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**Investigating the Livelihoods of Families Operating Small
Sugarcane Farms in Jamaica: A Case Study Perspective**

A thesis
submitted in partial fulfilment
of the requirements for the Degree of
Doctor of Philosophy

at
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by
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Abstract of a thesis submitted in partial fulfilment of the requirements for the Degree of Doctor of Philosophy.

Investigating the Livelihoods of Families Operating Small Sugarcane Farms in Jamaica: A Case Study Perspective

by

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This research project sets out to gain theoretical insights and develop an understanding of issues relevant to the livelihoods of families operating small sugarcane farms in Jamaica. The study started with the observation that small sugarcane operations in Jamaica were on the verge of collapse. This observation was based on the existing situation together with the fact that the preferential market price Jamaica received from the European Union for sugar would be reduced by 36 per cent in the 2009/2010 marketing year, and that these families would be severely affected. The primary aim was to identify strategies that can inform policy and planning relating to improving the livelihoods of these families in a sustainable manner.

The case study strategy was chosen as the appropriate approach for carrying out the research. Two of the seven sugarcane growing regions in Jamaica were selected as case study sites. Philosophically, the study was conducted within the constructivist-interpretive research qualitative paradigm, together with principles drawn from grounded theory. The sustainable livelihoods approach formed the theoretical base and framework of analysis to guide the study.

The study showed that two-thirds of the sampled families' per capita income averaged \$2.1 per day. They viewed themselves as poor. Even though sugarcane farming played an important role in the asset and activity dynamics of the families, it was factors other than sugarcane production that were responsible for achieving positive livelihood outcomes. Better off families with a per capita income that averaged \$8.8 per day were able to participate in lucrative income generating activities more readily, than members of poor families, due to their higher education status. While formal sector employment characterised the better off families, informal and illegal activities were critical adaptive strategies for most of the poor.

To improve the livelihoods of these families, evidence from the fieldwork revealed the need to tackle the elements of crime, invest in technical/vocational skill training and microenterprise development with particular attention given to non-sugarcane crops to provide an incentive and to boost on-farm earnings.

Keywords: Livelihoods, Jamaica, families, small sugarcane farms, case study.

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List of Abbreviations

ACP	African, Caribbean and Pacific countries
AIJCFA	All Island Jamaica Cane Farmers Association
CARE	Cooperative for Assistance Everywhere
CIA	Central Intelligence Agent
COMS	Common Organisation of the Market in Sugar
CRB	Commodity Research Bureau
CSEC	Caribbean Secondary Education Certification
DFID	Department For International Development
EIU	Economist Intelligence Unit
EU	European Union
FRI	Factory Recovery Index
GATT	General Agreements on Tariff and Trade
HEART	Human Employment and Resource Training
HFCS	High Fructose Corn Syrup
IDB	Inter-American Development Bank
IICA	Inter-American Institute for Cooperation on Agriculture
IMF	International Monetary Fund
ISO	International Sugar Organisation
JRCS	Jamaica Recovery Cane Sugar
JSI	Jamaica Sugar Industry
JSIF	Jamaica Social Investment Fund
MLSS	Ministry of Labour and Social Security
MOH	Ministry of Health
NAFTA	North America Free Trade Agreement
NPEP	National Poverty Eradication Programme
PAHO	Pan American Health Organisation
PATH	Programme of Advancement Through Health and Education
PIOJ	Planning Institute of Jamaica
SADP	Sugar Area Development Programme
SIRI	Sugar Industry Research Institute
SLA	Sustainable Livelihoods Approach
SPS	Special Preferential Sugar
STATIN	Planning Institute of Jamaica

Tc/ha	Tonne Cane per Hectare
Ts/ha	Tonne Sugar per Hectare
UNDP	United Nation Development Programme
URAA	Uruguay Round of Agreement on Agriculture
US	United State of America
USDA	United States Department of Agriculture
USTRQ	US Tariff Rate Quota System
WTO	World Trade Organisation

Chapter 1

Introduction

1.1 Background

Having worked with the Sugar Industry Research Institute (SIRI) in Jamaica from 1995 to 2005 as an Extension Agronomist, the researcher came to the study with the assumption that farmers needed to follow the recommended farming techniques and that this would make sugarcane growing profitable. The key initial research question was therefore how to make this happen. However, as the study progressed, the researcher came to realise that the problems were much deeper, and that a different approach was required that looked at livelihoods in a much broader context. This required a different set of research questions and a different research method than was originally envisaged.

An early observation of the study was that small sugarcane operations in Jamaica were on the verge of collapse. A review of the literature and, particularly, the evidence from fieldwork confirmed this view.

It can be argued that sugar has been lucrative in the past. However, with the impact of global trade liberalisation, sugarcane farmers in Jamaica have been faced with numerous problems that have reflected negatively on their livelihoods. Under global trade liberalisation, the Jamaican economy, particularly since the mid 1980s, has been faced with a large merchandise trade deficit, sliding exchange rates, high interest rates, and a growing public debt.

The agricultural sector, for example, has suffered major losses as the economy struggled under the World Trade Organization (WTO) driven Uruguay round agreement on agriculture (URAA) negotiations, which focused on reduction in support of market access, domestic support and export competition. Even with preferential export markets, and a share of Government support, the Jamaican sugar industry (JSI), among other agro-related industries remains heavily indebted, lacking in funds, technology and with run-down assets. As a consequence, since 1996 Jamaica's raw sugar production contracted from a high of 239,000 tonnes to a low of 124,000 tonnes in 2004 (SIRI 2002; Salmon and Thomas 2005).

1.2 Jamaica

Jamaica is the largest English speaking island in the Caribbean covering an area of 10,990 square km with a population of 2.68 million people in 2007. Total agriculture land area is 407,000 ha, of which 80 per cent is hilly and mountainous. Large plantations and pastures

dominate the fertile coastal plains, while small farmers are confined mainly to the rugged interiors (Campbell 2005).

According to the 1996 agricultural census, there were 187,000 farms averaging 2.1 ha which supported approximately 150,000 small farm families. Farms of two hectares and less constituted some 78 per cent of the farming community, with large-scale farms accounting for less than one per cent of the total number but occupying about 39 per cent of farm lands (Campbell 2005).

Jamaica operates as a mixed, free market economy with state enterprises as well as private sector businesses. The economy is heavily dependent on services which accounted for 67 per cent of GDP in 2008 (Central Intelligence Agency [CIA] 2009). The country derives most of its foreign exchange from tourism, remittances and the bauxite alumina industries (Planning Institute of Jamaica [PIOJ] 2008). Jamaica continues to suffer from varied economic challenges as well as a marked increase in crime.

1.3 The Jamaican Sugar Industry

Sugarcane is the major crop grown in Jamaica. The crop occupies approximately 35,000 hectares. Sugar is produced in Jamaica by seven estates, each with a factory. Two are owned by private interests, while five are owned by the Government. Jamaica produces only raw sugar; it does not operate a refinery.

Earnings from raw sugar exports averaged nearly US\$60 million annually between the mid 1990s and 2007, representing almost 6 per cent in total exports from Jamaica and about 36 per cent from total agricultural exports (SIRI 2002; PIOJ 2008). The JSI contributes almost 1 per cent to the GDP and provides employment for over 65,000 persons of whom 38,000 are directly employed (Mitchell 2004). The industry is supplied with sugarcane from approximately 10,000 registered farmers of whom 6,000 are small farmers, each operating on two hectares and less. In total, farmers occupy about 17,000 hectares and supply between 45 and 50 per cent of sugarcane deliveries each year (SIRI 2002).

1.4 Problem Statement and Rationale

The preferential market prices Jamaica has historically received from the United States (US) and the European Union (EU) for raw sugar were two to three times higher than the world market price. However, under global trade liberalisation and the WTO rulings, these markets are gradually eroding. Most importantly, the EU, in response to the WTO rulings, announced a reduction in raw sugar prices by 36 per cent starting in 2006 and taking full effect in the

2009/10 marketing year (5 per cent in 2006/7; 24 per cent in 2008/9; 36 per cent in 2009/10). The EU sugar reform policy also includes a package for least developed countries (LDC) under the Everything but Arms (EBA) initiatives, where preference will be given to those countries having free access to the EU market. This package would gradually induce the phasing out of import duties on sugar from 2006 to 2010 (Jamaica Information Service 2005).

Growers are frustrated about this. In 2005, for example, it cost Jamaica US 26 cents to produce one pound of raw sugar compared to the EU preferential price of US 27 cents per pound received (PIOJ 2006). Operating in such an environment would certainly be a formidable challenge. Though the JSI are looking at foreign direct investment (FDI), small sugarcane holdings such as those located in rugged terrain, inaccessible to mechanisation, long distances from factories and without economies of scale most likely will not be attractive to transnational corporation investment. In other words, small sugarcane farmers should look at alternatives outside the sugar industry.

Families operating small sugarcane farms in Jamaica are, therefore, the focus of this study with the implication that their livelihood within a changing environment is an important research topic. I will examine what the literature on sustainable livelihoods might have to contribute to this problem.

The study is to fill a void in Jamaican agricultural development that has been overlooked by the contributing literature. It is an ailing sector that requires the needs of its human resources (farmers). Studying the livelihoods of these farmers' families is of vital importance, but also has implications to further our understanding of the relationships between sustainable livelihoods and poverty. The study will also provide a model of how a research methodology can be applied to an investigation relating to the livelihoods of families operating small sugarcane farms in a Jamaican context. Moreover, this study will heighten the awareness and provide a better insight of how globalization impacts the livelihoods of families operating small sugarcane farms in Jamaica. For these reasons, this study is believed to make a useful contribution to the extant literature on poverty reduction\elimination and livelihood sustainability.

1.5 Research Aim, Objectives, and Questions

This research project sets out to gain theoretical insights and a clearer understanding into issues relevant to the livelihoods of families operating small sugarcane farms in Jamaica. The overriding aim of this study is to identify strategies that can inform policy and planning and contribute to the improved livelihoods of these families in a sustainable manner.

With this aim in view, two important research objectives were framed.

- 1) To identify the main causes limiting the positive livelihood outcomes of families operating on small sugarcane farms in Jamaica.
- 2) To identify strategies that can provide for a better understanding of the well-being of families operating small sugarcane farms in Jamaica and contribute meaningfully to the sustainability of their overall livelihoods.

For this study to meet its objectives, it is essential that three key research questions are addressed. These are:

- 1) What are the current livelihood systems of families operating small sugarcane farms in Jamaica?
- 2) What strategies are currently in place for these families?
- 3) What strategies can be identified to improve the livelihoods of these families in a sustainable way?

1.6 The Research Scope

This study focuses on the livelihoods of families operating small sugarcane farms in Jamaica. The overarching framework is the livelihood of the farmer's family. The study defines Jamaican small sugarcane farmers as those operating on two hectares or less and dependent on the returns from sugarcane production as a source of income.

There are several definitions of livelihoods. However, this study will adopt the definition put forward by Chambers and Conway (1992:6): "*A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living*". This particular definition is compatible with this project in the sense that it refers to livelihoods as a means of living, primarily based on an asset-vulnerability approach to understanding poverty. Here, these families' assets will be taken into account in regard to the balance that can be created between social relations and non-monetary aspects of poverty such as isolation and powerlessness.

This study brings together the concepts of a sustainable livelihoods approach (SLA) as a way of development thinking and how the theory can relate to the sustainable livelihoods of families operating small sugarcane farms in Jamaica. The concepts drawn from the SLA will be integrated as an operational tool both to analyse issues and target interventions throughout this project.

The Monymusk and Trelawny cane growing regions were selected as case study sites for this project. The Trelawny region was purposely selected from a group of two regions whose

factories were to be taken out of operations in 2008. The Monymusk region was also purposely selected from a group of five whose factories were expected to continue operations.

1.7 Thesis Structure

To appropriately address the above research questions and to meet the stated objectives of the study, the thesis is arranged in nine chapters. Chapter 2 provides the background for the study, which is considered useful in looking at the external environment in which the relevant families operate. There are two sections to this chapter. First, there is a section which gives an overview of Jamaica which includes a brief history, its geography, and the macro and socio-economic environment. Second, a synopsis on agriculture and the background of the Jamaican sugar industry follows.

In Chapter 3, the basic features and operations of the world sugar market and economy are outlined. The chapter also investigates the competitiveness of the JSI using the Michael Porter (1990) diamond framework. The investigation draws only on secondary data to gain insights about competitive advantage and the positioning of the JSI in current and future international trade. Findings from the investigation and aspects of the diamond framework were also used to embrace the conceptual and theoretical framework selected for this study.

Chapter 4 deals with the sustainable livelihoods approach (SLA) which is the analytical framework selected for this study. The development of the concept of SLA, its definition, principles and framework, are addressed in this section. Following the early application of the SLA concept (since 1987), which speaks centrally to poverty alleviation and reduction, numerous frameworks were developed. The Department for International Development (DFID 1999) sustainable livelihoods framework (the most cited in the literature) was adopted for assisting in structuring the research questions, developing the empirical semi-structured question guides and probes for fieldwork, as a framework for analysis and for manipulating and organising the overall study.

The sustainable livelihoods framework was selected based on its flexible ability to capture a wide range of development issues and its potential to grasp an understanding of people livelihood systems and the environment in which they operate. At the end of the chapter, some major sustainable livelihoods frameworks are compared and a critique of the SLA is given.

The focus of Chapter 5 is to describe the research methodology. The relevance for conducting the study in the selected research paradigm (the constructivist-interpretive) and applying

aspects of grounded theory are reviewed. The justification for selecting the case study as the preferred research strategy and developing the case study design are presented. Within the case study design, issues that were sensitised from the literature (Chapter 2 and 3) were outlined. The theoretical sensitivity process was divided into two. Chapters 2 and 3 informed the first set of theoretical statements which were viewed as 'lenses' to look at the world, while the second set was related to Chapter 7 where other livelihood studies were reviewed between and after fieldwork.

The chapter also looks at the methods used for collecting the empirical fieldwork data, the reasons for selecting the case study sites (the Trelawny and Monymusk sugarcane growing regions) and the sampling strategies of the families.

In Chapter 6 the case study reports take the form of an integrated summary of the data analysis and interpretation. Although two case study sites (multiple case studies) were selected for the study, the analysis and interpretation of fieldwork data were summarised in one chapter. Since most of the findings from both regions were similar, integrating the analysis and interpretation (from both case study sites) allow a cross-case comparison to be gradually undertaken. The chapter concludes with insights (that emerged from fieldwork findings) which were highlighted and presented under the respective five components of the sustainable livelihoods organising framework adopted for analysis.

Chapter 7 extends the review of literature on livelihoods studies. The structure of this thesis is different from many theses where the fieldwork follows the literature. In order to be consistent with principles of grounded theory, it was decided at the end of the first fieldwork to look at similar studies of livelihoods to see what the different findings they reveal. Within grounded theory, there is a longstanding debate as to whether or not this form of theoretical sensitivity should be undertaken at the onset or left until after the fieldwork. If it is conducted prior to fieldwork then it can influence, even if subconsciously, the questions asked. But if there is no sensitivity to the issues that others have found, then it is likely some important observations are missed. In addition, the initial fieldwork led to a revision of the research questions and subsequently a considerable amount of the literature relevant to livelihood studies was undertaken at the end of fieldworks. The chapter ends with some development issues concerning poverty alleviation and reduction in the Jamaican context.

Chapter 8 is the discussion chapter. The chapter compares the findings that emerged from fieldwork and the relevant concepts found in the review of the literature- Chapters 2, 3 and 7. In so doing, the chapter highlights and discusses major areas of concerns relating to livelihood

issues, poverty alleviation and reduction in general and Jamaica in particular. The chapter also outlines a number of considerations for policy attention.

Finally, Chapter 9 provides a summary of the study, answers to the research questions, methodological consideration and its limitations, and suggestions for future livelihood studies.

Chapter 2

Jamaica and Agriculture in Jamaica

2.1 Introduction

This chapter provides a background to the study. It comprises an overview of Jamaica itself and then agriculture in Jamaica. There are two sections to the chapter. Section 2.2 presents a review of Jamaica's history, which begins with the arrival of Christopher Columbus to the wider Caribbean region. An outline of the geography of the island follows. The section then examines the country's macro economy and concludes with a review of Jamaica's socio-economic environment.

Section 2.3 discusses agriculture in Jamaica. A brief view of the role of agriculture in the Jamaican economy is provided first. This is followed by a review of the crops and livestock sector together with the various agriculture programmes and the farmers' credit programme. The section and the chapter end with the background of the Jamaican sugar industry. The structure of the JSI, sugar and sugarcane production, sugarcane production activities, cost of sugarcane production and prices as well as sugarcane by-products are the focus of attention.

2.2 Jamaica

This section presents a review of Jamaica. Given that the study is primarily concerned with livelihoods, it is appropriate to begin with the history and geography of Jamaica to provide an understanding about the society and the environment in which people exist. The historical development section shows how the society was formed. The geography section gives insights on the physical environmental conditions, which includes the size and location of the island, the physical landscape, the biodiversity (fauna and flora) as well as the climate and water availability. The section then traces Jamaica's macro economy since the 1950s. The section ends by exploring the socio-economic environment which takes into account the living conditions of these families in a wider Jamaican context.

Data in this section are drawn mainly from the Planning Institute of Jamaica (PIOJ) and the Statistical Institute of Jamaica (STATIN). These are the principal agencies that conduct surveys on the economic, social and living conditions in Jamaica.

2.2.1 A Short History of Jamaica

Jamaica was discovered in 1494 by Christopher Columbus on the second of his four voyages to the Caribbean (Black 1965; Barringer et al 2007). The island's original inhabitants were the Arawaks Indians whom Black (1965) believes came from South America about A.D. 1000. The Arawaks called the island Xamaica, which meant land of wood and water. On Columbus' arrival, he claimed the island for Spain and substituted a J for the X and named it Jamaica (Henry and Harris 2004).

The Arawaks were said to be peaceful, kind, skilful artisans, who farmed, fished and hunted as a way of life (Campbell 1976; Bendure and Friary 1998).

The Spanish took early possession in Jamaica (and other Caribbean islands) and were active in agricultural production. Tobacco, cotton, indigo and sugarcane were prominent among the crops cultivated, along with livestock to a lesser extent (Black 1965; Morales Padron 2003). Spanish settlements were to be found throughout the islands.

With the outbreak of tropical diseases and frequent attacks by other European forces, Spanish settlements were either destroyed or made smaller. By the mid 17th century Spain had surrendered most of its possessions to Britain and France as well as the Netherlands and Denmark (Black 1965; Morales Padron 2003).

Jamaica was invaded and taken over by the British in 1655 (Williams 1966; Campbell 1976). Britain's ultimate goal for Jamaica and other Caribbean possessions was to produce sugarcane since the tropical conditions were suitable for its production (Williams 1966; Campbell 1976). Sugar then was a lucrative business in Europe as demonstrated by the Portuguese involvement with sugar production in Brazil. The British, with such an objective, quickly established several sugarcane plantations in Jamaica and its other Caribbean colonies (Williams 1966; Campbell 1976).

The Jamaican economy was largely driven by sugarcane plantations for the first 200 years of British rule (Black 1965). Jamaica became one of the leading cane sugar exporting countries during the latter years of the 18th century (Black 1965; Ballinger 2002; Spence 2004a) (Appendix A.1).

Although cane sugar continued to increase in Jamaica during the early years of the 19th century, production activities were adversely affected by the abolition of the slave trade in the British West Indies in 1804. This was exacerbated by the abolition of slavery in 1838 (Black 1965; Higman 1995; Barringer et al 2007).

Indentured servants were introduced from Asia to Jamaica and other British West Indies territories to replace the vacancy left by freed slaves who went and established settlements in the marginal hilly interiors. The livelihoods of these ex-slaves were marked by agriculture, whether as plantation (mainly sugar and to a lesser extent pimento, coffee and/or livestock) workers and/or subsistence farmers (Higman 1995).

The plantation economy was further diversified during the 1860s with the introduction of the banana industry (Black 1965). Like sugar, bananas were produced to strengthen exports to Europe and North American markets. According to Black (1965:196), also of economic importance during the latter part of the 19th to the early 20th century was a “wave of migration” of Jamaicans to Panama, Costa Rica, Cuba, the UK and North America.

Politically, although efforts were made for the British West Indies islands to join into a federation in 1921, steps were taken in Jamaica towards self governance and political sovereignty (Henry and Harris 2004). To this end, the People’s National Party was formed in 1938 and later the Jamaica Labour Party in 1943. The right for all Jamaicans 21 years and over to vote under the adult suffrage was granted in 1944. These events led to the first election also held in 1944 (Black 1965; Henry and Harris 2004).

During the first decade and a half of the post World-War 11 period in Jamaica, there were salient changes from a plantation society to a more diversified economy. The introduction of the bauxite/aluminium industry and rapid growth of the tourism sector spurred this change. Growth in the Jamaican economy was recorded in almost all the sectors but particularly in the manufacturing, transporting and construction industries (Black 1965).

The political directorates, with the vision to enhance economic growth and promote social development, and driven by the mass of the Jamaican population, opted for an independent constitution. On August 6 1962, British rule came to an end and Jamaica became an independent nation (Black 1965; Henry and Harris 2004). In the same year of independence the Jamaican constitution was enacted which adopted the parliamentary system of democracy based on the United Kingdom legal and political model (Black 1965).

2.2.2 The Physical Geography and the Environment

Location and Size

Jamaica lies between 77 degrees west and 18.3 degrees north of the equator and is one of the 27 island nations of the Caribbean (Michener 1989; Sirjue et al 1994; Duval 2004) (Appendix A.2). The island is 240 km long (east to west) and is approximately 80 km at its widest point

(north to south) with a coastline of 916 km covering an area of 10,990 sq. km (Sirjue et al 1994) (Fig. 2.1). The island is situated 140 km south of Cuba its closet neighbour, and about 150 km west of Haiti (Bent and Bent-Golding 1966).

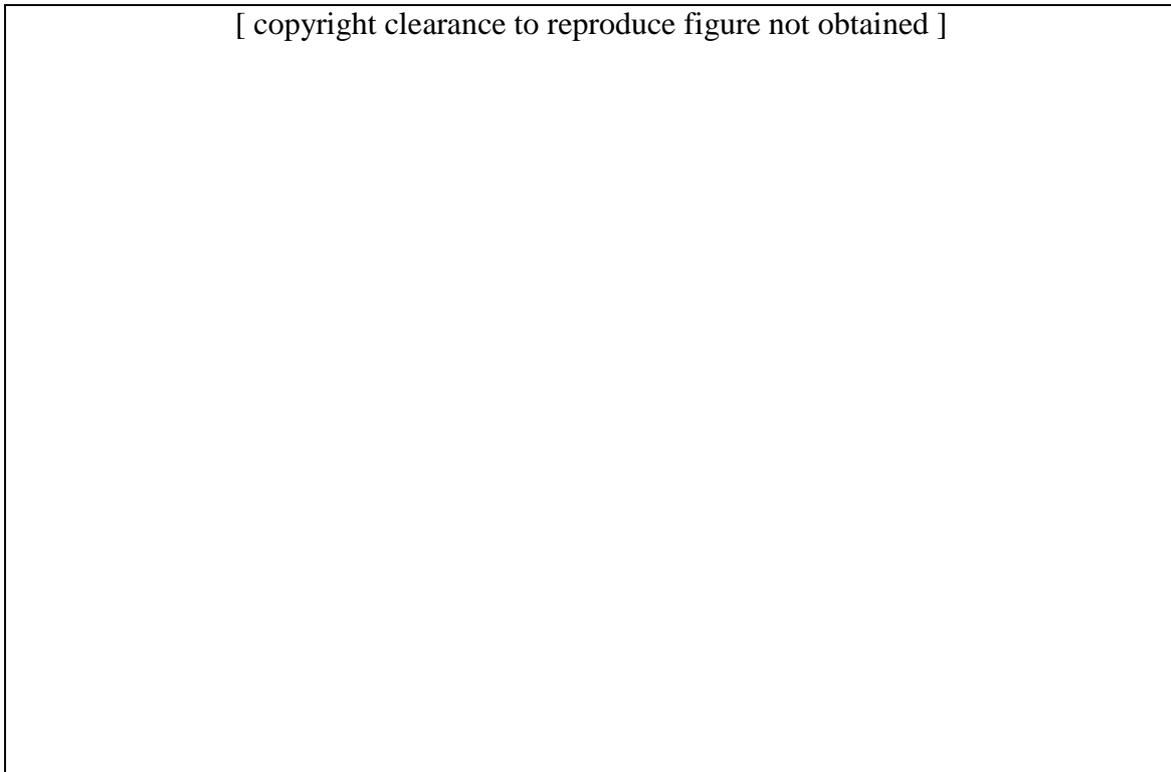


Figure 2.1: Map of Jamaica

Source: Bent and Bent-Golding 1966

Jamaica is divided into three divisional counties – Cornwall, Middlesex and Surrey which are further subdivided into 14 parishes. Middlesex is the largest of the counties and consists of five of the central parishes, while Surrey is the smallest consisting of the four eastern parishes (Appendix A.3).

The Physical Landscape

Jamaica’s physical landscape is characterised by its mountains, plains, rivers, waterfalls, beaches, forests, caves, valleys and wetlands. The landscape is dominated by a range of mountains and its associated slopes stretching almost the entire length of the island. Nearly 80 per cent of the island’s surface is 150 metres (m) above sea level with the highest point in the east, the Blue Mountains, which peak at 2,256 m above sea level (Bent and Bent-Golding 1966; Sirjue et al 1994). There are approximately 15 major mountains that form a chain, descending from the east to the west.

The continuous chain of mountains is the habitat for nearly 335,000 ha of the island's forest cover or 31 per cent of total land area (Sirjue et al 1994; Evelyn and Camirand 2003; Dunkley 2003). This stand of forest cover, however, has been depleting at a rate of 0.1 per cent annually (Evelyn and Camirand 2003, Forestry Department 2004). Bauxite, which is responsible for the removal of more than 4,042 ha of forest over 50 years of operations, as well as agriculture expansions, loggers, charcoal burners and yam stick traders, are major causes of deforestation (Evelyn 1997; Neufville 2001).

The Forestry Department (2004) reports that only 13 per cent or 139,960 ha of the existing cover contribute to protecting biodiversity. Some 26 major watershed management units operate throughout these forested areas to protect the availability and quality of the island's source of water (Forestry Department 2004). However, Dunkley (2003) reports that 17 (65 per cent) of these units are critically in need of attention.

The steep and rolling slopes from these mountainous areas give rise to numerous rivers, waterfalls and wetlands. There are nearly 120 streams (main tributaries and distributaries) of which 15 are considered major rivers. Most of these major rivers flow to the southern coastline and it is usual for them to be longer than those running to the northern coastline (Bent and Bent-Golding 1966; Sirjue et al 1994). The Black River, which is navigable for 40 km, is the longest (Kaplan et al 1976).

Waterfalls are a common feature along river routes in Jamaica. The Dunns River Falls, the Reach Falls and YS Falls are the major waterfalls scenery. The Dunns River Falls located in the tourist town of the north coast is a major centre of attraction for visitors to the island.

According to Sirjue et al (1994), there are 16 major wetlands or swamps across the island, which occupy some 32,000 ha. Twelve of these areas are to be found along the southern coastal area, while two are found along the northern coast. The remaining two are located at the eastern and western tips of the island. The two largest are the Upper and Lower Black River Morass - located in the parish of St Elizabeth (Sirjue et al 1994).

The major coastal plains are also one of the physical landscape features of the southern coastal area. All the major coastal plains are located in the southern section of the island. There are five major plains of which the Liguanea is the largest. The soils are almost always alluvial, being light to heavy clays and loams. With the exception of the Liguanea Plain which is taken up by the main urban districts (Kingston and metropolitan areas) of the island, the other four major plains are predominantly occupied with large plantations consisting mainly

of sugarcane as well as pastures (Bent and Bent-Golding 1966; Kaplan et al 1976; Campbell 2005).

While the southern coastal areas comprise all the major plains and the majority of the wetlands, most of the northern sections are narrow. The low lying areas are covered with sand and are mainly beaches. The narrower strips of the northern coast consist of four major beaches (Bent and Bent-Golding 1966; Kaplan et al 1976; Sirjue et al 1994). These beach areas are developed as the tourist belt of the island. Cottage industries and other tourism infrastructures are established along these beaches.

While the southern coastal areas are dominated by alluvial plains and the narrower northern region is dominated by beaches, inland basins and valleys are found scattered throughout. The soils of these valleys are derived from limestone parent materials and range from clay loam to alluvium (Bent and Bent-Golding 1966; Kaplan et al 1976). There are seven major valleys all occupied with plantations, mainly of sugarcane.

Also, widespread among the island's physical landscape features are over 380 major caves (Sirjue et al 1994; Fincham 1997). The Green Grotto Cave (the largest) is located along the north coast, and like the Dunns River Falls, is a major tourist attraction. Other underground conduits, particularly in the interior limestone areas of the Cockpit Country, have been explored. Some 300 caves are found in this unique part of the island (Evelyn and Gordon 2007).

The Cockpit Country is the largest primary (undisturbed) forested area in Jamaica covering an area of 450 km² (Evelyn and Gordon 2007). The area spreads across four parishes with most of it occupying the southern section of Trelawny. The karst topography is universally known for its precipitous steep hills and deeply eroded limestone valleys. According to Evelyn and Gordon (2007) the Cockpit Country provides for approximately 40 per cent of the island's freshwater supply.

Biodiversity (Flora and Fauna population)

The mix of plant, animal and bird species in Jamaica is highly diverse. According to Green (2008) there are approximately 3,000 plant species of which 700 are endemic (found nowhere else in the world). Among the popular plant species are orchids, fern, palms and bromeliads (Green 2008). The primary forested areas such as the Blue and John Crow Mountains Park as well as the Cockpit Country, among others, are the habitats for some of the Caribbean's endemic plant species. Of the 550 species of fern (plant) species that are found in Jamaica;

many are endemic to the Blue Mountains and the Cockpit Country (Evelyn and Gordon 2007). The authors believe that only a few areas of the world of comparative size can match the diversity of ferns found, particularly in the Cockpit Country. They add that of the 152 plant species found in the Cockpit Country 101 are endemic to the area.

