions and close down the least profitable ventures and expanding more profitable ones such as tourism as well as attract foreign investment to diversify the banana industry.

The economic analysis by Meindertsma and James (2007) a few years later reiterates the vast gap in production costs between big growers in Latin America and the Caribbean growers. Agricultural crops have been experiencing decline due to increased dependence on imported foods, low technical capacity, high labor costs and other factors resulting in a decreased ability to compete in this era of liberalized trading policies (Kasteele 1998; Ahmed 2001; Meindertsma and James 2007). Banana in particular has long been plagued by the relatively low quality of export bananas shipped to the EU (Grossman 1993). Latin American bananas are superior in terms of cosmetic appearance as well as size, whereas deficiencies in Caribbean bananas make it increasingly difficult to command the higher sales price in United Kingdom (UK) and other European markets. The farmers themselves in acknowledging that they are not able to compete with larger producers use this as a justification for the need for continued price support within the industry.

Focusing on banana production in Jamaica, the economic analysis sets the stage by recounting the declining trends in exports volumes, the reduction in the number of export farmers and the increasing challenges to meet certification requirements required for exports to the UK. They then move on to reasons for negative to minimal export profitability, contrasting the high costs of marketing (from production to maritime shipping costs to stocking costs) to the lack of investment by producers due to the low profit margins. Except for estates, all other farm sizes were shown to have low rates of returns and low net values. This was influenced by the subsidies being received by support agencies and the cost of reinvesting in the farms.

In exploring why non-estates were still exporting, the analysis revealed that except for some medium and large farmers, most banana sales were directed to the domestic market, whether to small-scale vendors or to banana chip makers. The domestic demand for banana is

highlighted as is touted as the most feasible option for most farmers to remain profitable while still engaging in banana production. Other options such as exiting export banana production and attempting to establish a niche market were also explored with emphasis on the possibility of entering Fair Trade banana production.

As the major player in the industry, the world's large banana companies have refocused on diversifying their crop base, growing pineapples, cassava and dasheen among other things. Their focus on the snack market is reflective in the increase in advertisement and pushing brand recognition to take advantage of the perceived demand for these products. This strategy parallels operations by Jamaica Producers, the largest banana producer in Jamaica (Meindertsma and James 2007). There has also been a corresponding shift in focus to the market side of the trade rather than just the supply side. "Preferred partnerships" with retailers and branding have been two of the major strategies. The Fair Trade banana movement (at the time) attracted large amounts of interest as a viable niche market. There was also an industry wide investment in becoming more vertically integrated and increase quality as a result of increased competition. ACP countries have seen reduced prices, been impacted by weather systems, faced declining productivity and challenges to maintain export quality. In the Caribbean, countries have had several more hurricanes devastating the banana crops and the investment by the EU have resulted in little improvements in yields.

The overall conclusion of these two articles was that industry does not facilitate the operation of small producers or the entry of newcomers. The ACP nations face a much graver situation as they lose more and more market share and would need prolonged support to maintain production or pursue alternative activities. Jamaican industry stakeholders have traditionally sent

representatives to the negotiating rounds to strive to maintain market share. However, with Jamaica exiting the export sector, future participation in such attempts is uncertain.

Trade economics is not the only influence on the banana industry. The work by Brown (2009) highlighted the strong role weather systems can have on world supply and demand of vanilla. The focus of this paper was on a qualitative analysis of the vulnerability of the Madagascar vanilla industry and the social and economic impacts of the passage of various cyclones on the farmers in the industry. There are similar concerns with price and quality of their product but, unlike the Jamaican banana industry, there is no domestic market for vanilla.

Madagascar is a major player in their industry, accounting for some 60-70% of world production. The government has primary control over the production and marketing of vanilla. Madagascar was hit by six cyclones in the first half of 2007. They were also hit by five other cyclones, three in 2000 and two in 2004 and other nations have aimed to take advantage of the losses in vanilla production in Madagascar by strengthening their own production. Jamaica in parallel, was hit by five hurricanes in four years from 2004-2008. Both industries are vulnerable to extreme weather conditions, however, banana in much more susceptible to the elements than vanilla. Brown cites sources that report levels of loss from 5-80% as compared to bananas which often reports near total loss.

As a market leader, Madagascar had the ability to influence prices and this led to reduced market demand for some time and facilitated the entry of Indonesia and synthetic vanilla as competitors. This was followed by the liberalization of the market in 1997, leading to price volatility. Meindertsma and James (2007) noted that banana farmers had a choice to sell to export market or domestic market; the fact that there is only one market for vanilla and also one optimal location for production (in NE Madagascar) meant that the market structure is much

more dependent on the purchasers than the Jamaican banana industry. Both industries have farmers who have little or no access to credit and often few farmers who work as a cooperative (Brown 2009, 254).

Brown reveals that the vanilla stakeholders regard cyclones as common occurrences but are not thought of as a major concern even though farmers are vulnerable to the immediate crop damage as well as the economic downturn resulting from the cyclone. In contrast, hurricanes have been an area of great attention in Jamaica, particularly with the increased frequency and severity of the storms and the severe damage to crops and farmer livelihood.

Politics of the Banana Industry in the Caribbean and Latin America

The political aspects of the industry are often interwoven with the economic operations on the local, regional and international level. An area of enduring interest with regards to the political implications of the banana industry is the Eastern Caribbean. The small islands of the Windward Islands have had a historically high dependence on bananas, making changes to the industry much more evident than larger countries. Moberg (2005) examined the Fair Trade movement and some of its impacts in the context of globalization. The Fair Trade movement has often been thought of as the most viable alternative to the declining terms of trade for the Caribbean banana industry, particularly in the Eastern Caribbean. In assessing the reality of Fair Trade in several areas across the Windward Islands (WI's) in the context of global agriculture, costs and benefits, risk and overall perception of the system by farmers were examined.

Fair Trade is an attempt to counter global agri-business through appealing to consumer preferences for more ethically produced goods through the Fairtrade Labeling Organizations (FLO). Europe has been a more promising ground for FLO products that the USA with the entry of Fairtrade products into the supermarket and into the realm of consumer choice. Moberg (2005) related this anti-globalization movement as a result of the creations of child labor, sweat

shops and other inequalities that people find unpleasant. Smaller producers have sought to become a part of FLO mainly because of the promise to provide a more viable market for the produce since they can't compete on the conventional market.

Countries such as St. Lucia and St. Vincent have been highly dependent on the industry but don't compare to Central American plantations with acreages more than the entire Caribbean. Moberg reviews some of the major economic drivers in the industry in a similar manner to Kasteele (1998). Unlike the US market, there are price tiers in the UK supermarkets which facilitate Fair Trade banana which are sold at a higher price than regular bananas. The price differential restricts the market for the fruit but increases consumption of these products led to an increase the number of farmers in the Eastern Caribbean wanting to take part and increased strategic marketing of banana exports from Dominica.

The reality of FLO regulations, challenges certification, in harvesting and shipping the fruit for FLO members was the next topic covered. An important point noted was that the price differential between generic and Fairtrade banana is not reflected in the prices paid to farmers (Kasteele 1998, 10). Other themes such as the perception of a less than equitable relationship, increased labor and production costs on farms and de-listing for breaking regulations were covered. Some of the positive impacts such as the fostering of co-operatives, the carrying out of projects using money from the social premiums such as for health insurance, education scholarships and other social benefits were highlighted to balance the analysis. Though Jamaica had not yet received FLO certification, it can be assumed that many farmers would face the same challenges as in the WI's.

Though most social benefits have been accrued through the use of the social premiums fund, farmers claimed the increased labor costs offset the higher returns for the fruit. There was

also the problem of more people wanting to join than space was available. Many farmers have benefitted from being part of a democratically elected organization and being part of the FLO community. However, the farmers have seen how little control over the world market they have. Increasing production responsibilities and regulations make Fair Trade banana a more complex business: “It’s kind of a new dependence” (Kasteele 1998, 13) as farmers now operate according to FLO influences rather than the previous EU-World market network. There are doubts as to how long this market will last and the FLO group has become a different middleman with a still small price portion going to farmers.

The drive to become part of such a movement and other political motivations do not always necessarily explain changes in land use patterns as exemplified by Grossman (1993). Taken from a political ecology perspective, the link between increased export agriculture and declining local food production in St. Vincent is examined. Development literature often assumes that local agriculture has been undermined when such a pattern is observed. However, this was not found to be of major significance. Instead factors such as unequal land ownership, physical characteristics of the landscape and changing dietary preferences were seen to be of greater importance. Most farmers cultivated less than two hectares (5 acres) of land often on mountainous terrain with banana being the primary crop. In areas where banana production was limited, farmers cultivated ground provisions and vegetables. The few areas of flat land were owned by estates and although making up just 1% of farmers, they controlled 49% of total land holdings. Despite this unequal distribution, it was the increase in food imports that contributed greatly to changes in land use in the island. Local food crops grown and sold in domestic markets face seasonal price volatility and limited demand. Consumers in urban and semi-urban areas preferred imported foods such as rice and flour due to costs, nutritional value, preparation time

and taste. The lack of government support contrasted with the relative certainty of a market for bananas in the EU, accounted for much of the land use changes in the island. Government policies encouraging banana production have resulted in intercropping systems (combining banana and other local produce) to capitalize on the benefits of export bananas as well as reducing labor costs for secondary crops.

A more top-down analysis of political change and the resulting impacts on the banana industry is Payne's paper on development options in the Eastern Caribbean banana producing islands. Payne (2006) examined the dependence of three countries (Dominica, St. Lucia and St. Vincent) on bananas and how their vulnerability was exposed with challenges on the protected trade status of Caribbean bananas and the impacts on the changing political nature in those islands. In the last 10 years, new governments were elected in many of the EC nations and all had similar characteristics, indicating a possible change in mindset from pursuing development as was practiced after independence. It is interesting to note that subsequent to the completion of Payne's paper, Jamaica also underwent a change in government in 2007 and possible future directions for the island's banana industry may be given by this paper.

There have been several theories of Caribbean development which have explained and proposed development paths (Payne 2006). W. Arthur Lewis' call for industrialization in the 1960s, William Demas' theory of the constraints of small islands and the proposal for regional integration, dependency theory by the New World Group (out of the University of the West Indies) and the emergence of neoliberalisation theory were among the major development theories explored. This set the stage for a discussion of recent radical thinking in the Caribbean following a middle ground between radical development theory and neoliberalism and how each of those theoretical paradigms influenced the development paths of the EC countries.

St. Lucia was the most economically successful EC country in the WI's; the change in government brought attempts to make banana farmers more responsible for the industry. The main industry body was privatized and Fair Trade production emphasized but no real exit strategy was developed. Tourism became the new mainstay of the island but faced competition from "all-inclusives" in the region as well as other adverse world events such as the terrorist attacks in the USA. Other options such as manufacturing and fishing are minor in comparison and there is no real push for development options despite the downturn in the economy. Dominica had good banana years in the 1980s but declined in the 1990s due to the impact of natural hazards; other options such as tourism and manufacturing had limited viability. There were several shifts in the political structure, but again no real development strategy emerged. From about 2000, the island has been under IMF supervision and the economic outlook has been bleak. The banana company was privatized only because the government could not bail it out. The overall stagnancy to the economy reflected the lack of real viable options for the banana. The third country, St. Vincent followed a similar path to the other WI's: increased growth in the 1980s into the 1990s followed by low growth for the rest of the decade. Hurricanes have had a major impact on the economy as it affected bananas. Unlike the other two countries, the change in government brought new energy to development pursuits as well as active attempts to maintain the banana industry. No privatization was done and EU aid was pursued to improve the quality of the industry. Low tourism potential and government reforms led to a decline in offshore financial centers and increased importance in the narcotics trade. IMF supervision has restricted some development paths for the government but at least there have been active pursuits leading to some economic growth.

The main point of the country overviews as articulated by Payne is that though all of the above-mentioned development options still stand, no single one is the answer. Political leaders have become instrumental in the development paths taken by the countries examined as the civil societies are generally weak. Development options are limited with tourism and manufacturing being minor and agro-industry facing several challenges. All the countries face a turning point to maintain a place in the global economy as previous development attempts have not facilitated economic growth.

The banana industry also had a great impact in Latin America. Rich and De Los Reyes (1998) brings this to bear on examining the influence of “banana politics” on changes in policies in Central and South America after the Cold War. The banana industry had had an especially enduring influence on Central America (leading to the coining of the term “banana republic”) with governmental policies developed for the benefit of the particular company in each country. With the end of the Cold War, millions of dollars were invested to increase production in Honduras and other Latin American nations and competition increased between multinational corporations for market share in Eastern Europe. This sparked a brief “banana war” between United Fruit (Chiquita) and Fyffes - a British company that resulted in an increased dominance of Chiquita in Central America. According to Rich and De Los Reyes (1998), the entry of an American politician into Chiquita was a driving factor behind the initiation and pursuit of the challenges to the EU trade agreements with the ACP countries through the WTO, as well as asserting that the company had influences in lobbying for restricted trade preferences for countries dominated by competitors. This article highlights that the influence of large companies on the political agendas of various countries have very real impacts, from changing land use to reducing economic benefits to changes in world market policies.

Globalization and the World Banana Trade

Mentioned in the theoretical approaches related to the banana industry, the globalization push over the last 30 years has its roots in post-World War II efforts to increase trade interdependence and accelerated with the GATT and formation of the WTO remove barriers to free trade. Though focused on economic activities, cultural and social globalization has also occurred with Western culture and social norms diffusing across the world. As one of the largest international agricultural commodities, the trade in bananas has experienced vast changes over the past 130 years.

The first 50 years saw the establishment of bananas as a key agricultural product. In 1879, Minor C. Keith and Captain Lorenzo Dow Baker had established organizations to ship Costa Rican and Jamaica bananas respectively to New York (Palmer 1932). Until the end of the century, the United States was the main focus of exports. The replacement of schooners with steamships for carrying bananas and many advances in shipping and manufacturing combined with the increasing demand for the fruit spawned some of the major agro-industries that laid the foundation for the banana industry. By the 1930s the industry suffered from the impacts of disease outbreaks and other natural disaster which led to the consolidation of industry players and the first step in globalizing banana trade. As the banana industry gained more and more importance, the Commonwealth Caribbean banana export trade became one underpinned by close political and economic ties with Europe, and particularly the UK (Clegg 2001). The development of the Jamaican trade at the turn of the 20th century, and the establishment of the trade in the Windward Islands and Belize after the Second World War was dependent on access to the UK market and financial support from the British government. This led to the creation of a close relationship between the main stakeholders involved in exporting bananas to the UK,

including the banana producers, the private corporate interests, and the relevant government departments.

The next 50 years saw the establishment and rise of massive banana plantations in Latin American countries such as Ecuador and Colombia, the decline of traditional banana producers and the establishment of trade agreements regarding imports of primary products to Europe from several former colonies worldwide. Table 2-1 highlights some of the major differences in production between the Caribbean and Latin America. Several of the plantations in Latin America were established by multinational companies from the United States of America (USA) (see Jones and Morrison 1952) such as the United Fruit Company (now Chiquita Brands International) in Costa Rica. While both Latin American and Caribbean producers experienced growth up to the early 1960s, it became very apparent due to economies of scale advantages as well as regular investment in improving production in Latin America meant that Caribbean producers could not depend on volume to remain viable. The 1950s and 1960s also saw numerous setbacks and changes in the Caribbean. In the Eastern Caribbean, low banana prices resulted in unfavorable contracts with suppliers, rising costs of inputs, disease outbreaks and natural disasters such as windstorms and a volcanic eruption all limited production (Grossman 1993). Many islands, including larger producers such as Jamaica also achieved independence in the 1960s, making this a tumultuous period for the banana industry. Hence there was an increased focus on securing trade agreements with the European Community (EC) to maintain the industry.

In 1975, the EC signed a trade and aid agreement with 71 ACP countries; this became known as the Lomé Convention, guaranteeing a market for bananas produced by these countries.

This contributed to a recovery in banana production and increased exports from the Caribbean up until the famed Banana Trade War in the early 1990s.

The EU is a major bananas market (second to North America) and liberalization was predicted to result in large market losses for smaller producers. Several US companies invested in establishing banana estates in African ACP countries, taking advantage of EU trade tariff regulations and resulting in increased production from that continent (Kasteele 1998). This increased competition continued to occur while members of the Caribbean industry tend to focus on competition with Latin America. Since the role of EU regulations has been a point of major focus, companies have had to redefine themselves in order to fit within this market. The EU trade mechanism tried to balance an integrated market with a guaranteed market for the traditional ACP countries. However, the mechanism was seen as antithetical to the mandate of neoliberalism expounded in the 1980s and challenges by various countries resulted in a prolonged "banana trade war" involving countries all over the world. In addition to seeking the elimination of the banana tariffs, Kasteele (1998) contrasts the operations of the major banana companies as an example of the differences in operation between US and EU companies. European focused companies were shown to have been diversifying where they sourced their bananas – often based on labor costs with SE Asia and Latin America being the foci of this investment. Plantations have been established in ACP countries to take advantage of EU market tariffs. There has also been increased vertical integration among the US companies to reduce licensing fees. There was also a significant movement to expand in developing markets in Eastern Asia and Asia (notably China and Japan)

Since the 1990s, there have been concerted efforts to dismantle this agreement, which was renewed three times and then replaced by the Cotonou Agreement in 2000. These events are

widely referred to as the Banana Trade War and are chronicles in articles by authors such as Clegg (2001), Kasteele (1998), Dearden (1996) and Shah (2002). Non-governmental organizations (NGO's) such as Oxfam and websites such as Banana Link have also become involved in the dispute, acting as advocates for the smaller producers and analyzing the benefits and impacts of the decisions made on the livelihoods of those nations involved in export bananas. Several lobbyists for ACP nations have also repeatedly questioned the dispute over such a small share of the European market.

Beginning in 1993, when the EU (formerly the EC) offered a revised tariff regime to Lomé signatories, there has been ongoing challenges to the validity of the agreement via the WTO by several Latin American countries backed by the USA) whose companies are the principal investors in those plantations. There were already conflicting views on the regime as during the GATT Uruguay Round France sought to maintain the protection the EU had established for ACP suppliers, while Germany refused to accept the GATT accord in case it weakened its challenge to the existing EU banana regime that it was challenging in the European Court (Dearden 1996). This added pressure eventually resulted in a gradual shift in emphasis away from the policy relations between the UK and the Caribbean towards a more complex issue network at the EU level. Prior to 1993 the EU banana market was fragmented by national import controls; half of the EU's member states importing bananas had a preferential system for their traditional `colonial' suppliers. By contrast Germany, the largest EU market for bananas, allowed tariff free imports and was supplied by the more efficient Central and South American producers. The removal of internal barriers to trade consequently led to differences over the common banana import regime.

Clegg (2001) highlights the establishment of the WTO as the turning point in attempts to dismantle the EU's banana regime benefiting the ACP countries. Leading up to the initial revision of the tariff regime, Costa Rica, Colombia, Guatemala, Nicaragua and Venezuela consulted with the EC as to whether the banana policies were GATT compliant. In June 1993, the GATT council ratified a ruling to remove the quota arrangement afforded by the national regimes to the ACP countries and requested that tariff rates for Latin American banana producing states be brought in line with those for other GATT members. Supporting this decision were studies showing that the existing regime increased world prices and consequently meant higher costs for consumers (Dearden 1996).

This ruling set a precedent for challenges to the single market regime in place under the EU. The first breach was made in 1994 when the GATT council's ruling against the single market regime led to increased quotas for the Latin American challengers. Caribbean banana interests had little influence in the discussions as they were only third parties to the GATT dispute (only those directly involved in the case could challenge or defend the regime). By the end of 1994, more serious challenges were undertaken as some US companies believed that the EU's regime seriously discriminated against them. In September, Chiquita Brands International and the Hawaii Banana Producers Association called on the United States Trade Representative (USTR) to act (Clegg 2001). The resulting investigation led to threats of unilateral action against claiming that the policies harmed US commerce. Many theories have been put forward as to the reasons for the entry of the USA into the dispute, among the most prominent being financial contributions to both the Republican and Democratic parties by the CEO of Chiquita (Clegg 2001).

Despite various concessions, the case against the EU was pursued leading to the EU stating its intention to comply with the WTO ruling against the EU. In 1996, the first challenge since the formation of the WTO was made as a petition by Ecuador, Guatemala, Honduras and Mexico and backed by the USA. ACP countries were only allowed third party rights at the panel hearings, grouped together with countries such as Canada, India, Japan, and Thailand, who had no direct interest in the dispute .This meant that the ACP countries were not able to be directly involved in a process which was considering the future status of their banana exports, a sharp break from the past. In May 1997, the panel upheld much of the complaints made in the petition; an unsuccessful appeal meant the EU and the ACP countries were unable to prevent adoption of the report. Shah (2002) notes that the decision meant that the small Caribbean producers would be forced to compete on a “level playing field” with the much larger Latin American producers and large multinational corporations. The EU was given until the beginning to 1999 to reform its banana regime to meet the WTO ruling.

The EU continued to offer several revisions to the tariffs in place which the Latin American nations rejected; after lengthy discussions within the EU, an agreement was reached amongst the member states in June 1998 which sustained preferential access for ACP bananas in an altered format; import licenses were to be issued to ships on a “first come, first serve” basis (Shah 2002). This led the USTR to outline plans for unilateral sanctions on EU products entering the USA in the amount of US$520 million. Even though the EU requested a review of the banana regime, the US sought clearance from the WTO to impose the sanctions. However, two Caribbean islands, Dominica and St. Lucia halted proceedings, arguing that a dangerous precedent might be set if the US was allowed to act unilaterally, thereby undermining the basic

foundation of the multilateral trading system (Clegg 2001). This only delayed the final ruling and in April 1999 the WTO authorized the USA to impose US$ 191.4 million in trade sanctions.

This effectively broke the back of EU resistance to challenges on the banana trade regime. Although the Caribbean and other ACP countries were able to secure some victories over the years, ACP interests were marginalized on certain issues at the EU level. ACP countries were relegated to third party status, and having no direct role in the negotiation process at the WTO due to the nature of the issue under consideration there was little opportunity for the ACP states to improve their standing within the dispute settlement process. The more distant the decision-making process became, the more damaging were the policy outcomes for the ACP nations. After the ruling in April, the EU took steps to reform the preferential trade policies yet again. Based on a reformed tariff quota system, there would be a period of transition and a tariff only system would come into force in January 2006, with the ACP receiving an appropriate tariff-preference (European Commission 1999). The transitional nature of the regime was aimed at easing the adjustment to a flat tariff system, and would enable the EU banana supplying countries to make the necessary adaptations to have some chance of survival. This included additional help for those countries most dependent upon bananas, such as successor arrangements to the Lomé Convention, or through EU structural funds (Kasteele 1998; European Commission 1999).

According to Clegg (2001) the Caribbean's position through this period of negotiation was to reiterate the importance of the banana export trade to the region's economy. They also argued strongly that that both the 'first come, first served' license allocation system, which would have ended guaranteed access for its bananas into the EU market, and the tariff-only regime were unacceptable. An alternative proposal put forward to adapt portions of the WTO ruling fell apart,

reportedly due to US influences. Continued pressure through the WTO challenged the Cotonou Agreement, resulting in changes in license distribution to be based on historical trading patterns. This reduced import quotas for ACP bananas by 100,000 tons to 750,000 tons while the quota favoring dollar bananas increased by 100,000 tons to 453 000 tons and a commitment by the EU to move to a tariff-only system in 2006. In return, the US removed its $191 million of sanctions imposed on the EU in April 1999 and agreed to support the EU's attempt to obtain a WTO waiver to allow for the continuation of the exclusive ACP quota until 2006.

By 2007, there were also further cuts in tariffs on non-ACP bananas imports into the EU and ACP countries continuing to voice their opposition to the cuts, citing their inability to compete with these large producers. In December 2009, a final tariff regime was agreed upon by all parties. According to the Wall Street Journal (2009), the EU will reduce tariffs on bananas from Latin American countries to €114 (US$167) a ton in 2017 from €176 today, in return for Latin American countries dropping their WTO case. The article as reported that banana imports from the former colonies will fall 14%, costing them $40 million a year, and imports from other countries will increase 17%, according to a study by the Geneva-based International Centre for Sustainable Trade and Development. The EU trade commission has acknowledged the grave challenges facing ACP countries and has pledged to assist these nations in transitioning to compete on this new playing field (through programs such as the European Union Banana Support Program discussed later).

There are several other facets in exploring the banana industry in Jamaica and the Caribbean. However, the most relevant literature to the current research topic has focused on exploring similar facets of economic challenges and political influences in banana production. There has been very little written on transitioning from banana exports save a listing of

“available” options. In this regard, my study will build upon the more general themes of the local, regional and world banana industry by exploring just what it is that stakeholders have been doing to diversify from this longstanding sector and its broader meaning in the context of an increasingly globalized world.

Table 2-1. Comparison of banana production between the Caribbean and Latin America.

Caribbean Countries	Latin American Countries
Growing areas hilly or mountainous. Limited land availability.	Large flat plains. Wide land availability.
Poor soil conditions and low yields (not more than 10 tons/acre).	Rich soil and high yields (18-24 tons/acre).
Majority are independent, small farmers.	Largely plantation agriculture, often owned by transnational companies and vertically integrated operations.
Higher wages than in Latin America.	Wage rates low, social conditions of workers poor.
Unit cost of inputs much higher due to smaller volumes and varying soil types.	Lower unit cost of inputs due to high volume. Lower freight on board price due to lower market wages, low social benefits and economies of scale.
Shipping costs generally higher: smaller volumes, more port calls.	Lower shipping costs due to high volumes.

CHAPTER 3
RESEARCH METHODOLOGY

Data Collection Methods

One of the most common means of conducting fieldwork involving farmers is the use of the questionnaire. In thousands of surveys each year, persons within the agricultural sector are handed forms to fill out, most often to obtain information such as what crops are grown, the land area they cover and what yields were recorded. My study has focused on adaptive strategies within the banana industry and while questionnaires would gather information on what changes had been made, no real information may have been collected on the reasons behind the options chosen. Due to the short field research period, a decision was made to also capture information on the reasons behind the various adaptive strategies. To this end semi-formal interviews were utilized – this would sacrifice extent for detail. This is by no means the only project to have done so as various other researchers working at various scales have gone this route.

Other considerations were made in deciding on the use of instruments in the field were the expected character of the target groups, feasibility of execution on the ground and the relevance of the instrument in collecting valid information. From prior experience, it should be noted that farmers are not very fond of having to answer questionnaires often due to past experiences with other data gathers that would often be pushing for specific answers to questions farmers may not be willing or able to answer. It should also be noted that some farmers have problems reading due to eyesight or issues with literacy and so having to answer questions on paper would be quite uncomfortable for them. Feasibility of execution is always mostly limited to access to the persons of interest to the study. As contacts would have to be made and pilot testing carried out, an instrument such as a focus group discussion or a completely structured questionnaire would require time for validation and also reduce the already limited pool of prospective targets for this

study. Linked to this is the instrument's ability to obtain the information desired. Questionnaires and semi-structured interviews can be used together to collect information on adaptive strategies with less intrusion than say, an ethnographic assessment but cover a significant number of people with sufficient depth. Group consensus on adaptive strategies would not be needed as the study was directed at exploring individual responses to the end of the export industry. One other consideration on the choice of instruments was based on familiarity. Both choices have already been used in other research projects at varying scales and so, one could proceed with confidence that effective research instruments could be formulated and used in the field.

The main period of instrument design and validation took place as part of a research methods course. Here questions were designed, tested and reformulated based on more general topics. These instruments were then refined to specifically relate to this thesis at the end of the coursework. The process followed a path similar to the one outlined below

In addition to the design of the research instruments, hypotheses were developed and the instruments geared to answer three hypotheses proposed prior to fieldwork. These were:

- Farmers who depend solely on the local banana market will be less able to sustain production and/or livelihood in the short term.
- Farmers that have developed adaptive strategies to the closure of the export market have subsequently maintained a relatively stable livelihood.
- Smaller land holders are likely to develop more adaptive strategies to the closure of the export market than larger land holders.

Field Data Collection

Once the instruments were designed and approval obtained from the IRB, the field data collection process was conducted between June and August 2009. The first step was to make contact with the relevant organizations in the banana sector. Emails proved to be a futile means of communication, so all conversations were done by telephone and personal visits. Contact was

made with the parish manager of the St. Thomas Rural Agricultural Development Authority (RADA). From this meeting, contact was established with other agencies such as the Banana Board (BB) and the Social Development Commission (SDC). Many of the employees had also worked in the banana industry and were able to give guidance on contacting former plantation workers. Contact with the BB enabled the study to get off the ground with pilot testing of the questions in the interviews and questionnaires. After conducting this with a former worker and two farmers, it became apparent that the questionnaire would not be an effective method of collecting the desired information. This instrument was retired and certain questions were incorporated into the semi-structured interview form. It also became clear that several different interview forms were needed based on the audience involved. This was done and a sample of the interview forms can be seen in Appendix A.

Interviews were conducted in the three month research period and after the first week, it was realized that three distinctive groups of interviewees (instead of two) could be identified. These were farmers, former workers and the support services. In addition, informal interviews were conducted where persons were not willing to be officially interviewed. Tours of farms and demonstration plots, attending farmer conferences and national meetings, integration into the operations of the support structure and touring agro-processing plants were all components of the field work. Another important aspect was the collection of secondary information to make up for the breadth of information that might have been collected via the questionnaire. Information was collected from sources as diverse as the government's Planning Institute of Jamaica (PIOJ) and Ministry of Agriculture (MoA), news clippings about the banana industry and brochures from various groups represented at farmer expos and meetings. All told, at the end of the field period in August, approximately 42 interviews and farm tours were conducted with 34 being formal

interviews representing all target groups but most heavily focusing on farmers. All interviews were transcribed using Microsoft Word and after all the data was collated, the process of data analysis began.

Data Analysis Methods

Quantitative Analysis

Due to the number of interviews collected from each target group, the only group on which detailed analysis could be carried out was farmers. Descriptive statistics were generated for all three groups to highlight some general trends on which discussion could begin. For the farmer dataset, three challenges arose. The first was the small sample size of farmers - 23 interviews were conducted and they represented 21 farmers. The second was the non-normal distribution of data, which further restricted the possible tests that could be used. The third was the nature of the data collected; because much of the information to be used came from the interviews, most of the data was nominal and ordinal with very little ordinal scale data. These three challenges combined meant that only certain non-parametric statistics could be used, ones that could be used to test a small dataset that had restricted transformation potential and exhibited non-normal tendencies. Three tests were identified and a brief description of each test used is given. Detail on how each was used can be seen in the chapter focusing on data analysis.

2x2 contingency table

A contingency table is a “cross-classified set of frequency counts for two nominally or ordinally scaled variables, each having two or more classes (Burt and Barber 1996, 364). This method of analysis allows simple division of the information collected in the interviews. In a 2x2 contingency table, two variables are identified and separated based on their median values. The resulting table can then be tested for statistical independence using the Chi-square distribution.

Spearman Rank Correlation Coefficient

A measure of linear correlation between two variables, this non-parametric test makes no other assumptions about the nature of the two variables when testing for a relationship. This test is used in place of one such as Pearson's product moment correlation coefficient since it is more suited for ordinal and nominal scale data or where the interval scale data may not be best suited for parametric tests (Burt and Barber 1996, 393). The correction factor for this test is applied as there are a significant number of ties in the dataset. For the purposes of this study, this test examined the relationships between pairs of farm characteristics that were able to be ranked.

The point biserial coefficient of correlation

This measure of correlation utilizes two variables, one which is dichotomous and the other being measured on a continuous scale. The binary variable is used to define two sub-samples not radically different in size. Together with the continuous variable, a measure of correlation is calculated which has a range from -1 to +1. This test has the advantage of having a known sampling distribution so that tests of significance are straightforward (Norcliffe 1977, 122). There are elements of both parametric and non-parametric correlation in this test and the assumptions are not distribution free.

Qualitative Analysis

The approach to examining the interviews collected was taken from Swisher (2009) as a means to maximize the potential of the rich content of this qualitative dataset. One of the first steps in the qualitative data analysis process was to archive the information collected. This involved transcribing each interview as well as entering comments on various impressions about each interview. These aided in the recall of pertinent information during the data analysis stage.

Once the interviews were typed, each was examined for major themes and trends. Codes were assigned for each theme noted, along with the relevant interview information. This allowed

for general categorization into common themes; these themes were used as threads linking each interview and enabled one to examine each one in more detail. These common themes were them broken down into categories which may be completely different from the general themes. After sub-categories were developed, the dataset was examined for relationships based on farm size, parish of interview and target group.

Once this was done, attempts were made to develop an ordered approach to explain the data collected. In this process, secondary data collected was incorporated into the analysis to examine the adaptive strategies that were discovered during fieldwork. Various approaches to explaining the dataset were pursued, including developing an overall synthesis, understanding the differences at the local level and exploring the adaptive strategies in the context of the world banana industry. The next step was to validate each of the approaches by comparing the results with the literature published. Combined with the quantitative analysis of the information collected, this approach sought to give a complete account of the adaptive strategies being pursued subsequent to the end of banana exports.

CHAPTER 4
PRESENTATION AND ANALYSIS OF DATA

General Findings

Most of the information to be analyzed was collected during fieldwork. As such, one of the first steps was to create descriptive statistics of this data in order to have a clearer understanding as well as possibly noting patterns within the entire dataset as well each of the target groups (farmers, former workers and support agencies).

Interviews were conducted across the entire island in the banana growing parishes. The location of the interviews can be seen in Figure 4-1. The eastern parishes of St. Mary, Portland and St. Thomas have long been considered the main banana exporting parishes for the last 20 years. Therefore it was not surprising that well over 50% of the interviews were from those areas. Interviews in the Kingston Metropolitan Area (KMA) were primarily with various support services and interviews conducted in St. Thomas were mainly with persons who used to work with the banana estate that closed with the end of exports. Figure 4-2 shows that among the formal interviews conducted, most were done with farmers. Though the number is relatively small, there were approximately 220 registered export farmers in the island in 2008, making the number of farmers interviewed just about 10% of the total population. However, the small number of interviews with other groups meant that statistical analysis could not be performed; instead only thematic analysis was conducted on these groups.

Since the largest group was for farmers, more detailed descriptive statistics could be obtained. Figure 4-3 shows the farm sizes of the interviewees. The pattern showed here indicated a large number of smaller farmers (up to 20 acres) with a smaller number of farmers with substantial land. This followed the trend in the Jamaican small holder agricultural system where the number of farmers may be high but the actual group producing most of the crop is quite

small. In Jamaica, there is one big estate - Jamaica Producers (JP) that dominated the market; further exploration of this phenomenon is done in the discussion of the findings.

Data was collected on the various activities done by farmers and these were divided into two main categories that are shown in Figures 4-4 and 4-5. The focus of this study was on the banana industry, so expectedly, all farmers interviewed grew bananas. The next most popular crop grown was dasheen[1], then coconut, plantain and various fast growing crops grown for cash (cash crops). There were a few things that should be noted in order to account for the trend seen. Coconut was traditionally intercropped with bananas since the beginning of the 20th century, particularly since the post World War II era when Jamaica pursued exports in the coconut industry. The tendency for farmers to grow root crops such as dasheen, coco[2], sweet potato and cassava[3] was due to the desire to grow hurricane resisitant crops as reflected in Figure 4-5. A few farmers also raised animals but during fieldwork, most farmers revealed that it was not considered a primary activity but mainly for household and community consumption.

With the end of banana exports and the resulting contraction in the marketplace, it was no surprise that farmers sought to reduce their banana acreage, as seen in Figure 4-5. With the reduction in acreage, farmers also reduced the amount of inputs (chemicals, fertilizers, hired labor) for banana production. Instead farmers sought to grow other crops, such as those in Figure 4-4. When the banana export sector was available, farmers just had to ensure the fruit was grown to specification and there was a ready market. However, several farmers have realized the need to diversify how the sell their crop as evidenced by the diverse markets being pursued by the

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[1] *Colocasia esculenta;* otherwise known as taro and closely related to the *Xanthsoma* genus.

[2] Belonging to the *Xanthasoma* genus, this plant is an arum that is generally called cocoyam in other countries.

[3] *Manihot esculenta*; this crop is also called manioc or yuca in other countries. “Sweet” cassava is the prevalent variety grown by farmers.

farmers. The choice of market depended on the formal and informal knowledge of the farmer to enter those markets, as well as prior experiences with each. The entry into the value added market was pursued by a small number of farmers, with the main restricting factors being education and the costs of entering into such a venture. Many were willing to be providers in the production chain rather than be actively involved. One important strategy to be noted was that almost all the farmers accessed support from the European Union Banana Support Program in Jamaica (EUBSP). This was significant as it reflected the dependence of the farmers to remain viable, even with the end of exports.