The diversity of the island's wildlife is a characteristic of the forest. The Cockpit Country, for example, is the home for the 28 of the island's endemic birds and 37 amphibian and reptile species. The tree frogs (*Eleutherodactylus griffiths* and *E. sisypodemus*), the Yellow-Billed and Black-Billed Parrots are all endemic to the Cockpit Country. The Cockpit Country and the Blue and John Crow Mountains Park are also the only habitats of the Giant Swallowtail Butterfly, the largest butterfly in the Western Hemisphere (Evelyn and Gordon 2007).

The Jamaican Yellow (boa) snake, the Jamaican iguana (lizard) and the Jamaican hutia (rodent) are other endemic terrestrial fauna found in Jamaica. They are, however, very rare (almost facing extinction) and are thus classified as special endangered species (Kaplan et al 1976; De MacPhee 1997; McFarlane 1997).

The island's wetlands are also habitats for numerous plants, particularly mangroves, about 200 birds (including migratory forms) species of which 24 are endemic, amphibians (crocodile, turtles) and various species of fish and shrimps. One of the wetlands is the home of the manatees (sea cow) – rare marine species (Kaplan 1976; De MacPhee 1997).

Other fauna that are common to Jamaica include bats, rats, mongoose, worms, molluscs, scorpions, mites, centipedes, millipedes, cockroaches, earwigs, crickets, bugs, beetles, moths, ants, wasp and flies (Peck 1997).

Climate and Water Availability

Rainfall is very variable between locations and time of the year in Jamaica. September and November are the wetter months while January and March are driest (Floyd 1979). Floyd (1979) and Sirjue et al (1994) explain that the uneven distribution of rainfall in Jamaica is attributable to the movement of the moisture laden north east Atlantic wind. The authors observe that when the wind comes in contact with the high Blue Mountains range in the north east section of the island, it rises and cools down causing the moisture to deposit in the form of rain. The areas surrounding the Blue Mountains receive up to 3,000 millimetres (mm) of rainfall annually compared with 1,500 mm received by the south central (rain shadow) section of the islands (Sirjue et al 1994). However, the PIOJ (2008) reported that average annual rainfall for the island between 2002 and 2006 was 2,081 mm.

Temperatures vary with location and time of the year. The island's five year (2002-2007) average annual temperature was 28.3 degree Celsius (PIOJ 2008). December and January are the coolest months while July and August are the warmest. Temperatures along the low lying coastal regions are warmer than the areas in the higher mountainous range. Differences occur of between 10 to 20 degrees depending on the distance from the coastline and altitude (Floyd 1979). As a general rule, temperatures will decrease by about 0.5 degree Celsius per 100 metres altitude.

Hurricanes (tropical storms) are frequent climatic occurrences in Jamaica. June to November declared each year by the Metrological Office as the hurricane season. Wind velocities range from 120 to 300 km per hour, and are associated with torrential rains causing widespread flooding, together with damage to crops, livestock, homes and infrastructures and threaten human life.

Between 2004 and 2008, there were six hurricanes: one in 2004, three in 2005, one in 2007 and another in 2008. Total damage for Hurricane Dean (the one in 2007) was estimated at US\$340¹ million of which agriculture accounted for \$55 million; six lives were lost (PIOJ 2008).

Jamaica is also under the threat of earthquakes. The Northern American Earthquake Plate is located 145 km north of the island (Sirjue et al 1994).

In regard to water availability, based on the findings of Kundell (2009) more than half (56 per cent) of average annual rainfall in Jamaica is lost to evapotranspiration. Average annual renewable water resource is 9.4 cubic kilometers (km³) per year: 5.5 from ground and 3.9 from surface (Kundell 2009). The Inter-American Development Bank [IDB] (2004) projected that by 2015, the island will need a total of 1.67 km³ per year of water: 1.31 for agriculture and 0.36 km³ for non-agricultural use. According to IDB (2004), the water supply from the various basin sources are adequate (Table 2.1).

¹ The US\$ is the currency used throughout this thesis unless otherwise stated.

Table 2.1: Major Water Basins of Jamaica

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Source: Kundell 2009.

The agricultural sector, particularly the sugar industry, is the major user of water in Jamaica (IDB 2004; Kundell 2009) (Fig 2.2).

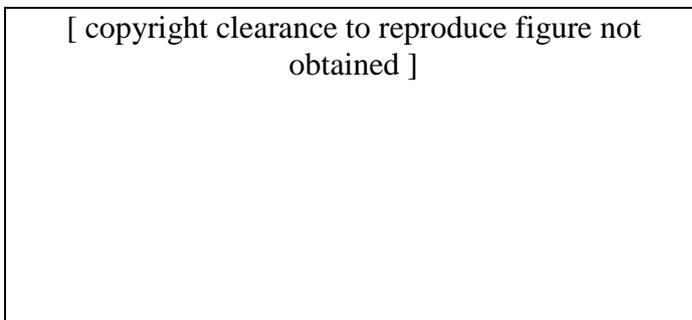


Figure 2.2: Water Usage in Jamaica

Source: Kundell 2009

On average, the annual per capita domestic water consumption over the period 2002-2007 was 0.036 megalitres (PIOJ 2008).

2.2.3 The Macro Economic Environment

1950s-1970s

Particularly since the mid 1970s, the growth of the Jamaican economy can be described as slow. Apart from the 1950s and the 1960s where real GDP growth averaged 9 and 4 per cent respectively, there has been a steady decline in the performance of the economy. The growth during the 1950s and 1960s is attributed largely to the heavy foreign investment in bauxite, tourism, commerce and the manufacturing industries (Huber and Stephens 1992).

Between 1973 and 1980, growth rates fell to an annual average of -3.2 per cent with annual inflation averaging 22 per cent (Thomas 1999). Thomas (1999) observes that the balance of payments during the period 1960 to 1971 recorded an accumulated surplus of \$95 million compared with a deficit of \$679 million accumulated in 1972-1980. The deterioration in the

balance of payments was evident in the accumulated current account deficit which increased from \$570 million in 1970 to \$1,620 million in 1980 (Thomas 1999). Thomas (1999) explains that the deterioration was driven by the failure of capital inflow to match the shortfalls in the current account which led to the shortages of foreign exchange and a reduction in the net international reserves.

The deterioration in the balance of payments during the first decade following independence paralleled an increase in the unemployment rate, which increased from 13 per cent in 1960 to 23 per cent in 1972 (Huber and Stephen 1992). Throughout the 1970s the issues of restructuring the economy, employment, particularly for youth were among the priority agenda of the Government. Programmes such as the national youth service, land lease, credit for farmers, national minimum wage, imposition of the bauxite levy, property tax, improvement in housing, education, health, and physical public infrastructures were implemented (Huber and Stephens 1992).

In the mid 1970s increasing current account deficits, reduced capital inflows and a foreign exchange crisis forced the Government to resort to the International Monetary Fund (IMF) for assistance (Huber and Stephens 1992). Assistance was offered but with stringent conditions as the economy proved fragile and continued to weaken.

The IMF is a multilateral financial agency that was designed to support open markets and international growth, and focuses primarily on the macroeconomic framework to eliminate balance of payment problems (Please 1984; Feinberge 1984). Nevertheless, authors such as Manley (1982), Bernal (1987), Girvan (1997), Huber and Stephens (1992), Ramsaran (1992) and Brown (1994) among others, criticised the institution for its framework. The IMF framework with conditionality or deregulated policy guidelines demanded the devaluation of the Jamaican currency, public salary cuts and massive public sectors layoffs to name a few. As Huber and Stephens (1992: 64) notes: “ the 1978 IMF agreement in particular imposed extremely harsh austerity policies, which depressed the consumption levels of Jamaican wage earners by more than one third in a single year”.

The 1980s

The 1980s was one of the remarkable decades in the history of economic development in Jamaica following the implementation of the World Bank led structural adjustment loan programme in 1980 (Le Franc 1994; Anderson and Witter 1994). Under the structural adjustment loan programme, the World Bank focused on examining the Government policies and investment programmes in an attempt to improve efficiency at the macroeconomic level

(Ramsaran 1992). Though the structural adjustment programme was similar to the IMF programme in attending to macroeconomic issues, there were differences in their timeframe and objectives.

On the one hand, the World Bank structural adjustment programmes aimed to invest over the long term with multiple objectives centred on strengthening the economy as a whole (Ramsaran 1992). On the other hand, the IMF's major purpose was to reconstruct financing by easing short term financial difficulties and, particularly, foreign exchange constraints (Looney 1987).

With the core responsibility to manage the budget deficit, the structural adjustment loan forced the Government to reform the public sector, divest state-owned enterprises, revise the banking system and deregulate its currency, as well as imports (Nelson 1989, Anderson and Witter 1994; Brown 1994; Campbell 2005). Operated as an open free market economy, the deregulation of imports led to a sharp rise in imports. This, combined with slow export earnings, created severe foreign exchange difficulties (Huber and Stephens 1992).

The years 1980-1985 were marked by the global economic slowdown and subsequent drop in commodity prices. According to Ramsaran (1992), these realities served to exacerbate the already depressed terms of trade and balance of payment situations in Jamaica which depends on its primary industries for exports. Bauxite, for example, the main earner of foreign exchange, had fallen in exports from 12 million tonnes in 1980 to 6 million tonnes in 1985 (Huber and Stephens 1992).

This particular loss in foreign exchange from bauxite, coupled with the reduction in prices and exports of other manufactured goods and agricultural produce, further worsened the foreign exchange capabilities during the mid 1980s. In 1977, for example, the US\$1 was valued at J\$0.91 and by 1985 it was J\$5.50 (Thomas 1999).

There was slow economic performance during the 1980s. Increases in gas and food prices, devaluation of the local currency, as well as the population's growing concern with the strict IMF policies that led to a succession of island-wide social protests (Huber and Stephens 1992; Anderson and Witter 1994). As a consequence, in 1985 the first general strike in history was called (Huber and Stephens 1992).

In summary, the 1980s was a decade of struggle both for the economy and the society. Real GDP growth averaged only 1.5 per cent throughout the 1980s. The unemployment rate for the decade averaged 20.7 per cent; the trade account was in deficit; while foreign debt doubled

from 1980 to 1989 (Huber and Stephens 1992). At the end of 1989, nearly half of the Government expenditure went to service debt (Thomas 1999).

The 1990s

The poor performance of the economy from 1991 to 1999 was evident in the annual growth rate of real GDP which averaged 0.65 per cent (Osei 2002a). Low productivity across the goods and service productive sectors was accompanied by high interest rates.

Other than the inability of the business community to cope with high nominal interest rates, which spiked at 42 per cent in 1995, it became questionable as to how members of the marginal society could manage with respect to the associated high level of inflation. For the decade 1990 to 1999 inflation averaged 27.2 per cent, peaking at 77 per cent in 1992 (Osei 2002a).

According to Osei (2002a) and Kirkpatrick and Tennant (2002), the high interest rates also created a dilemma throughout the financial sector in 1996. Several private commercial banks, merchant banks, building societies and insurance companies became bankrupt and were heading for collapse. In order to secure confidence in the general public, the Government opted for and provided a stimulus package through the establishment of a financial 'bail-out' institution in 1997- the Financial Sector Adjustment Company. The affected organisations were assisted to become functioning again (Kirkpatrick and Tennant 2002).

Though jobs were scarce and output growth was slow throughout the 1990s, the unemployment rates declined compared with the 1980s. Average annual unemployment rate was 15.8 per cent for the years 1990 to 1999 (Osei 2002a). This may be attributed to increased participation in the service sector as well as self-employment opportunities and increases in petty trades.

The problems of servicing debt, balance of payments difficulties and the struggle to maintain net international reserves, as well as the depreciation of the Jamaican dollar, were among the main issues of the Jamaican Government throughout the 1990s. In 1993, for example, more than half (51 per cent) of Government expenditure went towards servicing debt and the Jamaican dollar declined in value against the US dollar from J\$5.50 in 1989 to J\$36.50 in 1998 (Thomas 1999).

2000-2008

The 2000 decade began with much of the Government effort expended in managing the balance of payments account and attending to the nation's debt problems. Between 2001 and 2008, annual real GDP growth averaged 1.1 per cent (PIOJ 2008; CIA 2009) (Fig 2.3).

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Figure 2.3: Real GDP Growth (%) 2001-2008

Source: PIOJ 2008, CIA 2009

In 2004, the Government achieved fiscal discipline so as to maintain debt payment (Annual Economic Review 2005). However, Jamaica's external debt increased from \$3.91 billion in 1999 to \$10.3 billion in 2008 (Economist Intelligence Unit [EIU] 2003, 2006; CIA 2009).

The CIA (2009) classifies Jamaica's debt burden as the fourth highest per capita worldwide and a debt-to-GDP ratio of nearly 130 per cent in 2008 (in 2008, real GDP was \$20.88 billion). Between 2002 and 2006, half of Government expenditures were used for servicing public debt. The IDB, International Bank for Reconstruction and Development and the Caribbean Development Bank are the three multilateral lending partners to Jamaica (PIOJ 2008).

In an attempt to reduce the fiscal deficit, the Government has employed a series of measures to stimulate growth in revenue (such as tax increases) as well as tighten spending (including a freeze in public wages). However, at the end of 2008, there was deterioration in the fiscal deficit by \$50 million to reach \$672 million (PIOJ 2008; CIA 2009).

According to PIOJ (2008) and CIA (2009), the island's high dependence on food imports and oil kept inflation rates fluctuating around the 12 per cent mark between 2000 and 2008, peaking at 22.5 per cent in 2008 (CIA 2009; PIOJ 2008). The peak was driven by the soaring world market prices of basic food items and world oil prices during 2008. However, this was an improvement over the 1990 decade where average annual inflation was 27.2 per cent.

Similar to inflation, there were also signs of improvement in the level of employment since the 1980s. Unemployment rates declined gradually from 20.7 per cent in the 1980s to 10.1 per cent in 2008 (PIOJ 2008; CIA 2009).

In terms of the trade accounts, imports continued to outpace export growth as the trade account remained in deficit (Table 2.2). The import bill has been driven largely by a growing fuel bill and rapid growth in investment related imports by large mining and tourism investments (EIU 2006; PIOJ 2008).

Table 2.2: Jamaica Trade Account-Export (cif) and Import (fob) 2000-2007(US\$M)

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Source: EUI, 2003; PIOJ, 2008

On the export side, traditional exports which include, principally, bauxite/alumina, sugar and banana continued to dominate over the non-traditional exports mainly consisting of agricultural produce and manufactured goods. The bauxite/alumina sector was responsible for the bulk of the total volume of exports. Total bauxite/alumina exports between 2002 and 2007 accounted for 61 per cent of total exports and 83 per cent of the traditional exports (PIOJ 2008).

In terms of percentage of GDP, imports have been almost three times exports since 2000. In 2006, for example, imports expressed as a percentage of GDP was 55 per cent in comparison with exports, which were 19 per cent (EUI 2003; PIOJ 2008).

The balance of payments continued to be negative in 2007 as mirrored by increases in the current account deficit. The PIOJ (2008) explained that the main factors for the deterioration in the current account were attributed to the expansions in the goods account deficits and contractions in the services balance.

Improvement was noted in the gross fixed investment, one of the underlying factors to Jamaica's economic growth. In 2008, gross fixed investment was 35 per cent of GDP compared to 32 per cent in 2005 (EUI 2006; CIA 2009). The improvement may be as a result of direct foreign investment in the tourism and mining sectors.

In regard to the reserves situation, accumulated surpluses were reported in the stock of net international reserves between 2002 and 2007. The amount of surpluses in the net international reserves is a major determinant in the stabilisation of the Jamaican currency.

The value of the Jamaican currency continued to weaken against its US counterpart. Between 2000 and 2008 there were significant devaluations of the Jamaican dollar. The Jamaican dollar declined in value from US\$1=J\$36.50 in 1998 to US\$1=J\$72.2 in 2008 (SIRI 2004; PIOJ 2008; CIA 2009) (Fig 2.4).

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Figure 2.4: The Jamaican Currency Valued Against the US\$1 (1998-2008)

Source: SIRI 2004, PIOJ 2008 and CIA 2009

According to the PIOJ (2008), the sliding exchange rate was a consequence of a fall in private foreign inflows and an increase in the liquidity of the local currency.

Jamaica continues to earn most of its foreign exchange from remittances, tourism and bauxite/alumina (Fig. 2.5).

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Figure 2.5: Jamaica Top Foreign Exchange Earner (US\$M) 2002-2007

Source: PIOJ 2008

The PIOJ and STATIN (2007) reported in 2006 that almost half (45 per cent) of Jamaican households were recipients of remittances averaging \$700 per person. In 2004, Jamaicans received \$550 per person – the highest among Latin American and its Caribbean neighbours (World Bank 2006, cited in PIOJ and STATIN 2007).

2.2.4 The Socio-economic Environment

Population and Demographic Characteristics

In the 1960s, the population of Jamaica was 1.609 million and grew to 2.682 million by the end of 2007 (STATIN 2002; PIOJ 2008).

Between 2002 and 2007 the average annual growth was 0.5 per cent (PIOJ 2008). During the same period, the average annual crude birth rate was 17.7 per 1,000 populations and the crude death rate was 6.4. During the period 2002 to 2007 the average annual net migration was negative 19,000 (PIOJ 2008).

In 2006, the age profile of the population showed that 59 per cent of Jamaicans were between the ages of 15 and 64 (working age group), 31 per cent were under 14 (children), while 10 per cent were 65 and over (elderly) (PIOJ and STATIN 2007).

There has been an increase in the working age group and the elderly as compared to a decline in the proportion of children, particularly since 1970 (STATIN 2007). According to PIOJ and STATIN (2007) the increase in the working age population and the decline in the dependent children group have effected changes in the demographic structure which has reflected in the age dependency ratio. The age dependency ratio has steadily declined from 100.8 dependent persons per 100 working persons in 1970 to reach 69.5 in 2006.

PIOJ and STATIN's (2007) findings show that the age dependency ratio was always higher in rural areas relative to the national ratio. This is explained by the higher number of children in rural areas as well as the migration of the working age group from rural areas to the urban towns. This decline in the age dependency ratio is expected by the PIOJ and STATIN (2007) to be reversed by 2030.

The mean household size in Jamaica declined from 3.8 persons in 1996 to 3.3 in 2006. The PIOJ and STATIN (2007) reported that 46 per cent of households were headed by females which included greater numbers of children and adult females in comparison to male-headed households. Overall, female-headed mean household size was larger.

Consumption Levels and Poverty

In Jamaica, consumption expenditure of households is the approach adopted to calculate the rate of poverty of the population. The STATIN gathers data on household expenditure, home production and remittances to determine the per capita consumption each year. On determination of the per capita consumption by expenditure, they are ranked into five groups -

referred to as consumption quintiles. Quintile one is the poorest, while quintile five is the wealthiest (Table 2.3).

Table 2.3: Mean Per Capita Annual Consumption Expenditure, Jamaica (2006) (US\$).

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Source: PIOJ and STATIN 2007

While the national mean per capita consumption in 2006 was estimated at \$2,147, in rural areas it was \$1,691(PIOJ and STATIN 2007). National per capita consumption increased 31.8 per cent between 1996 and 2006. This shows that living standards have increased sharply.

With regard to allocation of consumption, the commodity group food and beverages continued to account for the bulk of the consumption expenditures (Fig. 2.6).

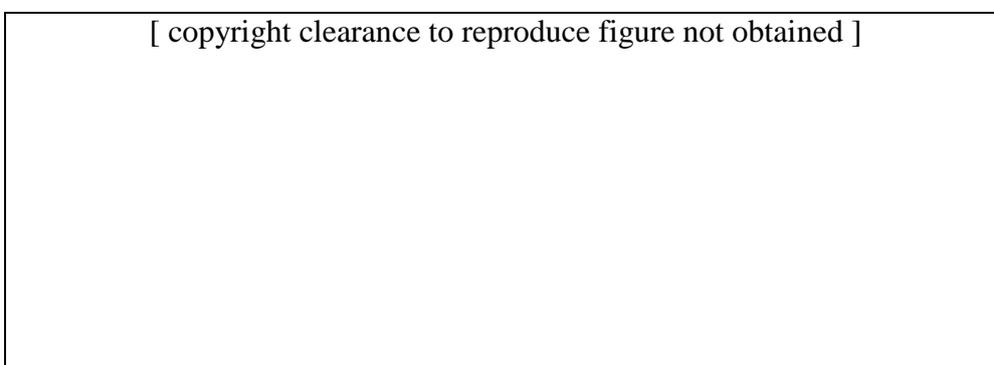


Figure 2.6: Share of Mean Per Capita Consumption by Commodity Group Jamaica, 2006

Source: PIOJ and STATIN 2007

The PIOJ and STATIN (2007) notes that though food and beverages constitute the major share of expenditure across consumption quintiles, there is a declining share in the proportion allocated to food and beverages as the quintile level increased.

The incidence of poverty in the Jamaican society, though fluctuating, has trended downwards between 1989 and 2006. The poverty rate estimated by the consumption expenditure approach is based on the principles of absolute poverty measurement. According to the PIOJ and STATIN (2007), in 2006 the absolute poverty line for a reference family in Jamaica was \$4,264. The PIOJ and STATIN (2007:15) define a reference family to be “five persons - two adults and three children”. For a single adult, the absolute poverty line was estimated at \$1,128. These poverty levels change annually with inflation. An all time low of 14.3 per cent incidence of poverty was recorded in 2006 (Fig. 2.7).

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Figure 2.7: Population below the Poverty Line Jamaica (1989-2006)

Source: Osei 2002, PIOJ and STATIN 2007

In 2006, based on the distribution of poverty, 66 per cent of the population living below the poverty line was residing in rural areas (PIOJ and STATIN 2007).

Social Safety Net and Welfare

Jamaicans are the beneficiaries of various social welfare programmes. Sources of these welfare programmes include international development partners, Government agencies, non-Government bodies and community-based organisations (Baker 1995; PIOJ 2008). These programmes target the most vulnerable in the Jamaican society including the dependent age groups, persons with disabilities and destitute persons.

While there are three Government ministries directly involved with social welfare programmes in Jamaica, there are over nine international partners, about 300 non-Government bodies and nearly 1,200 community-based organisations (International Fund for Agricultural Development and Inter-American Institute for Cooperation on Agriculture [IICA] 1994; Baker 1995; Jamaica Social Investment Fund [JSIF] 2006; PIOJ 2008).

According to PIOJ (2008: 25.14), social welfare and safety net programmes in Jamaica fall under two broad groups: 1) “The National Poverty Eradication Programme (NPEP) and 2) The Social Safety Net Reform Programme”. Since 2002, the JSIF, which focuses on social infrastructure and training for micro-finance is at the centre of the former, while the Programme of Advancement Through Health and Education (PATH) have been the major programme operating under the latter.

Under the NPEP, the JSIF has been the hub for investment in social and economic infrastructures, social services and organisation strengthening. Between 1996 and 2007, an estimated \$55 million was spent on 733 completed projects (PIOJ 2008).

The PATH is a Government of Jamaica programme with funding from the IBRD/World Bank. The programme provides financial (cash grants) assistance to the neediest persons in Jamaica (Jamaica Ministry of Labour and Social Security [MLSS] n.d.; PIOJ 2008).

According to the MLSS, the programme, incepted in 2002, covers education and health assistance to children under age 17 attending schools, the disabled, the elderly, the destitute, pregnant and lactating mothers. The benefits range from \$55 for the first year of the programme and increase to \$90 in the third year for each beneficiary (MLSS n.d.).

According to the PIOJ and STATIN (2007:60) PATH serves to integrate prior safety net programmes such as the “Poor Relief Programme, the Food Stamp Programme and the Old Age and Incapacity Programme. In addition, PATH has integral linkage with aspects of other welfare programmes including the National Health Fund, Secondary School Fee Assistance Programme, the Social and Economic Support Programme and the Jamaica Drugs for the Elderly Programme”. The linkage lies in the fact that those accepted by PATH are logically most at risk and, as such, are beneficiaries of other welfare and support programmes.

The PATH at the onset (in 2002) targeted some 236,000 beneficiaries and at the end of 2007 has covered over 90 per cent of the targeted beneficiaries island wide (PIOJ 2008). Between 2002 and 2007, \$800 million was spent in the programme (PIOJ 2008).

Health

Health care in Jamaica is provided by both the private and the public sectors. The Ministry of Health [MOH] (2007) reported that in 2006 the service of the public health delivery system was provided through four Regional Health Authorities by 24 hospitals and 322 health centres. In addition, the private sector operates another eight hospitals.

The PIOJ and STATIN (2007) reported that from the STATIN health survey in 2006, 53 per cent sought medical care from private facilities, while 41 per cent used public facilities with 6 per cent resorting to both. In regard to procurement of medication, the majority of population obtained their medication from the private sector. The Pan American Health Organisation [PAHO] (2001) states that there were some 550 private pharmacies operating in 1999.

Gastroenteritis continued to be the most reported of the communicable diseases in Jamaica in 2007. This was followed by febrile (fever associated) illness and conjunctivitis (PIOJ 2008). In addition, it was reported by the MOH (2007) that an estimated 25,000 persons was living with HIV in 2006.

For the curative diseases, hypertension (25 per cent), diseases of the respiratory tract (21 per cent) and skin diseases (18 per cent) were the top three reported in 2007 (PIOJ 2008).

Burns, poisoning, motor vehicle accidents, stab and gunshot wounds and sexual assaults were among the most regular reported accidents to health facilities. In 2005, females accounted for 55 per cent of the top five causes of death in Jamaica (Table 2.4). Road traffic accidents and suicides were some of the other causes of death reported.

Table 2.4: Top Five Causes of Death Jamaica, 2005

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Source: PIOJ 2008

In regard to human resources, consistent with previous years, the public sector has a shortage of medical personnel. According to PAHO (2001), there were some 2,000 practicing physicians providing health care in the private sector in 1999. However, the report says that there is the need to increase the nearly 650 practising physicians in the public sector so as to meet its health worker to population ratio, which is regarded as grossly inadequate (Table 2.5).

Table 2.5: Human Resources in the Public Health Sector Jamaica 1996-1999

[copyright clearance to reproduce table not obtained]

Source: PAHO 2001

Government allocation to the public health sector in 2007 was almost \$293 million. Of this amount, salaries accounted for nearly 80 per cent (PIOJ 2008).

According to the MOH (2007:54) the Government is committed to continue support and maintain levels of health through various programmes. These programmes include:

“environmental and veterinary public health, control of communicable and chronic diseases, reproductive and mental health, emergency care and disaster preparedness”.

Education and Training

There are four distinct levels in the official education system in Jamaica based on these respective age groups. These are: 1) the “Early Childhood or pre-primary (3-5 years), 2) Primary (6-11 years), 3) Secondary (12-18 years) and 4) Tertiary (19-24years)”. Although the system is supported by both the private and public sectors, the latter remained as the main provider being responsible for 88 per cent of total enrolment in 2006 (PIOJ and STATIN 2007).

Based on the PIOJ (2008:22.1) report, three-quarters of the 3-24 years of age “school-age cohort” were enrolled in formal education in 2007. The report also shows that the highest enrolment rate was achieved at the early childhood level (PIOJ 2008) (Fig. 2.8).

[copyright clearance to reproduce figure not obtained]

Figure 2.8: Enrolment Rate in Educational Institutions, Jamaica (2007)

Source: PIOJ 2008

The PIOJ (2008) reported that of the 2,297 early childhood institutions operating in Jamaica in 2007 (five of which were special education institutions), 6 per cent were unrecognised². The report showed that during the year there was an average teacher to student ratio of 1:22 and that there was an equal distribution among gender with average daily attendance rate of 69 per cent. Among the priorities of the sector were policies related to training, management and administrative strengthening together with curriculum development and agencies support.

In the primary department, in 2007, 92 per cent of total primary students were enrolled in public primary schools. The overall gender distribution was even, while average daily attendance in public primary schools was 82 per cent. In 2007, there were 10,662 teachers (89 per cent females) in the public system with an average teacher to student ratio of 1:27. Some 90 per cent of these public primary teaching staff was trained. Major developments in primary education in Jamaica in 2007 included the Ministry of Education Primary Textbook

² Those schools which have not satisfied the Jamaica’s Ministry of Education standards, such as teacher quality and physical infrastructure.

Programme as well as the Government of Jamaica collaboration with the IDB and the United States Agency for International Development (PIOJ 2008).

In 2007, there were 510 public secondary schools in Jamaica. Like the early childhood and the primary schools, gender distribution was even. In 2006, average daily attendance rate was 81 per cent at the secondary school level, with females having better average daily attendance rate across all the school types (PIOJ and STATIN 2007). Some 82 per cent of the 13,021 public secondary school teachers in 2007 were reportedly trained, with a teacher to student ratio of 1:19 (PIOJ 2008).

The PIOJ (2008: 22.1) reported that training was offered at the post-secondary level in technical and vocational skills. “Craftsmen, production process and operating personnel, related hotel service personnel and computing” were the main areas of training. The Human Employment and Resource Training (HEART) operated by the National Training Agency, as well as eight community colleges are the main providers of this training.

In regard to special education, the PIOJ (2008) reported that facilities were provided by both Government and community-based programmes for students with disabilities. In 2007, there were 21 public schools as well as reading resource rooms for remedial purposes at primary schools in six parishes. The community-based programmes operated some 10 homes and projects island-wide in 2007 (PIOJ 2008).

For entry at the tertiary level, it is a requirement of the education system in Jamaica to have passes in at least five subjects including mathematics and English in the Caribbean Secondary Education Certificate (CSEC). According to the PIOJ (2008) in 2007, only 29 per cent of secondary school candidates who sat the CSEC examinations met this requirement. In 2007, an estimated 65,872 students were enrolled in 33 tertiary institutions island wide, this included nine public teacher training colleges (PIOJ 2008).

Financially, the education sector was allocated 12.6 per cent of the 2007 Government budget, some \$694 million. Some 63 per cent of the education budget was spent at the primary and secondary level (PIOJ 2008).

One of the major education and training priorities of the Government is to upgrade the skills capacity of its working age population to meet domestic as well as international standards. One such challenge is to certify half of the labour force by 2008 (PIOJ and STATIN 2007).

The Labour Force

In relation to the labour force, in 2007, there were 1.261 million persons in the Jamaican Labour Force (PIOJ 2008). Total employment was 1.136 million. Of the unemployed in 2007, 65 per cent were females. The PIOJ (2008) report also shows that average weekly earnings of all employees were estimated at \$185 in 2007.

The service sector has been the principal employer of the Jamaican labour force. In 2008, nearly two-thirds of the labour force was employed by the service sector, 19 per cent by the industry sector, while agriculture employed 17 per cent (CIA 2009).

In addition, the private sector continued to absorb the majority of the workforce as the ratio increased to 7.2 private sector workers per public sector employee at the end of 2007 (PIOJ 2008).

In terms of employment by industry group³, the community social and personal services as well as the wholesale and retail trades, hotels and restaurants services provided employment opportunities for more than half the labour force in 2007. Agriculture, forestry and fishing accounted for the third largest share of the labour market as an industry group (PIOJ 2008; STATIN 2007).

Among the occupational groups⁴, in 2007, professionals, senior officials and technicians; service workers and shop and market sales workers; and agriculture, forestry and fishery workers accounted for more than half of the labour force (PIOJ 2008).

One of the major features of the Jamaican labour force was that the 14 to 24 age group (youth) constituted most of the unemployed (PIOJ 2008; STATIN 2007). In 2007, for example, the youth unemployment rate was three times higher than the 25 and over age group (adult) (PIOJ 2008). According to the PIOJ (2008), between 1997 and 2007 average annual youth unemployment was 30 per cent compared with 9 per cent for adults.

Those outside the labour force, are defined by STATIN (2007: xii), as follows. "All persons 14 years and older who were not classified as employed or unemployed are considered to be outside the labour force. Included in this category are full time students; persons incapable of

³ In Jamaica the labour market is divided into nine industry groups, namely, Agriculture, Forestry and Fishing; Mining, Quarrying and Refining; Manufacture; Electricity Gas and Water; Construction and Installation; Wholesale & Retail, Hotels and Restaurants Services; Transport, Storage and Communications; Financing, Insurance, Real Estate & Business Services; Community, Social and Personal Services (STATIN 2007)

⁴ The Jamaican Labour Force is classified into seven groups by occupation: Professionals, Senior Officials and Technicians; Clerks; Service Workers and Shop and Market Sales Workers; Skilled Agricultural and Fishery Workers; Craft and Related Trades Workers; Plant and Machine Operators and Assemblers; Elementary Occupations (STATIN 2007).

working; and persons not wanting to work or not available for work during the reference week”.

National Security

Other major considerations within the socio-economy of this study include crime and violence of which national security is the primary concern. It is appropriate to make clear the crime situation in Jamaica since it is believed to give better insights of factors affecting the livelihoods being investigated.

The CIA (2006) in 2005 described Jamaica as the murder capital of the world. In 2007, the PIOJ (2008) reported that in every 100,000 population there were 59 cases of murder. The report also highlighted that gang related violence accounted for half of the murders committed (Fig. 2.9).

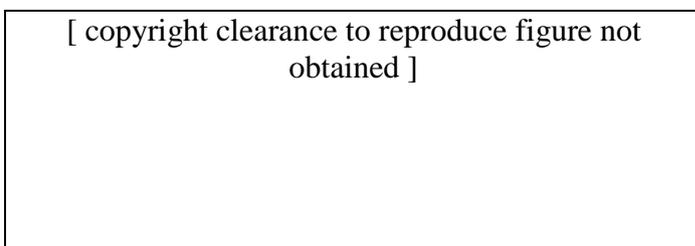


Figure 2.9: Motives for Committing Murder Jamaica, 2007

Source: PIOJ 2008

Of the total cases of crimes reported in 2007, 20 per cent were considered as major crimes which included murders, carnal abuse, rape, shooting, larceny, breaking and robbery. Between 1992 and 2007, the murder rate increased by 63 per cent (Moser and Holland 1997; PIOJ 2008).

National security in Jamaica is provided by the Government and is supported by the Jamaica Constabulary Force, which consisted of 8,233 police officers in 2007. The ratio shows that for every police officer there were 2,325 citizens. The constabulary force has been supplemented with a special body, which consisted of some 1,438 officers in 2007 (PIOJ 2008).

Based on the PIOJ (2008: 24.1) report in 2007, the Government continued to focus on, among other programmes, the “Community Security Initiatives, the Safe School Programme and the Citizens’ Security and Justice Programme”. These programmes, at the onset, were implemented largely to reduce the intolerable crime situation in Jamaica. Some \$186 million of Government expenditure in 2007 went towards the Jamaica Constabulary Force.

2.3 Agriculture in Jamaica

This section gives an overview of agriculture in Jamaica and the Jamaican Sugar Industry. Since the study is based on livelihoods of families operating small sugarcane farms, this section will contribute to a better understanding of the livelihoods of the sample families.

The Role of Agriculture in Jamaica

Despite the declining trend of agriculture's contribution to the GDP, the sector employed about 250,000 persons in 2007 and generated approximately \$260 million in export earnings (PIOJ 2008). The contribution of agriculture as a percentage of real GDP has declined from 9.2 per cent in 1995 to 5.2 per cent in 2008 (Campbell 2005; CIA 2009).

The economy has been heavily dependent on the sector, particularly in terms of job opportunities, foreign exchange earnings, and as a linkage which enhances activities in other sectors. Agriculture has also been a prime consideration in rural development and plays a pivotal role in poverty reduction strategies and development practices in Jamaica.

In Jamaica there are approximately 1.1 million hectares of land of which 407,434 are considered suitable for agricultural purposes (CIA 2006; Campbell 2005). The 1996 agricultural census revealed that there were approximately 150,000 farm families operating in Jamaica, with small farms of 2.1 hectares and less constituting some 78 per cent of the farming community (Campbell 2005).

Crop Production

Sugarcane is the major crop cultivated in Jamaica, along with bananas, citrus, coffee, cocoa, pimento and coconut (traditional export crops). Other crops of economic importance include vegetables, legumes, root crops, fruits and cereals (domestic and non-traditional exports).

Particularly since the latter part of the 1990s, the production of most of the country's traditional export crops have been declining. Between 1999 and 2007, all traditional export crops except for coffee have registered a significant decline (Table 2.6).

Table 2.6: Production of Traditional Export Crops Jamaica, 1999-2007 (Tonnes)

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Source: PIOJ 2008; STATIN 2004

This general declining trend is a consequence of a combination of factors ranging from adverse weather conditions (drought, flood and hurricane), disease infestation, low market prices, high costs of production as well as the lack of investment and the gradual erosion of preferences in international markets.

Sugarcane, the most important crop in terms of foreign exchange and employment, has been affected mainly by low market prices, high costs of production and a failure to invest in key areas of production. Drought has also been a deterrent factor for the crop in particular years to realise its productive target.

Bananas, the second crop of economic importance, have come under a market ruling imposed by the EU. Prior to 1997, Jamaican bananas were given preferential market access to the EU. With the removal of the preferential access, the industry had by 2007 reduced production by almost two-thirds. The industry has also been very vulnerable to the passage of various hurricanes and subsequent flood rains which threatened to wipe out the industry in 2004, 2005 and 2007.

The coconut industry was hard hit in the late 1990s by the deadly Lethal Yellowing Disease - a mycoplasmic infection.

Citrus and cocoa are two of the traditional export crops faced with reduced demand in international markets and low market prices. Furthermore, like bananas, their production has been adversely affected by tropical storms.

Non-traditional export crops have also shown a declining trend. They have decreased from 491,000 tonnes in 2003 to 423,000 tonnes in 2007 (PIOJ 2008). Drought, hurricane damage, high interest rates on farms loans, low returns on investments, and competition from cheap imports, are among the major reasons.

With the exceptions of legumes and condiments, as well as some tubers, which remained flat, all others have declined during the 2004-2007 period. Fruits, vegetables, cereals (corn), yams and plantains decreased significantly over this four years period.

In terms of foreign exchange, while traditional crops exports increased in earnings between 2001 and 2007, there was a decline in non-traditional crop exports.

Livestock Production

Livestock reared on a commercial basis include dairy and beef cattle, goat, poultry, pigs, and inland fisheries, with sheep to a lesser extent. While there was fluctuation in the number of goats, sheep and pigs slaughtered between 2003 and 2007, there was a gradual decline for cattle (Table 2.7).

Table 2.7: Livestock Slaughtered in Jamaica (Heads), 2003-2007

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Source: PIOJ 2008

This significant decline in the number of cattle slaughtered is largely attributable to the outbreak of the mad cow disease in USA in 2000. This alarm resulted in the reduction of beef consumption of most Jamaicans.

Milk has also decreased in production during the period. The production of milk has declined mainly because of competition from imports of cheap milk solids, resulting in low prices offered for locally produced milk. This has forced a significant number of dairy farmers out of business. PIOJ (2008) reported that milk production has fallen from 18 million litres in 2003 to 14 million litres in 2007.

Poultry is the most widely produced and consumed meat in Jamaica. While there were reported increases in poultry production between 2003 and 2007, there was a decline in egg production. However, both inland fisheries and marine catches have registered significant increases over the same period (PIOJ 2008).

Agriculture Projects and Programmes

Most of Jamaica's agriculture production is in the hands of farmers. However, the Government, through the Ministry of Agriculture, has been playing a role in the development

and sustenance of this sector. The Ministry of Agriculture has been spearheading and implementing several projects and programmes over the years in an attempt to assist farmers.

These programmes and projects are implemented through the various Government agencies and corporations such as the Rural Agricultural Development Agency (extension services), the Agricultural Development Corporation and the Agricultural Development Bank (farmer's credit). Commodity boards, statutory bodies - which include the Jamaica Agricultural Society and the 4-H Movements, among others, are also pivotal in implementation of the various agricultural strategies and support services of the Government.

In 2006, the Government initiated the Agricultural Development Strategy with the primary aim to improve productivity across the sector. Basically, the strategy focus was on "apiculture, small ruminants, organic practices, greenhouse and hydroponics, farmer's registration, fruit tree and fisheries" (PIOJ 2008: 10.1).

Also, in 2008, the Government embarked on a food security programme with the aim to reduce the reliance on food imports. The IICA (2009) reported that in 2008 food imports were responsible for 60 per cent of the nation's consumption and that the Government's focus was on seven priority measures to reduce that dependency. These include (IICA 2009:4):

- Increased production of cassava.
- Testing different rice varieties to best suit local conditions.
- Promotion of urban backyard gardening.
- The launch of a three-year school garden project focusing on fruit in 966 schools.
- A youth programme to engage more youth in agriculture.
- Expansion of the greenhouse subsector.
- Sourcing and distribution of economically priced inputs to contain production cost for farmers.

Farmers' Credit

Credit to farmers declined between 2003 and 2007. In 2007, 80 per cent of the loans went to agro-processing, while 17 per cent went to the livestock sector. Farm infrastructures, domestic and export crop production absorbed the remaining three per cent. Since 2000, the rate charged on agriculture loans has been 13 per cent per annum (PIOJ 2008).

Background of the Jamaican Sugar Industry (JSI)

The sugar industry is the oldest industry in Jamaica following its establishment in the 1660s (Black 1965; O'Connell 2004). The JSI was built on the premise to provide raw sugar to the British Empire (O'Connell 2004). Raw (brown) sugar is processed into refined (white) sugar, which is largely used as the consumer end product. Jamaica produces only raw sugar. It does not operate a refinery and is a net exporter of raw sugar to preferential markets in the EU and USA.

Between 2001 and 2007, earnings from raw sugar exports averaged \$94 million annually, representing almost 6 per cent in total exports from Jamaica and about 36 per cent in total agricultural exports (PIOJ 2008). The industry contributes almost one per cent to the GDP and provides employment for over 65,000 persons of whom 38,000 are directly employed (Mitchell 2004; PIOJ 2008).

The JSI Structure

The JSI is served by a number of organisations. The strong link that exists between the Government and the JSI has led to the formation of many structures. At the Government level, there are three ministries involved with the direct operation of the industry: the Ministry of Agriculture, the Ministry of Finance and the Ministry of Labour (Hilton 1991).

The Sugar Industry Authority, formed in 1970, has the central role to market the industry's products, coordinate research and advise the Government on development. The SIRI and the Jamaica Cane Product Sales conducts research and functions as the marketing agent respectively (Hilton 1991).

In terms of pricing, the sugar manufacturers are represented by the Sugar Manufacturer Corporation of Jamaica while labour relations are undertaken by the Sugar Producers Federation (Hilton 1991).

The Jamaica All Island Cane Farmers Association is the farmer (AIJCFA) representative for coordinating cane prices and for handling issues at the Government level. The Government-operated estates and factories are managed by Jamaica Sugar Holdings; the development of products from cane is the responsibility of the Natural Cane Product, while the Sugar Industry Housing Limited is responsible for managing the housing needs of the sugar workers (Hilton 1991).

Production

During the 1830s, there were some 670 sugar factories operating in Jamaica. However, with the amalgamation of factories and the advent of technology the number of factories was gradually reduced to 18 in 1965 (Sugar Industry Enquiry Commission 1967).

In 1965, sugarcane and sugar production peaked at 4.7 million tonnes and 506,348 tonnes respectively. Some 60,000 hectares of sugarcane were reaped, supplied by eight Government owned estates and 10 private sector estates as well as 29,000 farmers. Farmers operated on about 32,000 hectares that accounted for nearly half of the sugarcane deliveries that year (Sugar Industry Enquiry Commission 1967).

Since 2002, sugar was being produced by seven estates occupying approximately 34,000 ha (SIRI 2006). Five are owned by the Government and two by private interests. Appleton and Worthy Park are the two privately owned estates while Monymusk, Long Pond, Frome, Bernard Lodge and St Thomas Sugar are Government owned. Both private interests are local Jamaican companies. Frome Estate is the largest (10,100 ha), while St Thomas Sugar is the smallest (2,400 ha) (SIRI 2007) (Table 2.8).

Table 2.8: Sugar and Sugarcane Production by Sugar Estates in Jamaica, (2002)

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Source: SIRI 2003

In addition, the industry has been supplied with sugarcane from approximately 10,000 farmers of whom 6,000 are small operating on two hectares and less (PIOJ 2006). Overall, farmers occupied around 17,000 hectares and supplied about 45-50 per cent of deliveries each year (SIRI 2004 2007; PIOJ 2008) (Table 2.9).

Table 2.9: Sugarcane Production and Hectares in Sugarcane Jamaica, 2002-2007

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Source: SIRI 2004-2007 and PIOJ 2008

The JSI has contracted gradually since production hit its highest point in 1965. In 1996, raw sugar production was 239,000 tonnes and has steadily declined, to reach 122,000 tonnes in 2005. Thereafter, there was a modest increase (SIRI 1999, 2003; PIOJ 2008) (Table 2.10).

Table 2.10: Sugar and Sugarcane Production Jamaica, 1996 – 2007

[copyright clearance to reproduce table not obtained]

Sources: SIRI 2003, 1999 and PIOJ 2008

As mentioned in Section 2.3.2, the decline in production is explained by a combination of factors. However, the cost of production and the relatively low market prices and consequently low returns have been the main cause for the lack of investment in the sector. This lack of investment is a significant reason for low sugarcane yields. The incidences of drought periods and occasional hurricane damage have also compounded the problem of declining sugarcane yields.

Sugarcane Production Activities

In Jamaica land preparation for sugarcane is carried out using conventional methods that is, ploughing, sub-soiling, harrowing and furrowing. For planting, whole stalks or dibble pieces (10-15 cm) as seeds are placed into open furrows and covered with 5-8 cm of soil.

Replanting sugarcane fields in Jamaica is based on field productivity and age. Being a ratoon crop, the average replanted field will give economic yields of up to the sixth ratoon. It is

therefore recommended by the industry (SIRI) that fields be replanted every six years and as general guide to replant 16 per cent of total acreages annually. However, this recommendation has been a challenge for the industry, as demonstrated in 2006 when only half of the fields targeted for replanting were accomplished (SIRI 2007).

Irrigation for sugarcane production in Jamaica accounts for nearly 70 per cent of all irrigable land in Jamaica. Of the total 25,000 hectares of irrigated land, 17,500 hectares are in sugarcane (IDB 2004). The application of water in the irrigated plains (Monymusk and Bernard Lodge) using furrows has proven to be expensive. Since 2001, the centre-pivots are being used on sections of the irrigated plains and, to a lesser extent, on Worthy Park and Trelawny estate farms (Falloon 2001).

In terms of crop protection, the sugarcane smut and rust are two of the most significant diseases found in Jamaica. Leaf scald and yellow spot, as well as the ratoon stunting disease, are also considered by the industry as diseases of economic importance. For entomological considerations, based on SIRI (2004:10) report, the West Indies canefly (*Sacchararosydne saccharivora*) and the sugarcane stalk borer (*Diatraea saccharalis*) are two of the more threatening insect pests to the industry, although they are usually contained at tolerable levels.

As part of the crop protection management, weed control and herbicide usage is of paramount importance in the industry. The development of an effective weed control management programme, which is based on the type of weed encountered, the choice of herbicide and the method of eradication, is a test for growers (Allen 1980; Lewis 1997). However, it was observed by SIRI (2004) that where there are poor weed control practices, a lack of finance is the main explanation. In Jamaica, grasses such as Paragrass (*Panicum purpurascens*), Wild Pangola (*Dichanthium annulatum*) and Guinea Grass (*Panicum maximum*) are more difficult weeds to eradicate than the broad leaves found in sugarcane fields. As a means of preferred weed control practices SIRI (2002) advocated the use of pre-emergent chemical treatments.

Fertiliser usage for the industry is based on recommendations resulting from foliar and soil tests conducted by SIRI. Recommendations vary throughout the industry dependent on soil characteristics. However, on average, rates for plant canes are usually treated with 80-100kg/ha of nitrogen (N), potassium oxide (K₂O), and phosphorus pentoxide (P₂O₅). Ratoon rates normally fall between 80 and 120kg/ha. This means that based on a bag of fertiliser with standard weight of 50 kg, each hectare will take 10-12 bags for plant cane, while a ratoon field will take 10-14 bags. SIRI (2007) reported that about 6,000 ha of fields were unfertilised in 2006.

The sugarcane variety development programme is a central activity of the agronomy department of SIRI. According to Easy (2001) the programme has been delivering reasonably high yielding and high sucrose content varieties that are economically viable and are showing signs of adoptability. On average, the yield of the top five performing varieties in 2006 was 91 tonnes cane per hectare following establishment under moderate conditions (SIRI 2007).

For drainage, most growers believed that a little water is good for the crop so more must be better (Warner 1989). Against this background, in an attempt to educate farmers on the importance of drainage, SIRI has been conducting seminars and demonstrations annually throughout the different sugarcane growing regions (SIRI 1997).

Inter-row cultivations, also referred to as moulding activities, are particularly practiced on ratoon fields in the industry. Nevertheless, it is a SIRI recommendation for planted fields to be inter-row cultivated. The estate farms and larger growers have been carrying out the practice especially following harvesting. However, with the industry facing a lack of financial resource, there is a reduced level of moulding activities throughout the industry.

Harvesting normally starts in late December and ends in late June. In Jamaica, sucrose level is optimum from February to April. There are three main operations to harvest sugarcane in Jamaica: 1) cutting, 2) loading and 3) transportation. For cutting, this operation could be regarded as evenly shared between manual labour and mechanical harvester. However, for loading, more than 95 per cent of deliveries are by mechanical means, whether grab-loader or mechanical harvester. Manual loading is carried out in hilly terrains which are inaccessible to the appropriate machinery.

Most canes are transported to the factory by trucks (lorries), which are either owned or contracted by the estates. Other haulage such as carts drawn by tractors are used throughout.

Cost of Sugarcane Production and Price

Jamaica is categorised as a high cost producer of sugarcane (Ahmed 2001; Gillson et al 2005). The 2003 all Jamaica average cost of sugarcane production was determined as \$1,614 per hectare (SIRI 2004). Traditionally, on a per hectare basis, most of the cost for producing sugarcane went towards overheads. This is followed by cultivation, harvesting and then replanting. In some years the cost of harvesting exceeds cultivation (SIRI 2004). This is because of cost-cutting measures on cultivation, such as reduced field maintenance practices and expenses.

The average price per tonne of sugarcane received by the industry is primarily based on the prices paid for sugar and its derivatives - mainly molasses. Between 2002 and 2006 the national average price received by farmers was \$28.6 per tonne (SIRI 2003, 2004, 2007).

Sugarcane By-Products

The primary product of the sugar industry in Jamaica is the production of raw sugar.

The production of raw sugar has two secondary or by-products following its processing. These are molasses and bagasse. These secondary products can be further broken down into a number of products. Molasses can be processed into rum, yeast, cattle feed, xanthium gum, ethanol, vinegar, butanol, acetone and citric acid. Charcoal briquettes, human dietary fibre, panel board and fuel can be made from bagasse (Hilton 1991).

2.4 Conclusion

Having presented the background of the study, it is evident that agriculture and particularly sugarcane production is strongly linked and closely related to the history of Jamaicans. Though the economy became diversified in the latter part of the 19th century, agriculture continued to be a dominant part of the island's physical landscape and is predominately a way of life for many rural families.

Arguably, the dependency of Jamaicans on agriculture and the JSI is threatened, given their declining role as one of the major employers of the workforce, a key provider of food and a crucial earner of foreign exchange. However, what is of more concern is the deterioration of the macro economy as a whole. The Jamaican economy has experienced a decline in performance particularly since the 1980s. Between the 1980s and 2008, there was deterioration in both its trade and current accounts, which remained in deficit reflecting negative figures for balance of payments. While imports continued to outpace exports, there was a lack of foreign inflow resulting in sliding exchange rates. As a consequence, economic performance was sluggish with real GDP growth averaging 1.1 per cent over the period. The decline of the economy over the decades is highlighted mainly in the high debt-to-GDP ratio which was 130 per cent of real GDP in 2008. This has multiple effects not only on other macro-economic indicators but also on the socio-economic environment and the livelihoods of Jamaicans.

The high level of indebtedness has constrained numerous policy options and has prevented the Government from adequately investing in critical areas of public economic and social programmes. Even though there are improvements in some indicators over the 1980s and

1990s, the inability of the Government to effectively invest in needed programmes will have effects on the overall living conditions of Jamaicans. Violent crimes, including murders at intolerable levels, abductions, praedial larceny, break-ins, to name a few, are commonplace in Jamaican society.

Nevertheless, to appropriately address the above key research questions and to meet the objectives required, other influences that exist beside those cited in the background of this study must be examined. Given that the JSI is export oriented, it is relevant to explore the competitiveness of the JSI, taking into account the world sugar market and economy. This is outlined in the following chapter.

Chapter 3

The World Sugar Market and the Competitiveness of the Jamaican Sugar Industry

3.1 Introduction

The purpose of this chapter is to provide insights into the world sugar market and the competitiveness of the Jamaica Sugar Industry (JSI), particularly in international trade. Since the JSI was created on the basis to supply international markets with sugar, the chapter specifically looks at the impact of world production, export supply, import demand, price and consumption on the marketing of sugar. The use of alternative sweeteners and the role they play as a sweetening agent is addressed. A summary of Government policies are presented, since the future structure of the world sugar market depends on sugar policy reform and the decisions taken to comply with trade commitments and rules.

For investigating the competitiveness of the JSI, the Porter's Diamond Framework is adopted. The theory of competitive advantage, which is fundamental to the Diamond Framework and its origin, is reviewed. A critique of the Framework follows. The chapter concludes with the application of the Framework to the JSI.

3.2 The World Sugar Market

Sugar is part of a broader sweetener industry. In 2003, cane sugar was produced in 64 countries, while beet sugar was produced in 42 countries and alternative sweeteners were produced in 19 countries (Roney, 2004). Ten of these countries⁵ produced both beet and cane sugar (Nyberge n.d.). There are two natural sources for commercial sugar; sugarcane and sugar beet. Alternative sweeteners are sourced from natural high fructose syrup (HFS) and /or manufactured high intensity sweeteners (HIS) (Spence 2004a; Mitchell 2004).

All of the sugar produced in Europe comes from sugar beet, with the exception of that produced in southern Spain and the French Department Outre Mer which produced about 300,000 tonnes of cane sugar annually (Gudoshnikov 2004a; Mitchell 2004). Since it came into common use in around the thirteenth century, cane sugar was the only sugar produced until the early nineteenth century. The use of beet sugar in Europe became popular in the early

⁵ China, Egypt, Japan, Iran, Ecuador, Honduras, Pakistan, Mexico, Morocco, and the USA produced sugar from both beet and cane. (Nyberge n.d.).

1820s, and by the 1890s was dominating the share of the world sugar market and production (Ballinger 2002; Spence 2004a) (Fig. 3.1).

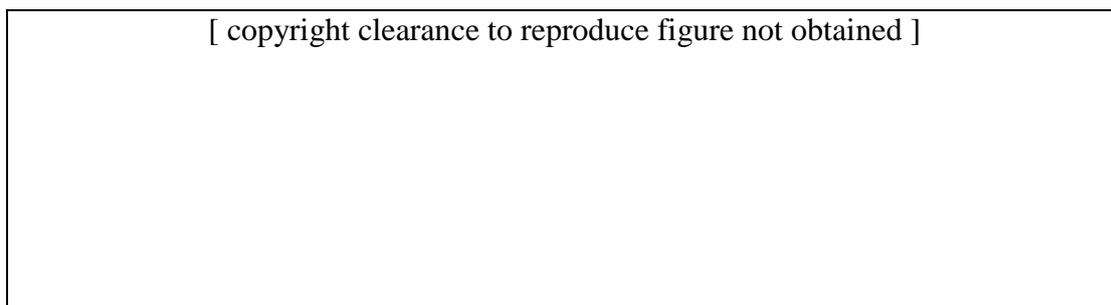


Figure 3.1: Cane and Beet Sugar Production from 1800-2002 (000 tonnes)

Sources: Spence 2004a

However, this dominance of beet sugar did not last long; and from the 1920s onwards cane sugar once again occupied the dominant share of sugar production.

Since the beginning of the 21st century, alternative sweeteners have been occupying almost 17 per cent of the world sweetener market leaving sugar with 83 per cent (Spence 2004a).

Alternative sweeteners are several times sweeter than sugar. Their use both in diet products and as a means of reducing cost has led to increasing use and popularity globally.

Sugar, as an economic commercial sweetener source, is found abundantly in sugarcane and sugar beet. Sugarcane by weight can yield up to 15 to 16 per cent sugar, while sugar beet will yield nearly 18 per cent sugar (Asadi 2006).

3.2.1 Alternative Sweetener Situation

The use of alternative sweeteners in medicines, beverages, confectioneries and the baking industries worldwide has steadily increased. There are two sources of alternative sweeteners: natural and manufactured. The natural alternative sweeteners are dominated by high fructose corn syrup (HFCS). For the manufactured high intensified sweeteners (HIS), saccharin and aspartame are mainly used (Spence 2004b).

The USA is the world's largest producer of natural alternative sweeteners, accounting for 75 per cent of the world output. The USA, for example, produced a total of 8.45 million tonnes of HFCS in 2002 (Table 3.1). Production of HFCS in Hungary and China has increased, while in Japan production has been stable since 1994, averaging approximately 800,000 tonnes annually (Spence 2004b).

Table 3.1: High Fructose Syrup (HFS) Production (000 tonnes)

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Sources: Spence 2004b

In 2002, world natural alternative sweeteners consumption reached nearly 12 million tonnes. The USA accounted for almost 70 per cent, the EU three per cent with almost one per cent consumed in Asia (Spence 2004b).

The use of manufactured sweeteners during the 1990s grew two to three times as fast as sugar (Spence 2004b). The increase was due to the rising demand for diet drinks and other slimming products. China is the world largest producer and consumer of saccharin, which is the most popular and widely used of the manufactured sweeteners. Spence (2004b) reported that saccharin is the cheapest available sweetener and is about 500 times sweeter than sugar.

Aspartame is the second most important manufactured sweetener and is almost 200 times as sweet as sugar. The USA is the largest consumer of aspartame, accounting for approximately 70 per cent of world consumption. Since 1992, the use of aspartame has been growing throughout the EU, the US and Asia (Spence 2004).

Also of commercial importance, is the use of acesulfame-k, which is manufactured in Germany, and is about 200 times sweeter than sugar. In 1999, approximately 300,000 tonnes of acesulfame-k were used worldwide; it has been used mainly in North America and Europe in the confectionery, beverage and the chewing gum industries (Spence, 2004b).

According to Spence (2004b:85), other important manufactured sweeteners of commercial value include “alitame (2,000 times sweeter than sugar), sucralose (600 times sweeter than sugar), neotame (8,000 times sweeter than sugar) and the plant extracts stevioside and glycyrrhizin”.

3.2.2 Sugar Production

Brazil is the largest producer of sugar, accounting for almost 20 per cent of world production in 2008. In 2008, the three top producers, Brazil, India (14) and the EU (11) accounted for nearly half (45 per cent) of the world production (Commodity Research Bureau [CRB] 2009). Approximately 75 per cent of total world production is accounted for by the top ten countries.

Centrifugal sugar, raw or refined, is produced from cane or beet. The processed crystallised form of sucrose is termed centrifugal sugar. Sugar is traded in both the raw and refined forms. However, during the last three decades and particularly since the 1990s, sugar is mostly traded internationally in its raw form, mainly due to the higher tariff imposed on refined sugar (Gudoshnikov 2004a, USDA 2005). The higher tariff rates have been introduced by countries to protect their local refineries.

At the start of the twentieth century, world sugar production was approximately 8.5 million tonnes (Gudoshnikov 2004a). World sugar production continued to increase steadily and by 2008 it reached 166.5 million tonnes (CRB 2009) (Fig. 3.2).

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Figure 3.2: World Sugar Production 1900-2008 (000 tonnes)

Sources: Gudoshnikov 2004a and CRB 2009

The 158 million tonnes increase over these 108 years represents an average growth rate of 1.4 million tonnes annually. However, between 2000 and 2008 an average annual growth of 8.2 million tonnes was recorded. The bulk of this increase has been attributed to the rise of sugar output in Brazil and India. During the period 1993 to 2008, sugar production in Brazil and India increased by 325 and 220 per cent respectively (Schmitz et al 2002; Gudoshnikov 2004a; CRB 2009) (Table 3.2).

Table 3.2: Sugar Production in Selected Countries (000 tonnes)

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Source: Gudoshnikov 2004a and CRB 2009

Regionally, growth in sugar production has been consistent in Asia and South America. India, one of the world's top producers (second largest since the mid 1990s) has been largely

responsible for the consistency in Asia. Also, since the 1990s Brazil has been the top producing country and has positioned South America as the world largest producer of sugar.