Less detailed descriptive statistics were obtained from the other two groups. Figures 4-6 and 4-7 show some of the general characteristics of the former workers that were interviewed. Interviews were more concentrated in St. Thomas (see Figure 4-6) as closure of the Eastern Banana Estate in the parish resulted in hundreds of job losses. The St. Mary Banana Estate was not closed but scaled down, resulting in fewer job losses. Banana estates tend to employ more males than females for field operations but more females than males for the packing operations. Figure 4-7 showed that more males were interviewed, but this was mainly due to the availability of persons to be interviewed.

With the end of exports and the consequent market contraction affecting all stakeholders, one of the greatest challenges that former workers faced was obtaining new employment. Figure 4-8 shows that of the six former workers interviewed, only one person was employed full-time. The engagement in seasonal work was focused on the sugarcane cutting season which had ended in June. Entrepreneural activities were focused on opening a shop selling low costs groceries and other consumables. For all effective purposes, the first three categories in Figure 4-8 were essentially the same at the time of fieldwork. The closure of the banana estate and the end of the

sugar cane season meant that there were very few employment opportunities and few people who could contribute to the economic base of the areas in which former workers were located.

One main role of the support agencies was to aid in the retraining of persons leaving the industry. However, as Figure 4-9 indicates, although most former workers were aware of retraining opportunities, even fewer pursued them, and none of the interviewees were able to access these opportunities. Interestingly, it was only the females that attempted to access any of the retraining information. They reported that the programs being done at the time were either for another district or were already full. There was the overall concern that information pertaining to training could only be obtained second-hand, leading to the impression of exclusion and abadonment of the area by the support services.

The major activities pursued by the main support services are highlighted in Figure 4-10. The key organizations in the banana industry were the BB and the EUBSP. The RADA is mandated to work with domestic crops and so was only concerned with diversification activities in the industry. This is related to retraining which was the some domain of the EUBSP, as opposed to training in various farming methods by the BB and EUBSP. The role of these organizations is discussed in more detail the discussion of the findings.

Statistical Analysis

Normality Testing

Before any of the tests were conducted, a series of normality tests were run on the dataset using NCSS as further proof for the use of non-parametric statistical tests. The results are shown in Figure 4-11. The implications of the tests will be further discussed in the results of the statistical tests.

2x2 Contingency Table

This test was used to examine whether or not there was correlation among farm size, number of crops grown and number of strategies pursued. After the observed and expected values were calculated, the Yeates "correction factor" Chi square formula shown in Equation 4-1 was used as the same size was small and at least one of the expected values were between 5 and 10.

$$X_y^2 = \sum_{j=1}^{m} [(|O_j - E_j| - 0.5)^2 / E_j] \tag{4-1}$$

The Phi coefficient (φ) was also calculated for each combination using the formula shown in Equation 4-2:

$$\varphi = \frac{A*D - B*C}{\sqrt{(A+B)*(C+D)*(A+C)*(B+D)}} \tag{4-2}$$

where A,B,C and D are the observed values in the 2x2 contingency table as shown in Figure 4-12. The coefficient has a range of $-1.0 < \varphi < +1.0$.

The resulting values are shown in Table 4-1. Along with the calculated values, the significance of the results was tested at both the 75% and 95% confidence levels as shown in Table 4-1. The only pairing that showed a statistically significant association is farm size vs. the number of strategies pursued, at the 70% confidence level but there is only a very weak association between the two. There was no significant association between any of the pairings according the Phi coefficient. However, it must be noted that there was the problem of having enough observations in all cells for the first and third pairings. Contingency table results become suspect if there is more than one cell with less than five observations. Due to the small sample size, and the distribution of observations, this problem could be expected from the dataset.

Spearman Rank Correlation Coefficient

The second non-parametric test was the Spearman rank correlation coefficient which measured linear correlation between two variables. The same group of variables was used in this test. The first step in this test was to convert the raw scores to ranks and then the difference between the ranks of each observation on the two variables is calculated. Because of the large number of ties in the dataset, a formula derived from classic Pearson correlation coefficient between ranks was used.

Spearman's rho (ρ) was calculated using the formula in Equation 4-3:

$$\rho = \frac{n(\sum x_i y_i) - (\sum x_i) * (\sum y_i)}{\sqrt{n(\sum x_i^2) - (\sum x_i)^2} * \sqrt{n(\sum y_i^2) - (y_i)^2}} \tag{4-3}$$

Where x and y are the rankings for a given observation i, and n is the total number of observations.

The significance of Spearman's rho was calculated using the formula in Equation 4-4 and compared to the Student's t distribution.

$$t = \rho * \sqrt{\frac{N-2}{1-\rho^2}} \tag{4-4}$$

Where N is the total number of observations.

The results of the test summarized in Table 4-2 show that there was no statistically significant correlation among farm size, the number of crops or animals grown or the number of adaptive strategies pursued for this dataset. Even though there was no value in testing the significance of Spearman's rho, there was expectedly no significance in those values.

Point Biserial Coefficient of Correlation

The third non-parametric test was the point biserial coefficient of correlation. Unlike the other tests that compare two variables, this test used one variable that was continuous and one

that was binary. In this way several combinations could be tested. There were two assumptions that had to be made when this test was conducted. These were:

- The binary variable, X, may be used to define two sub-samples (X=0 and X=1). The values of Y within these sub-samples should be normally distributed and should have equal variance.
- The two sub-samples defined by X should not be radically different and the more equal they are in size, the more accurate is the test.

For this test, the dichotomous variable, X had approximately equal sub-samples. However, as shown in Figure 11, there were issues of non-normality and consequently equal variance.

The means of the sub-samples were calculated using the formulae in Equation 4-5:

$$\overline{Y_0} = \frac{\sum Y_{0i}}{N_0} \quad \text{and} \quad \overline{Y_1} = \frac{\sum Y_{1i}}{N_1} \tag{4-5}$$

Where Y0 and Y1 denote the sub-samples for each i-th observation, and N is the number of observations and N = N0 + N1.

Next, the standard deviation of the continuous variable, Y (ŝY), was calculated using the formula shown in Equation 4-6:

$$\hat{s}Y = \sqrt{\frac{N\sum Y^2 - (\sum Y)^2}{N(N-1)}} \tag{4-6}$$

After this, the point biserial coefficient (rpb) can be calculated as in Equation 4-7:

$$rpb = \frac{\overline{Y_1} - \overline{Y}_0}{s_Y} * \sqrt{\frac{N_1 * N_0}{N(N-1)}} \tag{4-7}$$

Finally, significance testing against the Student's t distribution was done by calculating the t value using the formula in Equation 4-8:

$$t = rpb * \sqrt{\frac{N-2}{1-r_{pb}^2}} \quad (4\text{-}8)$$

The results of the test are shown in Table 4-3. A total of 21 combinations of variables were tested and all 21 returned very weak correlations. Again, even though it would not improve the validity of the results, statistical significance of the coefficient was tested at the 75% and 95% confidence levels – all variables tested confirmed that all the results were not significant.

In summary, the only test that returned any statistically significant correlations was the 2x2 contingency table but this suffered from limitations of a small dataset.

Thematic Analysis

Using an adaptation of the data analysis components from Swisher (2009), there were three main levels to the thematic analysis: assigning codes to each interview, finding the general themes of each interview and assigning them to categories and finding relationships between those categories.

Each interview was assigned codes based on the target group interviewed, the parish of the interview and whether or not each farmer was involved in exports up to the closure in 2008. A breakdown of the results is shown in Table 4-4.

After coding the interviews, themes were identified from each interview and these were collated into more general categories. These results are shown in Figure 4-13. The themes for the farmers interviewed were coded and similarities sought across the parishes in which the interviews took place. Similar themes were coded a one (1) and the absence of a theme was coded as a zero (0).

These themes were then aggregated into categories that would allow for the exploration of relationships, both within the dataset and the secondary information collected. An example of the categoriesidentified being placed into higher level categories based on relationships is shown in

Table 4-5. These related categories were often treated as a whole for the discussion of the adaptive strategies in the next section.

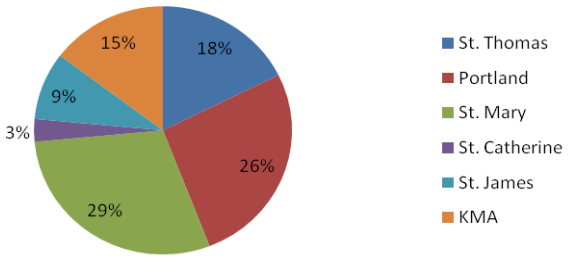


Figure 4-1. Interview locations

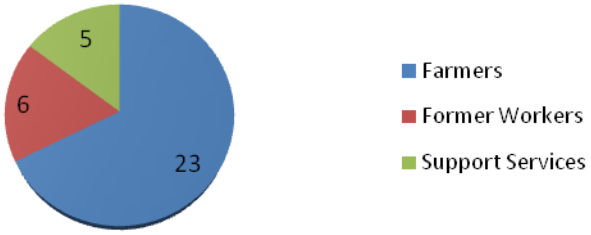


Figure 4-2. Interviews by target grouping.

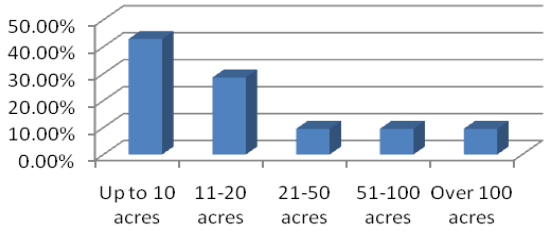


Figure 4-3. Farm sizes of interviewees: Small farmers have up to 20 acres, medium farmers have from 21-50 acres, large farmers have from 51-100 acres and estates have over 100 acres.

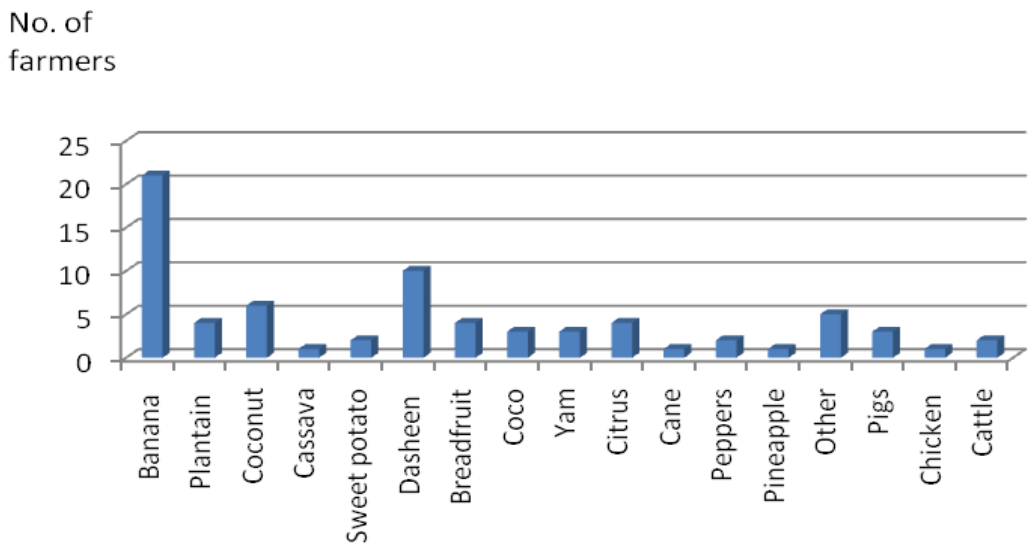
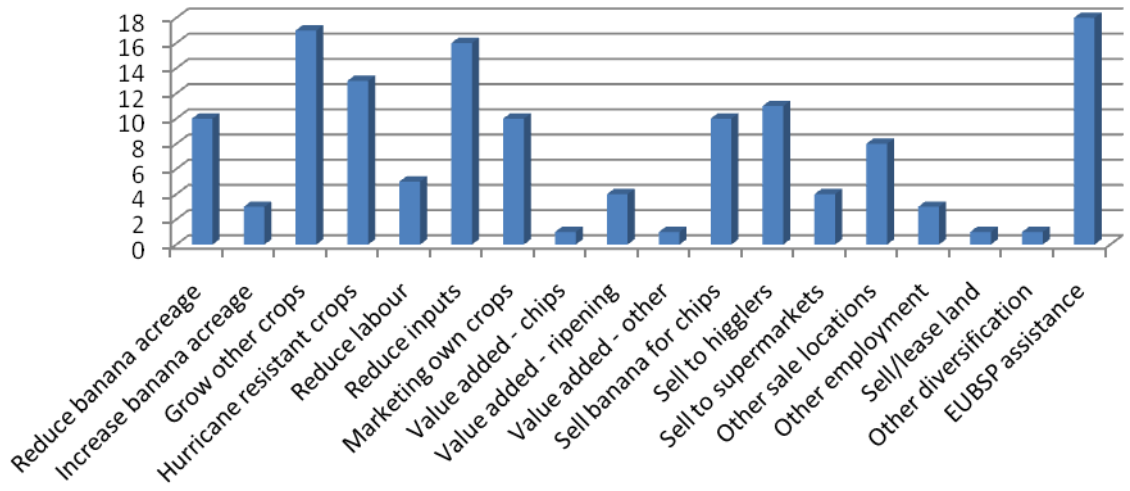
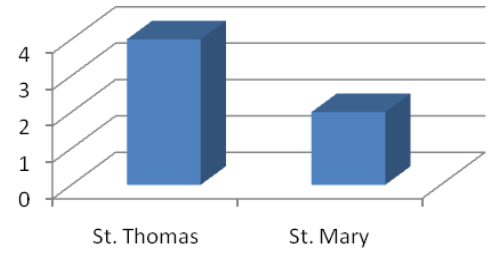


Figure 4-4. Crops grown and animals raised by farmers.

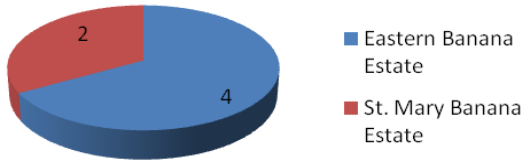


* Higglers are small scale vendors that form the key link between farmers and the domestic market.

Figure 4-5. Adaptive strategies pursued by farmers interviewed.



A



B

Figure 4-6. Details of former workers interviewed: A. Locations of former worker interviews. B: Former places of employment of interviewees.

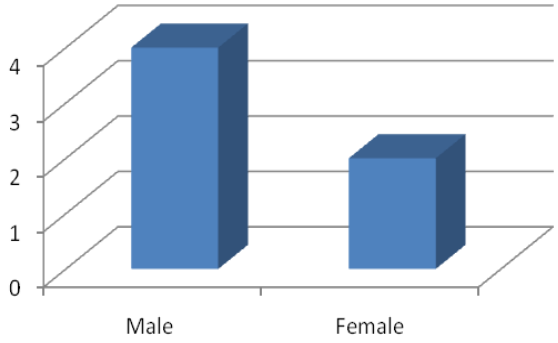


Figure 4-7. Gender breakdown of former workers.

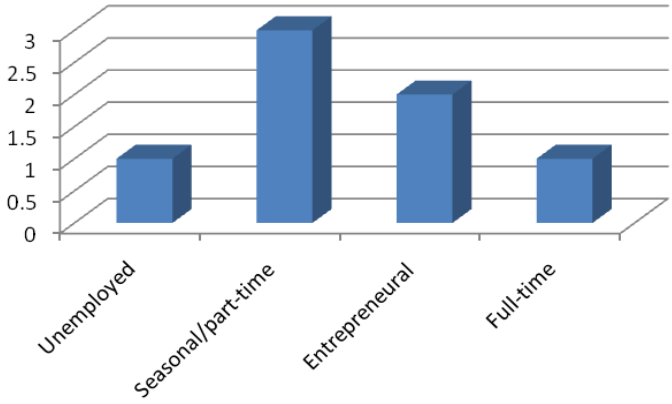


Figure 4-8. Current employment activities of former workers.

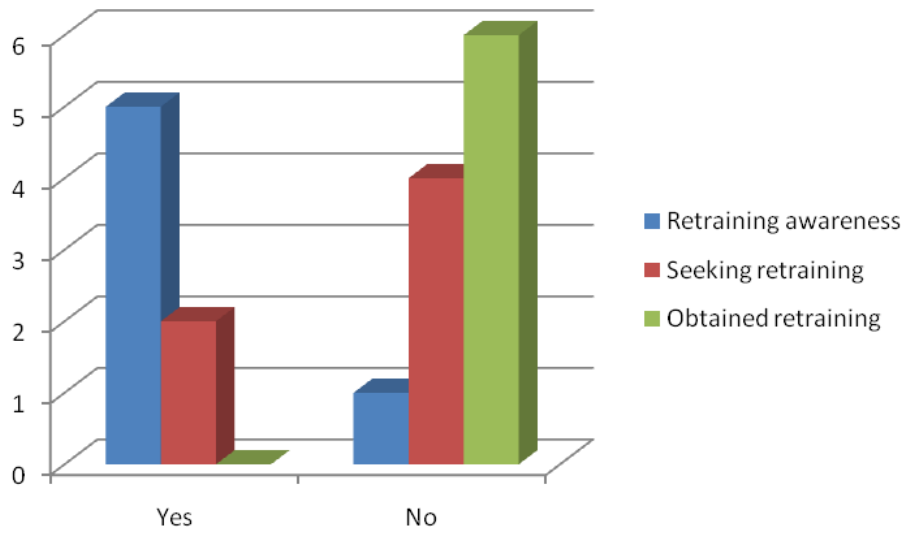


Figure 4-9. Retraining awareness among former banana workers.

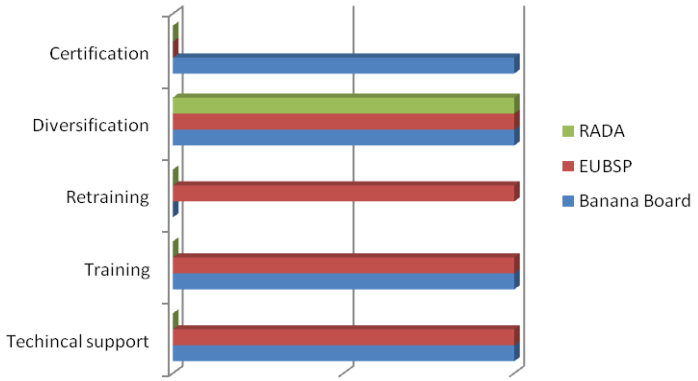
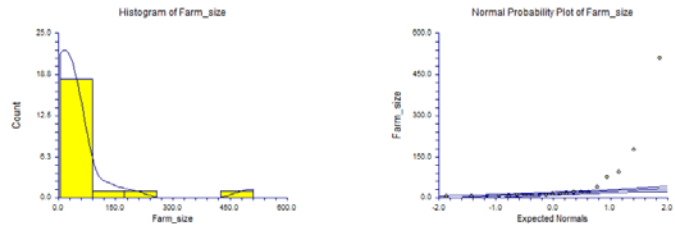


Figure 4-10. Support activities by service agency.