For declines, on a regional basis, Central America sugar production has fallen since Cuba lost its share of quota from the Soviet Union.

Europe also registered a decline in sugar production between 1986 and 2000 due mainly to the collapse of the Eastern European centrally planned economies (Gudoshnikov 2004a). Of note, the EU has the leading role in all three categories of production, importation and exporting.

3.2.3 Sugar Consumption

The consumption of sugar is one of the key factors impacting the world sugar market. The quantity of sugar consumed is mainly driven by population growth and the level of changes in the per capita consumption. Changes that occur in the per capita consumption levels are influenced by the growth rate of incomes, sugar prices, use of alternatives sweeteners and, to a lesser extent, cultural habits. The population growth rate accounts for almost 85 per cent of growth in sugar consumption (Jolly 2004a).

Globally, the consumption of sugar had risen to 162 million tonnes in 2008 (CRB 2009).

While the annual per capita sugar consumption increased between 1900 and the 1960s, since the 1970s world consumption has been hovering around the 20 kg average (Jolly 2004a; International Sugar Organisation [ISO] 2007) (Fig. 3.3).

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Figure 3.3: World Per Capita Sugar Consumption from 1900-2006 (kg)

Sources: Jolly 2004 and ISO 2007

Sugar consumed per person in 2006 was highest in the Netherland Antilles (142 kg), Swaziland (102 kg) and St Kitts and Nevis (90 kg), while in Rwanda (1.6 kg), Zaire (1.7 kg) and the Central African Republic (2.4 kg) sugar consumption per capita was the lowest (ISO 2007).

On a continental basis, Asia has been the largest consumer of sugar since the mid 1990s. In 2002, for example, Asia accounted for 40 per cent of world sugar consumption with a per

capita consumption of 14 kg. Europe has been second since the 1990s, accounting for 23 per cent in 2002, while Africa accounted for 9 per cent in 2002 and was ranked third (Jolly 2004a).

3.2.4 Sugar Imports

In 2008, some 44.8 million tonnes of sugar were imported worldwide. The EU, the largest importer accounted for 8.1 per cent. Next was Russia (6.3 per cent) followed by Indonesia (5.4 per cent) and the USA (4.5 per cent). The top 10 importers accounted for 43.6 per cent of total sugar imports in 2008 (CRB 2009) (Table 3.3).

Table 3.3: Top 10 Importers of Raw plus Refined Sugar in 2008 (000 tonnes)

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Source: CRB 2009

Regionally, North Africa, the Middle East and Sub-Saharan Africa are the largest and most active importers of sugar. These areas, for example, imported 13.1 million tonnes in 2002, accounting for 30 per cent of global imports (Jolly 2004b).

More than 70 per cent of world sugar production is consumed within the country of production, the remaining 30 per cent is traded internationally (Lord and Barry 1990; Jolly 2004b). Almost one-quarter of the internationally traded sugar is used to satisfy preferential markets and special quotas, while the remaining 75 per cent is traded as residual on the international free market (Lord and Barry 1990; Jolly 2004b).

The majority of the raw sugar imports are undertaken by a small number of large importers. For example, in 2006, a total of 13.2 million tonnes of raw sugar representing 53 per cent of world raw sugar imports were imported by Russia, the USA, the EU, Japan, South Korea, Canada, China and Malaysia. Each imported over one million tonnes of raw sugar (ISO 2007). Russia, the largest importer, accounts for nearly one-eighth of global net imports (USDA 2005).

In comparison, there is a thinner spread of refined sugar imports than for raw sugar. During 2006, some 4.8 million tonnes of refined sugar were imported by Pakistan, Israel, Sri Lanka, Indonesia, Syria and Iraq, with each importing over 500,000 tonnes (ISO 2007). This volume accounted for only 24 per cent of all refined sugar imports.

In order to create stability between the use of refined and raw sugar, toll refineries are operated in several countries. One of the world largest toll refinery operations is in the United

Arabs Emirates, while others are found in the US, the Republic of Korea, Malaysia, China and Saudi Arabia (Jolly 2004b).

3.2.5 Sugar Exports

Since the mid 1990s, Brazil has emerged as the leading exporter of both refined and raw sugar, accounting for 39 per cent of total world sugar exports in 2008. Thailand, India and Australia were the next largest exporters (Gudoshnikov 2004b; CRB 2009). In 2008, more than three-quarters (76 per cent) of global sugar exports were supplied by 10 countries (Table 3.4).

Table 3.4: Top 10 Exporter of Sugar 2008 (000 tonnes)

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Source: CRB 2009

Beet sugar producers export only refined sugar. For cane sugar, most exports are as raw sugar. However, a few cane sugar producers' export only or mostly refined sugar, while only a small number export both refined and raw sugar (Gudoshnikov 2004b). The larger importers of raw sugar will determine the future trend from raw to refined sugar exports.

In terms of dependency of the world sugar market on exporters, net exporters account for almost 80 per cent of world sugar production (Gudoshnikov 2004b). According to Gudoshnikov (2004b), approximately 25 per cent of net exporter output is available to the world sugar market, after supplies to domestic and preferential markets. The world sugar market depends on exporters for supplies which are expressed as a share of domestic production. Sugar producers supplying 40 per cent and less of domestic sugar production to the world market are termed low dependency. There are also medium and high dependency net sugar exporters that supply 40-60 per cent and over 65 per cent respectively (Gudoshnikov 2004b).

While Brazil, Thailand, Cuba and Australia were high dependency exporters, the EU, Russia, Indonesia, US, Malaysia, Korea, Canada and Japan were among the high import dependency countries.

For preferential trade arrangements, the world sugar market is characterised by special trade arrangements, where agreed volumes of sugar are delivered to large importers such as the EU and the USA at fixed prices. These preferential market accesses have been eroding gradually, and in 2002 accounted for 8 per cent of global exports (Gudoshnikov 2004b). Nonetheless,

most cane sugar exporters are beneficiaries of some preferential arrangement (Gudoshnikov 2004b; Haley et al 2006) (Appendix A.4).

3.2.6 Sugar Pricing

The pricing of raw sugar traded on the world market is mostly through the New York No. 11 contract on the New York Board of Trade, while refined sugar is traded on the London International Financial Futures Exchange. The raw sugar price is the International Sugar Agreement price whereas the London daily price is the refined sugar price (Jolly 2004c; CRB 2009).

The US dollar is the currency in which sugar is traded on the world market. The value of the US dollar is placed against the IMF Special Drawing Rights where an index is used to assess the price on the world market. Jolly (2004c:39) describes the Special Drawing Rights as “a basket of currencies that consists of the US dollar, Euro, Japanese yen and the pound sterling”.

One pound of raw sugar will yield 0.92 pounds of refined sugar. With the 100 raw to 92 refined established ratios, the prices of refined sugar normally move with raw sugar prices. The difference in prices will be widened if the raw volume is in surplus and conversely, will narrow if the raw volume falls (Jolly 2004c).

For the decade between 1988 and 1998, world market prices for raw sugar ranged from a high of 14 cents per pound to low of 8 cents per pound. By 2000, prices of raw sugar recovered to 12 cents per pound. Following Brazil’s hike in world sugar production in 2002, the prices of raw sugar went to almost 5 cents per pound (Jolly, 2004c). However, in 2003, prices increased to 7.5 cents and gradually trended upward to reach 13.8 cents in 2008 (CRB 2009).

The instability of sugar prices since the 1950s is an example of price slumps and booms. The world sugar market price slumps are normally longer than price booms. Jolly (2004c) points out that between 1950 and 2002, six price cycles were identified. Cashin et al (1999) observed that the International Sugar Association sugar prices usually have 46-month boom duration and a 38-months to seven year slump.

One of the parameters used by sugar exporting countries to predict world market prices is stock levels. The measured stock consists of the quantity of surplus or deficit of sugar accumulated over a specific time. The time of the year to measure the stock is an important aspect of the sugar market.

3.3 Government and Sugar Policy Reform

Governments in most sugar producing countries provide assistance to their domestic sugar industry by offering several support programmes through trading policies, such as tariff rate quotas and export subsidies. In terms of domestic support, Government involvement includes production support prices, shared costs and restrictions on competing products. Lord and Barry (1990) point out that trade arrangements and domestic support offered by governments, are usually vulnerable to trade distortions.

The support and assistance of the sugar industries by government is one of the key issues to be addressed by the WTO. In response to the WTO commitments, the sugar policy reform programme, in some countries, liberalises their sugar markets; the reform programme aims to reduce and eliminate malpractices in the sugar industries.

Jolly (2004d) comments on a WTO report that shows Australia as the only producer that does not impose tariffs and New Zealand, Hong Kong and Singapore as the only sugar net importers without tariffs. In 1997, the sugar tariff averaged 59 per cent in developed countries and 14 in developing countries (Jolly 2004d).

3.3.1 WTO/ Uruguay and the Doha Rounds Agreements on Agriculture

At the end of World War II, the General Agreements on Tariff and Trade (GATT) was created to provide a global forum in order to reduce government intervention in international trade. In 1994, GATT was incorporated into the WTO, which has taken over the negotiations and dispute resolution of international trade matters (Anderson and Josling 2005). The WTO consisted of over 152 member states in 2008 (Europa 2009). Under GATT/WTO, the Uruguay Round of Agreement on Agriculture (URAA) negotiations (1986-1990) focused on reduction in support of market access, domestic support and export competition. The reduction rates would be implemented over a period, with the commitments not applicable to the LDCs (Jolly 2004d; Anderson and Josling 2005; Gillson et al 2005) (Table 3.5).

Table 3.5: Commitments under the Uruguay Round Agreement on Agriculture (%)

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Sources: Jolly 2004d

According to Niemi and Teivonen (2001), Niemi (2003), Mensbrugge et al (2003) and Jolly (2004d), only a few countries have been complying with the URAA. They claim that larger

WTO members such as the EU, the USA and Brazil have employed strategies to manage domestic sugar programmes and trading practices.

In 2001, WTO launched a new round of negotiation in Doha, Qatar, which is an extension of the URAA, with the aim to improve on the objectives. A series of deadlines was set with the expectation that all agricultural negotiation would be completed by the start of 2005 (Jolly 2004d).

The negotiation conditions and deadlines were not met by the WTO negotiators for the Doha or the Canun 2003 ministerial meetings. Jolly (2004d) believed that there was confusion between WTO members, leaving several countries to concentrate on regional trade agreements. Marks (1997) and Adabre (2006) noted that the countries within the ACP group were all developing states who were debating and querying the necessity of WTO rulings, which they argued will eventually cripple their economies.

Wolfe (2009) questioned whether the failure to conclude the 2008 Doha Round calls for a reform of the WTO. Adler et al (2009) said issues preventing the completion of the negotiations were barriers to progress for other area such as service. Adler et al (2009) estimated that completion of the Doha negotiations could realise profits of up to \$520 billion annually from global exports.

3.3.2 The Impact of Sugar Policy on Marketing

The EU and the US sugar regimes have been affected by the WTO negotiations. The EU was restricted on the volume and value of export subsidies and the USA was regulated to a minimum import quantity.

The EU sugar regime, or the Common Organisation of the Market in Sugar (COMS), was introduced in 1968 by the Common Agriculture Policy. The COMS is responsible for providing assistance to sugar producers in addition to the controlling of imports and exports (Gillson et al 2005).

In the USA, the Jones-Costigen Act was the first sugar Act, enacted in 1934, while the US Tariff Rate Quota System was instituted in 1990 (Alvares and Polopolus 2002; Garside et al n.d.).

In the URAA, the USA agreed to import a minimum volume of 1.256 million tonnes annually. There were two tariffs; one for within quota (1.256 million tonnes) and the other for volumes above this. Haley (2001) explained that the US high-tier sugar tariffs were sugar imports that surpassed the level of the agreed quantity, which have base rates for raw sugar of

18.08 cents per pound and, for refined sugar, 19.08 cents per pound. These rates were to be reduced for five years, until 2000. Larson and Borrell (2001) claimed that with the sugar policy reform, the Lome Convention, the North American Free Trade Area and the enlargement of the EU15 to EU25 would likely impact negatively on related sugar economies.

For the EU, since 1965 the sugar policy has been scheduled for reform every five years (Haley et al 2006). The sugar policy reform proposed in 2004 by the EU which included the elimination of over quota sugar exports and the re-export of sugar imported under preferential terms was inadequate to comply with the WTO commitment (Jolly 2004d). The proposal further included reduction of sugar prices by 36 per cent from euro 631.9 to Euro 404.4 per metric tonne over a four-year period, starting in 2006/07.

The proposed policy reform suggested that the sugar regime would be fully liberalised, which would see significant changes in ACP/EU trade relations. The reform however, included a compensation package (accompanying measures) for losses that would be incurred as a consequence of the associated price reduction. The compensation package would cover seven years starting in 2007 and continue up until 2013. A total of 40 million Euros was allotted for the first year as part of the accompanying measures for the ACP countries (Ministry of Foreign Affairs and Foreign Trade Jamaica 2006). Realistically, there was no doubt that EU had to reform its long running policy. However, the ACP sugar producers contend that the change was too deep, too quick and too soon (Singh 2005). The Economic Partnership Agreement (see Appendix 4) focused on changes in regard to deregulated trade that was compatible in principle with rules of the WTO. The Agreement offered an outline for ACP and EU negotiations over a period of twenty years, starting in 2008.

Orden (2002) was of the opinion that the future of the EU sugar regime would be dependent on the WTO. The author added that the acceptance of the regional trade agreements in the EU sugar policy may be a step taken towards strengthening multilateral trade.

3.4 Competitiveness of the JSI

To ensure that the objectives of the study were met, all possible factors influencing the livelihoods of the families were taken into account. As such, the competitiveness of the JSI, particularly in international trade, was taken into consideration and eventually forms an integral part of this study.

The Porter's Diamond Framework was selected for the investigation. The framework was developed by Harvard Professor and international business consultant, Michael Porter. The

framework was chosen for this study on the basis of its flexibility to investigate the competitive advantage of industries in international trade. Porter's book, the *Competitive Advantage of Nations* (1990), in which the diamond was presented, provided the link between strategic management and international economies. The book answers the question of why nations, industries and firms advance and succeed.

The diamond framework is first presented below, followed by the origin of competitive advantage.

3.4.1 The Porter's Diamond Framework

The Porter's diamond framework was developed to measure the competitive strength of a nation's industry in international trade. The framework consists of four broad determinants: factor conditions, demand conditions, related and supporting industries, and firm strategy, structure, and rivalry (Fig. 3.4). In addition, two important outside variables are included to complete the framework. These are government and chance.

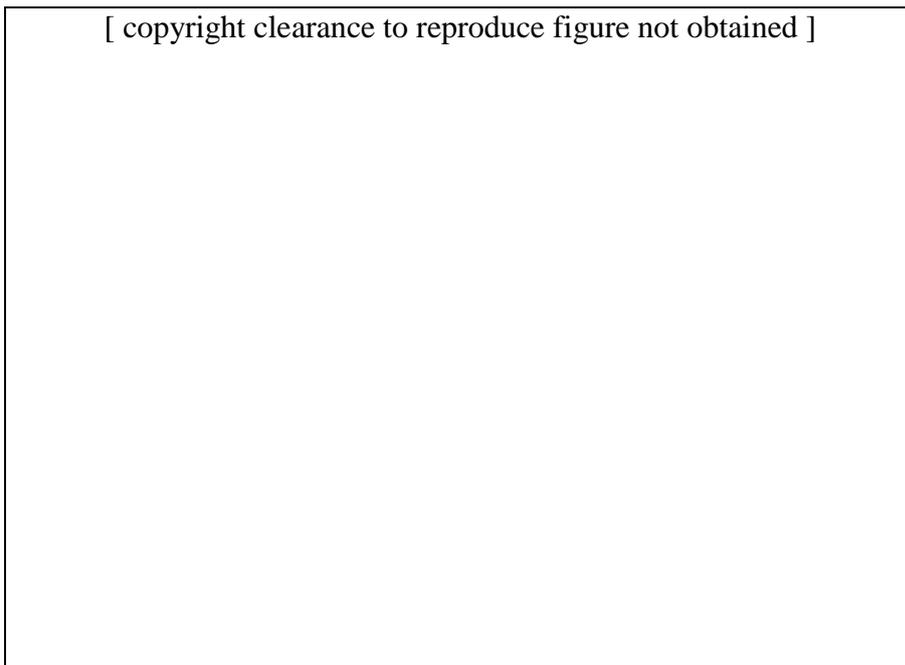


Figure 3.4: The Porter's Diamond Framework

Source: Adapted from Porter (1990)

Factors Conditions

Factor conditions are the factors of production. Based on the diamond framework, factor conditions refer to those inputs which are necessary to compete in an industry, such as labour, land and capital. To investigate the role of factor conditions in the competitive advantage of

nations, Porter further categorised these factors of production into human resources, physical resources, knowledge resources, capital resources and infrastructure.

To examine the role of factor conditions in competitive advantage, Porter divides factor conditions into basic, advanced, generalised and specialised components. Basic factors are natural resources, climate, location, unskilled/semi-skilled labour and debt capital; while advanced factors include modern infrastructure, highly educated personnel and university research institutes in sophisticated disciplines. General factors are highway systems, a supply of debt capital or a pool of well motivated employees with college education; whereas specialised factors include narrowly skilled personnel, infrastructure with specific properties and knowledge bases in particular fields.

Porter observed from his study that the most notable and sustainable competitive advantage was effective when a nation possessed both advanced and specialised factor conditions compared to competitive advantage based on general and basic factors. Porter adds that factor conditions in successful nations were created or upgraded over time rather than those that were inherited.

Demand Conditions

The demand conditions in the diamond framework relate to the local demand conditions for the industry's product or service. Based on Porter's findings, home demand determines the level of improvement and innovation of industries. He identifies three important attributes of home demand, namely, composition, the size and pattern of growth, and the mechanisms by which a nation's domestic preferences are transmitted to foreign markets.

For composition of home demand, Porter recognises three characteristics including (1) structure of demand, (2) sophisticated and demanding buyers and (3) anticipatory buyer needs. Porter considers the size, the number of independent buyers, the rate of growth of home needs, early home needs and early saturation as very important aspects of competitive advantage.

With the mechanisms by which a nation's domestic preferences are transmitted to foreign markets, Porter acknowledges that mobile or multinational local buyers and influences on foreign needs are essential for industries to gain competitive advantage. Porter clarifies that the results of the various demand conditions for gaining competitive advantage depend on the diamond's other determinants.

Related and Supporting Industries

According to Porter, this particular determinant refers to the presence of supplier and related industries in a nation's industry that are internationally competitive. He recognises that most of the successful industries within each nation tend to form clusters.

Porter points out that an industry receives maximum benefit when its suppliers are international competitors. His findings show that home-based suppliers with global positions are more valuable sources of information and technical awareness. He observes that related industries in a competitive environment often attract new entrants who bring new approaches, thus encouraging competition.

Porter claims that local firms in related industries generally split activities and frequently form associations, while international success in one industry can pull through the demand for complementary products or services. He explains that pull through is a result of industries that tend to be strongest in the early development of the particular industry.

Firm Strategy, Structure and Rivalry

This determinant relates to how companies are created, structured and managed, as well as the prevalence and type of local competitors. Porter states that national advantage is effective with certain styles and strategies and the way firms within industries are organised; the pattern of local competitors also plays an important role in creating advantages through innovation allowing the possibility for international success.

Porter realises that no one system of management is appropriate to the success of industries across nations. He observes that nations will succeed in industries where practices are conducive in the environment for establishing competitive advantage; hence, recognising the importance of unusual commitment and effort.

Among the strongest empirical findings of Porter's research is the link between domestic rivalry and the establishment and sustenance of competitive advantage in an industry. The study shows that industries that succeed often have a myriad of competing local rivals, with the stronger local companies equipped to succeed internationally.

Porter emphasises the role of new business formation that depends on domestic rivalry to create new competitors as essential to feed the process of innovation; hence, upgrading competitive advantage.

The External Factors – Chance and Government

Chance

The role of chance in Porter's diamond framework relates to events that have influence on how environments are shaped for competitiveness. Porter explains that chance has to do with the situation in a country that is outside of the company's or industry's power to influence. He said that chance events include invention, wars, increased demands, meaningful movements in financial markets or exchange rates and discontinuities in input costs and technology.

Porter considers inventions and entrepreneurship as the heart of national advantage, while occurring as a chance event. He adds that the role of the determinant often identifies where invention and entrepreneurship are likely to appear in a specific industry.

Government

The role of Government in the diamond framework may be regarded as the most important variable influencing contemporary international competition. Porter declares that government's actual role in national competitive advantage is to influence the four determinants through its policies, either positively or negatively.

According to Porter, although government's role is partial, they have an important effect on national competitive advantage and its policies will fail if they remain as the only competitive source. He said effective policies work in industries where the basis of determinants are present and government strengthens them, but lacks the ability to create them. Governments in the diamond act as a catalyst, altering policies to affect the need or cause of a particular situation.

3.4.2 Origin of Competitive Advantage

The importance of a company's success or failure in international trade is the basis of competitive advantage. Since the early 18th century, many authors have contributed to a body of literature known as 'comparative advantage' discussing and explaining concepts of international trade, business strategies and economic success. Whereas comparative advantage relates to nations and the products where they have a trading advantage, the related concept of competitive advantage is used for individual firms.

Alderson, in 1965, adding to his 1937 fundamental aspect of competitive adaptation, is one of the first authors to suggest that companies should strive for unique characteristics to distinguish themselves from competitors (Hoffman 2000). Ansoff conducted a study based on

corporate firms during the early 1960s. According to Klein (2001), Ansoff first came up with the term competitive advantage in his book *Corporate Strategy*, published in 1965. Ansoff used the term only to describe what companies needed to compete effectively (Klein 2001).

Ackoff in his book, *A Concept of Corporate Planning*, published in 1970, also used the term competitive advantage, and Andrews a year later also used the term in his book, *The Concept of Corporate Strategy* published in 1970 (Klein 2001).

In a follow-up to Alderson's suggestion about companies possessing unique characteristics in competition, Hall in 1980 and Henderson in 1983 documented their contribution regarding firms creating unique advantages in order to be successful (Hoffman 2000). Day's book titled, *Strategic Market Planning: The pursuit of competitive advantage*, published in 1984, was based on suggestions that may be useful to sustain competitive advantage.

Porter in his book, *Competitive Advantage: Creating and sustaining superior performance*, published in 1985, focused primarily on the types of competitive strategies firms can possess (low-cost and/or differentiation) to achieve a competitive advantage. Porter's earlier book, *Competitive Strategy*, published in 1980, analysed industries and competitors, and serves as a forerunner for the *Competitive Advantage* (1985) and *Competitive Advantage of Nations* (1990).

With *Competitive Advantage of Nations* (1990) as well as publication of his best selling books *Competitive Strategy* (1980) and *Competitive Advantage* (1985), Porter was established as one of the leading authors on competitive advantage. His book *Competitive Advantage of Nations* (1990) explores what makes a nation's companies and industries competitive in global markets and drives an entire country's economy.

Porter's 1980 publication presents the Five Forces of Competitive Model which provides an outlook for assessing and analysing the competitive strength of a firm. Porter (1980:3) argues that "the state of competition in an industry depends on five basic competitive forces". He adds that that the profit to be derived by an industry will depend on the combined strength of these forces, which differ from industry to industry. Porter (1980) identifies potential entrants, suppliers, buyers, substitutes and industry competitors as the five forces driving industries' competition.

In addition, Porter, from extensive research in industry competitiveness and strategy, identifies three broad generic strategies for achieving competitive advantage, as outlined in the 1985 publication. Porter (1985) shows how a firm can create and sustain competitive

advantage in its industry through the implementation of the generic strategies. These three generic strategies are cost leadership, differentiation and focus. However, Porter (1985) stresses that cost leadership and differentiation are the two basic types of strategies to gain competitive advantage. He describes how a firm can gain a cost advantage or how it can differentiate itself and how it can play a role in establishing competitive advantage. Porter (1985) adds that generic strategies are rooted in industry structures which resulted from a firm's ability to deal with competition better than its rival.

Another important aspect of Porter's work relates to the value chain. Porter (1985) introduces the value chain as a device to disaggregate the company's activities in order to understand the behaviour of costs and sources of differentiation. A company's value chain for competing in an industry is firmly fixed in a broader flow of activities called the value system. According to Porter (1985) the value system includes suppliers to the company's value chain passing through the distribution channel to its buyers.

Porter's contribution to the concept of competitive advantage, which focuses on trade, is primarily concerned with ways to improve the performance of the competitive market.

3.4.3 Critiques of the Porter's Diamond Framework

The popularity of the Porter's diamond framework has led to several criticisms in its use to determine competitive advantage. Many authors and scholars have presented their views on the use of the framework's ability to address why nations, industries and firms advance and are successful in international trade. Since the diamond framework is selected for investigating the competitiveness of the JSI, it is worthwhile to take a glance at the critique in order to identify any likely weaknesses and strengths.

Porter built his concepts with contributions from several disciplines including economics, geography and psychology, together with contributions from organisation, systems and entrepreneurship theories (Grant 1991; Munnich et al 2002). Grant (1991) assessed the diamond framework and found several weaknesses but appreciated the fact that the model offered new insights into the development of industries and nations, extending the theory of international trade and investment, which is significant in the study of strategic management. Grant (1991:547) adds that "a critical strength of Porter's analysis is its ability to span three levels of aggregation: the firm, the industry and the nation."

In addition, Lammi and Rouvinen (1996) commented on the usefulness of the diamond framework which was used to assess the competitive advantage in the Finland Forest Project.

According to Lammi and Rouvinen (1996) the study was well received and Porter's thoughts were in agreement with the ideas of the Finland Forest new policy approach. Smid and Noordam (2002) also reported that the diamond framework was successfully used to assess the competitiveness of the financial service sectors in Turkey, Cyprus and Malta. The use of the diamond framework inspired a wide range of research in several industrial countries as well as in many multi-sector investigations.

Although the Porter's diamond framework is widely accepted worldwide, explaining and providing answers relating to competitive advantage, it has been subjected to exhaustive critique. According to many scholars, Porter has never offered a clear or consistent definition of competitive advantage. Klein (2001:2), for example, notes that "in all of Porter's 536 pages 'competitive advantage' (1985), he never quite tell us. We learn that it can be created through cost leadership or differentiation, but he never manages to define it in any other way than as the quality that brings about success." Grant (1991) also argues that there is inconsistency in Porter's definition of competitive advantage as the analysis moves from the industry to the national level; competitive advantage is defined in terms of productivity at the national level compared with export and foreign investment at the industry level.

Tavoletti and Valde (2008) argued that the framework overlooks important aspects when applied to the Dutch flower sector. The authors claimed that the framework does not elucidate how the components combine to create conditions in which a firm can succeed internationally. Tavoletti and Valde (2008) note that in the case of the Dutch flower firms, social innovation is an integral part of its success, something Porter omits in explaining success in a nations' firm. They are of the opinion that Porter is biased towards technological innovation. But even with technological innovation, Kantrow (1983), Drucker (1985), Quinn (1985) and West and Bogumil (2001) have shown that innovation by itself does not necessarily guarantee competitive success. Krugman (1990) stresses that under protectionism, success in accelerating the adoption of new technology could be self-defeating, leaving workers worse off.

Porter (1990:86) argued that "home demand shapes the rate and character of improvement and innovation by a nation's firms; and that nations gain competitive advantage in industries of industry segments where the home demand gives local firms a clearer or earlier picture of buyers needs than foreign rivals can have." Cartwright and Nankivell (1992) reported that a study was conducted on the New Zealand export-dependent land-based industries to test the predictive ability of the Porter diamond framework. According to Cartwright and Nankivell (1992) the results were astonishing: the framework predicted the stronger international

competitiveness for poor performers for industries that are strongly competitive, which was the reverse of the actual situation. They concluded that the reason for the poor predictive ability of the diamond framework has resulted from its insistence that sources of competitive advantage must be home-based.

Similarly, Nair et al (2007) reported that the success of the Bangalore software industry was started off by serving North America markets and not the home market. The authors also noted other inconsistencies relevant to the related support structure and factor condition components of the Porter's framework. The authors argued that different sectors required different levels of support structures as the Bangalore software sector related and support structure was small at its early stage of development.

There were other concerns of inconsistencies in the applicability and predictability of the Porter's framework. Attention was drawn to areas related to cluster dynamics (eg Harrison and Glasmeier 1997; Bahlmann and Huysman 2008) and globalisation and free market relevant issues (Dunning 1993; Barragan 2005). While many scholars believed that the concept of cluster was complicated and Porter framework added to its complexity, others say the framework needed considerable adjustments to address global market issues.

Criticising the Porter's diamond framework in detail however, is not the focus of this study. The above-mentioned shortcomings are insignificant when compared to the diamond framework's achievements. Understanding the diamond offers opportunities to analyse and describe situations relating to a country's factors impacting on firms and industries. Against this background, the Porter's diamond framework has proven useful to investigate the competitive advantage in the JSI. A key issue relevant to this thesis is that the diamond is used as an analytical and organisational framework; its usefulness in this way, as an analytical construct, does not require prior acceptance of all of the insights which Porter claims from his specific use of the framework.

3.4.4 Investigating the Competitiveness of the JSI

To investigate the competitive advantage of the JSI it was important to collect relevant information and data relating to each of the diamond determinants and the two external factors (Appendix A.5). Given that a significant number of the required data were presented in Chapter 2, only the additional necessary and relevant information will be dealt with here. The framework is used to provide a structure rather than relying on empirical outcomes.

Porter identified that success in a nation's industry was determined by the four broad interacting variables which created the environment conducive for competition. Porter added that the four mutually reinforcing determinants were also influenced by government and chance events. A description of each determinant and the effect on the competitive advantage of the JSI is presented below.

The JSI Factor Conditions

Porter divided factor conditions into five broad categories, (1) Physical resources, (2) Human resources, (3) Infrastructure, (4) Knowledge resources and (5) Capital resources. A description as well as an analysis, of the factor conditions relating to the impact of the JSI competitiveness follows.

Physical Resources

In regards to physical resources, all of the required data on Jamaica's physical resources (except for land cost) were presented in Chapter 2. The cost of land for agricultural purposes will depend on location, accessibility to a water source, (mainly irrigation and/or river) and public utilities (power, telephone and road). Basically, land in close proximity to a township is more expensive, ranging between \$80,000 (near townships) and \$40,000 (rural areas) per hectare. Land suitable for agriculture can be expensive in Jamaica because of competition from housing developers and real estate companies.

Based on the physical environment, it could be argued that there are some advantages to producing sugarcane in Jamaica. Accordingly, the impact of physical environment on potential to compete effectively will be briefly examined.

Sugarcane thrives best in tropical areas and yields from a low of 35 – 40 tonnes per hectare (tc/ha) in some countries to a high of 110 tc/ha in Egypt (Alam and Khan 2001; SIRI 2001; Chatin et al 2004; Raja 2006) (Table 3.6).

Table 3.6: Some Sugar Producing Countries with Average Sugarcane Productivity (2000).

[copyright clearance to reproduce table not obtained]

Sources: Alam and Khan 2001; SIRI 2001; Chatin et al 2004 and Raja 2006

Assuming that correct management is in place, Jamaica's soils, temperature and rainfall do not create an advantage when compared with other sugar producing countries. Temperature, which is considered as being an important element in the ripening and maturity of the sugarcane plant, does not offer any additional edge over other sugar producing countries. The crop, when mature, will yield up to 14 tonnes of sugar per hectare (ts/ha). The ts/ha vary from country to country with Australia averaging 13.85 ts/ha compared to Jamaica's 5.5 (SIRI 2003; Raja 2006) (Table 3.7).

Table 3.7: Tons Sugar per Hectare (ts/ha) in Some Sugar Producing Countries

[copyright clearance to reproduce table not obtained]

Source: SIRI 2003 and Raja 2006

Similarly, the bulk of the soils on which the crop in Jamaica is established has potential to yield an average of 60 – 95 tc/ha (Rao 1985). This productivity does not give the JSI any special advantage when compared with soils of other sugar producing countries.

Also, the southern coastal plain where a large percentage of the sugarcane fields are established, is identified as a rain shadow area. The key message is that yields in Jamaica are low.

Overall, the JSI operates within physical limits that precluded Jamaica from attaining the economies of scale enjoyed by many other sugar industries worldwide.

Human Resources

The JSI employed over 38,000 persons inclusive of field and factory workers, farmers, administrative and technical personnel in 2004 (Table 3.8). Another 15,000 are employed indirectly.

Table 3.8: Employees of the JSI, 2004

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Source: SIA, 2006

The bulk of the JSI workforce is field workers accounting for just over 50 per cent. The field workers are dominated by cane cutters. These field workers are usually supervised by farm managers, supervisors and headmen. The education levels of these farm managers, supervisors and headmen are usually high school graduates and/or very experienced field personnel. On the sugar estate farms, farm managers are normally holders of agricultural diplomas.

The 6,000 factory workers are mostly casual labourers functioning with a primary or secondary high school education. There is a wider spread of technical factory staff than field workers. The factory technical personnel consist of chemists, electrical, mechanical and industrial engineers and technicians. The General or the Operation Managers of the sugar estates in Jamaica function with a Bachelor degree either in the agriculture, management or engineering disciplines.

The technical staff at the administration and marketing levels are mostly tertiary trained personnel, functioning with diplomas and Bachelor degrees. The research arm of the industry consists of mostly technical persons functioning with Bachelor and Master Degrees. Each department of the research institute is served by field officers who are mostly holders of diplomas in various disciplines. The director of the institute and the laboratory manager, since the late 1990s, have held PhDs.

In 2001, the cost of the JSI labour force accounted for nearly 25 per cent of total operational costs (SIRI 2002). Jamaica is a very high-cost raw sugar producer and has one of the world's lowest rates of raw sugar production per industry employee. Between 1999 and 2001 the industry produced about 5.5 tonnes of raw sugar per industry employee annually (Mitchell 2004) (Table 3.9).

Table 3.9: Raw Sugar Produced per Sugar Industry Employee 1999 – 2001

[copyright clearance to reproduce table not obtained]

Source: Mitchell 2004.

The cost of the sugar industry's labour force has presented one of the main limitations to competitiveness of the JSI. In addition, the findings of a report of the Task Force on the JSI (commissioned by the Government of Jamaica in 2001 to investigate the viability of the industry) show that production per man day in the JSI was 0.87 tonnes of sugar, compared with the international market which averages three tonnes of sugar per man day (Seaga 2006; Smith and Thomas 2002).

Capital Resources

The Government-owned Sugar Company of Jamaica which operates five of the seven sugar estates has reported liabilities averaging \$200 million in 2009 (Jamaica Gleaner 2009).

In addition, the industry is challenged with the reality of adjusting to conditions in which market preferences are being eroded. The Jamaican Government, planning for change under its restructuring and rationalisation strategy announced the closure of two state-owned factories by 2008. At the time of the fieldwork in 2009, one was already closed. It was estimated that the rationalisation strategy would cost approximately \$671 million over the 10 years, from 2006 to 2015 (PIOJ 2006) (Appendix A.6).

The sources of finance for the strategy include the Government of Jamaica together with private sector interests. In addition, funding will be available from the EU sugar reform accompanying measures estimated, at \$55 million. According to PIOJ (2006) the priority activities of the country strategy is to carry out work relating to upgrading and improving both factory facilities and field conditions.

The lack of available funds has been the most important factor limiting the viability of the JSI. The industry lacks funds to carry out basic maintenance work both to factory and field operations (McDonald 2004). The privately owned plants are more efficient in terms of performance in comparison with the state owned operations. Overall, the entire industry has been adversely affected by an insufficient flow of funds to carry out effective upgrading to achieve targets that could realise true international competitiveness.

Knowledge Resources

The JSI professionals are mainly sourced from 33 tertiary institutions island-wide. In Jamaica there are 21 agricultural research organisations (Roseboom et al 2001). SIRI, which is the research arm of the sugar industry, was established in 1973 replacing the Sugar Research Department set up in 1942. At the time of establishment, SIRI's main function was to research and develop methods of improving agriculture technology as it relates to cane production. Later, in 1975, a factory technology division was established to assist factories to improve their efficiency.

The industry, through SIRI, is kept informed of new developments through numerous workshops, magazines, newsletters, reports, circulars, advisory booklets, seminars and annual conferences. More specifically, cane growers are provided with SIRI's extension service.

The lack of economies of scale coupled with insufficient funding for research is a serious handicap for the JSI. The lack of economies of scale in the JSI makes the development of agriculture technology extremely expensive. Most of SIRI's recommendations to the industry are not adhered to, resulting largely from the lack of funds. But even some of the experiments and study procedures that SIRI requires cannot be afforded (Wilson 2006). This shows that the industry's potential to innovate and upgrade through research is limited. In short, the knowledge base and technology needed by the JSI presents limitations for international competitiveness.

Infrastructure

Jamaica has 21,552 km of main roads of which 15,937 are paved and 33 km of expressway (EIU 2003; CIA 2006, 2009). In the late 1980s, the state-owned Jamaican Railway Corporation ceased operation of its 339 km network. Since then, a leased portion is used by the bauxite industry for transportation (EIU 2003). Jamaicans are served by two international airports and five major transshipment ports (CIA 2009).

In 2006, there were over 342,000 telephone main lines in Jamaica. The liberalisation of the telecommunications market in 1999 has seen the increased use of cellular networks. In 2007, there were 1,292 Jamaicans with internet access (CIA 2009). There are three main daily newspapers as well as several regional, community, societal and cultural publications and newspapers. The Nation is served by two commercial television stations with 17 radio broadcast stations (EIU 2003; CIA 2009).

The overall infrastructure in Jamaica does not present any specific advantage that distinguishes the country from other developing nations worldwide. The road networks in some of the sugarcane areas are sometimes inaccessible especially following torrential rain. The government has made annual allocations to maintain cane access roads but the emphasis is usually placed on areas that are most in need, resulting in little or no attention provided to some areas.

The JSI Demand Conditions

Based on the diamond framework, the demand conditions determinant emphasises the important role of home demand which provides the platform for upgrading or creating competitive advantage. Porter argues that local demand is at the root of national advantage and the more demanding customers are in the domestic market, the greater the need for firms to constantly improve their competitiveness.

To apply the demand conditions determinant for investigating competitive advantage in the Jamaican sugar industry, it is important to describe and assess the demand for Jamaican sugar and its derivatives both at the local and international levels.

Between 2000 and 2007, Jamaica's annual raw and refined sugar consumption averaged 133,000 tonnes. Annual raw sugar consumption over the same period averaged 75,000 tonnes, while imported refined sugar averaged 65,000 tonnes (Smith and Thomas 2002; Salmon and Thomas 2005; Rothschild and Thomas 2006; Haley et al 2008).

Although Jamaica is an exporter of raw sugar there are cases where the country has imported raw sugar to satisfy local needs. The importation of raw sugar results from the commitment of the JSI to fulfil the share of the EU and the US market quotas.

Raw sugar is mainly consumed in Jamaican households, while the consumption of refined sugar is used mainly for manufacturing purposes in the soft drinks, beverage, confectionary and baking industries.

Salmon and Thomas (2005) reported that Jamaica's raw sugar demand was fulfilled by Guyana and Belize during the 2002/2003 marketing years. However, since 2003 Colombia has emerged as the leading supplier of refined sugar to Jamaica followed by Guatemala and the US. Jamaica, since the marketing year 2003/2004, has been importing refined sugar from almost seventeen countries (Salmon and Thomas 2005).

Average annual per capita consumption of sugar in Jamaica is considered stable, ranging between 20.5 kg and 22 kg compared to annual global consumption of 23.1 kg (Jolly 2004a; Salmon and Thomas 2005; ISO 2007).

The Jamaica Cane Product Sales is responsible for the relative stability of sugar prices which have contributed partly to current consumption levels (Table 3.10).

Table 3.10: Jamaica Domestic Sugar Prices 2002-2005 (US\$/Tonne)

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Sources: Rothschild and Thomas 2006; Sugar Industry Authority 2006; SIRI 2003.

Based on Rothschild and Thomas' (2006) findings, alternative sweeteners are available in the Jamaican market, but have not penetrated the retail sector. Nevertheless, the demand for alternative sweeteners in diabetic and dietary slimming products is increasing significantly.

For added value products, both the Jamaican manufacturing sector and the retail market depend on the JSI for supplies of value-added products, mainly rum, molasses, and bagasse. The production of alcoholic beverages by the manufacturing sector demands the use of rum, which is sourced from the country's five rum distilleries. Rum production from these distilleries, based on available molasses, was sufficient to supply the manufacturing sector and the retail market with 10-12 million litres between years 2000 and 2005. It is customary for these distilleries to import extra molasses so as to fulfil their rum export quotas (PIOJ 2006).

The animal feed manufacturing sector, the pharmaceutical, the baking industries and the end consumer markets are important consumers of molasses. There are cases where the larger animal feed manufacturers need to import molasses to fill gaps of local shortages.

The development of an ethanol fuel sector is one of the major areas to be undertaken by the JSI restructuring plan. There are currently two dehydration plants with a capacity of 440 million litres (110 million gallons) of hydrated ethanol (PIOJ 2006). Based on the PIOJ (2006) report, it will require approximately 70 million litres of ethanol to meet Jamaica's needs. Ethanol is used as a substitute or replacement for methyl tertiary-butyl ether in gasoline. This is added to gasoline to increase the octane rating.

Brazil is the supplier to the two ethanol plants in Jamaica which export their output to the USA. The Government of Jamaica owned Petroleum Company is in partnership with a Brazilian firm to provide feedstock for ethanol production largely for export to the USA

(Biopact 2007). In 2007, Jamaica exported some 80 million gallon of fuel ethanol to the US (Haley et al 2008).

Renewable energy from cane waste and bagasse is used to generate electric energy in the JSI. These materials are used to provide approximately 30 megawatts of electric energy annually which is absorbed within the JSI. Under the government of Jamaica energy policy, the use of bagasse and other waste from the sugar industry will be incorporated into a programme for the development of co-generation facilities. The generation of electric energy from the JSI co-generation units will be coordinated with the electric companies to provide energy for the consumer market (PIOJ 2006).

The ornamental horticultural (potting mixture), poultry (bedding) and the beef feedlot (ration mix) industries also require a significant quantity of the bagasse produced by the JSI.

Vinegar from sugarcane is also the most popular and widely used of all the sourced local vinegars. It is extensively used in local food preparation, and as a preservative for spices and condiments.

In Jamaica, the retail market and the manufacturing sector place less emphasis on the use of other value added products from the sugar industry. The pharmaceutical and food processing industries have been requesting a very small quantity of citric acid and dietary fibre, while the demand for panel board by the construction industry is fulfilled by less expensive imported materials. The local demand for other by-products of the JSI such as charcoal briquette, acetone and butane is commercially insignificant.

The SIRI collaborates with the Scientific Research Council and the University of the West Indies and has been conducting research on various sugar cane derivatives. These derivatives, which can be divided to a wide range of products with commercial potential, include cosmeceuticals, nutraceuticals, xanthum gum and propylene glycol (PIOJ 2006).

In regard to international demand of the JSI, the country is a supplier to two of the most important preferential sugar markets. The bulk of Jamaican raw sugar exports are sent to the EU preferential market under the EU/ACP sugar protocol. The remaining quantity of export allocation is used to fulfil the US quota under the USTRQ. The preferential market agreements are centred on duty free access.

Under the EU/ACP sugar protocol, Jamaica has been supplying the EU preferential market with an annual quota allocation of 127,000 tons of raw sugar. In addition to the EU/ACP sugar protocol, Jamaica is a supplier to the Special Preferential Sugar (SPS) agreement

operated by the EU sugar import regime. The SPS agreement negotiates for Jamaica to assist in supplying raw sugar to fulfill the refining capacity of four EU member states. The Jamaica SPS quota fluctuates annually depending on the specific needs (see Appendix 5 for more on preferential arrangements).

Raw sugar exports from Jamaica to the USA are small relative to the EU (PIOJ 2008) (Table 3.11).

Table 3.11: Jamaican Raw Sugar Exports 2003-2007 (Tonnes)

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Sources: PIOJ 2008

The prices received by Jamaica for raw sugar vary with the respective markets. The prices received from the EU are normally higher than that of the US (PIOJ 2008) (Table 3.12).

Table 3.12: Prices of Raw Sugar in Respective Markets 2003-2007 (\$/tonne)

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Source: PIOJ 2008 and CSB 2009

Jolly (2004c) believes the small volume traded on the open market compared to total world consumption, together with the production cycle of sugarcane and Government policies are the main factors contributing to the fluctuation of the world sugar prices.

The JSI is an important exporter of rum to Europe and North America. The industry produces approximately 24 million litres of rum annually of which 10–12 million tonnes are exported (PIOJ 2006).

The inability of the industry to satisfy their export preferential market quotas on several occasions is a clear indication that the industry's production activities need significant improvement to compete in international sugar trade.

The JSI Related and Supporting Industries

Sugar production is divided into two parts. The first is the field or agricultural section which cultivates and provides sugarcane and the second is the factory section which processes the sugarcane into sugar.

Since the production of sugar is an agro-processing entity, it depends on agricultural as well as industrial supplies of materials, information and technology. The sugar industry also shares technology, inputs, customers and distribution channels within the agricultural and industrial sectors.

In terms of suppliers to the JSI, many organisations and companies provide inputs ranging from machinery, equipment parts, tools, chemicals and reagents, fertilisers, herbicides, pesticides, together with technical knowledge, information and expertise for advisory of use and implementation. In the case of related industries, the JSI is connected to and shares information, technology, distribution channels, inputs and customers with several organisations.

Historically, the JSI depends on overseas inputs and services due to the inability of Jamaica to provide all the needs of the industry. The commencement of the JSI has helped Jamaicans to be exposed to industrial development through construction and maintenance to factories, which were centred on overseas technologies and advisories.

Tate and Lyle is one of the prominent multinational organisations operating in the JSI. This organisation provides information and inputs to cane production, sugar processing, sugar transfer, sugar shipment, molasses distribution and fabrication of sugar, as well as provision of consultancy services.

The larger local suppliers to the JSI include the Jamaica Public Service, the main supplier of power and electricity; Petrojam Ltd, the supplier of fuel energy; the National Irrigation Commission, facilitating irrigation; the National Housing Trust, assisting in providing for the housing needs of the industry; and the commercial banks. In addition, the government public services such as credit, communication and transportation, together with education and health facilities, are important service providers to the sugar industry.

The JSI related industries range from Government entities to private interests. The sugar industry shares technical, marketing and research information with the Jamaican Government's various commodity boards (cocoa, coconut, banana, citrus, and coffee). These commodity boards collaborate with the government research institutions such as the Scientific Research Council, the Caribbean Agriculture Research Institute and the University Research Unit.

These institutions and commodity boards create facilities for testing particular inputs that are common in use in the various industries, for example fertilisers, pesticides, herbicides and

chemical reagents. Both private and government marketing agencies also share information with the JSI in various aspects such as packaging and branding of the various by-products manufactured by the industry.

In short, since the mid 1990s, the decline in production has been impacting on JSI related/supporting industries, which has presented some limitations to the competitiveness of the industry.

The JSI Strategy, Structure and Rivalry

Based on the diamond framework, the determinant strategy, structure and rivalry relate to how companies are created, structured and managed, as well as the nature of local competition.

As discussed in Chapter 2, the JSI was built for the purpose of supplying the British Empire with raw sugar. Since then, the JSI has been producing raw sugar for export to Europe. On average, particularly before the late 1990s, Jamaica exported more than 70 per cent of its annual production under preferential market agreements (SIRI 2002).

In terms of management, both the private interests and the Government owned sugar estates management structures are similar. With the exception of the board of directors, the companies' management frameworks resemble each other in their hierarchical designs. At each estate an operations manager is put in charge of the particular company. Since sugar production operation is divided into two parts, the agricultural and the factory section, a manager is placed at each section at the respective estates. An administrative manager is also placed at each estate to manage the administration and matters concerning industrial relations. All reporting follows the vertical management structure.

Rivalry among the estates can be analysed from an agricultural as well as factory perspective. At the factory or processing level, rivalry is expressed in terms of factory efficiency. The efficient performance of a sugar factory in Jamaica is the ability of the plant to extract 92 per cent and over (Factory Recovery Index [FRI]) of a given volume of sugarcane delivered. The efficiency of a factory will depend mainly on the type of equipment and technology available. The privately owned sugar factories (Appleton and Worthy Park) are the most efficient factories in the country (Table 3.13) (SIRI 2005, 2007).

Table 3.13: Comparison of the Jamaican Sugar Factory Efficiency (FRI) 2003-2006

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Source: SIRI 2005, 2007

The rivalry that exists at the farm level lies in the quality of cane delivered for processing. Cane payment in Jamaica is based on the level of sucrose in cane (cane quality) which is expressed as the Jamaica Recovery Cane Sugar (JRCS). Prior to delivery, the load of cane is tested at a laboratory (core) to predict the level of sucrose, which is put into a formula to calculate grower payments.

Sugarcane price varies in the different areas depending on the level of sucrose present in the cane and the average JRCS for that particular factory area. Payment is higher for farmers in areas that exhibit high JRCS averages. The Worthy Park sugar cane farmers have been receiving the highest sugarcane quality (JRCS) averages in Jamaica (Table 3.14) (SIRI 2005).

Table 3.14: Comparison of Cane Quality in Jamaica (JRCS) 2003-2006

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Source: SIRI 2005, 2007

The costs of producing raw sugar in Jamaica are among the highest worldwide. The relatively high costs have been associated with all areas of production. According to Seaga (2006), based on the report of the Task Force (mentioned under the JSI factor conditions), the cost of producing sugar in Jamaica is nearly twice as much as the average ACP producers. In 2001, for example, it costs Jamaica \$660 to produce one tonne of sugar relative to the ACP average cost of \$375 per tonne (Seaga 2006). Further comparison shows that low cost raw sugar

producers⁶ worldwide averaged \$176 per tonne while the six major producers⁷ averaged nearly \$210 per tonne in 2001 (USDA 2004).

In essence, the strategy, structure and rivalry that exist in the JSI are likely to fall within a range that indicates an absence of international competitiveness. The type of production management strategies, together with the industry structure and level of competition, appears to be compatible with the way the industry was created. The industry was created in colonial times and has not gone through any period of self-innovation; instead it adapts to technologies that are copied and brought to common use. This is evident with most other ACP countries which rely on preferential market prices encouraging players to function in a position of complacency.

Government's Role in the JSI

The Jamaican Government traditionally has been a major player in the sugar industry and in 2008 owned more than 75 per cent of the existing domestic sugar industry assets. This includes the five Government owned sugar factories and associated sugarcane land.

Several steps were taken by the Government to continue its support to the sugar industry taking into account the WTO commitments. The government, through the Ministry of Agriculture, has implemented services through research and extension, development of technology, human resources as well as marketing (Campbell 2005).

However, despite the financial support by the Government, the sugar industry continues to perform below viable targets. For example, funding through the Government credit facilities sourced from the Caribbean Development Bank was allocated to the industry in 2003 to support the replanting programme totalling \$6.7 million (James 2006). According to James (2006), the replanting programme was not successful mainly because of drought conditions. Since 2004, the Jamaican government has been advertising its sugar factories and estates for sale under its agricultural policy divestment programme.

The Role of Chance in the JSI

According to the diamond framework, the possibility of the JSI meeting the economic viability targets as set in the strategic plan of the industry is through the occurrence of a chance event. For the industry to restore viability it needs to consistently produce around

⁶ Low cost raw sugar producers in 2001: Australia, Brazil, Guatemala, Malawi, Zambia and Zimbabwe (USDA 2004).

⁷ Major raw sugar producers in 2001: Australia, Brazil, Colombia, Cuba, South Africa and Thailand (USDA 2004).

220,000 tonnes of raw sugar annually (PIOJ 2006), at a cost equivalent to the average of the large producers – that is, around \$210 per tonne.

To reach this target means that the industry must increase field productivity from an average of 5.2 ts/ha to 8.5 ts/ha, and the Factory Recovery Index (FRI) must increase from an average of 88 to 95 per cent (PIOJ 2006; SIRI 2007). In reality, these targets are possible but require occurrences such as inventions relating to factory and field efficiencies, a reconsideration of the European Commission's decision to reform its sugar regime, significant change in the currency market and/or bilateral trade arrangements.

An invention relating to field or factory operation in the JSI is one possible means of strengthening the strategies of the restructuring plan. But is this likely? An invention in the industry could allow for increased efficiency, but not necessarily guaranteed success. If there should be an invention it must be accompanied by a significant impact on cost reduction.

The probability of the European Commission to reversing its decision on the 36 per cent price reduction is very slim. In the event where regional trade is negotiated between Central American sugar producers, the low cost producers such as Mexico and Guatemala will dominate over the Caribbean market. If these efficient, low cost sugar producing Central American countries are competing with Jamaica on such a market, most likely the pricing and share of quota negotiated will not allow Jamaica to operate competitively. In addition, although there are negotiations for foreign direct investment there is no guarantee that the venture will be successful and/or sustainable.

Furthermore, Schmitz et al (2002) and Gudoshnikov et al (2005) claimed that Brazil, the world's leading producer and exporter of sugar, has the potential to provide for any shortfall in world production. This claim is supported by Haley et al (2008) who argued that half of the country's sugarcane production has been going into ethanol production annually since the mid 1990s. Therefore, what this means, is that Brazil's energy sector will impact on the volume of sugar available for world trade.

Summary of the Competitiveness of the JSI

Based on the above investigation, while it appears as if the preferential market is the only identifiable competitive advantage that the JSI currently possesses, it is gradually eroding. The investigation shows that there are several sources of competitive disadvantage in the JSI (Appendix A.7). The lack of capital resource is identified as one of the most important sources of competitive disadvantage in this industry. The lack of capital has prevented the

industry from investing in key areas and has triggered several limitations such as field and factory inefficiencies. These inefficiencies make it extremely difficult or perhaps untenable for the JSI to compete at the global level.

3.5 Conclusion

The study commenced with the observation that small sugarcane operations in Jamaica were on the verge of collapse. The background of the study presented in Chapter 2 as well as the world sugar market and the competitive strength of the JSI in this chapter has demonstrated the nature of the external environment in which these families operate.

In addition to the sluggish economic performance and high level of crime, the families are also faced with a complex sugar market situation. The WTO negotiations are designed to promote fair trading practices in the world commodity markets. These negotiations are accompanied by a number of conditions that require policy reforms such as trade deregulations and liberalisations. With these objectives in mind, the preferential access offered to sugar exporters such as Jamaica would be eroded under these WTO rules.

To appreciate fully an understanding of the families being investigated, it is useful at this point to outline the theoretical and conceptual framework used to guide the study. It should be mentioned that while investigating the competitiveness of the JSI, theories pertinent to the Porter diamond framework, were taken into account. The Porter's theories of competitive advantage were found useful and have offered support to the sustainable livelihoods approach (SLA) - the theoretical framework selected for this study. In the next chapter an overview of the SLA is presented.

Chapter 4

The Sustainable Livelihoods Approach

When William Jansen was interviewing poor people in rural Bangladesh, one asked him: Gentleman, whatever are you writing so much about the poor people? God, himself, does not love the poor people: so what help will your writing do?

-----Robert Chambers (1983: ix): *Rural Development. Putting the Last First.*

4.1 Introduction

This chapter presents a brief overview of the sustainable livelihoods approach (SLA). The growing popularity of the concept of the SLA since the late 1990s reflects an increasing recognition of how organisations and governments promote development by reducing poverty. The basic idea of the SLA is to provide a different way of development thinking and to promote livelihoods in developing and low-income territories to enhance progress in poverty elimination (Ashley and Carney 1999; Ellis and Biggs 2001).

The concept of SLA in its simplest form is a combination of equity, capabilities and sustainability (Chambers and Conway 1992). The primary aim of SLA is to assist poor people to achieve long-term improvements against an indicator of poverty (Ashley and Carney 1999). It was estimated in 2000 that approximately 1.2 billion people globally were living below the poverty line (less than \$1 per day) of which 75 per cent live in rural areas (Haug 1999; Ashley and Maxwell 2001). How to assist the impoverished develop an acceptable standard of living is of vital importance to the SLA thinking.

The concept of SL is interpreted in a variety of ways (Ashley and Carney 1999; Hussein 2002). However, the idea of accepting and understanding the resource constraints of the poor, together with the risks they face and the established setting that either allows or hinders them to make progress, is the core of the SL thinking (Ellis 2002). The idea of understanding and making efforts to reduce poverty is therefore central to the SLA.

This chapter presents a summary of the development discourse and how it relates to SLA, followed by an overview of the SLA and its underlying principles. A description of the Department For International Development (DFID 1999) conceptual SL framework and a comparison of the four most quoted SL frameworks, as well as a critique of the SLA, are presented.

4.2 Development of the SLA

The concept of sustainable livelihoods is multidisciplinary and strongly rooted in the international development literature. According to Scoon (1998), the SLA, which involves a shift in paradigm, is increasingly important in the development debate. The changing views on poor people's lives, the significance of food security, together with institutional and policy issues, are entrenched in the concept of SLA (Chambers and Conway 1992; Ashley and Carney 1999).

However, to have a full understanding of exactly where the concept of sustainable livelihoods originated from requires some knowledge of development theories, practices and policies, together with the action and activities relating to poor people and their surroundings. How to assist the poor achieve a livelihood is not new thinking; what is new is the idea of SLA for analysing development projects and programmes (Haug 1999; Ellis 2002). Ultimately, the effort to reduce poverty is the primary goal and focus of SLA thinking (DFID 1999).

A follow-up of the international development discourses since the 1950s shows that there is a sequence of themes and ideas that have led to the SLA way of thinking. Particularly, contributions from McNamara (redistribution with growth), Chambers (powerlessness, vulnerability and strategies) and Sen (entitlement and gender) play very important roles in the framing of the SLA concept (Haug 1999; Ellis and Biggs 2001). The assessment of rural poverty and development also creates an opportunity for authors, professionals, researchers and development organisations to explore and build on findings relevant to poverty reduction. The SLA captured in one form or another, a sequence of themes, theories and policy thrusts that have been impacting on rural development ideas since the 1950s (Ellis and Biggs 2001) (Table 4.1).

Table 4.1: Rural Development Ideas since the 1950s

[copyright clearance to reproduce table not obtained]

Source: Ellis and Biggs 2001

According to Haug (1999), the SLA is closely related to the Integrated Rural Development Programme implemented in the early 1970s. The SLA shares a mix of complex and integrated sectoral and disciplinary measures with the Integrated Rural Development Programme which failed in practice and re-surfaced in the late 1990s in a sustainable livelihoods form (Haug 1999; Ellis and Biggs 2001). Chambers (1987) believes that the shift to SLA from the Integrated Rural Development Programme incorporates the best of environmental, development and livelihood thinking. Chambers and Conway (1992) add that the SLA has been developed on the grounds that there was disappointment in the thinking about production, employment and poverty resulting in hunger, malnutrition and famine.

4.2.1 Pioneers of the SLA

The idea of sustainable livelihoods was first published by the World Commission on Environment and Development (WCED) report, *Our Common Future*, in 1987 (The Brundtland Commission Report) (Meikle et al 2001; Solesbury 2003). The Brundtland Commission report consisted of two main concerns: the idea of needs of the world poor and the concern about limitations on the environment's ability to satisfy present and future needs. The Brundtland report triggered the first policy debate on the concept of SLA (Solesbury 2003). Later, in 1988, Conroy and Litvinoff edited the paper *The Greening of Aid: Sustainable Livelihoods in Practice*, published by the International Institution for Education Development (Solesbury 2003).

The United Nation Development Programme (UNDP) then published the first Human Development Report in 1990 and by 1992 the Institute of Development Studies published *Sustainable Rural Livelihoods: Practical Concepts for the 21st century*, authored by Chambers and Conway (Solesbury 2003).

Following these first users of the term sustainable livelihoods, a stream of development organisations began to explore and adopt the concept of the SLA (Ellis 2002) (Appendix A.8).

The SLA theme, which surrounds social protection, vulnerability and livelihoods, goes beyond rural development to include urban areas. Although the SLA concept emphasises rural livelihoods, initially, the distinction between rural and urban livelihoods was equally important in the SLA thinking (Short 1999). In fact, the ratio of urban to rural poverty is increasing and it was been projected by the IFAD that by 2015 40 per cent of the poor will be urban, compared with 35 per cent in the 1990s (Ashley and Maxwell 2001).