Normality Test Section of Farm_size

Test Name	Test Value	Prob Level	10% Critical Value	5% Critical Value	Decision (5%)
Shapiro-Wilk W	0.4444095	6.498784E-08			Reject normality
Anderson-Darling	4.593272	2.206866E-11			Reject normality
Martinez-Iglewicz	194.3299		1.206468	1.336919	Reject normality
Kolmogorov-Smirnov	0.3693582		0.173	0.188	Reject normality
D'Agostino Skewness	5.028056	4.954772E-07	1.645	1.960	Reject normality
D'Agostino Kurtosis	4.3617	0.000013	1.645	1.960	Reject normality
D'Agostino Omnibus	44.3056	0.000000	4.605	5.991	Reject normality

Plots Section of Farm_size

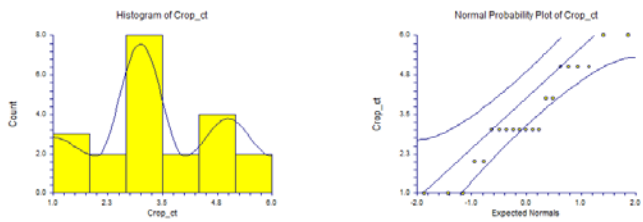


A.

Normality Test Section of Crop_ct

Test Name	Test Value	Prob Level	10% Critical Value	5% Critical Value	Decision (5%)
Shapiro-Wilk W	0.9187242	8.182993E-02			Can't reject normality
Anderson-Darling	0.7219379	5.971636E-02			Can't reject normality
Martinez-Iglewicz	0.9626315		1.206468	1.336919	Can't reject normality
Kolmogorov-Smirnov	0.2172249		0.173	0.188	Reject normality
D'Agostino Skewness	0.2337294	0.815195	1.645	1.960	Can't reject normality
D'Agostino Kurtosis	-0.8030	0.421971	1.645	1.960	Can't reject normality
D'Agostino Omnibus	0.6994	0.704883	4.605	5.991	Can't reject normality

Plots Section of Crop_ct

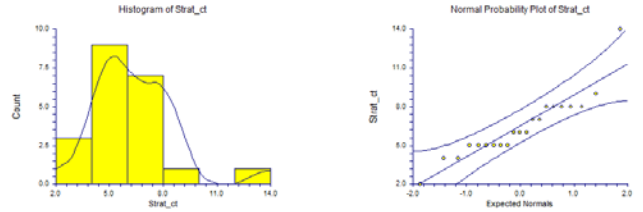


B.

Normality Test Section of Strat_ct

Test Name	Test Value	Prob Level	10% Critical Value	5% Critical Value	Decision (5%)
Shapiro-Wilk W	0.8883275	2.091552E-02			Reject normality
Anderson-Darling	0.7830756	4.219419E-02			Reject normality
Martinez-Iglewicz	1.606724		1.206468	1.336919	Reject normality
Kolmogorov-Smirnov	0.1663361		0.173	0.188	Can't reject normality
D'Agostino Skewness	2.376637	1.747126E-02	1.645	1.960	Reject normality
D'Agostino Kurtosis	2.4151	0.015730	1.645	1.960	Reject normality
D'Agostino Omnibus	11.4812	0.003213	4.605	5.991	Reject normality

Plots Section of Strat_ct



C.

Figure 4-11. Normality test results for farm size (A), crop and animal count (B), and adaptive strategy count (C).

A	B
C	D

Figure 4-12. Diagrammatic representation of values used in the 2x2 contingency table.

Table 4-1. 2x2 contingency table results.

	Calculated chi-square value	Critical value @ α=0.30	Critical value @ α=0.05	Result	Phi correlation coefficient	Result
Farm size vs. No. of crops/animals grown	0.585	1.074	3.84	Not significant	-0.309	Moderate, negative association
Farm size vs. No. of strategies pursued	1.217	1.074	3.84	Significant at the 70% confidence level	-0.055	Weak, negative association
No. of crops/animals grown vs. No. of strategies pursued	0.3374	1.074	3.84	Not significant	0.252	Weak to moderate positive association

Table 4-2. Results of the Spearman correlation of coefficient test.

	Calculated Spearman's rho (ρ)	Result	Calculated t-value	Critical value @ α=0.25	Critical value @ α=0.05	Result
Farm size vs. No. of crops/animals grown	-0.000299	Extremely weak, negative association	-0.00130	0.686	1.721	Not significant
Farm size vs. No. of strategies pursued	-0.000308	Extremely weak, negative association	-0.00134	0.686	1.721	Not significant
No. of crops/animals grown vs. No. of strategies pursued	-0.00105	Extremely weak, negative association	-0.00458	0.686	1.721	Not significant

Table 4-3. Point biserial test results.

Main group	Sub-group	Point biserial correlation coefficient	Correlation result	Calculated t-value	Critical value @ α= 0.25	Critical value @ α= 0.05	Significance result
Farm size vs. Various factors	Farm size vs. Dasheen growers	0.000667	Extremely weak, positive	0.0029	0.688	1.729	No significance
	Farm size vs. Banana acreage reduction	-0.000502	Extremely weak, negative	-0.00219	0.688	1.729	No significance
	Farm size vs. Hurricane resistant crops	-0.000297	Extremely weak, negative	-0.0013	0.688	1.729	No significance
	Farm size vs. Marketing own crops	-0.00056	Extremely weak, negative	-0.00245	0.688	1.729	No significance
	Farm size vs. Selling banana for chips	0.00394	Extremely weak, positive	0.00172	0.688	1.729	No significance
	Farm size vs. Selling banana to supermarket	0.000193	Extremely weak, positive	0.000844	0.688	1.729	No significance
	Farm size vs. Selling banana to other locations	0.000324	Extremely weak, positive	0.00141	0.688	1.729	No significance

Table 4-3. Continued

Main group	Sub-group	Point biserial correlation coefficient	Correlation result	Calculated t-value	Critical value @ α= 0.25	Critical value @ α= 0.05	Significance result
Crop count vs. Various factors	Crop count vs. Dasheen growers	-0.000645	Extremely weak, negative	-0.00281	0.688	1.729	No significance
	Crop count vs. Banana acreage reduction	-0.00485	Extremely weak, negative	-0.00211	0.688	1.729	No significance
	Crop count vs. Hurricane resistant crops	-0.0695	Extremely weak, negative	-0.303	0.688	1.729	No significance
	Crop count vs. Marketing own crops	-0.00211	Extremely weak, negative	-0.00921	0.688	1.729	No significance
	Crop count vs. Selling banana for chips	0.00196	Extremely weak, positive	0.00853	0.688	1.729	No significance
	Crop count vs. Selling banana to supermarket	0.00256	Extremely weak, positive	0.0111	0.688	1.729	No significance
	Crop count vs. Selling banana to other locations	0.00000199	Extremely weak, positive	0.00000869	0.688	1.729	No significance
	Strategy count vs. Marketing own crops	-0.00087	Extremely weak, negative	-0.00379	0.688	1.729	No significance
	Strategy count vs. Selling banana for chips	-0.00031	Extremely weak, negative	-0.00133	0.688	1.729	No significance
	Strategy count vs. Selling banana to supermarket	-0.000236	Extremely weak, negative	-0.00103	0.688	1.729	No significance
	Strategy count vs. Selling banana to other locations	-0.00018	Extremely weak, negative	-0.00079	0.688	1.729	No significance

Table 4-3. Continued

Main group	Sub-group	Point biserial correlation coefficient	Correlation result	Calculated t-value	Critical value @ α= 0.25	Critical value @ α= 0.05	Significance result
Strategy count vs. Various factors	Strategy count vs. Dasheen growers	0.000551	Extremely weak, positive	0.00241	0.688	1.729	No significance
	Strategy count vs. Banana acreage reduction	-0.00132	Extremely weak, negative	-0.00575	0.688	1.729	No significance
	Strategy count vs. Hurricane resistant crops	-0.00121	Extremely weak, negative	-0.00526	0.688	1.729	No significance
	Strategy count vs. Marketing own crops	-0.00087	Extremely weak, negative	-0.00379	0.688	1.729	No significance
	Strategy count vs. Selling banana for chips	-0.00031	Extremely weak, negative	-0.00133	0.688	1.729	No significance
	Strategy count vs. Selling banana to supermarket	-0.000236	Extremely weak, negative	-0.00103	0.688	1.729	No significance
	Strategy count vs. Selling banana to other locations	-0.00018	Extremely weak, negative	-0.00079	0.688	1.729	No significance

Table 4-4. Initial coding of interviews.

	Farmers in export up to 2008 closure	Farmers not in exports at closure	Former Workers	Support Services	Total
St. Thomas	1	0	4	1	6
Portland	8	1	0	0	9
St. Mary	8	0	2	0	10
St. Catherine	0	1	0	0	1
St. James	1	2*	0	0	3
KMA	1	0	0	0	1
Total	19	4	6	5	34

* One farmer was never involved in exports.

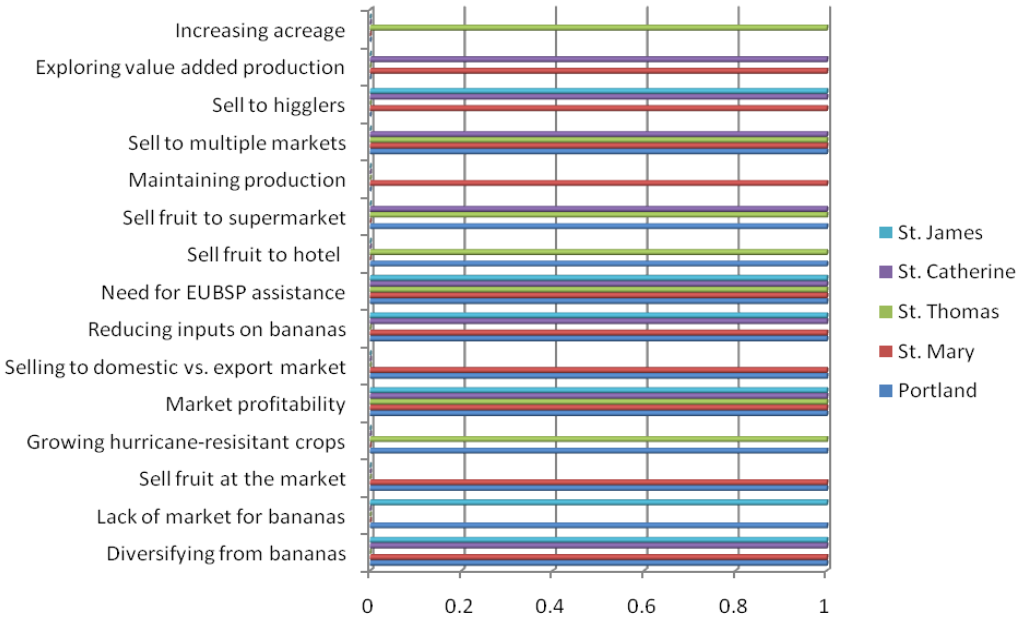


Figure 4-13. General categorization of interview themes for farmers.

Table 4-5. Sample reclassification of themes based on common relationship.

Old categories	New categories
Diversifying from bananas	Diversification strategies
Growing hurricane-resistant crops	
Selling to domestic vs. export market	
Reducing inputs on bananas	
Maintaining production	
Increasing acreage	
Exploring value added production	Need for marketing
Lack of market for bananas	
Need for EUBSP assistance	Assistance from support services
Reducing inputs on bananas	
Exploring value added production	Value-added production
Sell fruit to hotel	Marketing strategies
Sell fruit at the market	
Sell fruit to supermarket	
Sell to multiple markets	
Sell to higglers	

CHAPTER 5
DISCUSSION OF ADAPTIVE STRATEGIES AMONG THE TARGET GROUPS

Since the mid-1800s Jamaica has been in the business of exporting bananas. However, the closure of the export market in October 2008 left stakeholders in a precarious position requiring significant restructuring in order to remain viable. As noted in the literature, farmers faced challenges not only from their immediate socio-economic and physical environment but also on the global market. Persons engaged in agriculture in developing nations such as Jamaica often face a losing battle to remain viable in such circumstances. The additional challenge of adjusting to a new market structure would have widespread implications on adaptive strategies. In response to the closure of the export sector, the government had modified its mandate regarding bananas to refocus the industry on the domestic market. Thus, farmers, former workers and the various support services have had to make significant adjustments to this new reality.

The Jamaican banana industry is unique in that unlike most small banana-exporting industry, there is a strong local demand for bananas. Sold in a variety of forms, from green and ripe fruit, as chips and a part of desserts, bananas are popular among locals. According to an article published before the closure of the export sector, “Jamaicans consumed 100,000 tons or more than three times the 32,000 tons of bananas sold to foreign markets in 2006” (Rose and Myers 2008). With such a strong potential, several stakeholders played down the importance of the loss of on the local side, and one might ask “why have these farmers focused on the export sector?”

Answers to this question have played out in the aftermath of the closure with the claims of a huge domestic capacity have been countered by certain stakeholders and others facing difficulties in finding a market for their produce. One large farmer calculated that if the lower guestimates of 80,000 tons were being produced island-wide, you would have approximately

13,800 boxes or 400 truck loads per day. Since there was no evidence of such large movements of fruit, the farmer countered that a more reasonable estimate would be 27,000 tons (4,500 boxes or 30-40 truck loads per day) which would be just below the quantity of fruit exported in 2008. With bananas for the local markets are grown island-wide by thousands of small farmers and the loss of the export market, this reality has forced banana farmers to find creative ways in becoming competitive in an already occupied market. This endeavor has been further hampered by the lack of quantitative data on the domestic banana market made it difficult for farmers to gauge market capacity and the ability to remain viable in the industry. But as we will see, all of these challenges are being addressed by each of the target groups as they adapt to their new reality.

Adaptive Strategies Among Farmers

Most farmers that were involved in banana exports did not focus solely on the export market; not all fruit grown is of export quality and those "reject bananas" were often sold at markets, to local vendors known as higglers[1], to enterprises that focused on making banana chips among other avenues. With the closure of the export market, these farmers have had to sell all their fruit through these routes, putting them in direct competition with thousands of other small farmers across the island that grow and sell bananas. This reduced domestic market capacity has led to several adaptations which will be examined below. Interestingly, many of the events predicted by Meindertsma and Grant (2007) should exports cease have come true. Adjusting to domestic demand has meant downscaling production, increasing the share of bananas dedicated

[1] Higglers are small scale vendors of a variety of items ranging from agricultural products to commercial goods. They often form the key link between farmers and the domestic market as middle men (and women); often willing to purchase irregular amounts of produce, these vendors are a ready market for farmers.

to chips since there is a limited capacity for ripe bananas, job losses and decreased profit margins due to competition with other domestic producers.

Land Management Strategies

Though small land holders made up the largest proportion of banana farmers (see Figure 5-1), it was the large farmers who had a significant share of the export sector. However, both groups have had similar approaches to managing the acreage under production. Over the past 25 years there has been a steady decline in producers; in 1984 there were well over 1000 farmers according to the Banana Board. This fell to 500 exporters in 1987 and by 2008 there were only 220 farmers registered as exporters. These farmers tended to be longstanding farmers, stakeholders who were among the best banana farmers and often unwilling or unable to pursue other ways of life. In contrast with the Caribbean banana industry, producers in Latin America tend to have a larger portion of large farmers and average farm sizes surpass those of islands like Jamaica by orders of magnitude. Figure 5-2 displays the level of banana exports over a 24 year period. After peaking in the mid-nineties, banana exports have followed the pattern of decline. As discussed in Chapter 2, decreasing profit margins and eroding terms of trade with the EU as a result of the liberalization of the world banana market have forced several farmers out of the industry and arrested investments in order to improve efficiency and compete globally. Additionally, the repeated occurrences of natural disasters have contributed to the decline; many farmers were hard hit by droughts in the mid-1990s and then hurricanes in the last few years and were thus unwilling or unable to resume production.

Among farmers still in production, the major estate - JP, was estimated to have had some 80-95% of the export market have had to cut production significantly and close one of their estates in order to adjust to the transition to the domestic market. The resulting job losses among hundreds of workers and their impacts will be discussed later on. Small and medium farmers

have also had to cut acreage in a bid to cope with the new market. Figure 5-3 shows that almost half of all farmers reduced their banana acreages with a comparatively small proportion (14.27%), increasing banana holdings. Several farmers reported having to give away dozens of bunches of fruit or else leave them to rot on the trees since they were not able to sell any of the fruit. Several others have had to sell their fruit for a net loss when they go to a market or sell to a higgler. Most made the decision to keep only the most productive portions of land and either leave the rest to fallow or grow some other crop. The small number of farmers who reported increasing acreage reported that they were recovering from the damage sustained from the last hurricane. Interestingly, one farmer planned to increase banana holdings beyond their pre-hurricane levels due to encouraging signs from the government's increased focus on food security – "grow what we eat and eat what we grow" and a belief in the possible return to exports.

Not only did farmers reduce the amount of land they farmed, almost every farmer altered their land use patterns by way of growing other crops (and in a few cases, rearing livestock). Individual strategies varied among farmers but generally fell into one of three categories:

- A movement from monocropping bananas to multicropping.
- A continuation in multicropping with a reduced focus on bananas.
- Multicropping with increases in banana acreage.