4.2.2 Definition of Sustainable Livelihoods

Reviewing the discourse of development policies and activities, as well as the measures used to determine poverty, suggests that there is no one definition of SL that is universally accepted. There are several approaches used to measure poverty of which (from a social scientist perspective) economic well-being, capability and social exclusion are the most frequently adopted (Wratten 1995; Wagle 2002). Attempts to integrate and broaden these three measures in a sustainable livelihood context will expand development policies and help provide better understanding and thinking about strategies to reduce poverty (Kanbur and Squire 1999).

The term sustainable livelihood can be defined in many ways. However, according to the DFID (1999:1.1), most of the ardent supporters of the SLA have adopted the definition put forward by Chambers and Conway (1992): “A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base.”

4.3 The SLA

The SLA is a way of development thinking about how to reduce the number of people living in poverty worldwide. The WCED and the UN Conference on Environment and Development in 1987 and 1992, respectively, have combined their efforts in connecting the socioeconomic and environmental issues of people’s livelihoods within a framework for sustainable development (Brocklesby and Fisher 2003).

The SLA focuses on institutions and organisations, including participation, empowerment and policies that link the understanding of poverty at the micro, meso and macro levels (Haug 1999; Carney 2002). Basically, the SLA takes wide view of project priorities, objectives and scope that provides a logical framework and design for analysis (Carney 2002). In essence, the idea of SLA, as a conceptual and analytical framework, seeks to capture the dynamics of poverty and well being by supporting the basic levels of good development practices (Gilling et al 2001).

The development thinking that has grown and strengthened into an approach in the late 1990s owes much to the Department For International Development (DFID), the United Nation Development Program (UNDP), Oxfam and the Co-operative for Assistance Everywhere (CARE) as its main supporters (Carney 2002; Brocklesby and Fisher 2003).

The wide range of interpretation of the SLA allows it to be very flexible and non-prescriptive in nature. It is interpreted as an objective, a set of principles and as an approach (Ashley and Carney 1999). The SLA has been adopted by several development organisations and professionals as part of their policy to guide intervention strategies and to inform their analysis and programmes (Hussein 2002; Carney 2002). Although the SLA is flexible, its relevance is based on a set of six core principles supported by a range of techniques (Ashley and Carney 1999). Objectively, these principles should provide an understanding of the key areas of the SLA.

4.3.1 The SLA Principles

According to Ashley and Carney (1999), DFID (1999) and Carney (2002), the SLA development thinking should be:

- *People centered*
- *Responsive and participatory*
- *Multi-level*
- *Conducted in partnership*
- *Sustainable*
- *Dynamic.*

According to Ellis (2002), the more sustainable livelihood interpretations have diverged from these principles, the less effective they are achieving the objective of reducing poverty (Box 1).

Box 1: SL Principles.

[copyright clearance to reproduce table not obtained]

Source: Ashley and Carney, 1999.

Based on DFID (1999) experience working with the SLA, the six principles can be fitted to any development activity; they provide an understanding of the interactions between external support and people's livelihood strategies and needs. According to Ashley and Carney (1999:7) an understanding of the principles includes:

- the priorities that people identify
- the strategies they adopt in pursuit of their priorities
- the institutions, policies and organisations that determine their access to assets/opportunities

- their access to social, human, physical, financial and natural capital, and their ability to put these to productive use, and
- the context in which they live, including external trends, shocks and seasonality.

As mentioned above, the principles are supported by several techniques including the sustainable livelihood framework. The sustainable livelihood framework is widely used and is the most quoted of all techniques. In the following section the sustainable livelihood framework is presented.

4.3.2 The Sustainable Livelihood Framework

The sustainable livelihood framework is only one of many analytical tools used for implementation of the SLA (Carney 2002). Other methods used for the implementation of the SLA include elements of poverty, institutional, stakeholders' and social analysis (Ashley and Carney 1999). The sustainable livelihood framework is a tool for analysis that seeks to improve the understanding of livelihood in general and the lives of poor people in particular.

Since the SLA is people-centered, the framework will not work in a straightforward way, but will assist stakeholders with views to participate in relevant dialogue concerning factors influencing people's lives (DFID 1999). While the sustainable livelihood framework particularly emphasises the multiple interactions between the main factors affecting livelihoods, drawing attention to the influences and processes, it also provides checklist for the design of monitoring systems (Ashley and Carney 1999; DFID 1999). However, Ashley and Carney (1999) observe that to monitor and evaluate systems, participatory approaches are essential because measuring change in livelihoods has proven to be very difficult.

Ashley and Carney (1999) and DFID (1999) contend that although the use of the framework as an adjustable tool in planning and management is versatile, without the principles it will not effectively provide development activity. From experience, the authors note that the framework cannot, and does not, try to capture all that is considered important in poverty elimination. To get the most from the framework, however, according to DFID (1999:18):

“The core ideas that underlie it should not be compromised during the process of adaptation. One of these core ideas is that (most) analysis should be conducted in a participatory manner.

- Use of the framework should be underpinned by a serious commitment to poverty elimination, developing dialogue with partners to address the underlying political and economic factors that perpetuate poverty.

- Those using the framework must have the ability to recognise deprivation in the field even when elites and others may want to disguise this and skew benefits towards themselves (this will require skill and rigour in social analysis)”.

There are several sustainable livelihood frameworks currently in use. The adoption of the SLA in development projects plans and programmes since the late 1990s has seen a variety of sustainable livelihood frameworks evolve and develop. However, the asset vulnerability framework is the most cited.

The asset vulnerability framework was developed (and continues to be developed) by the Sustainable Rural Livelihood Advisory committee of DFID in collaboration with the Institute of Development Studies (among others) and its use was reaffirmed by the DFID following the DFID annual Natural Resources Advisers’ Conference in 1998 (DFID 1999; Ashley and Carney 1999).

Below is a schematic representation of the DFID conceptual sustainable livelihood framework illustrating the interrelationship between the components governing livelihoods (Fig 4.1).

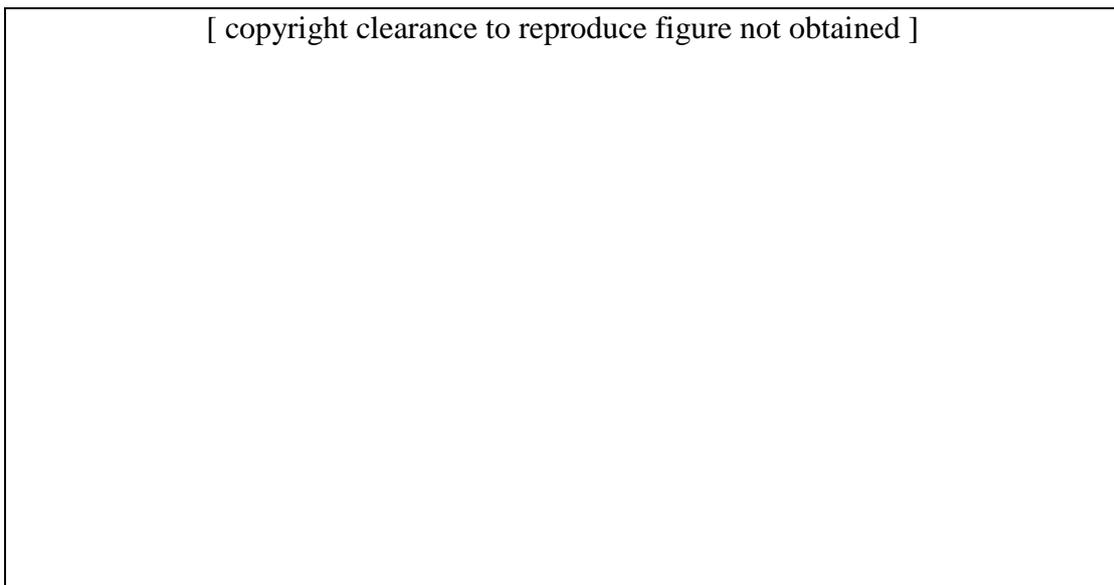


Figure 4.1: DFID Sustainable Livelihood Framework

Source: DFID 1999

The Vulnerability Context

The vulnerability context refers to the environment in which people live. People in an environment are susceptible to shocks, trends and seasonality over which they have no control (DFID 1999) (Table 4.2).

Table 4.2: The Vulnerability Context

[copyright clearance to reproduce table not obtained]

Source: DFID 1999

Shocks, trends and seasonality can shape livelihoods by affecting people's ability to achieve outcomes from strategies (Ellis and Freeman 2005a). According to DFID, trends are not always negative; however, in the sustainable livelihood vulnerability context such influences are responsible for difficulties poor people are confronted with most often. Also, influence from the vulnerability context will affect different people in various ways; for example, natural shocks can impact more on farming activities than on employment in urban areas (DFID 1999).

Assets

Basically, in the livelihood framework assets, resources and capital are interchangeable terms. As stated by DFID, to achieve positive livelihood outcomes, people require a wide range of assets. This belief forms the basis upon which the SLA is initiated. DFID adds that no one specific type of asset can sufficiently provide all the needs that people try to fulfill.

The framework categorised five distinct types of capital needed by people to have a favourable lifestyle. In the DFID framework these capitals are normally presented in an asset pentagon (Fig 4.2).

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Figure 4.2: The Asset Pentagon

Source: DFID 1999

According to DFID, human capital includes knowledge, skills and health status, financial capital refers to money and available stocks, physical capital is defined as infrastructure and

tools; natural capital describes arable land, air quality, forest and water availability; while social capital is family and community connections.

The DFID argues that these five capitals are thought of as the units (building blocks) of people's livelihood. The pentagon was developed within the core of the DFID framework to highlight the interactions between the five assets, specifically showing the differences that may occur in people's access to assets. According to the DFID, the basic understanding of the pentagon is that assets are inaccessible at the centre, while accessibility to assets will be maximised at the outer perimeter. The DFID notes that the shape of pentagons are constantly changing due to instability in access to assets and maintains that a time factor should be included in any asset analysis.

The DFID identifies that sequence and substitution of assets are an important relationship to enhance favourable livelihood outcomes; the relationship between assets can indicate where people's support should be focused which is critical in the SLA.

The DFID (1999: 2.3.1) makes the commitment to "promoting better education, health and opportunities for poor people through various means; these range from providing direct support to education and health to helping to provide safe drinking water and emergency assistance in time of crisis". The DFID, in an attempt to fulfill its commitment in the statement of purpose, has laid down a set of objectives, which are largely centred on the five categories of asset (Table 4.3).

Table 4.3: DFID Sustainable Livelihood Objectives (1999)

[copyright clearance to reproduce table not obtained]

Source: DFID 1999

Notably, it was the intention of the DFID (1999:2.4) through the structures and processes component to get hold of the sixth objective: "a policy and institutional environment that supports multiple livelihood strategies and promote equitable access to competitive market for all."

The DFID states that overall financial capital is the most flexible of the asset components, since it can be transformed easily into other capitals, to fulfill direct positive livelihood outcomes, and can change limitations into opportunities. Nonetheless, the DFID recognises that financial capital is the least available to the poor.

In summary, the management and handling of assets by the poor, whether sufficient or inadequate, to achieve a positive livelihood outcome, will depend on the other framework components, particularly transforming structures and processes.

Transforming Structures and Processes

Within the DFID framework, structures and processes are taken to be institutions, organisations, policies and legislation that influence people's lives. The DFID recognises that access to capital, the terms of exchange between capital and returns to livelihood strategies are adversely affected by structures and processes. In other words, changes in structures and processes have a considerable impact on how people can convert their available resources. However, how people can capitalise on assets through structures and processes are usually beyond their control (Ellis and Freeman 2005a). Additionally, issues of culture, well-being and how things are done are dealt with through the structures and processes component of the DFID sustainable livelihood framework.

The DFID emphasises the importance of understanding the way in which assets are shared at the individual and community level. For example, the DFID realises that the value of assets such as land and shelter will be affected by organisations, policies, laws, technologies, governance and, even more so, cultural beliefs and issues. Notably, the DFID accepts that analysing the changes in structures and processes at the multiple levels are not well developed in the framework. Nonetheless, the DFID investigates the overall interactions between changing structures and processes at the community and individual levels as a starting point of the analyses.

Furthermore, the DFID framework offers an insight into the effective changes of key policies and organisations in people's lives. Feedback on the vulnerability context, choice of livelihood strategies and impact on livelihood outcomes, are considered by the DFID as important aspects of the structures and processes component within the sustainable livelihood framework.

Specifically, the DFID observes that changing structures and processes is one of the most common problems in development because it does not work to benefit poor people. Identifying that the provision of structures without processes is ineffective, the DFID (1999: 2.3), in an attempt to solve the problem has encouraged:

- Building structures that represent the poor.
- Promoting reform with structures that make policy and provide services to the poor.

- Providing support to the establishment or expansion of the scope of private sector organisations.
- Supporting joint forums for decision making and action.

Since processes are so critical and play vital roles in changing poor people's livelihoods, the DFID prioritises the participation of governments in reforming policies, plans and programmes to provide better opportunities for the poor. Also, from a donor perspective, the DFID makes processes a particular focus for donor considerations. Although addressing problems in processes, mainly through means of sector programmes and activities, is not fully developed within the framework the DFID offers support to the expansion of structures and to reducing market development costs, such as regulations for trading.

Finally, when considering structures and processes, the DFID accepts that substantial work is needed to develop practical methodologies for analysing policies impacting on the poor.

Livelihood Strategies

Livelihood strategies are defined by the DFID (1999:2.5) to be "a combination of activities and choices that people make and undertake in order to achieve their livelihood goals." Based on the DFID beliefs, there are striking differences in the traditional development livelihood strategies compared with the SLA thinking. The DFID states that the SLA thinking on livelihood strategies is a systematic process which seeks to control the existing livelihood influences by strengthening the opportunities and monitoring limitations.

The spread of choice and value, as observed by the DFID, is essential in strategy formulation because it provides the poor with opportunities to be flexible over time and particularly to possess the ability to tolerate and survive the shocks and stresses of the vulnerability context. The DFID adds that there is a possibility that choice and value can be achieved by working to improve the poor's access to assets and to encourage the type of structures and processes that can change into positive outcomes.

Although the different livelihood activities require different strategies, the DFID realises that the poor who possess enough assets are likely to make positive livelihood choices, especially if they support movement in labour markets and reduce costs related to new ventures.

Variations in livelihood strategies are of primary importance in the DFID framework. The DFID focuses attention on livelihood strategies between various groups so as to direct support to the most suitable areas. Also, the DFID considers competition among the poor as an

important aspect of livelihood strategies, recognising that there is no solution to problems when people are competing, particularly for jobs and markets. Nonetheless, the DFID insists that expanding choice and opportunities can reduce the problems existing in competitive settings.

In sum, the DFID maintains that the positive outcomes the poor seek are strongly linked and directly associated with strategies.

Livelihood Outcomes

In the simplest form, the DFID looks at livelihood outcomes as the results of livelihood strategies. The livelihood outcome component of the framework as suggested by the DFID is a hybrid, integrating the aims of the DFID and users, focusing on accomplishments, indicator development and advancement in poverty reduction.

In order to make the framework succeed, the DFID uses five categories of livelihood outcomes that can only be established through participatory enquiry. These outcomes include increased income, increased well-being, reduced vulnerability, improved food security and sustainable use of the natural resource base.

While it is difficult to measure the difference between well-being and increased income in the framework, the DFID points out that it is important for people to decide each day what strategies suit their situation the best. The DFID explains that livelihood programmes should be based on the achievement of livelihood outcomes, hence, supporting the poor to meet their objectives, which can be realised by consulting groups at the processes level.

The livelihood outcomes component of the framework is particularly difficult and poses a challenge to nearly all development activities; however, the DFID advises that situations should be carefully examined, and how these situations can be dealt with over time to enhance livelihoods, is a priority to strengthen the flexibility of the overall structure of the framework.

4.4 Comparing Sustainable Livelihoods Frameworks

Given that an outline of the generic framework is presented, it would be interesting to look at the different frameworks used by some of the more prominent development organisations. Since Oxfam, CARE, the DFID and UNDP are well known development agencies; how the agencies have been adapted using the sustainable livelihood framework is presented below.

While it is important to note that Oxfam, CARE, the DFID and the UNDP have based their work on the SLA core ideas, likewise, their frameworks have also shown some similarities.

Together, representatives from these development agencies have been focusing on assets, prioritising linkages at all levels (micro, meso and macro) and emphasising flexibility of application (Carney et al 1999; Ellis 2002; Hussein 2002). A common feature shared among these agencies is the fact that their approaches are continuously developing (Carney et al 1999; Ashley and Carney 1999; Carney 2002; Short 2002). Adding to the list of similarities, Carney et al (1999) observe that most of these agencies adapting to the use of the SLA are consistent with the work of Chambers and Conway.

Although the conceptual SLA idea is commonly shared among the four agencies, differences in focus and understanding of the SLA are shown in their framework applications.

Specifically, the DFID emphasises flexibility in the use of the framework together with the principles of sustainable livelihood approach and participation, particularly focusing on poverty and its primary causes (Carney et al 1999). The DFID livelihood framework seeks to promote a holistic approach that can assist in recognition of ways of improving and raising the standard of living of the poor (Hussein 2002).

Meanwhile, the CARE sustainable livelihood framework concentrates broadly on issues of food security at the individual and household levels, emphasising household livelihood security and basic needs (Carney et al 1999; Drinkwater and Rusinow 1999). The CARE household livelihood security framework applies to villages and neighbourhoods including tangible and intangible assets, and linking disaster with development (Drinkwater and Rusinow 1999; Hussein 2002). CARE has extended the sustainable livelihood framework with inputs from the Right Base Approach which points to the issues of accountability and social justice; this particular area of the CARE framework is not adequately addressed in the sustainable livelihood approach and it provides an opportunity for CARE development assistance (Hussein 2002).

The Oxfam development programme is structured around emergency relief and emphasises the need for economic development and environment management (Carney et al 1999; Hussein 2002). Like CARE, the Oxfam sustainable livelihood framework incorporates the RBA, which focuses attention on livelihood impact and outcomes, considering sustaining livelihoods as a social and economic right (Hussein 2002; Neefjes n.d.). Additionally, Oxfam in an attempt to avoid relying totally on the sustainable livelihood framework for analysis, has created an environment in which the framework can be fitted in situations conducive to particular needs (Carney et al 1999).

According to Hussein (2002), Oxfam uses the framework as a point of departure by offering a language useful to discuss causes of poverty and means to address it, making provisions to develop strategies on a regional and country basis.

Within the Oxfam framework the role of markets and trade are of particular importance, highlighting the causes of market patterns to identify influences that can bring about changes to enhance the lives of the poor (Hussein 2002; Neefjes n.d.). Overall, the Oxfam framework focuses special attention on economic, social, institutional and ecological issues (Hussein 2002).

The sustainable livelihood framework of the UNDP is largely concerned with its involvement with agriculture and natural resources, emphasising the importance of access to assets (Carney et al 1999). The UNDP framework takes strategies as a point of entry to emphasise the extent of poverty and the measures that can be used to reduce the various forms of poverty (Carney 2002). The UNDP has used the sustainable livelihood framework at the field level mainly in local planning, rural and urban environments, education, governance and gender which addressed employment opportunities, food security, business development and natural resource management interventions (Hussein 2002).

The UNDP framework specifically prioritises policy advice and support which seeks to promote income generation, natural resource development, use of technology, empowerment, good governance and financial services (Hussein 2002). In short, from a practical perspective, the UNDP framework has been particularly used for integrating environmental, social and economic issues for analysis and programming; however, programme design in the UNDP framework is easier given the high level of focus placed on enterprise clustering (Carney et al 1999).

In conclusion, it can be argued that similarities in all four frameworks override their differences. Although each agency places emphasis on different roles, each framework used for analysing sustainable livelihood has been defined in relation to the five key components. Comparatively, all four frameworks adopt an asset-based approach, though some focus attention more on assets, capabilities and related activities, which appears to be a matter of different interpretation (Carney et al 1999).

Carney et al (1999) believe that the different interpretations of sustainability and the need to understand and facilitate micro-macro links are the most challenging areas of these frameworks. Also, the varying levels of emphasis placed on empowerment and technology in the framework suggest that there is a need to heighten the awareness of differences and level

of focus in their approaches, which can assist in future direction by providing a common ground for learning (Carney et al 1999).

4.5 Criticisms of the SLA

The idea of SL has drawn much attention in development practice and policy, particularly since the late 1990s. The approach represents a way of thinking on how to deal with poverty reduction as a departure from the conventional development thinking (Haan 2000; Farrington and Lomax 2001). While the overarching problem of reducing poverty continues to be one of the major challenges facing the world today, the SL concept has been making positive strides to combine poverty and environmental policies into a macro-economic framework (Haug 1999; Farrington 2001; Carney 2002).

Among its strengths, the SLA offers certain levels of superiority in project intervention and provides broader insights of poverty than conventional development thinking (DFID 1999; Farrington 2001). It suggests access to resource and rights, to minimise risk and vulnerability, and to have an understanding of institutions and processes that are essential in organising activities will enhance positive outcomes for the poor (Ashley and Carney 1999; Farrington 2001; Carney 2002). Additionally, the SLA also provides an outlook on the factors that influence the poor, which help to identify entry points and provide the reality checks necessary for macro development interventions (Farrington 2001; Farrington and Lomax 2001).

Furthermore, the SL framework has proven to be versatile in planning, formulating and implementing strategies on poverty reduction (Mukherjee et al 2003). Although the SLA is evolving and evidence of its performance still needs more time for an appropriate assessment, it has been significantly adding value to poverty reduction effort (Carney 2002).

Hinshelwood (2003) and Hocking (2003) recognise that the application of the SLA to community development has proven to be effective in planning and implementing projects. The SLA is also proven to be useful in assessing and reviewing projects, not only those designed from the SLA principles but also those not originally based on the SLA concepts (Farrington et al 1999; Ashley and Hussein 2000; Adato and Meinzen-Dick 2002).

While the principles are taken into account, the SLA offers a structure that can assist in identifying solutions to particular aspects of poverty reduction (Singh and Gillman 2000; Moser and Norton 2001). Ultimately, Norton and Foster (2001) show the potential of the SLA in guiding the development and preparation of poverty reduction strategy papers for national

Governments. The approach is reliable at the macro level since it is linked to policies and that it does not speak specifically to issues of politics and, hence, enhances an analytical framework rather than adding value to a particular policy (Norton and Foster 2001).

The use of SLA in many situations has led to greater diversity in the interpretation of the concept (Hussein, 2002). The different interpretations of the SLA have been the subject to considerable scrutiny. Normally, the SLA is interpreted as a set of principles, an analytical framework and as a development objective (DFID 1999; Ashley and Carney 1999; Farrington 2001; Carney 2002).

Basically, it is understood that the SLA is a complex functional system with participants sharing a common goal and supported by a set of principles (Singh 1996; DFID 1999).

However, the different interpretations of sustainability between users raises the question as to whether the SLA can effectively bring about the change needed taking into account its range of scope?

Authors such as Beaumont (2002), Hamilton and Townsley (2007) and Foresti et al (2007), found that there was evidence of limitations in using the SLA in development practices. Foresti et al (2007) declare that there were obvious gaps highlighted in the way in which the approach treated rights and power. Differences at the household, and particularly at the societal level, were not defined sufficiently (Foresti et al 2007). Based on Foresti et al's argument, how decisions are taken at the household level is never fully explored in this approach. Culture, also should be specifically incorporated with the understanding that decisions are largely based on culture which is essential in determining people's livelihood strategies (Foresti et al 2007).

Similarly, Hamilton and Townsley (2007) found major gaps while using the SLA in forest policy reform and went ahead to re-arrange the sustainable livelihoods framework. The principles of the SLA were followed, but with a modified version of the sustainable livelihoods framework. The authors develop a model which focuses on the transforming structures and processes component of the framework. Hamilton and Townsley (2007) believe that their adjusted framework would prove vital to practitioners for project entry points but should not be used as a tool for development interventions.

Beaumont (2002) observes that the SLA was particularly lacking in basic criteria for predicting livelihood outcomes that require a broader analysis of development issues. For improving people access to natural resources, for example, the author notes that there is a necessity to emphasise the full effect of the intervention and its associated livelihood

outcomes rather than focusing on the approach objectives. There is also the necessity for the SLA to give special attention and introduce a tool to assess the local impact on natural resources development interventions (Beaumont 2002).

In addition, Rajkota and Wolf (2009) comment on the shortcomings in the use of SLA in youth unemployment projects. Among the critiques, the authors identified that the approach offers minimum help for application and that the non-sectoral element was unrealistic. The lack of focus on financial sustainable services points to issues of capacity building among youth as well the need to strengthen assessment in youth livelihood projects were other recognised weaknesses of the SLA (Rajkota and Wolf 2009).

Seeley (2001) and Pinder (2008) argue that the SLA, particularly as a tool for development, has made progress in some situations but fails in other critical areas. Pinder (2008) points out that the SLA fails to capture effectively critical issues in conflict and disaster affected areas, while Seeley (2001) concludes that the SLA must be highly responsive to issues of physical disability.

Another aspect of the SLA that has been thoroughly scrutinised is the need to understand and facilitate successful micro-macro links (Carney et al 1999; Hussein 2002). Carney et al (2009) observe that the non-Government organisation development activities are not macro focused which is strongly linked to entitlement.

Other areas of concern about the SLA are the different level of focus placed on empowerment as well as the lack of flexible use of technology in poverty reduction activities and strategies (Carney et al 1999; Hussein 2002). Technology and particularly empowerment are clearly emphasised in the SLA; again these areas have been continuously criticised against the background that contemporary poverty reducing policy must be fully focused to enhance positive livelihood outcomes (Carney et al 1999).

Nevertheless, according to Carney (2002) emphasis has been placed on identifying the strengths and weaknesses in the SL approaches, thus gaining the understanding of sustainability by acknowledging and addressing the gaps and implications for positive change (Table 4.4).

While this project relies on the conceptual SLA framework with a focus on DFID, it is necessary to look at the development taking place within the organisation. Clarke and Carney (2008) said that great emphasis was placed on the SLA between 1998 and 2002. However, the authors observed that areas of limitations of the SLA and changes within DFID organisational

focus have led to a decrease in its use. According to Clarke and Carney (2008), the SLA failed to capture and address issues relevant to institutional factors and policies that affect livelihoods. They explain that there was a change from small micro-level projects to broader macro-level approaches at national levels. This change is reflected in ways DFID coordinates and manages development interventions, viewing the SLA as only essential in small scale projects. The DFID engagement in development interventions at the national level focuses on more technical and economic issues such as support for budgetary procedures that goes beyond the SLA (Clarke and Carney 2008).

Table 4.4: Strengths and Weaknesses of SLA

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Source: Ashley and Carney, 1999.

4.6 Conclusion

The SLA, though seeming progressive towards poverty reduction is not a straightforward solution to this complex problem. Adopters of the SLA therefore must take into account that

institutions and policies that will create the environment necessary for sustainable growth and development are very difficult to monitor.

Nevertheless, the SLA, which seeks to incorporate a wide range of development issues particularly concerning poverty alleviation, is adopted as the theoretical and analytical structure for this study. Its potential to grasp a full understanding, being sought, of the people's livelihood system, as well as its flexibility in analysing situations, make the framework the appropriate choice.

Irrespective of the inherent weaknesses of the SLA, the framework nonetheless can be used to capture various aspects of livelihood systems and tailored to specific study settings. In other words, it can be used as a guide, as well as a lens of enquiry as is done here.

The SLA plays a central role in formulating the research questions and providing a continuous supporting arrangement throughout. It makes available a guideline of questions to use for the empirical primary data collection process and forms the nucleus of the data analytical and interpretation phase.

At this point of the research, an outline of the methodology and strategy used for conducting the study follows.

Chapter 5

The Research Methodology and Strategy

5.1 Introduction

Chapter 5 outlines the methodology and strategy used to carry out the research. The methodology, which is primarily concerned with the philosophical orientation, is directly linked to what strategy or strategies must be employed in the study. For this study, how the research is carried out (which depends largely on the nature of the research problem and the type of questions posed) is addressed by the choice of methodology and strategy.

The chapter first looks at the methodology and the role it plays in research. This is followed by the reasons for and the type of methodology selected. Aspects of the constructivist interpretive qualitative paradigm, as well as principles of the grounded theory are the methodologies chosen for the study.

Next, the chapter deals with the case study strategy, the appropriate research strategy of choice for designing this study. The rationale for selecting the case study strategy is then discussed and presented. The chapter ends with a discussion on the case study design, which includes the case study protocol - a guide for the line of inquiry undertaken.

5.2 Selection of Paradigm and Methodology

Many authors, such as Creswell (1994), Denzin and Lincoln (1994), Kuhn (1996) and Babbie (2004), suggest that it is imperative for research to be conducted using the researcher's perspective (paradigm). A research paradigm is a way of looking at the world which consists of philosophical assumptions: methodology⁸, ontology⁹ and epistemology¹⁰ (Babbie 2004). These assumptions of the paradigm framework will both guide the researcher and shape the research.

With the understanding that methodologies are the root of research paradigms, then the rationale for the paradigm of choice is based on a world view. Additionally, my training and experience, psychological attributes, the nature of the research problem and the audience for the study were criteria taken into account when choosing an appropriate approach for this research project.

⁸ Methodology - The research process.

⁹ Ontology – The nature of reality.

¹⁰ Epistemology – The relationship between the researched and the researcher.

To address this research problem and give answers to these proposed questions, there was the need to gain a complete understanding by collecting various forms of data and analysing them from different angles to construct a rounded picture of this complex situation. Given that this study has multiple realities, as well as the exploratory and interpretive nature of the research questions, focusing on inductive logic linked to a qualitative orientation was the best fit.

Qualitative research, which seeks to provide insights and understanding of situations and often focuses on theory building, is consistent with the primary objective and aim of this research study. According to Denzin and Lincoln (2008), qualitative research draws on a diversity of interrelated interpretive practices with the aim of gaining a better understanding of the situation being studied. The central idea of qualitative research is the social aspects of the real world, with a focus on people behaviour, opinions, attitudes, cultures and events that go on around them (Hancock 2002); together with the above mentioned qualitative features, this provided sufficient reasons for this research adopting the qualitative approach.