Prompted by the decreased economic returns over the past 20 years and more recently with the impacts of hurricanes since 2004, there were very few farms that still continued monocropping bananas during the period of fieldwork (indeed there have been few since the watering down of the preferential trade agreement with the EU at the end of the 20th century). This only observation of this phenomenon was in two medium scale farmers, with one being a

"pure stand"[2] plot which was a part of a larger farm belonging to the College of Agriculture, Science and Education (CASE). In addition to growing other crops, most emphasized hurricane resistant crops as shown in Figure 5-3. The types of crops grown by the farmers interviewed are shown in Figure 5-4. Hurricane resistant crops are often denoted as crops that can withstand the damage associated with these storms or at least recover quickly after the event. For example, the two most popular crops banana were dasheen (taro) and coconut. The dasheen plant is composed of large, heart-shaped leaves above ground and a corm (tuber) below ground which can ensures the plant survives, while coconut trees are quite flexible and bend in the wind. Many medium and large farmers in St. Mary and Portland grew coconut trees amongst the banana trees as a traditional practice; coconuts used to be exported by the island but are still popular today for sale at tourist destinations and on the local market. Several others planted crops such as cassava (yuca), sweet potato, and coco (cocoyam) in addition to growing bananas. Space for these crops often came by removing less productive acreages or intercropping with bananas (less common). These tubers were also classified as hurricane resistant crops due to their similarity to dasheen. It is interesting to note that such crop decisions were not influenced by government policies but rather on aversion to risk, current domestic demand and indigenous knowledge among these producers.

Multicropping with less focus on banana was the hallmark of small farmers. With less acreage than medium and large farmers, the primary goal is often risk mitigation, hence a reduced focus on growing bananas. They tended to grow hurricane resistant crops and other cash crops such as pumpkin and both sweet (bell) pepper and a variety of hot peppers. Smaller land holdings meant a greater occurrence of intercropping with few pure stands of bananas grown as

[2] Pure stand is a term commonly used when referring to an area of land that is dedicated solely to one crop, in this case bananas.

even the two medium farmers who were increasing banana holding were growing other crops as diversification. There were several other notable crops being grown. Plantains are easily grown with bananas but generally fetch a higher price in the domestic market as it is a more prized fruit. Citrus (mainly oranges) and breadfruit are tree crops that have a strong demand in the local market year round. A few farmers raised animals but they were in general not very popular. Altogether, these crops and animals provide options for farmers as they seek to maintain a steady income flow that was provided by export bananas. The diversification of the crop base mirrors several such strategies taken by the large banana multinationals (Kasteele 1998). Dole Food Company sold off unprofitable portions of their business and invested in developing their fresh fruit business. Chiquita Brands International added a packaged-food division and Del Monte Fresh Produce and Fyffes have also invested in the fresh fruit business, expanding their operations to parts of South America, Eastern Europe and Asia

Export-oriented farmers have tailored the production of bananas to meet the high standards set by the international market and though the standards of Jamaican consumers have increased with respect to cosmetic appearance and fruit quality, they are not as high as international consumers. This slightly lower expectation coupled with the high cost of inputs such as fertilizers and other chemicals prompted most farmers to cut back on the use of one or more type of farm input. Among the farmers interviewed, 76.19% took the decision to reduce the amount of inputs used on their farms. This ranged from increasing the length of time between chemical treatments to not purchasing the chemically treated protected sleeves that cover the bananas (see Figure 5-5). Table 5-1 highlights the cost of production for 0.4 hectares (1 acre) of land. With the costs for maintaining this small area being US$3,274.193, it is obvious that reducing some of

[3] Exchange rate at time of fieldwork: approximately US$1.00 to J$80.00. Maintenance costs = J$261,935.19

the costs such as eliminating Sigatoka disease control or reduce labor costs would ease the overall burden on a farmer. Of the farmers that chose to reduce inputs, most chose to significantly reduce the amount of fertilizer they applied to the plants, to reuse or completely eliminate the use of protective sleeves and importantly to reduce labor costs by laying off workers, not hiring day laborers and/or doing the labor themselves. The reduction of land acreage is closely related to the reduction in labor costs, and as we will see in the strategies of ex-workers, this has had a compounding effect on farming communities. Due to currency devaluations the costs of inputs have steadily risen over the years, prompting many farmers to slightly reduce input even when producing bananas for exports. This had a compounding effect on the quality of bananas and as many farmers reported, an increased percentage of fruit were rejected as fit for sale in Europe as input costs rose.

Marketing in the Domestic Banana Sector

One common thread that linked all farmers interviewed during the period of fieldwork can be boiled down to a single word: marketing. Virtually all farmers recognize the increased need for marketing with the end of banana exports. In the years prior to the halt of exports, farmers had a guaranteed market in the Banana Export Company (BECo); they were mandated to purchase all available bananas that met the export criteria. Exporters grew the bananas, and sold them to BECo with the remaining fruit being sold domestically. Farmers, though sometimes cognizant of the global issues surrounding the banana industry, were primarily concerned with selling their fruit to BECo. With no export outlet, the market was glutted with thousands of tons of fruit and all farmers from the smallest to the largest have had to increase their focus on finding innovative ways to penetrate a saturated domestic market. Those farmers who have not made inroads in marketing their fruit have been seen to suffer the most with little or no sales. Lower

educational levels were often cited as being the major restrictive factor in farmers' marketing knowledge and interest.

The main areas of focus among farmers have been finding viable niche markets across the island and on value added production, particularly the ripening of fruit and production of banana chips as shown in Figure 5-6. Other areas of focus have been selling to supermarkets, hotels, higglers, along roadsides and in markets. The top three marketing options represented the most cost effective means of obtaining sales. Despite the glut on the market, several farmers have targeted the JP chips factory in St. Mary as an outlet for their crops. Because the making of banana chips does not require any special standards in terms of banana quality, several medium scale and a few small scale farmers were contracted to provide the factory with bananas for chips. However, these opportunities became harder to come by as the estates owned by JP also had thousands of tons of bananas that required harvesting and processing.

For those that have pursued selling their own crops instead of to a middle man, prices being fetched for fruits have not fallen dramatically but the variety of choices for consumers have led to reduced individual sales and have forced farmers to expand their search for a market. This parallels the situation on the world market – importing countries generally have lots of choices to purchase bananas, and unless mandated to under some trade agreement, tend to purchase the lower cost "dollar" bananas from the large Latin American producers. There were reports by various farmers that some bananas from Eastern Jamaica even found its way into western markets such as Montego Bay in St. James. Such a broad search just gives an indication of the dearth of sales in the current banana growing parishes in the island. The sale of bananas island-wide was also impacted by the presence of other fruits in the domestic market. In a tropical country such as Jamaica, there is always some fruit that will compete with bananas. In

the summer, (at the time of fieldwork), mangoes and oranges are in ready supply and are often comparatively cheaper or more filling. Many farmers also commented that bananas were at their peak at the beginning of the year and also during the summer so they have the added challenge of a productive season without the necessary sales outlet. Another element of added suppression was the closure of most schools for the summer holidays. Students are an important consumer base, as schools routinely purchase bananas and banana chips to be sold either as snacks or as part of the cafeteria lunch offerings. Together, these factors have led many farmers to increase their focus on the value added sector.

There are two major aspects of value added production: ripening and banana chips. Figure 5-6 shows that very few farmers chose to pursue this aspect of marketing. This is because to take advantage of the benefits of value added products, farmers also need substantial capital to invest in such ventures. In fact only the larger farmers and estates engaged in ripening bananas for sale and only the largest producer, JP was involved in the manufacture of banana chips. In order to ripen bananas, one would need to have a ripening room which is really a specially fitted room that is air conditioned to maintain temperature and sealed to maintain the ethylene gas which is used to promote and control the ripening process. A flowchart of the ripening process can be seen in Appendix B. Both estates have ripening rooms but are for private use; there less than five such rooms across the island available to smaller farmers. These ripened bananas are usually sold to retailers such as supermarkets and niche markets such as hotels. However, some smaller farmers have also targeted the higher end of the retail market and thus are not as free to minimize the cost of inputs as other farmers are doing. These higher end groups require that the quality of the fruit be at the same level as that of export bananas and farmers need to maintain the requisite certification to be considered eligible. Not only that, but because of the large number of banana

farmers, the market is saturated and enables retailers to have significant control over the quantities purchased and from whom. In this buyer's market, farmers were in no position to request higher prices and because of the limited shelf space producers face an ever-decreasing profit margin. Farmers also faced the problem of payments from supermarkets; produce is often paid on consignment i.e. a retailer will accept a certain amount of fruit but will only pay for what is sold. Since ripe bananas tend to have quite a short shelf life, if they are returned to the producer, then they are of little value when payments and returns are made. For this reason there have been several farmers (not interviewed) that have suffered heavy financial losses and ceased production, making others wary of entering this arena.

JP has become heavily involved in value added production, in fact their company mandate has been to reduce the dependence on primary banana products and make agro-processing the core of their business (following a similar pathway as the major banana multinationals). According to the Human Resources Manager of the company, they have expanded their operations in the snack production particularly the making of chips from banana, dasheen and cassava. This is evidence by the increase in advertisements and branding campaigns witnessed across the island such as those shown in Figure 5-7. JP also encouraged farmers to sell excess green fruit to their factory in order to augment supplies from their own estates and allow more of their fruit to be sold ripened. This area of value added production is seen as a major outlet for bananas with dozens of farmers having sold substantial quantities to these manufacturers as described earlier. JP is not the only producer of banana chips in the island; however they are the largest producer of chips and the most profitable.

Several other small producers exist, focusing on single parishes or regions in the island. The challenge still remains to make chips production more profitable so that smaller farmers can

enter this market. Costs of production such as labor, infrastructure and utilities serve to erode profit margins unless one is able to sell large volumes of chips as JP does. One farmer calculated that just factoring only the cost of conversion of bananas to chips (not including production costs) would net a producer US$ 0.019 ($J1.55) per ounce of chips (see Appendix B for calculations). With a bag of chips holding at most a few ounces, large economies of scale would be needed to make chips production a viable enterprise. Other industry stakeholders have lobbied to import fresh banana from outside the island but due to the threat of disease from other places through vegetative material, this has been banned. However, chips have been imported since Hurricane Ivan in 2004. These chips are often produced more cheaply than even JP. Sources such as Honduras and Panama can easily fry sub-quality banana and produce the chips at lower costs. These chips currently have a small market share due to consumer preferences for local brands but even JP has been sourcing banana chips from outside the island (they have a plantation in Honduras and a snack factory in the Dominican Republic). This is yet another potential threat to the Jamaican banana industry since there is still much demand for these products.

Other Diversification Strategies

There were a few other diversification strategies that were named by farmers. These included finding various, unspecified locations to sell their fruit, leasing their land for some other usage and in the case of JP, continuing their involvement in shipping and logistics. On the world market, there are the options of Fair Trade and organic bananas as value added products but these would require re-entry into banana exports. These options would also require heavy investments of time and financial resources, both of which are in short supply among current banana producers. In the months following the end of exports, the MoA strove to integrate displaced farmers into the domestic market structure with the promotion of Production and

Marketing and Organization (PMO) groups. These groups were developed not just for banana farmers, but as a means of enabling farmers to work as a cooperative and increase efficiency in the key areas as indicated by the name of the initiative. The MoA does not set restrictions on the crops that could be produced in order to make the groups as accessible as possible. However, at the time of the conclusion of fieldwork, there was no report on the effectiveness of the farmer groups as many areas were still struggling to create a unified structure. These efforts by the government were complemented by the work of other agencies such as the Scientific Research Council (SRC) and the EUBSP. Details on their work will be discussed below.

Adaptive Strategies Among Former Workers and Support Services

These two targets groups have been combined due mainly to the smaller number of persons interviewed and because of the qualitative nature of the dataset. As shown in the data analysis, thematic analysis was used to obtain the various adaptive strategies being pursued by these groups. Due to the limits of the dataset, greater focus will be placed on the role of the support services with information from the worker revealing just one side to the multifaceted issue of adjusting to the closure of the export sector. The work of the support services in the diversifying from the industry is closely related to assisting both former workers and farmers and as will be discussed, several programs have been implemented with varying results.

Former Workers

While farmers had to face difficult choices in terms of what to grow, persons who worked with the large estates and were made redundant faced significant challenges in finding alternative employment. According to the persons interviewed, a few former workers were fortunate enough to obtain employment in the business sector; others went into growing cash crops on their small land holdings (with none focusing on banana for the domestic market). Many of these workers have had to make do with sugarcane cutting, yard care and other various forms of part-time

manual labor or temporary employment. Particularly for the workers from Eastern banana estate, it appeared that the majority of the workers who were made redundant were still seeking employment.

Opportunities for diversification, retraining or other alternatives seem to have passed them by as most had heard of meetings that were to be held but have not been able to access these opportunities. As Figure 4-8 highlighted in the previous chapter, only one person found full time employment nine months after the closure of the export market. More in-depth exploration revealed that education was a major determinant in finding employment. Most persons engaged in banana estate usually did not complete secondary education and in several cases did not complete primary (elementary) level schooling. With this handicap, several workers are limited to focusing on manual labor, while those with higher levels of education have greater opportunities for obtaining employment. With this in mind, projects of the support services specifically target unskilled persons and assist them in gaining a skill in order to increase their marketability. However, among those interviewed, the few who were currently employed or knew of others that were employed reported that they actively sought opportunities apart from those offered through the support services. Like the farmers, the workers interviewed saw a great need for increased marketing in the banana industry; however their reasoning was that this would increase the likelihood of regaining employment in the sector.

Overall, most workers were living on the remnants of monies received as part of their redundancy package and faced a significant challenge regaining a productive livelihood in the near future. The unemployment of these workers has also negatively impacted the communities in which they live. A large portion of business enterprises in and around the banana estates depended on purchases from workers and their families to remain open. With the closure of the

estate, many businesses have failed while others, such as those seen in Figure 5-8 struggle to keep their doors open. This ripple effect continues to make more people unemployed, depressing the economic activity in the affected communities.

Support Services

There are several entities that are directly and indirectly involved in the administration and regulation of the banana industry. Each related service organization has felt the impact of the end of banana export, with the extent of impacts depending on their level of involvement. The backgrounds and work of the key groups are examined below.

Backgrounds

The support services in the banana industry have also been affected by the closure of the export market. With no export activity, there was no longer a need for the BECo and it was scheduled to be disbanded by the end of 2009. The contraction of the industry also resulted in redundancies and reduction in work hours at agencies like the BB and the EUBSP. The EUBSP, which was established as part of the transition assistance measures after restructuring the banana trade regime had a specific timeline of operation and was set to be discontinued in 2010. This is in line with the EU directives on financial aid for the local banana industry. However, the support services responded the most smoothly to the change in the landscape of the industry. With the government mandate now on the domestic market, the local Banana Board's focus continued on farm certification, other extension services and regulation of the banana market. The EUBSP has provided funds for the diversification of the industry through its Rural Development Program (RDP). While adjustments such as the acquisition of hard data on the domestic market were being done, the support services had the least problems despite the period of turbulence in the industry. The support agencies did not focused too much on marketing; instead this emphasis was being left to the island's Ministry of Agriculture.

The BB of Jamaica is a regulatory agency established in 1953 through an act of parliament. They regulate standards with relation to production, exports, value added, fruit growth, quality etc. The BB has had changing roles as the industry evolved; they have administered a number of banana insurance schemes, operated farms, conducted spraying operations and other various functions. In the 1980s the need for restructuring led to the formation of the Banana Export Company to handle buying and selling of bananas for export. The primary functions of the BB are regulations and mitigations, and delegation of responsibility. The BB works closely with the EUBSP with the BB focusing on the technical side of things and the EUBSP focusing on improving competitiveness and facilitating diversification.

The overarching role of the EUBSP is to maintain economic livelihood in banana producing communities. With the steady decline in production over the years, the EUBSP targets the former workers, farmers and other producers in the industry. The program is divided into two parts: the Banana Implementation Program (BIP) and the Rural Diversification Program (RDP). The focus of the BIP was to improve the competitiveness of both domestic and export banana and plantain. Such support included financial aid (agricultural inputs such as fertilizer, fungicides etc.), technical services, research and development, pathological analyses and extension services. The RDP focuses on support for those who have come out of banana or diversified. It provides alternative investment opportunities and social and infrastructural support. Diversification can be agricultural or non-agricultural but should aim to improve or maintain the economies of communities in the 6 traditional banana parishes. According to the project manager in charge of the RDP, operations effectively began in 2006. The annual budgetary support was provided under the Special Framework of Assistance (SFA) which was to be run from 2001 to 2008.

Another government entity, the RADA has become more integrated with the banana activities since the focus is more domestic. RADA focuses primarily on domestic crops (export crops have their own boards) and so with the increased work load, The EUBSP is to be institutionalized and the staff become a part of RADA at the end of the EUBSP's course of operation. This will enable better "management" of projects as EUBSP projects often run in the order of millions of dollars so this will help accountability of the program.

Adaptations

So how have the major support entities adapted to the change in the banana industry? In the BB, the focus has shifted to the domestic industry, while the EUBSP has focused more on the RDP aspect of its operations.

With the closure of the export market, the government has modified the BB's mandate to focus on the domestic industry. The end of exports meant that several banana farmers were likely to stop production altogether; the aim of the BB was to improve the quality of production for those persons still in the sector and strengthen the capacity for development should the island ever return to exports. As outlined in the role of the Board, they have continued with certification efforts to maintain the standards of production. However, many farmers have found these difficult to stand by as there is no real incentive in the domestic market for "perfect" bananas. Personnel have also continued the very important work of disease control, particularly the Black Sigatoka[4] and Moko[5] diseases, which, if left unchecked, would lead to the destruction of a

[4] Black Sigatoka disease is a leaf spot disease of banana caused by the fungus *Mycosphaerella fijiensis* Morelet. Plants with leaves damaged by the disease may have up to 50% lower yield of fruit. It is the successor of the Yellow Sigatoka disease which was common several decades earlier. Control is expensive and requires the chemical treatment of all plants in a certain radius around the affected plant(s).

[5] Moko disease is a bacterial disease that affects several other crops other than banana. It too reduces yield of the crop and is easily spread through contaminated water, plant material or even soil. Because of this, it is controlled by destroying the affected plant and surrounding plants.

significant proportion of the island's banana plants. They also continued to teach skills such as ripening, chips making and vacuum packing of green bananas for those interested in pursuing value-added production (the SRC also aids in this effort through the provision of food formulations). The Board has also faced added challenges of preventing the importation of fresh bananas and reducing the imports of foreign banana chips as the lower cost of these products could cripple the sector.

Apart from pursuing technical services, the BB has also been instrumental in setting up a Catastrophe Fund to insure banana crops. The Caribbean has one of the highest risk levels for tropical storms and so appropriate insurance is very difficult to come by, expensive or both. As local crops are damaged with the passing of a storm, the fund would provide a means of risk management that farmers could get involved in. Since the closure of the export sector, the BB has stepped up efforts to make people join and membership had increased (at the time of the interview) from zero in 2005 when Hurricanes Dennis and Emily affected the island, to 302 farmers in 2009.

Since the halt to exports, the EUBSP has focused primarily on the operations in the RDP. The SFA's provided through EU funding has been the key element in promoting diversification in the sector and assisting stakeholders who wish to become involved. There were a total of eight SFA's to implemented but due to inactivity and the imposition of time limits on the use of the funds, SFA 2001 began in 2006 and at the time of fieldwork, calls for proposal were being made for SFA 2006 through 2008.

Initial SFA's (2001 and 2002) did not have a time limit. However, the EU changed the rules because the money wasn't being spent. SFA 2003 was to be spent by June 2008 and each subsequent SFA had a lifespan of 3 years, i.e. the money must be spent within that time. A grant

contract mechanism is used to award monies; with each SFA focusing on different areas (eg. business, infrastructure, skills training and remedial work). Calls for proposals are launched in the media to ask organizations to submit proposals to fit the determined categories. After a four stage evaluation process, grants are approved and a contract would be entered in with that particular organization. The respective entities can receive up to 75% of the project's funds from the EUBSP. It should be noted that each year is composed of various types of grants, depending on the focus of that year's call for proposals. An outline of the various diversification projects pursued is given in Table 5-2 with additional details available in Appendix C.

Despite the dates and timelines for the respective SFA's, operations to disburse the monies did not begin until 2006 and several were not implemented until 2008, the year banana exports were halted. The first SFA to be run was for 2003 where all projects were either designated as large grants (between US$ 11,800 and 118,000 or €10,000 to 100,000)

1 or small grants (less than US$11,800 or €10,000). Eight large projects and 13 small projects were pursued and provided important lessons for the new grant contract mechanism This SFA was completed in 2008 and focused on specific communities in eastern and central Jamaica. Through these projects persons who wanted to come out of banana pursued activities ranging from cattle farming, growing bell peppers and bee keeping to non-agricultural pursuits such as operating a radio station, block making and sewing. Dozens of jobs were generated and several businesses in and around banana communities benefited from these projects. After SFA 2003, the large and small grant concept was discarded and funds were disbursed based on the amount approved for the grant. More rigorous standards were also put in place such as providing monthly reports to ensure that the money was being spent correctly.

[1] In 2006 dollars. At the time of the grant the exchange rate was approximately €1 to J$51.60, and US$1 to J$61.00.

SFA's 2001 and 2002 were all large projects and almost US$2.4 million (J$200 million) was to be spent on institutional strengthening, infrastructure development, providing access to micro-credit, organize and implement various skills training programs and pursue various development and/or income generating activities. It is important to note that these project began in October 2008, right when many workers were made redundant and several farmers faced a future without export bananas. Spread across the island, these six projects focused on providing opportunities for people in the industry to diversify into other skilled activities, form groups to access sub-grants2 and create employment opportunities for themselves and others. With most of these projects ending in late 2009, after fieldwork was completed, the effectiveness of many of these projects has yet to be seen. However, one project pursued by the Human Employment and Resource Training Trust / National Training Agency (HEART Trust/NTA) was well documented. This project ran 15 months from October 2008 to December 2009 and targeted former banana workers, farmers and community members affected by the closure of export sector, particularly in the parish of St. Thomas where Eastern Banana Estate was closed. This project also featured cooperation from other groups such as the Social Development Commission (SDC) and the Jamaica Foundation for Lifelong Learning (JFLL). At the end of the program, 227 people received certificates of participation, signifying that they had obtained at least one marketable skill or improved their literacy, both of which would ease their transition into diverse and sustainable income generating activities.

Under SFA 2005, two projects were approved (see Table 5-2) for US$1.5 million (J$119 million). These projects were spread across the island and again focused on traditional banana

[2] Sub-grants were sums up to €10,000 (J$1.2 million) which could be given out to small groups from the larger proposer organization. The main grantees would evaluate these sub-grantees through their own internal mechanism.

growing communities and pursued simialr goals to SFA's 2001 and 2002. These projects are scheduled to be completed in the second half of 2010 and should achieve similar or greater results as the HEART Trust/NTA project as persons in the industry who have not yet secured a source of employment will be seeking every avenue of doing so. With the EUBSP scheduled to be phased out in 2010, RADA began working with the RDP in monitoring the projects in 2008 and is now the implementing agency for these projects. The remaining SFA's to be considered will last until 2012 and so RADA will be monitoring them until contract with RADA ends. For agricultural projects, they envisage that those in line with the government's agricultural vision will get continued support after the SFA funds are used up and that successful projects may be replicated as all projects are meant to be sustainable. The most recent call for proposals under SFA 2007 reflected this new direction; an island-wide survey of the Jamaican domestic banana industry is to be done over a six month period with deadlines for submission in January 2010. The complete SFA poster can be seen in Appendix C.

Adaptations were also being pursued by the less involved agencies and ministries across the island. On June 28, 2009, the Ministry of Agriculture launched its inaugural PMO Conference. This conference drew farmers from all across the island with the goal of setting into motion, the government's efforts to mobilize farmers to become more market-oriented and to formally establish cooperative PMO groups with the aim of increasing efficiency and reliability in supply and negotiating appropriate demand for the various kinds of produce. This conference reflected the government's desire to facilitate commercialization but not actual participation in marketing of produce; this onus is on growers or industry organizations. All of the banana industry support organizations were present as well as dozens of other government and private organizations. At the end of fieldwork, it was yet to be seen if these groups had any impact on

the way banana farmers grew and marketed their crops. At the higher end of the marketing chain, the SRC provided several opportunities for banana producers to get involved in value-added processing of bananas. Through a subsidiary by the name of Marketech Ltd., the SRC had several available food formulations for use. These included: green banana and plantain chips and flour, minimally processed banana, natural juice purees, dried banana as parts of products and banana figs (chocolate covered ripe bananas). Though very few producers have pursued these options, they nonetheless remain available to interested parties.

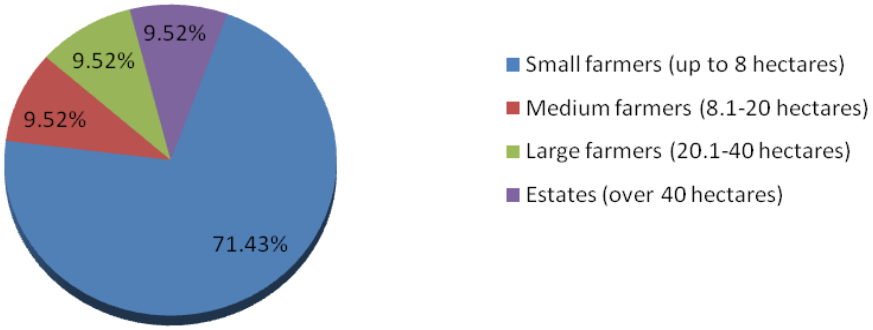


Figure 5-1. Farmer classification by land area cultivated.

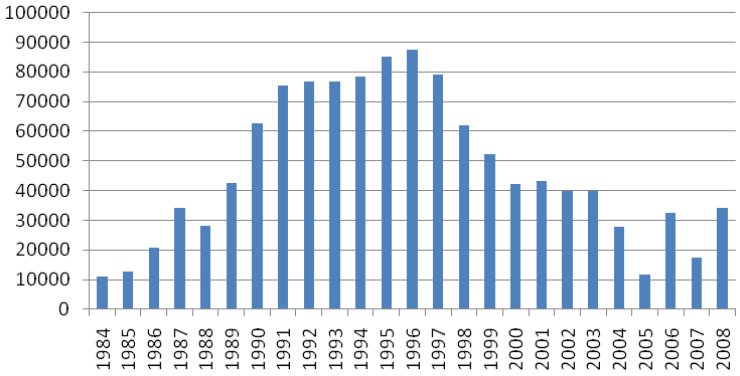


Figure 5-2. Jamaican banana exports from 1984 to 2008.

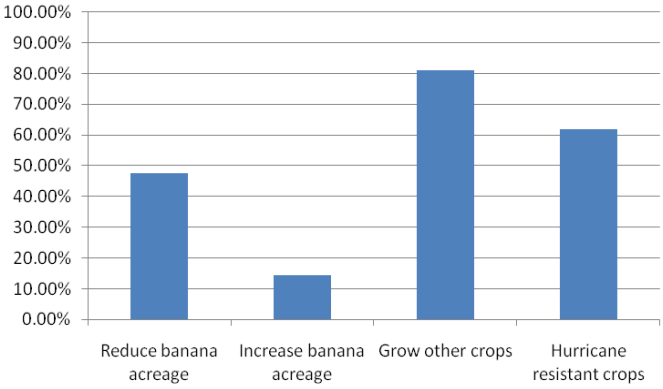


Figure 5-3. Land management strategies among farmers interviewed.

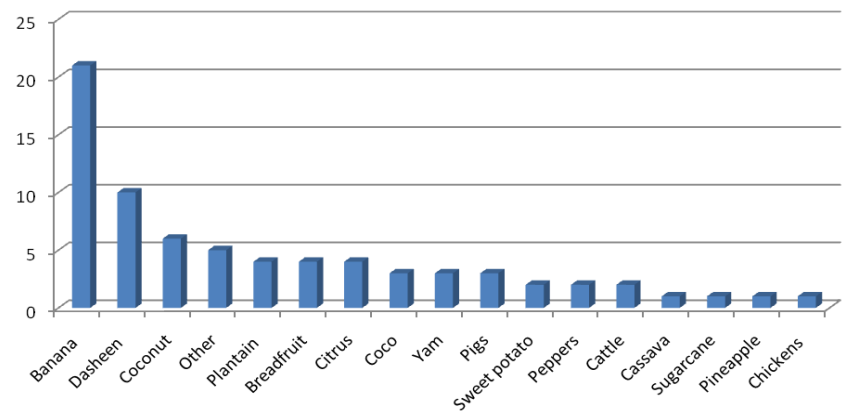


Figure 5-4. Popular crop and animal choices made by farmers interviewed.

Figure 5-5. Protective sleeves used to protect and treat bananas. The sleeves contain a slow-release chemical to prevent fungus or pest invasion.

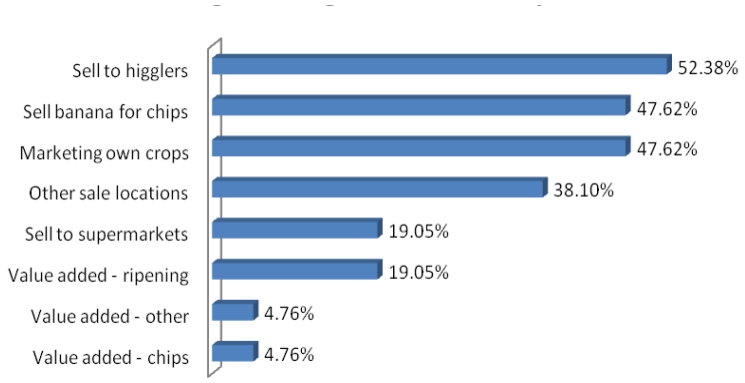


Figure 5-6. Marketing strategies pursued by all farmers interviewed.


A.


B.

Figure 5-7. Advertising of Jamaica Producers snack products through various media: A. Product display at an agricultural showcase. B. JP van advertising banana chips.


Figure 5-8. Businesses in trouble, Golden Grove, St. Thomas: Several stores have closed (left) or seen little business (right) in this community near to the closed Eastern Banana Estate.

Table 5-1. Summary production costs for 0.4 hectares (1 acre) of domestic banana for one year.

SUMMARY OF PRODUCTION COST PER ACRE / YEAR			
ITEM	COST J$	TOTAL COST J$ ($US)	% COST
Establishment Cost			
- Labor	28,400.00		
- Maintenance	28,690.00		
		57,090.00 (713.63)	17.9
Maintenance Cost			
- Sigatoka control	51,757.50		
- Weed control	12,000.00		
- Fertilizer	68,400.00		
- Nematicide	11,180.00		
- Bunch care	7,917.69		
		155,255.19 (1940.69)	48.7
Labor costs	67,680.00	67,680.00 (846.00)	21.2
Worker welfare	17,000.00	17,000.00 (212.50)	5.3
Transportation costs	2,000.00	2,000.00 (25.00)	0.63
Supervision and management of farm	24,000.00	24,000.00 (300.00)	7.5
Establishment Total		57,090.00 (713.63)	17.9
Maintenance Total		261,935.19 (3,274.19)	82.1
Grand Total		319,025.19 (3,987.82)	

* Approximate $US figures are in brackets: 1US$ = J$80

Table 5-2. Summary information for the EUBSP SFA projects.

SFA year	Number of projects	Total funds disbursed in $J ($US)	Target groups	Proposed goals or achievements
2001	2 large projects	54.6 million (682,500)	Traditional banana growing communities across the island	- Strengthening institutional capacity - Provide income generation activities - Facilitate sub-grants
2002	4 large projects	137.7 million (1.72 million)	Traditional banana growing communities in eastern and central Jamaica	- Increase economic opportunities and reverse economic decline - Skills training and empowerment
2003	8 large projects and 13 small projects	47.88 million (598,500)	Traditional banana growing communities in eastern and central Jamaica	- Infrastructure development and equipment purchases - Skills training - Business development
2005	2 large projects	119 million (1.49 million)	Traditional banana growing communities across the island	- Institutional capacity strengthening - Infrastructure development - Social intervention programs - Facilitating sub-grants

NB – There was no information available for SFA 2004.

CHAPTER 6
CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

This study has focused on a quickly dying primary industry in a small, developing nation. What has been learnt from the information gathered? And how does it matter?

General Conclusions

Three hypotheses were posed at the beginning of my study and the outcome of each will be reviewed here:

Hypothesis 1 asserted that monocropping bananas would lead to a reduction in expected length of maintaining a livelihood. However, it was found that there were virtually no farmers remaining who grew only bananas. As we have seen throughout the study, a number of factors have caused this phenomenon. Banana has long since passed the period where one could live comfortably on that one crop. Declining terms of trade on the world market, increased local, regional and global competition, disease outbreaks and the impacts of extreme weather conditions are among the myriad of reasons why farmers do not cultivate only bananas. This hypothesis could not be tested but this proved to be a valuable confirmation of the events that have been occurring within the Jamaican banana industry.

Hypothesis 2 assumed that those farmers that have adjusted to the loss of the export sector have been able to maintain their place in the local banana industry. Here, we see a wide range of answers. By and large, farmers that have remained in production seem to be holding on, at least for the short term. However, the contraction in market space has “put the squeeze” on all producers and those who are feeling the pinch the most are the ones that have not been able to secure an outlet for their produce. Large players such as the estates have been able to absorb losses better than many smaller land holders because of their diversified holding and their drive to find new avenues for their product. Small and medium scale farmers have had varied

successes in holding their own. Some have had to be content with selling enough to survive while others have been able to fit into existing niches on the local market.

Throughout this study, one might have developed the impression that if only the hurricanes had not hit, then Jamaican banana exports would continue indefinitely. This is not the case; the series of hurricanes were simply the "straw that broke the camel's back." Banana exports were becoming less and less profitable. The changes in the international trade of bananas prompted several prominent stakeholders to withdraw in the last 20 years and of those that remained took steps to diversify away from banana. In the case of JP and Tulloch Estates, the two largest banana producers, this ranged from growing other crops (both traditional and non-traditional) to investing value added production and involvement in non-agricultural enterprises. The decision by JP to halt exports was made with the knowledge that they were positioned to operate with a diminished presence in banana exports. There are several stories that are even now playing out in the adaptive processes: from international support, to the need to be more globally integrated to tests of the organizational strength of the support services in Jamaica's banana industry. What seems simple on the surface has a myriad of intricacies beneath.

Hypothesis 3 essentially stated that the smaller the land holder, the more diversified the strategies to the end of the export market. However, according to the statistical tests carried out, there is no significant relationship between farm size and the number of crops. Additionally, there is no statistical relationship between the number of strategies pursued and farm size. Profit maximization theories (such as rational choice theory) would lead one to believe that because larger land holders tend to focus on volume to achieve economies of scale, they would not be the ones to incorporate a variety of adaptive strategies. This however, is not the case in the Jamaican banana industry where other factors are the determinants of how much one adapts.

In retrospect, one could argue that it is hardly surprising that there is no relationship between farm size and the number of adaptive strategies. Indeed, this study has pointed to the possibility of statistical populations that are not arranged by farm size. One possible distinction might be geographical location. Farmers closer to the coast have greater access to transportation networks and market whereas those located a significant distance inland tend to be more isolated from such markets, face higher production costs and receive less current information. An exploration of spatial distribution and adaptive strategies might prove more fruitful in establishing the statistical relationship premised in the third hypothesis.

But what of former workers and the agencies that support the industry? They may have not been the focus of the initial study but they give valuable insight on how the local sector has been adapting to the changes forced upon it. Based on the secondary information collected regarding the banana retraining project, the changing roles of the BB, EUBSP and RADA as well as insights gained from interviews, it can be categorically said that these two groups are at the opposite ends of the stick in terms of adapting to the loss of the export market. Persons who were employed by the banana estates tend to be of low education and other skills save the willingness to work hard. In the parishes of St. Mary and particularly St. Thomas, the estates were a major employer. With Eastern closed and SMB scaled down, both parishes and thousands of persons (directly and indirectly) now face a harsh economic climate, with the island in the vice grip of a global financial crisis and little alternatives for employment. Indeed, for the parish of St. Thomas, the other major industry - sugarcane is on its last legs. Hence, persons no longer employed due to the shrinkage of the export sector are between a rock and a hard place with regards to means of eking out a livelihood for themselves and their families.

Support, agencies by comparison have had a mild transition. Though there have been hundreds of job cuts and bodies such as BECo set to close down, the support agencies have done well to refocus on the local banana industry. The BB's new mandate to optimize the domestic banana industry should be completed in the next 12-18 months and allows all stakeholders to be more competitive in the medium term. Indeed, it could be said that the health of the banana industry will improve once this is done.

Though the need for marketing has been covered in the discussion of the findings, it must be reiterated here. When the export sector was present, farmers and workers were in a passive "receive" mode and had no real incentive to develop marketing strategies. The government has already taken steps to improve this for the entire agricultural sector with their PMO groups and facilitation of innovative use of agricultural products. The onus is on the members of the banana industry to take advantage of these tools and make the most of them. The importance of the domestic industry cannot be stated enough. As the only viable market left for farmers, they will have to continue to find creative ways to excel in this competitive period as only those that manage to survive the resulting fallout will subsequently have room to expand and prosper.