For the choice of methodology, a combination of components drawn from the constructivist/interpretive approach, together with some concepts from grounded theory, as well as the SLA (presented in Chapter 4) have guided this entire research process.

5.3 The Methodology

5.3.1 The Constructive/Interpretive Approach

Philosophically, this project is guided by a set of principles which is a combination of beliefs about the nature of reality, the relationship between the research and the researcher and the entire process of the research (Lincoln and Guba 1985).

Given that the research is interpretive in nature, it is guided by a set of beliefs and feelings; the constructivist approach assumes relativist ontology, a subjectivist epistemology and naturalistic set of procedures with findings presented in the form of grounded theory (Denzin and Lincoln 2003). Within the constructivist/interpretive paradigm and methodological framework were assumptions and concepts (themes). These major themes were summarised into categories relating to the research design strategy, data gathering and field work strategies and data analysis strategies (Patton 2002).

Consistent with the major themes or principles of the constructivists/interpretive methodological model, this study focused on naturalistic inquiry, emergent design flexibility and purposeful sampling as its main design strategies (Patton 2002). For data gathering and fieldwork strategies, emphasis was placed on qualitative data (observations that provide

detailed information, dense description, interviews, case studies and document review), personal experience and engagement, empathic neutrality and attention paid to the overall collection and field work process (dynamic system) (Patton 1980; Singleton et al 1993; Patton 2002).

In terms of the data analysis strategies, every effort was made to ensure that the research framework facilitating this project followed an inductive form of logic. Inductive reasoning moves upwards in philosophical levels, from more specific to more general assumptions and guided by principles rather than rules (Patton 2002; Punch 2005).

Other important data analysis strategies included a holistic perspective, unique case orientation, context sensitivity and voice, perspective and reflexivity were also integrated as major constructivist/interpretive themes (Patton 2002). The precise outcome of this research project was dependent on (for the most part) how close these common themes linked to the selected methodological frame?

Since this study was constructivist in orientation, and given the nature of the research problem, aspects of the SLA and grounded theory were integrated in the methodological framework. Apart from grounded theory being one of the most widely used and influential methodologies in qualitative studies (Denzin and Lincoln 1994), it served at the forefront of the qualitative revolution and allowed for qualitative studies to have a place in social scientific inquiry (Charmaz 2003). The decision to combine components from the SLA, the constructivist/interpretive approach and grounded theory to frame this study was intended to make the emerging theories denser and more precise. The combined elements basically consisted of planned inductive guidelines for studying people in their natural settings, with an understanding of the real world.

What follows are concepts of grounded theory as they relate to the procedures used in this research.

5.3.2 Grounded Theory

The term grounded theory was coined by two American sociologists, Barney Glaser and Anselm Strauss, following their research in the medical field (Strauss 1987, Strauss and Corbin 1998). Essentially, the theory concerns the systematic development of generating theory with a focus on data collection and analysis (Glaser and Strauss 1967).

According to Patton (2002:125), “grounded theory focuses on the process of generating theory of a particular theoretical content”. The grounded theory approach is not a method or technique; instead it is an approach or style for conducting qualitative research with features such as comparative analysis, theoretical sampling, methodological guidelines that include constant comparisons and coding procedures (Glaser and Strauss 1967; Strauss 1987; Dey 2005).

The grounded theory approach focuses mainly on people’s actions and interactions emphasising field-based data collection, which must include the views of the people being studied (Glaser and Strauss 1967; Strauss and Corbin 1994; Schwandt 1994). Charmaz (2003) adds that grounded theory should provide useful concepts and that data should be arranged methodically to elucidate the studied phenomena. According to Charmaz (2003), the grounded theory approach was a result of epistemological assumptions, methodological terms, inductive reasoning and systematic guidelines supported by the philosophical study of process, action, and meaning into empirical inquiry.

The generation of theory was the central idea behind the applicability of grounded theory as an approach in this project. Shaping the data collection and analysis procedure to gain depth, clarity and understanding has helped the researcher develop a grounded theory. The theory was grounded in the sense that it was inductively developed from the researcher’s observations and interviews through fieldwork (Glaser and Strauss 1967; Patton 2002; Punch 2005); that is the theory was based on data and was inductively generated because the study started with an observation rather than pre-established assumptions or perceptions. The researcher entered the fieldwork with no pre-conceptions and moved from a specific observation to realise a pattern that will relate to general principles (Babbie 1999).

According to Glaser and Strauss (1967:46), Glaser (1978:1) and Strauss and Corbin (1990:42) the grounded theory approach also takes into account “theoretical sensitivity” which provided insights to the researcher’s ability. The aim of being theoretically sensitised was to demonstrate an understanding of the main contributions in the subject being studied, how they have been generated and applied, thus providing the knowledge of the main questions (Hart 1998).

From a constructivist grounded theorist perspective, the theoretical frame is a flexible device for gathering knowledge and making it accessible to the research audience, such as other researchers, policy makers, scholars and practitioners (Strauss and Corbin 1994; Patton 2002). In part, this study adopted a theoretical framework as a means to compare and contrast the

results with other similar livelihood (international development) studies and add to the ongoing dialogue in a SLA context.

As a follow-up to the selected qualitative approach, this project drew mainly from the SLA complemented by components of grounded theory. The constructivist/interpretive grounded research framework encourage data collection from various sources and emphasises specific analytical strategies as a starting point of theory development (Charmaz 2003).

There were multiple decisions that were taken into consideration that were based on how much complexity to introduce (Charmaz 2003). The introduction of what level of complexity used was dependent on the audience, the research approach and methodology as well as the strategy of choice.

The goal of this type of project was to gain theoretical insights and understanding of situations rather than to prove facts. The selection of the qualitative paradigm assumed differences between people and situations with an ultimate aim of understanding these differences.

The specific strategy for carrying out the research follows.

5.4 The Case Study Strategy

The nature of this research problem and the proposed questions, together with the selected research approach and methodology, has collectively provided the grounds for, and clues to, selecting the most appropriate strategy for meeting the objectives of this project. Since this research has three primary concerns to (a) examine contemporary events (b) adopt types of research questions focusing on “what”, “how” and “why”, and (c) investigate by describing, exploring and explaining a phenomenon in a natural setting (Yin 2003:1-7), then a case study was preferred as the main strategy, but supported by document analysis and associated secondary data.

Despite the availability of other research strategies such as survey, experiment, document analysis, models and archival analysis case study remains the dominant strategy of qualitative research within the constructivist paradigm (Woodford 2006). While there may be similarities between strategies, the case study was more consistent with this study’s primary objective to develop as full an understanding as possible. The case study aimed to understand the studied case in depth, acknowledging its difficulties and its context with a holistic focus (Merriam 1988, Eisenhardt 2002; Yin 2003; Stake 2003). In other words, a case study should provide a unified understanding, the ultimate aim of this research project.

Another important purpose of case study, which set it apart from other possible research strategies for this project, is that it can be applied to almost any situation. This flexible feature of a case study research depends mostly on the design.

5.5 The Case Study Design

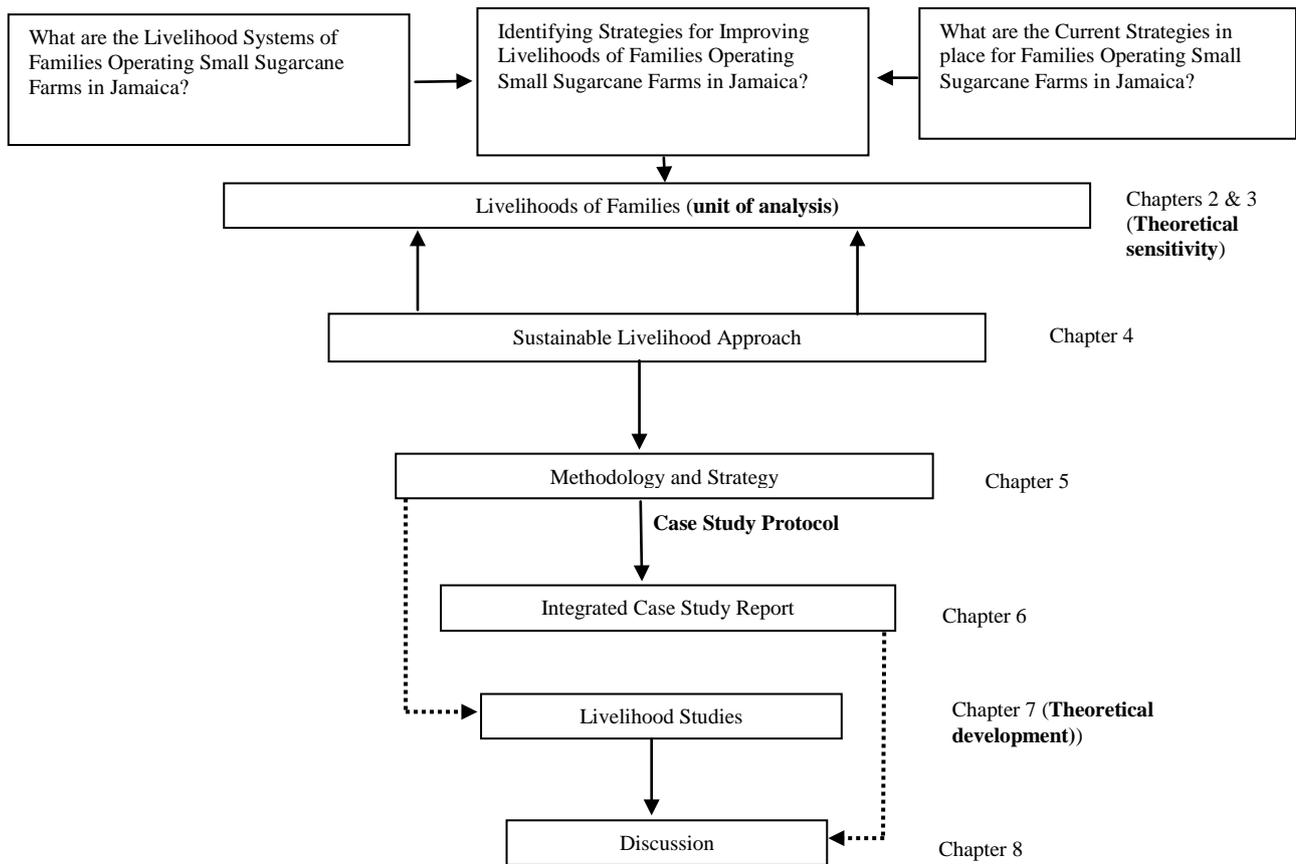
As part of the credibility and accountability of this study, the case study design has been used for the logical, consistent and accurate development of this project. Generally, a research design sets out what is to be found out as well as what is the most appropriate way to do it (Babbie 2004; Schloss and Smith 1999). For Yin (2003:19), a research design “is the logic that links the data to be collected (and conclusions to be drawn) to the initial questions of study”.

Yin (2003:46-47) identified four relevant case study designs. These are “single-case embedded, single-case holistic, multiple-case embedded and multiple-case holistic”. The reasons for selecting any of the four major designs will depend on the research questions to be addressed. Typically, multiple case studies consist of two or more single cases while holistic designs take into consideration an entire (whole) view of what is being studied. Conversely, embedded designs look at specific areas (part of the whole) of the studied phenomenon (Yin 2003). Multiple-case studies are, in fact, time and resource consuming and can be very expensive. They should follow replication logic rather than the sampling logic usually considered in surveys and experiments.

Yin (2003) recognised that replication logic must be distinguished from sampling logic in a case study. Sampling logic, which involved an outline of statistical procedures to calculate occurrences of a phenomenon common in surveys, will not suit a case study situation. To apply sampling logic to this particular project would uncover the phenomenon of interest and its context, but it would require many cases to provide statistically valid conclusions about the broader population. There would also be time and financial constraints that would be beyond the scope of this study.

For these reasons this research study adopted the multiple study design to investigate the livelihoods of families operating on small sugarcane farms from two cane growing regions in Jamaica. The study took into account the need to have an entire (holistic) view rather than a partial (embedded) outlook on the phenomenon with the aim to follow the replication approach. With such design the research questions, the unit of analysis and the theoretical plan as well as the case study protocol were considered as the major components of this research process (Fig 5.1).

Figure 5.1: The Research Process.



An outline of the case study design components is presented below.

5.5.1 Unit of Analysis

The unit of analysis was the main aspect of the study directly related to the results. Though it appears straightforward, it can sometimes be difficult to identify and/or select the appropriate level of analysis. For clarity, Singleton et al (1993:51) described the unit of analysis as “the entities (objects or events) under study”. The authors add that social scientists study a variety of units called elements or cases such as individual people, families, organisations, positions and relationships, social roles and artifacts. Babbie (2004) noted that the unit of analysis, in its simplest form, was what or who was being studied. In social science research, the individual is the most typical unit of analysis (Babbie 2004).

Based on Yin’s (2003) definition, the unit of analysis was directly linked to the primary research questions of the case being studied. When selecting and identifying the appropriate unit of analysis, he argued that it will become obvious following the development of the research questions. The data to be collected and analysed along with the research questions to

be answered will be determined by the unit of analysis (Yin, 2003). Therefore, the assessment carried out in this study was what determined the unit.

The unit of analysis for this project developed around the livelihoods of small sugarcane farmers' families. There are two units of analysis. One is at the level of the sugar growing region. But embedded within this is the family unit. As the investigation unfolded, and it was apparent that differences within each region were more important than differences between regions, then the family unit of analysis became more important.

5.5.2 Theoretical Sensitivity

It is a tendency for researchers to bring their personal knowledge, theoretical acquaintance and a level of understanding to their study (Glaser and Strauss 1967; Glaser 1978; Strauss and Corbin 1994). As pioneer grounded theorists, Glaser and Strauss (1967:46) coined the term "theoretical sensitivity" which referred to issues of personal experience and theoretical knowledge of the researchers.

On account of the grounded theory principles, there was a need to make explicit all theoretical sensitivity. The SLA and the Porters Diamond (competitiveness of the JSI) as well as the insights gained from the world sugar market and the general background of the study were a consequence of theoretical sensitivity. Therefore, it should be specifically acknowledged that these are "lenses" used to look at the world.

Another form of theoretical sensitisation was also taken into consideration. This second form of theoretical sensitisation was informed by other livelihood studies conducted between and after the fieldwork. Within grounded theory, there is a longstanding debate as to whether researchers should carry out extensive literature reviews prior to fieldwork. If the second form of theoretical sensitisation is undertaken prior to fieldwork then it can influence the questions asked. However, if there is no sensitivity to the issues that others have found, then there was the likelihood of missing important observations.

As such, it was decided to look at the second form of theoretical sensitisation following the first phase of fieldwork. With such an approach, the initial observations of the first fieldwork provided initial findings through which important supporting and contradictory information was sought from the literature. This, in turn, guided the specifics of the second phase of fieldwork.

A set of statements that were derived from the preceding Chapters 2 and 3 and influenced by the analytical framework was as follows:

Initial Findings (IF) 1: The livelihoods of Jamaican sugarcane farmers are threatened as a result of adverse market trends (particularly relatively low commodity prices).

IF2: Based on Porter's (1990) diamond framework, the JSI operates within (physical resource) limits that prevent Jamaican sugarcane farmers from attaining benefits enjoyed by many sugarcane farmers worldwide.

IF3: The high debt-to-GDP ratio prevents the Jamaican Government from adequately investing in priority areas of national development.

The inductive approach adopted for this study provided the opportunity to collect data from the interpretive field study and obtained the views from various sources on issues relating to the livelihoods of families operating small sugarcane farms in Jamaica. It was the views and interpretations from the empirical fieldwork that were used to provide insights rather than those collected from the literature prior to the fieldwork. As mentioned above, these statements were regarded as “lenses” which formed guidelines for the study to keep within boundaries.

The second set of statements of theoretical sensitisation will be presented at the end of Chapter 7 following the literature review of other livelihood studies. The theoretical statements developed in Chapter 2, 3 and 7 provided a framework of comparisons with results from the fieldwork. This framework will be the core of Chapter 8.

5.5.3 The Case Study Protocol

The basis upon which a researcher follows a set of guidelines to carry out a particular investigation, with the aim to describe, explore and explain a phenomenon in its natural settings, is termed a case study protocol. The case study protocol helps keep the researcher's attention on the subject being studied and to anticipate problems (Yin 2003).

According to Yin (2003), the case study protocol should include the fieldwork plan: persons to be interviewed, data collection methods, data analysis plan and the case study report.

5.5.3.1 Fieldwork Activities and Data Collection Methods

As a central part of the case study design, fieldwork activities were carried out in Jamaica to collect data. There were two phases of fieldwork: The first phase was carried out over a nine-week period between January and March 2008, while the second was five weeks in May to June, 2009. The activities were concentrated in two (Monymusk and Trelawny) of the seven sugarcane growing regions in Jamaica that were purposively selected as case study sites.

The fieldwork activities focused on primary data collection relevant to the livelihoods of families operating on small sugarcane farms in Jamaica. Since the study was undertaken at the inductive level, multiple sources of evidence were used for data collection. The main source of evidence included in-depth semi-structured interviews with family members of 30 small sugarcane farms. Other complementary sources such as direct observations, group discussions, transect walks, seasonal calendars and key informants were drawn on. Additionally, local texts were reviewed, while various government agencies and non-Governmental organisations were consulted for secondary data.

Rationale for selecting the case study sites

The study sites were selected on the grounds that two of the seven sugar factories would be taken out of operation in 2008 and that the livelihoods of these affected families (and most vulnerable) needed to be investigated. However, with the aim to capture diversity and have an overall understanding of the livelihoods of families operating small sugarcane farms in Jamaica, it was decided to include one of the regions whose factory will continue operation.

As such, the Trelawny region was selected from a group of two (along with the Bernard Lodge region) whose factories would be taken out of operation, while the Monymusk region was selected from the group of five whose factories would continue operation.

Consistent with the aim to provide diversity and to have more valuable contrast, it was found necessary to include regions that had distinct variation in production systems and economic bases for the investigation. For example, the majority of cane farmers supplying sugarcane to the Monymusk factory (and also Bernard Lodge) relied on irrigation, whereas farms in the Trelawny (and the other four) regions were rain-fed.

Furthermore, the economic bases in both regions were distinguishable. The tourist industry was the major foreign exchange earner for the Trelawny region, whereas the bauxite/alumina industry was the main foreign exchange earner for the Monymusk region. Therefore, the mixed views and opinions of families from both regions reflected the diversity of livelihoods of families operating small sugarcane farms in Jamaica.

If Bernard Lodge were to be selected, then Monymusk would not be the best choice with Bernard Lodge, since both were irrigated regions. However, Bernard Lodge with any one of the other four rain-fed regions would yield similar outcome as Trelawny and Monymusk in terms of production system – that is, irrigation versus rain-fed.

In regard to economic base, three of the five regions with the options to continue production have the bauxite alumina industry located in their parishes (Monymusk, Worthy Park and Appleton), while the other two regions (St Thomas and Frome) were located in parishes that were tourist- oriented. Due to financial and time limits on the study, it was not feasible to select more than two sites. The purpose behind the selection of two sites was to gain in-depth insights and as full an understanding as possible, rather than focusing on the number of cases.

Although the study was designed to provide diversity, and the selection of the cases to provide valuable contrasts, another reason for selection was because the parishes in which the study sites were located have had high incidences of poverty. For example, the incidence of poverty in Clarendon rose from 13 per cent in 1998 to 27 per cent in 2002. This compared with Trelawny where poverty level increased from 18 per cent in 1998 to 31 per cent in 2002 (PIOJ and STATIN 2003).

For these reasons, families operating small sugarcane farms in the Trelawny and Monymusk regions were considered appropriate for closer investigation.

Families' Interviews

Minichiello et al (1990), Fontana and Frey (1994), Warren (2002), Johnson (2002) and Ruben and Ruben (2005), among others, observed that in-depth semi-structured interviews were one of the most effective tools for accessing the beliefs about a situation and a flexible way of understanding others. For these reasons, semi-structured interviews were singled out as the most fitting tool for the enquiry.

Interviews with farmer families accounted for nearly 70 per cent of the time spent on all activities. It was challenging, during the planning stage of the study, to determine the number of families required to provide sufficient information. Nevertheless, it was recognised that as the interview sessions progressed, emerging themes started to become pronounced as there was a constant repetition of information. As such, the 30 families, as initially set out in the study plan, were sufficient to provide rich and adequate information.

Selection of Families for Interview

Contacts were made from New Zealand with the All Island Jamaica Cane Farmers Association (AIJCFA) for permission to conduct the research with families. This was obtained.

A combination of purposive and random sampling techniques was used to select families for interviews. The interviews were based on a sample of 30 families selected from a list of

sugarcane suppliers to the Monymusk and Trelawny sugar factories. The strategy for selection of families used a two-stage stratified design, in which the initial step was to identify families operating on two hectares or less and to place them in their respective cane growing areas. Two hectares or less were selected as an appropriate figure based on the fact that 60 per cent of sugarcane farmers in Jamaica operate on this land size. It was estimated by extension officers that in 2007 farmers operating on two hectares or less comprised 60 and 65 per cent of the number of farmers in the Monymusk and Trelawny regions respectively (see Chapters 1 and 6).

For the Monymusk region, there were three distinct areas – Vere, Mid-Clarendon and Upper-Clarendon – while the Trelawny region had two – Long Pond and Hamden. To avoid mistakes in the placement of farmers in their area and size of operation, sugarcane extension officers were called on for assistance. The extension officers said that there were families who operated with two hectares or less for sugarcane but had more land. They explained that this was because of a lack of enthusiasm toward sugarcane production leading to reduced acreages. As such, families that operated with two hectares and less of sugarcane but had more land were taken into account. This was considered desirable for the study, since it provided an understanding of the families' behaviour towards opportunities that existed outside sugarcane production and the changes taking place over time.

The second step in the selection of the sample was to choose a random number of families from each area and to allocate interviews in relation to the size of the area. In the Monymusk region, the Vere area had the most families (with two hectares and less in sugarcane) followed by the Mid Clarendon and then the Upper Clarendon area. Like the Vere area, the Long Pond area in the Trelawny region had more families operating on small plots. Overall, 10 of the families (seven from Monymusk) had land that exceeded two hectares, but none had more than two hectares of sugarcane.

The distribution of interviews for the Monymusk region included eight families from the Vere area, four from the Mid-Clarendon area and three from the Upper-Clarendon area. In the Trelawny region, nine interviews were conducted in the Long Pond area and six from the Hamden area. All selected families were informed about the exercise and consent sought. A follow-up of the date, time and venue were set at their convenience.

The Interview Content

General information about each family, information relevant to land use and farming activities as well as a checklist of DFID SLA guiding interview questions formed the core of the

interview with families. Since the interviews were semi-structured, focusing on in-depth, open ended questions, the DFID-adopted checklist of questions was used mainly as a guide (Appendix A.9). Focusing on the emerging issues and themes became central to the investigation.

The Interview Session

For the first phase all of the interview sessions were carried out at the participants' homes. Approximately 70 per cent of the potential participants took part in each session. Children under age 18, impaired elderly members and chronically ill members did not participate. On average, each session lasted between three and three and half hours for the family members. However, discussion on sugarcane cultivation and management were left until last and took roughly another three-quarter to one hour. In most instances, only one or two members took part in the sugarcane cultivation and management discussion. An understanding of the information sheet containing the research purpose and ethical considerations allowed the sessions to progress without difficulties, with all of the consent forms signed. However, most of the participants declined the use of a tape recorder.

For the second phase, emphasis was placed on issues that did not need the time and full participation of members as in phase one. Therefore, on average, clarifying particular issues did not take more than 45 minutes in any of the sessions.

Overall, the sessions were conducted in a conversational manner and were actively supported by participants who co-operated throughout.

Other Sources of Data Collection

Other sources of data collected included direct observation, group discussion, transect walk, seasonal calendar, key informant and consultation for secondary data.

Observation was an ongoing and a key source of evidence throughout the entire fieldwork. This particular data gathering tool allowed the researcher to collect detailed information and, at the same time, gain in-depth practical insights on nearly all relevant (tangible and intangible) aspects of the way of life and the living conditions of families on small sugarcane farms. The study sites' physical infrastructure was specifically looked at. Special notice was also taken of access to, and availability of, natural resources to community members, including rivers, sea, Government Crown lands, forested woodlands and mineral deposits (mainly limestone marl and rocks). Of great concern was how community members organised themselves and utilized these resources, which formed a part of their daily activities as a

means of living. Direct observation was necessary for collecting information relevant to the specific areas of the SLA components, given that certain information were not willingly disclosed or made readily available.

The use of group discussion for collecting data at the case study sites served as an extension to strengthen data derived from interviews and what was observed. Four group discussion sessions were conducted during the fieldwork exercise (two in each region). The decision taken to collect data through group discussion was in order to combine the views and opinions of other community members who shared similar service provisions and facilities as the families of small sugarcane farms. The outcomes of these group discussion sessions proved useful, as they provided an understanding of situations that sometimes needed clarification. For instance, group discussion participants were normally in a position to better explain policies that were operational at the community level.

The content of the sessions was centred on the community and issues surrounding livelihood systems. Although there was a guideline to a checklist of questions (Carney 2002) (Appendix A.10), participants often exercised great flexibility, and issues kept emerging as the session progressed. The composition of the discussion group varied. However, it normally consisted of sugarcane farmers (small and large), businessmen, community workers, self-employed, technical and professional employees, and the unemployed. The researcher strived for a group of ten to twelve participants.

Data was collected from six transect walks as the fieldwork unfolded (three in each region). With the nature of the research problem and the type of research questions to be answered, it was necessary to make visits to fields (farm visits) or work sites of family members. Their primary day-to-day involvement and how they arranged their activities and implemented relevant strategies were pivotal to this study.

The ultimate aim of the transect walk was to have as full an understanding as possible of the activities that make up the normal work cycle of family members to meet their basic needs. In part, it was during transect walks that some of the vital observations about the study sites were noted. In fact, it was during two of the transect walks that the opportunity arose to explain and discuss seasonal calendars with the families (Appendix A.11).

Family members from both regions explained the seasonality of farm production, which included harvesting, cultivation, planting, and work and food availability. Members were delighted to share information and explain their involvement with production and work systems.

Information was collected on crop planting dates, as it correlated with period of rainfall and time of harvesting. The seasonality of crop production and harvesting periods was integral to employment opportunities and the working system for family members from both regions. Also, information on crop seasonality provided an understanding of how family members, within their work systems, applied strategies to meet their basic needs.

For key informants, two discussion sessions were held with the head of the sugar transformation unit in the Government of Jamaica's Ministry of Agriculture (Appendix A.12) - one in the first phase and the other in phase two. A brief discussion was also held with the Chairman of the AIJCFA in the second phase of fieldwork relating mainly to the association response to the Government's re-structuring plan. The information collected from the informants provided insights on policy and planning in relation to the JSI.

In regard to secondary data, information on sugarcane production and management were presented in annual publications from SIRI. Data on survey of living conditions, and economic and social survey were collected from the Statistical Institute of Jamaica (STATIN) and the Planning Institute of Jamaica (PIOJ). Secondary data was also sourced from Government agencies and non-Government bodies.

5.5.3.2 Data Interpretation and Analysis

The analytical strategy adopted in the study revolved around the structure of the selected SLA theoretical and analytical framework, presented in Chapter 4. The data collection and analysis procedure directly related to the five components of the SLA: the vulnerability context, assets, livelihood strategy, transforming structures and processes and livelihood outcomes.

The structure of the SLA framework provided the basis for the interplay between the data collected and the analytic procedure. This interplay allowed for the alternating of data collection with data analysis throughout the fieldwork. Even though the analysis continued between phases and after fieldwork, this alternating process during the two visits of the fieldwork allowed for a logical link between the collected data and the data analysis process. The alternating process, which reduced the likelihood of misinterpretations, also helped to strengthen the linkages between the respective components of the SLA.

The outline of the SLA components created a balance between the data collection process and what need to be analysed so as to keep the study within limits. In fact, the checklist of the family interview's questions was derived from an analytical perspective of the DFID SLA framework.

To best answer the research questions, the data analysis process was integrated at three levels. For the first, general information on family member's age, education level, employment status, income, and the head of the household were analysed. In addition, the physical household which included the type or tenure (rented or owned) of the building, the number of bedrooms, the presence of or access to, kitchen, bathroom, toilet, electricity and potable (piped) water system, were included in the analysis.

Information relevant to land use and farming activities, with particular focus on access to cane production, was analysed at the second level. This included land tenure (leased or owned), hectares in use, hectares in cane, years in cane, cane production and productivity as well as annual returns from cane. Analysis of both the general family information and land/farming activities was sought in relation to the asset and vulnerability components of the SLA.

At the third and final level, the DFID checklist of interview questions was analysed and interpreted. The DFID SLA framework provided a structure where relevant interpretations were placed under one of the five components.

Analysis of the vulnerability context included cultivation of crops other than sugarcane, livestock rearing, employment opportunities and other income earning activities, the variation of income earning opportunities throughout the year, the calculation of the different income earning activities and their importance to the household, the marketing of produce and price variation, the proportion of the household food needs that was met by own production versus what was purchased, the percentage of income that was spent on household needs, the most difficult time of the year, and access to appropriate financial institutions and remittances.

In regard to control over, and access to, resources, human capital was analysed as it related to household member's education/training, health, knowledge commonly shared, access to viable information, and views on information that were lacking. Analysis was conducted on household member's connectedness with community members and the wider society (member of groups or organisations) as social capital.

Analysis on access to and conflict over natural resources was carried out. For physical assets, family member's views on infrastructures such as roads, electrification/water networks, schools, health clinics, post offices, transportation system, and marketplaces' accessibilities and level of appropriateness were included in the analysis. Finally, when assessing access to resources, financial assets were analysed on how family members kept their savings.

For transforming structures and processes, analysis about how participants' view organisations serving their communities (their effectiveness and accessibility) and their level of political and human awareness were carried out.

The bulk of the data analysis carried out on livelihood strategies included each participant's source of income from the different activities, the amount of time allotted to each activity and how these income and activities were changing over time. Analysis also took into account the options family members were making, and the combination of activities that appeared to be working best (or were not workable) for them.

Families' security against violence, crime and their assets and factors affecting set goals and changes of income over time were analysed in relation to livelihood outcomes.