Viewed under the lens of globalization, Jamaica's exit from the export banana sector may be seen as a blessing in disguise. Facing reductions on already low profit margins due to the changes in the EU banana regime, nature forced what political leaders had failed to do for decades – get out of a generally unprofitable and costly venture. In order to compete at the global level, major changes would be needed such as reducing production costs and increasing efficiency. The current stakeholders in the Jamaican banana sector are not able (or willing) to invest vast sum for uncertain returns. The challenges on the domestic market may serve to benefit the most persistent and financially able producers as they would then have the experience

to explore innovative value-add banana products and/or high value niche markets in the future. It is undeniable that the socio-economic costs have been high but in the long run, the resilience of those impacted will prevail as they adapt to the new reality ahead of them.

What Could Have Been Done Differently?

At the end of this study, I have arrived at various conclusions regarding the hypotheses posed and the general experiences of the groups examined all of which are valid and applicable to the situation at hand. However, no research is perfect and there were several aspects that could be improved.

One of the main constraints was the limitation of time and resources. This study was conducted in one field season over a period of two and a half months – much too short if one is to do a comprehensive study on this topic. In addition to the limited time, there was the issue of distance between contacts and availability of participants. Most banana farmers involved in exports were located in disparate regions of the island, ranging from plots near the coast to land holdings on hillsides. Though registered, several farmers were not easily accessed due to a lack of telephone services; some farmers do not travel with their cellular phones and for others, the numbers were just not working. For much of this study, I had to depend on the availability of personnel from the BB in order to access farmers. Without their knowledge of the location of several farmers, I would not have been able to find even half of the ones I interviewed.

The second major limitation is the small sample size and sample distribution of interviewees. Though the total population of export farmers is just over 200 farmers and 21 farms were captured, it is quite conceivable that there are several other diverse stories to emerge. With such a small sample, it was a challenge to establish significant statistical relationships and divisions into individual statistical populations was quite unfeasible. To do so would render most statistical tests inapplicable. The sample size of the former workers is even smaller. There are

well over 1000 former workers in the industry and to adequately represent how they're adapting, more fieldwork would have to be done. However, this group was not the focus of this study due to the limits of time and resources and in the future, questionnaires would be a good way to capture some of the ways they have been adapting.

The impact of the small sample size is partially seen in the statistical tests that were carried out. Small samples lead to high variability in the results and this most often leads to low t-scores and an increased chance of no significant results. It may be that the hypotheses posed could be correct but it could also be that the small sample size, both in number and distribution masked any possible significant occurrences in the population. The population of banana farmers is inherently non-normal with the majority of farmers occupying small land areas and so the range of tests to be used is restricted to non-parametric ones. However, with more resources I would be able to collect more interviews with farmers in the banana producing regions and possibly uncover statistical relationships not seen previously.

The distribution of the sample is also of concern. Farmers are located in many parishes and not enough samples were taken in each parish to be able to draw much of a comparison among the parishes. A greater and more diverse sample would have enabled some form of spatial analysis utilizing GIS and some other spatial statistical techniques. This limitation also applies to the distribution of former workers. These interviewees were from a small number of communities and as seen in the work of the support services, could not do more than show one side of a multifaceted set of issues. The support services group is quite representative because of their small number and the fact that I got interviews with key persons in the support agencies. However, it might be useful to gain other perspectives on the work of these said agencies by

other stakeholders such as the banana farmers themselves (small and large), former field workers members of the manufacturing sector which was not considered in this study.

Recommendations

At the end of this study, there are three recommendations that I believe will be key in the way forward for the industry:

- Complete a thorough economic analysis of the domestic banana market. Although there are some steps being taken in this regard (such as SFA 2007), rapid assessment of the domestic market will aid farmers and support agencies to determine where to focus marketing and support efforts.

- Explore the viability of developing a sub-sector focusing on value added markets such as Fair Trade bananas. This has been shown to have some success in the Eastern Caribbean and could possibly be applied in Jamaica.

- Continue to provide opportunities for stakeholders to form cooperatives. Working together will achieve better economies of scale and enables groups of people to maintain their livelihoods rather than individual efforts. There have been some steps in this direction, such as the PMO groups and the skills should be imparted to these groups so that they will have a strong chance of succeeding.

APPENDIX A
INTERVIEW FORMS

Adaptive Strategies in Banana Farming – Farmer Interview Form

The following questions will be exploring how farmers and workers in the banana industry have been managing the closure of the banana export sector.

Opening question: How long have you been into banana farming?

Probe: How did you get into growing crops for export?
Probe: What other crops do you grow?
Probe: How important is the industry to you?

1. In the past two years, did you see any changes in the industry leading up to the closure of the banana export market?

   Probe: Were you growing bananas for export then?
   Probe: What changes did you make when you saw those changes?

2. Now that the export market is gone, how do you sell your bananas?

   Probe: Why these ways?
   Probe: Do you think getting retraining will be important for you?
   Probe: Is this more or less profitable than the working with the export market?

3. Did you sell all of your bananas to the export company (BECO)? What is your major market now?

   Probe: Did you get any advance warning?

4. What changes are you making with the loss of this market?

   Probe: What other crops are you growing?
   Probe: Are you going to just one crop or more than one?
   Probe: Is anything else going to be done with this land?

5. How has the end of exports affected a. banana prices, and b. local competition?

6. Are there any special groups or extension services that are helping farmers adjust to the changes?

   Probe: What are some of the things they have been doing?
   Probe: Do you think these things are helpful or not?

7. What do you think can be explored to expand the banana industry?

   Probe: How important do you think it is to go into value-added products?

8. Are there any other things you can think of that have changed in banana farming since the export market closure?

   Probe: Why are these things happening?
   Probe: Does the change in market have anything to do with this?

Closure question: What do you see happening in the banana industry in the next year?

Probe: Why do you say this?

Thank you very much for completing this interview with me. The time you took to do this is highly valued. Please remember that you have my contact information on the consent form that I gave to you. Please feel free to contact me if you have any questions on how this information is being used for this research project.

Adaptive Strategies in Banana Farming – Former Worker Interview Form

The following questions will be exploring how workers in the banana industry have been managing the closure of the banana export sector.

Opening question: How long have you worked with the banana industry?

Probe: How did you get into the area of banana farming?
Probe: How important is the industry to you?

9. In the past two years, did you see any changes in the industry leading up to the closure of the banana export market?

   Probe: Were there any changes at your workplace?
   Probe: What changes did you make when you saw those changes?

10. Now that the export market is gone, what are you doing for work now?

    Probe: Why these ways?
    Probe: Do you think getting retraining will be important for you?
    Probe: Is this more or less profitable than the working with the banana industry?

11. What changes have you observed in the industry since the closure?

    Probe: Is it shrinking? Diversifying? Growing?

12. Have you received aid from any support programs?

    Probe: What are some of the things they have been doing?
    Probe: Do you think these things are helpful or not?

13. What do you think can be explored to expand the banana industry?

    Probe: How important do you think it is to go into value-added products?

14. Are there any other things you can think of that have changed in banana farming since the export market closure?

    Probe: Why are these things happening?
    Probe: Does the change in market have anything to do with this?

Closure question: What do you see happening in the banana industry in the next year?

Probe: Why do you say this?

Thank you very much for completing this interview with me. The time you took to do this is highly valued. Please remember that you have my contact information on the consent form that I gave to you. Please feel free to contact me if you have any questions on how this information is being used for this research project.

Adaptive Strategies in Banana Farming in Jamaica – Jamaica Producers Interview Form

The following questions will be focusing on the role of the Jamaica Producers Group (JPG) in the banana industry and how the impacts of the closure of the export banana sector are being managed.

Opening question: What are the operations of the JPG like, within and outside the banana industry?

Probe: What are some of the general aims of the company?
Probe: Is there a fact sheet that could be obtained that contains the key production information regarding JPG?
Probe: How diversified is the group?

15. What has been the general reaction of the JPG to the closure of exports?

    Probe: Was it expected?
    Probe: What were some of the preparations being made for this event?

16. a. How has the company been managing the fallout due to the banana exports?

    Probe: Have management programs been put in place?
    Probe: What specifically has been done on the banana farms?

    b. Are any of these things aimed at assisting workers and/or other farmers?

    Probe: How have workers/farmers responded to these measures?
    Probe: Would you consider them to be a success/failure/work in progress?

17. What are some of the changes you have observed in the industry since the closure of the banana export market?

    Probe: Do you see any changes in the foreseeable future?
    Probe: How has the JPG changed in response to these changes?

18. What are some of the specific strategies that are being used to plug the hole left by the market closure?

    Probe: What about value-added production?
    Probe: Are any new crops being encouraged?
    Probe: Are people moving more towards other crops or moving out of the industry entirely?

19. In the next year, what are some of the trends you see as the JPG rebuilds from the closure of the banana export market?

    Probe: Do you think these trends will continue?
    Probe: Why do you think so?

    Closure question: Are there any other things you can think of that will affect the JPG banana operations in the near future?

Thank you very much for completing this interview with me. The time you took to do this is highly valued. Please remember that you have my contact information on the consent form that I gave to you. Please feel free to contact me if you have any questions on how this information is being used for this research project.

Adaptive Strategies in Banana Farming in Jamaica – Banana Board Interview Form

The following questions will be focusing on the role of the Banana Board in the banana industry and how the impacts of the closure of the export banana sector are being managed.

NB: Note-taking form provided separately.

Opening question: What are the general functions of this agency?

Probe: Is the focus more technical or oversight / administrative?
Probe: How extensive is the reach of the agency?

20. What has been the general reaction of people involved with banana farming to the closure of exports?

    Probe: Was it expected?
    Probe: Were people preparing for this event?

21. a. What are some of the assistance programs being offered since the closure of banana exports?

    Probe: Who created these programs?

    b. How are these things aimed at assisting farmers and/or workers?

    Probe: How have farmers responded to these attempts at assistance?
    Probe: How much of the farmer population is able to access these services?

22. What are some of the changes you have observed in the industry since the closure of the banana export market?

23. Are there any specific strategies that will be used to plug the hole left by the market closure?

    Probe: Why/why not?
    Probe: Are any new crops being encouraged?
    Probe: Are people moving more towards other crops or moving out of the industry entirely?

24. In the next year, what are some of the things that you expect will be seen among these farmers and workers?

    Probe: Do you think this trend will continue?
    Probe: Why do you think so?

Closure question: Are there any other things you can think of that will affect farmers in the near future?

Thank you very much for completing this interview with me. The time you took to do this is highly valued. Please remember that you have my contact information on the consent form that I gave to you. Please feel free to contact me if you have any questions on how this information is being used for this research project.

Adaptive Strategies in Banana Farming in Jamaica – EUBSP Interview Form

The following questions will be focusing on the role of the EUBSP in the banana industry and how the impacts of the closure of the export banana sector are being managed.

Opening question: What are the general functions of this agency?

Probe: Is the focus more technical or oversight / administrative?
Probe: How extensive is the reach of the agency?

25. How has the EUBSP been working in the island prior to exports?

    Probe: Was the focus on preparing people for the end of exports?

26. a. What are some of the assistance programs being offered since the closure of banana exports?

    b. How are these things aimed at assisting farmers and/or workers?

    Probe: How have farmers responded to these attempts at assistance?
    Probe: How much of the farmer population is able to access these services?

27. What are some of the changes you have observed in the industry since the closure of the banana export market?

28. Are there any specific strategies that will be used to plug the hole left by the market closure?

    Probe: Are any new crops being encouraged?
    Probe: Are people moving more towards other crops or moving out of the industry entirely?

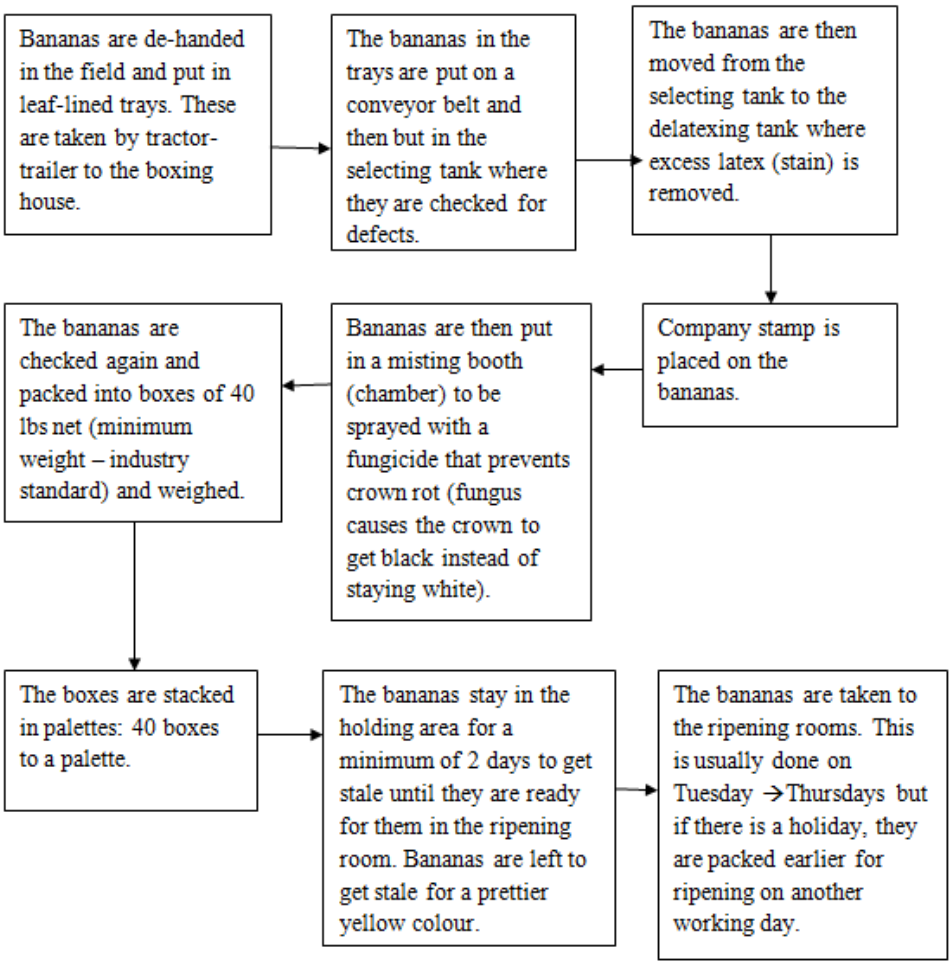
29. In the next year, what are some of the things that you expect will be seen among these farmers and workers?

    Probe: Do you think this trend will continue?

Thank you very much for completing this interview with me. The time you took to do this is highly valued. Please remember that you have my contact information on the consent form that I gave to you. Please feel free to contact me if you have any questions on how this information is being used for this research project.

APPENDIX B
VALUE ADDED PRODUCTION IN THE BANANA INDUSTRY

Flowchart of the Banana Ripening Process



Cost Calculations in Producing Banana Chips

Average purchase price for 1 box (40 lbs.) of banana = J$1200
Assuming 10% of the banana is dry matter, total dry matter = 40 lbs.*10% = 4 lbs. or 64 oz.
Cost per ounce of dry banana = J$1200/64 oz. = J$18.75

The average bag of banana chips costs J$40 and usually has no more than 2 oz. of chips.
For a 28g (0.987 oz.) bag of Family Treat banana chips, costing J$20.30, the profit margin for this bag of chips is J$1.80. This is assuming no production costs.

Once production costs begin to be factored in, one quickly realizes that moderate to high volumes of production and sales are necessary to turn a profit. To further reduce costs, it would be beneficial to produce, rather than purchase the fruit necessary for making banana chips.

APPENDIX C
EUROPEAN UNION BANANA SUPPORT PROGRAM DIVERSIFICATION GRANTS

EUBSP RDP Grant Contracts Awarded

RDP GRANT CONTRACTS AWARDED

SFA 2001 GRANT CONTRACTS

1. INSTITUTIONAL STRENGTHENING OF MICRO FINANCIAL INSTITUTIONS
(Total EU Grant €496,436.48 or $54,620,424)

Applicant /Title	Budget (Euro)	Target Area/Group	Scope of Proposal	Duration
Applicant; St. Thomas Co-operative Credit Union Ltd **Title;** Institutional Capacity Building of Parish Credit Unions Operating as Microfinance Institutions	**EU's Cont;** 496,469 **App. Cont;** 383,738 **Total 880,207**	Traditional Banana growing communities of; Portland, St. Thomas, St. Mary, St. Catherine, Clarendon, St. James	- Strengthen the institutional capacity of Credit Unions to respond to the needs of the target group; - Improve access to micro-credit and innovative financial services and support to MSEs for the target group. - Provide a suite of business development training and technical support services for MSEs; and - Facilitate sub-granting programmes for groups of MSEs to implement qualified sub-projects	Duration - 13 Months. (October 2, 2008 to November 1 2009)

2. IMPROVE ACCESS TO VOCATIONAL EDUCATION, SKILLS TRAINING AND REMEDIAL LEARNING;
(Total EU Grant €300,000.00 or $33,007,500)

Applicant /Title	Budget (Euro)	Target Area/Group	Scope of Proposal	Status
Applicant; The HEART Trust-National Training Agency **Title;** Banana Sector Retraining Project	**EU's Cont;** 300,000.00 **App. Cont;** 73,683.00 **Total 373,683.00**	The traditional banana growing areas of St. Thomas, Portland, St. Mary, St. Catherine, Clarendon and St. James.	The overall objective of the action is to provide greater access to alternative training and certification opportunities for banana farmers, and banana farm and port workers to enable their transitioning into new, diverse and sustainable income generating activities Results to be achieved include; 1. Training needs analysis conducted 2. Career counseling workshops conducted 3. Skills and pre-vocational programmes piloted 4. ICT enabled remedial programme piloted 5. Programme evaluation conducted and follow up planned	Duration - 15 Months. (October 2 2008 to December 31, 2009)

SFA 2002 GRANT CONTRACTS

RURAL DIVERSIFICATION AND BUSINESS ENTERPRISE DEVELOPMENT; (Total EU Grant =€1,251,987 or J$137,749,869)

Applicant /Title	Budget (Euro)	Target Area/Group	Scope of Proposal	Status
Applicant; Coventry University **Title; Promoting Rural Integrated Development and Enterprise: A Participatory Business Model for Organic Agro-Tourism**	**EU's Cont;** 267,996.91 **App. Cont;** 47,293.57 **Total 315,290.48**	Location; Mango Valley, St Mary	To increase the income opportunities of the MVVFS group and adjoining communities with training for organic certification of crops and agro products, improvements in packaging and marketing of these products as a basis to establish an agro tourism visitor experience based on the Mango Valley Pride brand Training in organic agricultural certification Enhancing the branding and marketing strategies of agro-food products Identification of agro tourism potential Development of community based agro-tourism strategy Training on tourism attraction development and service quality Development of user friendly 'tool-kits' for organic certification and community resource audits	Duration - 12 Months. (November 11 '08 to November 10 '09)
Applicant; Inter American Institute for Cooperation on Agriculture (IICA) **Title;** Development of an Agro-Tourism Industry in the Buff Bay Valley Area	**EU's Cont;** 324,050 **Applicant** 57,186.00 **Total 381,236.00**	Communities of Charles Town, Tranquility, Balcarres and Cascade in Portland Target group; Farmers, cottage agro-processors and craft-makers,), Youth, Charles Town Maroons	To reverse the economic decline in the target communities by providing new income earning opportunities to residents in these communities 1.New economic prospects stimulated by development and marketing of tourism attractions in the communities 2.Revitalise agricultural production by securing new market channels for farmers and strengthening their capacity to supply 3.Use this agro-tourism project as a model for rural development in the banana production belt and other communities across Jamaica	Duration - 15 Months. (September 30, '08 to December 29, '09)

Applicant; Jamaica Egg Farmers Association (JEFA) **Title;** Table Egg Marketing Development Programme	**EU's Cont;** 250,000.00 **Applicant** 48,126.83 **Total** **298,126.83**	Location; Traditional communities of Clarendon, St. Catherine, St. Mary	The association will acquire a packaging and grading processing facility and expand existing liquid egg plant. Current and new entrants in the egg farming industry will be trained in business development, husbandry, productivity, on-farm food safety, food safety and biosecurity. Promotional drive to attract displaced banana workers from all areas to enter egg farming industry.	Duration - 12 Months. (November 14, 08 to November 13, '09)
Applicant; Christian Aid **Title;** Strengthening Capacities for Sustainable Livelihoods	**EU's Cont;** 409,940.00 **Applicant** 72,343.00 **Total** **482,283.00**	**Location;** Communities of Johnson Mountain, Spring Bank, Mount Vernon, Somerset and Trinityville in St. Thomas	To improve and sustain the livelihoods of farmers and their communities in Johnson Mountain, Spring Bank, Mount Vernon, Somerset and Trinityville, former banana producing communities of St. Thomas, through the strengthening and empowerment of community and farmer organisations to diversify their economic opportunities, expand their existing business enterprises, creating both income and employment opportunities, and to become more resilient to disasters. Main activities include; - Community mobilization and training, Poultry production; Slaughterhouse construction, management and marketing -Cash crop and livestock production. - - Rehabilitate and construct check dams to prevent land slippage in Somerset; Plant Seedlings Nurseries in the communities of Somerset and Johnson Mountain; Feasibility studies for development of new products and irrigation system.	Duration - 15 Months. (September 30, '08 to December 29, '09)

RDP GRANT CONTRACTS BRIEF

SFA 2003; LARGE AND SMALL GRANTS – DEADLINE JUNE 30, 2008

LARGE GRANTS (Between Euro 10,000 and 100,000)

Project	Funding (J$)		Grant Disbursed	Achievements	Comments
	Appl. Cont.	Grant Sum			
Strengthening the Development Capacity of JTFA; **Applicant** – Jeffrey Town Farmers Association Ltd. **Location;** Jeffrey Town, St. Mary	9,769,072	9,200,000	4,852,430	- Addition (1100sq.ft) to and equipping of multipurpose building for group. - construction of community abattoir -chicken and feed for 10 farmers - computer training for 50 youths - training of 25 radio station personnel and launch of radio station	Pick-up ($2.0m) and radio equipment ($0.8) had to be considered inkind instead of cash contribution as were procured prior to signing of contract
Capability Building for Non-traditional Agricultural Entities **Applicant;** Jamaica Exporters Association **Location;** St. Thomas, St. Mary, St. Catherine	2,357,480	6,842,520	$5,474,016	- 100 farmers and 25 extension officers trained in agricultural, marketing and business management best practices - 10 farmers' groups (190 farmers) and in 3 parishes and schools received farm inputs (seedlings and fertilizer) - training and resource manuals prepared and circulated - lead farms/demonstration plots established	.
Dairy Herd Expansion. **Applicant;** Fred M. Jones estates **Location;** Eastern St. Thomas	2,836,545	8,567,951	$6,854,361	- 70 heifers acquired; refurbishment of milking facility completed and equipment installed; 0.72 km. road rehabilitation work completed with drains installed; 92 chains of PVC pipes installed to improve water supply to dairy. 10 workers employed during implementation and 4 additional during current operation phase	49 animals sold to cow bank scheme as at 30/06/08. The bank continues to grow. Applicant's milk production has increased by 20%
Turf Project **Applicant;** Fred M. Jones estates **Location;** Eastern St. Thomas	8,208,401	4,597,834	$3,678,267	Four hectares of turf established; land preparation and sowing equipment procured; Irrigation system acquired and installed; 8 persons mainly females permanently employed	6,692sq ft of turf sold as at 30/06/08, much less than targeted due to delay in maturity. Sale currently on-going.

Expansion of Plant Capacity **Applicant;** CANCo. Ltd **Location;** Central St. Thomas	7,112,056	9,200,000	$7,360,000	Main focus of project is the purchase and installation of a number of pieces of agro-processing equipment, training of employees and research and marketing of new products as the Processing Plant seeks to expand and diversify its products and improve its operational efficiency. Over 100 farmers have been supplying agricultural products to this processing facility	Most of the pieces of equip. were procured overseas. However, although ordering and payment were done before the project deadline delivery was done after the deadline. This business venture has a significantly impact on the target group in central and eastern St. Thomas
Enhancing Competitiveness **Applicant;** Victory Bakery **Location;** Mt. Industry, St. Catherine	$994,838	2,454,362	$2,257,685	Acquisition and installation of bakery equipment including, dough break machine, bread pans, baking sheets etc; refurbishing and renovation of bakery facility; purchase of computer; purchase and installation of generator. Three additional/new workers employed	Project has resulted in enhanced productivity, efficiency of the Bakery.
Retooling and Certification Exercise **Applicant;** WESS Industries **Location;** Port Antonio, Portland	8,748,837	6,600,000	$3,253,052	Block machine (used) purchased, renovated and installed. Container purchased and partially (80%) refurbished for use as office, however planned storage facility not completed.. To date just over 100 persons have participated in the construction certification exercise with HEART, 23 graduated at level one	Certifying of construction workers fairly successful, exceeding target. Modernization of plan far less successful and procurement of trucks (2), not accomplished. This is attributed primarily to family problems and financial challenges of the applicant,
Green & Colour Bell Peppers and Tomatoes **Applicant;** Fort Stewart Farms Ltd. **Location;** Portland	$2,637,000	7,391,000	$5,912,800	Four hectares of land planted in bell pepper with plastic mulch and drip irrigation. During the production of crop some 40 persons, mostly ex-banana women workers were employed. Due to break down in marketing arrangement and financial constraint 35,000lb of peppers was lost. Cold storage truck, a tractor and equipment imported from abroad but arrived after the deadline of the project.	The project has been hampered by financial constraint of the applicant, late delivery of equipment and break down in marketing arrangements.
Total		**54,853,397**	**39,642,611**		

Small Grants; < € 10,000					
Pilot Agro-forestry Initiative for Sustainable Rural Development **Applicant;** Forestry Convervancy **Location;** St. Mary	605,000	920,000	$736,000.	2 hectares of timber trees intercropped with hot and sweet pepper and water melon. One bush cutter & roter tiller, one mist blower, two forks and two spades bought. Three field days held attended by 60 farmers Overall objective is to demonstrate and promote viable agro-forestry techniques for both large and small farmers	There is potential for this type of sustainable farming system. However, the the project got off to a slow start and most of the crops initially planted were destroyed by cows.
Pilot Agro-forestry Initiative for Sustainable Rural Development **Applicant;** Forestry Convervancy **Location;**, Clarendon	300,000	885,000	$708,000.	Limited land preparation, weed control only. One fork, one spade and one bush cutter purchased One training session held with twenty five persons attending	Difficuty in obtaining suitable equipment (tractor) to carry out initial preparation delayed start of project. Later affected by drought. Applicant is to continue with programme and to involve farmers
Upgrading of Sherries School Uniforms Manufacturing **Applicant;** Sherries School Uniforms and Fashion **Location;**, Port Antonio/ Rio Grande communities	386,600	920,000	$736,000.	Space rented for storage of materials One industrial serger, two family size sergers & sewing machines purchased and currently being used. Just over two thousand yards of fabric were purchased and used to make uniform and for training. A total of fourteen women trained by HEART/NTA 15 women and one male involved in the project	Business operated 4 sales outlets during peak production period – (school uniform period). This is up from 2 outlets
Beekeeping Project **Applicant;** -Skibo Creative Craft & Home Eco. Gp. **Location;**, Skibo, Portland	275,600	639,884	$627,480	Bees and boxes purchased to establish fifty (50) colony apiary for the group. Also procured are - Extractor and miticide. The current membership which totals twelve females and one male received apiculture training under the EUBSP funded Institutional Strengthening of the Portland BFA	The project will concentrate on the multiplication of colonies for distribution to its members and on production of honey as source of income for the group
Beekeeping Project **Applicant;** Buzzing Bee **Location;**,Guys Hill, St. Mary	$278,200	834,713	$709,483	Floral calendar developed. A nursery stock of 10 colonies for expansion and sale established. Production stock of 20 colonies being maintained. 17 of 20 members received bees. The target group of 20 has been provided	Group was newly formed and intend to expand its membership in short order. Training is also provided to the agricultural students of

				appropriate apiculture training.	Guys Hill High School where the apiary is located
Modernization of the Passley Gardens Hatchery **Applicant;** Passley Gardens Hatchery Ltd **Location;**, Passley Gardens, Portland	557,326	871,713	$833,077	Two pieces of hatchery equipment (incubator modules) acquired and installed; Electrical system refurbished; Hatchery repainted, water tank repaired; hatchery supervisory staff and five production workers trained in hatchery management	With the improved efficiency the Hatchery the quality, cost and reliability of supply of chicks to farmers are expected to improve.
Beekeeping Project **Applicant;** BSH Beekeeping Group **Location;** Mt. Herman, Portland	214,000	640,420	$634,292	Storeroom completed and currently in use Honey extractor, veils, smokers, Hive tools bought. A total of 50 colonies were also bought for the group. All fifteen members of the group were trained in six training sessions	Colonies are to be distributed to members
Institutional Strengthening Portland Bee Farmers Asso. **Applicant; Portland Bee Farmers Ass.** **Location;**, Portland (parish wide)	225,000	668,765	$609,390	Several training sessions conducted by the PBFA for its member groups, including BSH and Skibo. A curriculum was also developed. Total of 29 farmers received 12 training sessions. 12 resource bee keepers received advanced training. Computer equipment acquired and bee equipment for its commercial apiary	Resource Bee farmers who received advanced training are available to provide advice to other bee farmers throughout the parish
Bath Commercial Food Preparation Training Programme **Applicant;** Bath Commercial Council **Location;**, Bath, St. Thomas	509,000	920,000	$736,000	Renovation of the kitchen done. Also, Commercial stove with fitting along with utensils were bought but not yet in use. Other activities including training in Commercial food preparation by HEART/NTA and RADA, product development by SRC and sale promotion were not achieved	This project got off to a late start due to the absence of the president during the initial period. Despite persistent efforts by the PIU the applicant failed to present the required final report and supporting documents for expenditure incurred.
Empowerment Through Entrepreneurial Training **Applicant;** Port Morant DAC **Location;**,Hampton Court Centre	$594,250	714,000	$400,000	7 communities were mobilized to participate in this project. 20 persons received training in project planning, entrepreneurial and business management. Development Plans for communities currently being prepared for the DAC	Achievement of project below expectation as third party, JSIf has been behind on its contribution

Pera Point Sewing Training Project **Applicant;** Port Morant DAC **Location;**, Pera point, St. Thomas	1,253,700	753,000	$350,000	4 industrial machines acquired. Resource building renovated including electrical wiring. 13 ladies completed the training conducted by HEART/NTA.	Project got off to a slow start because of insufficient machines for the participants to use. Third party has been behind in provision of its contribution
Port Morant Dev. Area Craft Training Programme (Banana Paper Making & Leather) **Applicant;** Port Morant DAC **Location;**,Hampton Court, St. Thomas	661,900	917,000	$450,000	15 of 25 persons from the group completed training (4 are pass employees of Eastern Banana Est.). Two industrial machines bought and are being used in the making of an array of leather/paper craft items. Leather was also purchased for training purposes.	Even though funding for training from the grant is at an end training of member's continues
Rowlandsfield Multi-Media-Information Technology Training Programme **Applicant;** Rowlandsfield Comm. Dev. Ben. Soc **Location;**, Rowlandsfield, St. Thomas	290,500	858,500	$713,509	Community centre renovated and made ready for computers and other equipment. Community was sensitized and mobilized with the assistance of the youth club in the community and the SDC. Computers have been acquired and relevant ITC training carried out. Some 50 members participated in training sessions and use of facility.	ITC training and use of facility by the community continues
total		**10,542,995**	**8,243,231**		

SFA 2005
SOCIAL & ECONOMIC INFRASTRUCTURE
(Total EU Grant = approx.€2,312,000 or J$119,198,628)

Applicant /Title	Budget (Euro)	Target Area/Group	Scope of Proposal	Status
Applicant; St. James Parish Council **Title;** Rural Economic and Social Infrastructure Support Project for Traditional Banana Growing communities **Duration**; 18 Months (24/12/08 to 23/06/10)	**EU's Cont;** 1,156,000 **App. Cont;** 776,766 **Total 1,932,766**	Traditional Banana growing communities of; Portland, St. Thomas, St. Mary, St. Catherine, Clarendon, St. James	The specific purposes to be achieved are: - Local Level Institutional Capacity Development: Project Implementation Support and Project Oversight; Parish Council and Local Sustainable Development Planning; and Community Based Organizations/Representative Groups - Targeted Engineering Works Construction/Rehabilitation of Community Economic Infrastructure and Facilities for Sustainable Livelihood Social and Economic Reintegration Support Programmes - Sub-Granting Programmes for Community Groups/Representative Associations to Implement Targeted Qualified Economic Sub-Projects	Mobilisation of project
Applicant; Jamaica Social Investment Fund (JSIF) **Title;** Infrastructure Improvement Project for Traditional Banana Growing Communities **Duration**; 24 Months (24/12/08 to23/12/10)	**EU's Cont;** 1,156,000 **Applicant** 289,000 **Total 1,445,000**	Traditional Banana growing communities of; Portland, St. Mary, St. Catherine, Clarendon.	The aim of the project is to; - Implement infrastructure projects including, early childhood and primary level educational institutions; community water supply systems; primary health care facilities; agriculture feeder and access roads. - Develop and implement social interventions aimed at building social capital within the targeted communities. - Enhance institutional capacity to manage and maintain projects that are implemented. - Enable beneficiary communities to become self-reliant through assistance with income-generating activities. - Strengthen organizational and management capacity of communities	Mobilisation of project

SFA 2007 Call for Proposals

Ministry of Agriculture & Fisheries
European Union Banana Support Programme
193 Old Hope Road, Kingston 6, Jamaica
Tel: (876) 970-3937/3938 Fax: (876) 927-2450
Email: eupmu@cwjamaica.com

INVITATION FOR EXPRESSION OF INTEREST

Banana Industry Market Survey & Study

The European Union Banana Support Programme in Jamaica (EUBSP), financed under the Special Framework of Assistance for Traditional ACP Suppliers of Bananas - SFA 2007(Budget Line No. B-21.06.05), is inviting expressions of interest for the conduct of a survey of the domestic market for bananas and a study to determine the structure of the industry. The Contracting Authority for the survey and study is the Rural Agricultural Development Authority (RADA). The study will be conducted island wide-over a period of six months.

Expressions of interest in conducting the above study, submitted in triplicate, should be sent or hand delivered to:

EUBSP Overall Co-ordinator,
RADA/EUBSP Offices,
193 Old Hope Road,
Kingston 6.
JAMAICA.
Tel: +1 876 970 3937-38;
Fax: +1 876 927 2450.
Email: ***eupmu@cwjamaica.com or eubsp_admin@cwjamaica.com***

The **closing date** for receiving expressions of interest is **4.00 pm** local time on **January 13 2010.**

In drawing up a short-list, consulting firms and consultants will be assessed based on:

a. The proposed methodology for the study
b. Proof of experience in successfully conducting similar studies in the past
c. The qualifications and experience of the key experts being proposed for the conduct of the study

Shortlisted firms will subsequently be sent the detailed Terms of Reference and invited to participate in a competitive negotiated tender.

SCOPE OF WORK

The European Union has provided support to the banana industry in Jamaica since 1996. The current European Union Banana Support Programme (EUBSP) is being financed under the ten (10) year Special Framework of Assistance (SFA), council Regulation 856/1999 of the European Commission: Special Framework of Assistance for Traditional ACP suppliers of bananas to the European Union.

The overall objective of the European Union Banana Support Programme is the promotion of sustainable development in the traditional banana growing communities of the parishes of Portland, St Mary, St James, St Thomas, Clarendon and St Catherine.

The survey of the domestic market and the study to determine the structure of Jamaica's banana industry are expected to:

- Clearly define the structure of Jamaica's banana and plantain industries
- Accurately define and measure the domestic market for bananas, plantains and their value-added products
- Analyse the efficiency of the domestic banana market and conduct preliminary assessment of potential overseas market and the feasibility of re-entry into the traditional banana export market in the United Kingdom
- Conduct a value chain analysis of the banana and plantain industries

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BIOGRAPHICAL SKETCH

Mario Mighty entered the University of Florida having received his Bachelor of Science degree from the University of the West Indies (Mona Campus) in Jamaica where he majored in geography. Prior to enrollment for his master's degree, he worked with a geo-spatial firm associated with his undergraduate university for a period of one year. As an international student he found the learning environment at the University of Florida both interesting and challenging. He believes that his faith in Jesus Christ has made a significant difference to his graduate studies as well as the quality of his extra-curricular involvement on and off the college campus. He graduated from the Department of Geography having received his Master of Arts degree from the University of Florida in the spring semester of 2010 and plans to continue his graduate studies within the field, with the ultimate aim of returning to his native homeland of Jamaica.