Apart from striving for accuracy in the analytical process, the approach taken to integrate the collected data at three levels was to provide a basis for reporting the results.

5.5.3.3 *The Case Study Report*

The format of the case study report was a reflection of the analytical framework. The results of data interpretation and analysis are presented in a summarised case study report in the next chapter.

Although fieldwork was carried out in two of the seven sugarcane growing regions in Jamaica (multiple-case study), the interpretation and analysis of data were integrated into one chapter. Since most of the findings from both regions were similar, integrating the analysis and interpretation (from both sites) allowed for a cross-case comparison to be undertaken.

Basically, the report is divided into four sections. First, the background of each region is presented separately - the geography and natural settings, the economic environment, basic utility access and service facilities as well the sugarcane farming community.

From the second section, which consists of the demographic characteristics and household facilities of the sample families, the report becomes integrated. Sugarcane production and management of the sample families and their livelihood system are presented in sections three and four, respectively.

The report ends with insights that emerged from the case study results which are highlighted and presented under the respective five components of the SLA organising framework adopted for analysis. These insights are outlined in Chapter 8 as a framework of comparison with the statements of theoretical sensitisation developed in Chapter 2, 3 and 7.

Chapter 6

An Integrated Review of Data Interpretation and Analysis

6.1 Introduction

This chapter provides an interpretation and analysis of the data collected during fieldwork carried out in Jamaica to investigate the livelihoods of families operating on small sugarcane farms. Two (Monymusk and Trelawny) of the seven sugarcane growing regions were selected as case study sites. The fieldwork activities focused on primary data collection about the livelihoods of these families. Since the study was undertaken from an inductive perspective, multiple sources of evidence were drawn on. The main source of evidence was in-depth semi-structured interviews with family members of 30 families (15 for each region) operating small sugarcane farms. Other complementary sources, such as direct observations, group discussions, transect walks, seasonal calendars and key informants were also drawn on.

Although the chapter focuses on primary data, secondary data were integrated to gain insight and a better understanding of the livelihoods of these families. Local texts were reviewed, while various Government agencies and non-Government organisations were consulted.

This chapter, which is presented in the form of a case study report, comprises four sections and concludes with insights that emerged from the interpretation and analysis of data. These are:

- The background of the study sites
- The demographic characteristics and household facilities of the sample families
- Sugarcane production and management of the sample families
- The livelihood system of the sample families.

For the background section, the Monymusk region is presented first, followed by the Trelawny region. For the other three sections – the demographic characteristics and household facilities, sugarcane production and management, and the livelihood system of the families – the interpretation and analysis from both regions are integrated. This integration allows for cross-case analysis to be undertaken. The integrated interpretation and analysis of the various sources of evidence allows for constant comparisons to be undertaken which provides some scope for theoretical generalisation. No attempt was made to generalise to the population

within a statistical framework. Instead the cross-case analysis process offered opportunity to generate analytic generalisation statements. These analytic generalisation statements as key themes conclude the chapter.

6.2 Background of the Study Sites

This section introduces the Monymusk and the Trelawny sugarcane growing regions. The Monymusk region is located in the parish of Clarendon and the Trelawny region in the parish of Trelawny. Sugarcane is the major crop grown in these parishes. Production of sugarcane is concentrated in three distinct areas of Clarendon: the Vere area, the Mid Clarendon area and the Upper (Northern) Clarendon area.

In Trelawny, sugarcane production is found mainly in the Long Pond and Hampden areas. Given that secondary data and information on the specific areas were lacking, it was decided to relate secondary data in the context of the parishes, their closest administrative boundary. Insights on the parish's geography and natural setting, their industrial environment, access to basic utilities and services and the sugarcane farming communities are presented below.

6.2.1 Clarendon - Geography and Natural Setting

The parish of Clarendon is one of the eight southern parishes in Jamaica and is found almost half way along the length of the island (see Chapter 1 **Figure 1**). In terms of size, the parish is the fourth largest of the fourteen parishes covering an area of 1,167 km² (Jamaica Gleaner n.d.).

May Pen, the capital (main administrative and economic centre) of Clarendon, is centrally located in the parish. May Pen functions as the main administrative and commercial centre for the parish, and is on the main transportation route, serving as a transit point for commuters travelling from the various western parishes of the island to the capital of Jamaica, Kingston, which lies nearly 55 km from May Pen. The northern section of the parish is known for its hilly terrain comprising two main mountain ranges; the Bull Head (900 metres) and the Mocho Mountains (650 metres) (Jamaica Gleaner n.d.). The Bull Head Mountains dominate the northern Clarendon range and peaks nearly at the centre of the parish, while the Mocho Mountains are situated more towards the north west of the parish. Networks of townships are to be found scattered throughout these ranges.

The majority of the southern section of the parish is occupied by the Vere plain. The Vere plain is one of the five major plains found in Jamaica. Most of the area is dominated by

sugarcane. Townships are found across its landscape, stretching from the extreme southern coastal districts to the rolling slopes of the surrounding mountains.

Between the hilly northern region and the southern Vere plain proper is the Mid Clarendon area. Several towns, including the capital of the parish, are to be found in this region. The Rio Minho, which is the main river in the parish, extends from the extreme north to the south of the parish where it empties in the sea. Like all the other seven southern parishes, Clarendon is bordered to the south by the sea.

Population

Based on the latest available data, in 2001, there were approximately 237,000 (50.26 per cent males) persons residing in Clarendon of which 236,370 were to be found in private dwellings, 600 in non-private dwellings (institutions) and 30 found on the streets. Total urban population within Clarendon was estimated at 30 per cent of the total parish population (STATIN 2002).

Rainfall and Soil Type

As mentioned in Chapter 2, rainfall is variable with respect to location and time of the year in Jamaica. The northern mountainous sections of the parish normally received higher rainfall averages than the lower coastal Vere and Mid Clarendon areas. As such, irrigation is used to supplement moisture requirements for agriculture production in the Vere and Mid Clarendon areas (Irrigated Plain). Annual average rainfall received at Monymusk (excluding the Upper Clarendon area) from 2001 to 2006 was 1,166.5 mm (SIRI 2004, 2007) (Table 6.1).

Table 6.1: Monymusk Annual Average Rainfall in Millimetres, 2001-2006

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Source: SIRI 2004, 2007

The dominant soils of the coastal Vere plain and the Mid Clarendon areas ranged from heavy to light clay and loam. The Four Paths Loam, the Sydenham Clay, the Agualta Loam and the Caymanas Sandy Loam were found scattered in these areas. Based on Rao's (1985) findings, when inputs are adequate, sugarcane yields will average up to 85 tonnes of sugarcane per hectare on the Agualta Loam which dominates most of the Monymusk farms on the Vere plains. Most of these soils maintain a dark grey to greyish brown colour. For the Upper

(northern) region of the parish there was a dominance of clay loam. Stretches of the Pennants clay loam (light grey) were identified in the larger plateau areas and neighbouring villages.

The Economic Environment

The parish's most important industries are bauxite mining/alumina processing and agriculture. The mining of the bauxite ore is concentrated in the north western section of the parish, mainly in the Mocho Mountain range. The bauxite ore is transported by rail to the processing plant located in Hayes, one of the parish's urban towns on the Vere plain.

Agricultural production is widespread in the parish. The Agricultural Census of 1996 revealed that there were 62,718 hectares of farm land in Clarendon representing some 14 per cent of total farm land island wide. Also, at the time of the census 12,337 farm holdings were reported in the parish, which accounted for 12 per cent of the total number of farm holdings in Jamaica (STATIN 1997).

Fisheries (both marine and in-land), contracted poultry farming, dairy and forestry all formed a part of the Clarendon agricultural sector. Root crops, vegetable production, legumes and fruits are cultivated throughout the parish. The Upper Clarendon area is known for coffee, citrus and cocoa production. However, according to members of the group discussions, domestic food production in the parish has been steadily declining since the mid 1990s. This was confirmed by official statistics showing the total domestic food production, for example, in 2002 was 34,984 tonnes compared with 54,729 tonnes in 1999 (PIOJ and STATIN 2003).

While Clarendon has been experiencing a decline in domestic agriculture production, traditionally the agricultural sector has been the 'backbone' of the parish. Despite the increasing share of community, social and personal services, along with the significant share of the wholesale and retail trade and other industry groups, agriculture still accounts for the dominant share of the Clarendon labour force (PIOJ and STATIN 2003) (Table 6.2). In 2008, of the 55,420 companies registered in Jamaica there were an estimated 817 in the parish (Registration of Companies 2009).

Table 6.2: Distribution of employment by industry in Clarendon 1998 and 2002 (%)

[copyright clearance to reproduce table not obtained]

Source: PIOJ and STATIN 2003

Basic Utility Access and Service Facilities

The population living in Clarendon, particularly in the Monymusk sugarcane growing communities, had access to basic utilities (potable water and electricity), schools and health services as well as a developed network of roads. All the major thoroughfares were paved with asphalt. Transportation needs for commuters were met mainly by taxi.

The Sugarcane Farming Community

Lionel Town, ‘home’ of the Monymusk sugar factory, is one of the main towns on the Vere plain, located approximately 10 km south of May Pen. The sugar factory is supplied with sugarcane from its estate’s farms and farmers. While most of the estate’s farms were established in the Vere locality, farmer’s sugarcane cultivation was to be found in the Vere, Mid Clarendon and, to a lesser extent, in the Upper Clarendon areas. Most of the large farmer’s development was located in the Mid Clarendon area, whereas a high percentage of the small farmers’ holdings were concentrated in the Vere area.

According to extension officers, in 2007, it was estimated that total land area in sugarcane in the Monymusk region occupied approximately 5,700 hectares, of which estate farms were responsible for 3,100 hectares. Almost 600 registered farmers operated on the remaining 2,600 hectares. Of the number of farmers, nearly 60 per cent were small operating on two hectares or less of sugarcane.

Sugarcane production in the parish has been on the decline particularly since 1996, reflecting the overall trend in Jamaica (see Chapter 2). Between 2000 and 2006, sugarcane production in the Monymusk region declined by nearly one-half (Table 6.3).

Table 6.3: Cane Production in the Monymusk Region (tonnes) 2000-2006

[copyright clearance to reproduce table not obtained]

Source: SIRI 2001-2007.

The focus now turns to the background of the Trelawny region.

6.2.2 Trelawny - Geography and Natural Setting

Trelawny is the fifth largest parish in Jamaica covering an area of approximately 880 km² (Jamaica Gleaner n.d.). The parish is one of the six northern parishes and is located more towards the west of the island.

Falmouth is the capital of Trelawny. It is located to the north of the parish and is one of the main northern sea coast towns in Jamaica. The capital is a tourist township and served as a central transportation point between Montego Bay and Ocho Rios, the two major tourist destinations on the island. The parish is bordered to the north by the sea and mountains to the south. The southern mountain range consists mainly of Mount Ayr which peaks at over 1000 metres above sea level (Bent and Bent 1966). The Cockpit Country which adjoins Mount Ayr to the east is an extended mountainous and peculiar area (karst topography) in the parish consisting of several caves and underground conduits. At lower altitudes throughout the mountain ranges several townships are to be found.

Most of the central section of the parish is flat and is occupied mainly by the Queen of Spain Valley. Townships are found scattered throughout this valley. The Martha Brae is the main river of the parish which meanders from the mountainous southern section to the north where it drains into the sea.

Population

The Jamaican population census of 2001 reported that there were approximately 73,000 persons living in Trelawny of which 50.8 per cent were males. Of the total parish population 72,432 were found in private dwellings, 550 in institutions and 18 found on the street. It was estimated that one-fifth of the parish population was living in urban areas. (STATIN 2002).

Rainfall and Soil Type

Rainfall distribution is somewhat variable throughout the parish. Normally, the mountainous southern section receives higher annual averages than the coastal or central part of the parish. Annual average rainfall recorded in the cane growing region of the parish, from 2001- 2006, was 1,357 mm (SIRI 2004-2007) (Table 6.4).

Table 6.4: The Trelawny Cane Growing Region Average Rainfall in Millimetres 2001-2006

[copyright clearance to reproduce table not obtained]

Source: SIRI 2004-2007.

The soils of the Trelawny sugarcane growing belt are predominately clay. Heavy dark brownish clays are widespread in the region but more dominant in the Hampden proper. The

Carron Hall Clay and the Killancholly Clay are the dominant soils of the Trelawny sugarcane region. Discussion with sugarcane extension revealed that most of the soils in the region will yield up to 80-85 tonnes cane per hectare if rainfall is adequate and the inputs are properly managed.

The Economic Environment

Tourism and Agriculture are the mainstays of the Trelawny economy. Tourism is concentrated in the northern coastal areas of the parish with a layout of hotels and development of numerous tourist scenes. Craft villages, fruit stalls, restaurants, bars, golf courses, polo clubs, cottages and water sports are among some of the facilities found along the parish coastline.

On the agriculture side, Trelawny is well-known as one of the top domestic food crop producers in Jamaica. While sugarcane is the dominant crop grown in the parish, root crops and tuber production have been the core activity for a significant number of families. Trelawny is well recognised island-wide as the 'yam paradise'. Yam production is the dominant crop established in the southern hilly region and constitutes a major share of the villagers' livelihoods. During the reference years, 1998 to 2002, Trelawny was the second largest producer of domestic food crops of the 14 parishes. Production, however, declined from 102,875 tonnes in 1998 to 85,802 in 2002 (PIOJ and STATIN 2003).

According to the Agricultural Census of 1996, there were 34,278 hectares of farm land in the parish representing some 7.6 per cent of total farm land area in Jamaica. The census also revealed that some 6,332 farm holdings were in the parish representing some 6 per cent of total farm holdings island-wide (STATIN 1997).

Marine fishing is common along the parish north coast region, while livestock farms are found scattered throughout the Queen of Spain Valley. Forestry is also an important agricultural activity for the parish and is concentrated along the southern mountainous interior of Mount Ayr.

Though the parish shows a decline in agricultural output, the sector remained the most important employer of labour force in the parish (Table 6.5). A total of 266 companies were registered in parish in 2008 (Registration of Companies 2009).

Table 6.5: Distribution of Employment by Industry in Trelawny 1998 and 2002 (%)

[copyright clearance to reproduce table not obtained]

Source: PIOJ/STATIN 2003

Basic Utility Access and Service Facilities

The supply of potable water and electrification were in the reach of most dwellings in the Trelawny sugarcane growing areas. The more isolated sections of the parish are located in the hilly interiors where sugarcane is not cultivated. Health facilities, schools and other basic facilities such as road and public transportation services are reasonably accessible. Taxis, covering the various routes throughout the parish, were the main source of public transportation. All of the main thoroughfares were asphalt paved, whereas only some of the local road paved. Like most other areas in Jamaica, both main thoroughfares and local roads were, for most part, in a deplorable condition.

The Sugarcane Farming Community

The Trelawny sugar factory is located in Clarks Town which is one of the parish's urban centres. Clarks Town is situated some 15 kilometres south of Falmouth (the capital) and provides administrative and commercial services to several townships found in the Long Pond area. Sugarcane cultivation has been the primary economic activity of these townships since historical times. Sugarcane for the factory is sourced from the estates farms as well as farmers. The concentration of the estate farms are found around the Long Pond area which also comprises most of the small sugarcane farmers. The Hampden area, which is about 8 to 12 km north of the factory, also consists of both estate farms and sugarcane farmers.

The extension officers at the Trelawny Sugar Company estimated total cultivation under sugarcane in 2007 to be roughly 3,000 hectares. Estate farms occupied some 1,600 hectares, while the 400 farmers cultivated approximately 1,400 hectares. The extension officers explained that it was difficult to say how the land was distributed among farmers, however small farmers operating on two hectares or less accounted for almost 65 per cent or about 260 of the total number of farmers. Land in sugarcane has been fluctuating since the late 1990s in the region, resulting from the level of uncertainty that exists in the business.

There has been an overall reduction in sugarcane production in the parish since the 1990s. The decline reflects the national trend (see Chapter 2). The production of sugarcane declined

by more than one-half between 2000 and 2006, but with considerable volatility between years (Table 6.6).

Table 6.6: Sugarcane Production in the Trelawny Region (tonnes) 2000-2006

[copyright clearance to reproduce table not obtained]

Source: SIRI, 2001-2007

6.3 Demographic Characteristics and Household Facilities

This section offers insight on the demographic characteristics, household composition and facilities of 30 families operating on small sugarcane farms in the Trelawny and Monymusk sugarcane growing region in Jamaica. An integrated analysis of household size, age and sex structure, headships and access to basic facilities such as kitchen, bathroom, potable water, electricity, house tenure and the number of persons per bedroom, is presented below.

Household Size

A total of 203 occupants were living in the 30 households interviewed during the reference period January-March, 2008, with a mean household size of 6.7. Of the total number of occupants, 47.7 per cent were adults and 52.3 per cent children (18 years and under). Three of the households had two housing units while two had three. The mean number of adults per household was 3.2 compared with a mean of 3.5 for children.

While the mean household size ranged from three occupants to a high of 13, the margin between the two regions was small. The Monymusk mean size was slightly larger, but the mean number of adults per households was the same, while numbers of children in the Monymusk region were also slightly higher.

At this point, it is useful to note that the pattern of income distribution within the sample suggested that there was a clear distinction between the better off and the poor families. The better off were the families with the top 10 per capita income (upper income group). There were large differences between the per capita income of these 10 families and the rest of the sample. The remaining 20 families, therefore, were classified as poor (low income group). These differences between the better off and poor families were considerably greater than differences between the regions. Of the 10 better off families in the sample six were from the Monymusk region. Details of the income distribution and per capita income of the sampled families are given below in Section 6.4.

Poor families in the sample were found to have larger household size with more children than the better off families. While the mean household size of poor families was twice the size of the better off, the mean number of children in the poor families was three times higher than the better off.

Some 23 of the households in the sample consisted of extended families. Extended family here means relatives living together or sharing household resources other than the nuclear family. Nuclear family consists only of parents and dependent children. All but one of the Trelawny cases was extended families, whereas in Monymusk nine of the 15 families were extended. The mean household size of these extended families in the total sample was 7.4 persons. This was compared with mean household size of 4.9 persons for the nuclear families. Although there were extended families among the better off, the majority (5 out of the 7) of the nuclear families were better off.

All of the extended households except for one had the presence of a grandparent (third-generation). The only one extended family without a grandparent consisted of second generation relatives, that is, children, aunts, in-laws, nieces and cousins. In both regions only one of the families had the presence of a fourth-generation (great-grandparent).

Sex and Age Structure

Just over half of the sample (54.6 per cent) was female. Most of the females were in the working age group 15 to 64 (Table 6.7).

Table 6.7: Distribution of Age by Sex of the Sample, Jan-March, 2008

Age Group	Female		Male		Total
	Monymusk	Trelawny	Monymusk	Trelawny	
14 and below	26	22	20	23	91
15-64	29	29	19	15	92
65 and over	1	4	8	7	20
Total	111		92		203

The number of female children was five per cent higher than the number of male children and was presumably due to natural causes. However, in the working age group the number of females was 27 per cent higher than the number of males. While there was a dominance of females in the overall sample, males were dominant in the elderly age group, accounting for 75 per cent of this age group. The cause of these differences was not currently understood and required further investigation.

The dominance of males in the elderly dependent age group of 65 and over, as well as the large proportion of the dependent age group 14 and below, echoed some concerns about the working age group's capability to handle and provide for those in need.

The mean age of the working group was 35 years, with the majority falling between ages 19 and 59. In Jamaica the age group 15-18, while considered as part of the workforce, is normally made up of students attending schools.

The age dependency ratio of the sample was 121 dependent persons per 100 persons of working age. There were more dependent persons in the Trelawny region. In Monymusk it was 115 compared with 127 in Trelawny. As mentioned in Chapter 2, in 2006, the all-Jamaica dependency ratio was nearly 70 (PIOJ and STATIN 2007). While the dependency ratio of the sample was relatively high compared with the all Jamaica estimates, 40 per cent of household heads in the sample were aged 65 and over.

Household Headship

The concept of headship is complex. The determination of headship was communicated by interviewees using their own criteria. The person who was the most responsible in terms of control over assets viewed themselves as the head of the household. Control over assets was the preferred term rather than ownership, given that there were families who lease their land and/or rent their houses. For some of the families there was some discussion over headship, particularly when there was a dominant male figure, but as discussions progressed it became apparent that control over assets was the determining factor. In some societies the male is the head, in other societies it is not so. The issue of headship is culturally determined.

Females were the head of households for more than half of the families (Table 6.8).

The majority of the female-headed households belonged to the low income group. Although there was an even mix between female and male-headed households in the upper income group, all the elderly female heads of households were in the low income group. Also, nearly half of the families of the lower income group were headed by the elderly.

Table 6.8: Household Headship by Age, Sex, Household size and Income Levels of the Sample, Jan-March 2008.

Variable	Monymusk	Trelawny	Avg/Total
Male heads	8	5	13
Female heads	7	10	17
Avg age of male	59	68	64 (40-70)
Avg age of female	49	56	53 (26-72)
Low income			
Female	4	8	12
Male	4	4	8
Upper Income			
Female	2	3	5
Male	4	1	5
Household Size			
Female	7	7	7
Male	6	6	6

NB. There were 12 elderly heads of household of which 10 were from the low income group. All five male heads of households from Trelawny were in the elderly age group.

During the interviews, the question was raised as to whether the household heads lived with a partner. Less than half of the number of household head reported that they lived with a partner (Table 6.9).

Table 6.9: Household Headship Relationship of the Sample, Jan-March, 2008

Variable	Monymusk		Trelawny		Total
	Male	Female	Male	Female	
Living with Partner	6	3	2	2	13
Marriage	2	2	0	1	5

Of the remaining heads of households not living with a partner, six reported that they were in a relationship but not living together – four of whom were females. There was no positive association between household heads’ partner relationship and income levels. The heads of households who reported that they had partners were spread across the different income groups. The same trend was observed with those who reported not living with partners.

Household Facilities

All the homes in the sample had their main living sections (bedroom(s) and/or hall way) built from concrete and steel. Of the 30 homes, there were 12 completed houses. These completed houses consisted of bathroom, toilet (flush), kitchen, bedroom and living facilities constructed under one roof with a supply of piped water and electricity. For the incomplete houses, the

main living sections were separated from the kitchen, bathroom and toilet (pit latrine) facilities.

In regard to household tenure, 60 per cent reported that they owned their houses. Rent and rent-free were the tenure of the remaining families (Table 6.10).

Table 6.10: Household Tenure and Access to Facilities of the Sample, Jan-March, 2008

Household Tenure	No of Household	Potable Water	Electricity	Person per Bedroom	Complete House	Incomplete House
Own	18	11	17	1.8	9	9
Rented	8	7	8	2.5	1	7
Rent-free	2	3	4	2.1	1	3
Total	30	21	29	2.1	11	19

All the homes had access to kitchen, bathroom and toilet facilities. It was common among the incomplete houses for their kitchen, bathroom and toilet outer walls to be built from wooden materials (board) and/or metal (galvanised) sheets. Of note, for some of the completed houses, there was the presence of an additional outside kitchen, bathroom and, especially, a latrine. There was a strong positive association between the families of the upper income group and completed houses. Only one member of the better off families did not live in a complete house. For household tenure, there was no evidence of association with income levels.

Twelve of the families did not have ready access to potable water (piped water in households). However, they normally had access to a public standpipe within a one km radius of their home. Water was transported from standpipes to these households in 10 litre plastic buckets by household occupants (mainly children) and was stored at the households in 180 litre metal drums for both drinking and other domestic uses. For those householders with piped water inside their homes, there was still the presence of 180 litre metal drums for storage purposes; this they explained was in case of a water lock off.

At the national level in 2006, the PIOJ and STATIN (2007) reported that more than half of Jamaicans dwellings were overcrowded. The report also showed that while 60 per cent of all Jamaicans were owners of their house of residence, in rural areas it was 70 per cent. In addition, the report revealed that water was connected to 70 per cent of households and 90 per cent of the households had the use of electricity as a source of light, while kerosene accounted for the remainder.

6.3 Sugarcane Production and Management of the Sample Families

To gain an in-depth understanding of the livelihood of families operating on small sugarcane farms in Jamaica, it was decided to examine these families' sugarcane operations and practices. This section deals with the production strategies and management of the sugarcane crop by the families and, in part, will address research question two. The question posed: What are the current strategies of small sugarcane families in Jamaica? Land availability and tenure along with strategies centred on sugarcane production were taken into account.

6.3.1 Land Use and Tenure

Land available to the families ranged from 0.8 hectares to 10 hectares. However, one family from Trelawny was treated as an outlier in terms of land use. This family had 10 hectares of which 1.2 hectares were used for sugarcane and the remainder used for pasture, coffee and root crop production. The family explained that they have been gradually reducing sugarcane cultivation since the late 1990s.

For the other 29 families, land holdings ranged from 0.8 hectares to 4 hectares, averaging 1.8 hectares. Some 95 per cent of the available land was in use. Sugarcane accounted for 82 per cent of the land in use averaging 1.4 hectares. Land cultivated in sugarcane ranged from 0.6 hectares to 2 hectares. Land that was not cultivated in sugarcane was used primarily for other crops including orchard crops (oranges, coffee and cocoa), legumes, root crops and vegetables.

Land tenure type among the Monymusk families was by ownership and Government or private lease. However, in the Trelawny region land tenure was by ownership, private lease and the sugar estate lease (Table 6.11).

Table 6.11: Land Use by Tenure of the Sample, Jan-March, 2008.

Land tenure	No of household		Total hectares		Hectares in use		Hectares in cane	
	M/musk	Trelawny	M/musk	Trelawny	M/musk	Trelawny	M/musk	Trelawny
Own	5	5	14.2	18.8	13.2	18.8	7.8	8
Govt Lease	7		10.4		9.8		9	
Private Lease	3	4	7	4.2	6	4.2	6	4.2
S/Estate Lease		6		9.4		9.4		8.6
Sub Total	15	15	31.6	32.4	29	32.4	22.8	20.8
Total	30		64		61.4		43.6	

In terms of headship by tenure, there was an even split between female and male-headed households operating on their own land in the sample. For private lease agreements, the other land tenure type common in both regions, female-headed households, accounted for more

than half of those reported. While male-headed households dominated the Government leases in the Monymusk region, sugar estate leases were mainly controlled by female-headed households in Trelawny.

An examination of data showed there was no strong association with land tenure and income levels. Tenure types were spread across the different income groups. Even though six out of the 10 better off families were land owners, the third and fourth better off families had lease agreements. Moreover, families of the bottom 20 per cent of the upper income group were land owners.

When the number of years in sugarcane operation was questioned, the mean number of years among the sample was 20, ranging from 10 to 35 years. Some 22 years in Monymusk and 19 in Trelawny. There was no positive association with the numbers of years in sugarcane production and income levels.

6.3.2 Sugarcane Production

Sugarcane production among the sample families has been fluctuating downward since the mid 1990s, reflecting the respective regions and Jamaica as a whole (see Chapter 2 and Section 6.2 of this Chapter). Over the years the sugarcane crop in the regions has faced several problems including long periods of droughts, hurricanes, cattle damage and illicit fires.

The families expressed the view that their inability to maintain and achieve adequate yields stemmed from low sugar prices and the high cost of production. They stressed that if all the recommended practices were to be adhered to, then sugarcane cultivation would be futile and useless. The families explained that they have to manage the recommended practices with great discretion so as to survive in the business. As a consequence, several practices and physical inputs were carried out inadequately, as reflected by the decline in production.

In 2007, sugarcane yields in Monymusk were 30 per cent higher than in Trelawny (55.9 tonnes cane per hectare [tc/ha] compared with 39 tc/ha). Irrigation and other related cultivation practices in the Monymusk region largely explained this difference. Families from Trelawny explained that drought was a serious problem for most of the crop year and that growth was slow resulting in low yields and production. Although there was a vast difference in yields between the regions, there was no difference between the yields of the poor and the better off families. When yield was examined there was no positive association between income levels and productivity.

What strategies were used and how the sample families manage and deal with sugarcane production are presented below.

Replanting

Though the sampled families accepted that it was imperative, in the JSI, to replant once every six years their major concern was cost reduction rather than adherence to recommendations.

In 2007, based on the industry replanting recommendation, some 20 of the families' sugarcane fields needed replanting. Most (13) of these families were from the Trelawny region. The families operating on older fields which needed to be replanted were of the opinion that replanting was too expensive and did not guarantee significantly higher yields. When asked about their plan to replant, they argued that 'supplying'¹¹ of the fields is effective and is a suitable substitute practice for replanting. They pointed out that with the exorbitant cost for land preparation and tillage it was more economical to carry out supplying. The families added that even if they replant their fields, the repeated on-going practice of supplying was necessary, therefore they should just stick to it.

When queries were made on replanting loan programmes facilitated by the industry they shared the view that they learned from experience not to deal with loans to replant sugarcane. They viewed the loan as working without pay. The families explained that for the first three years following replanting it was impossible to realise an income. They said if during those years harvesting cannot be carried out, which was likely, then the repayment period will be lengthened accordingly.

The families pointed out that with the possibilities of illicit fire, cattle damage, drought and hurricane, then the effort needed with a loan to replant cane was not worth it. Families in the Trelawny region showed concern over uncertainty about the survival of the industry in their region so were reluctant to replant.

Fertilisation

Manual labour was used by the sample families to apply fertiliser. It has been customary for sugarcane farmers in Jamaica to receive fertilisers through a credit system operated by the AIJCFA. This system provided sugarcane farmers with fertiliser based on the quantity of sugarcane delivered. The system gradually reduced the number of bags of fertiliser a

¹¹ Supplying is the practice of filling gaps in sugarcane fields with sugarcane stalks to maximise on field population and yield.

particular farmer received, taking into consideration a decline in yield. This was the case with the sample families.

The declining trend in sugarcane tonnes among the sample families, in part, has led to a fall in fertiliser application. Therefore, this gradual under-fertilisation has reflected negatively in sugarcane yields. Although some families have purchased bags of fertiliser to offset for the losses, the general tendency of most families was to utilise what was allotted.

The families declared that they cannot purchase fertiliser from their pockets as it was very expensive, and it was better for AIJCFA to withdraw rather than for them to purchase. They added that with the increased rate of fertiliser prices, families soon cannot afford to accept the quantity allotted.

Furthermore, some of the families admitted that the number of bags that they received from the AIJCFA was sufficient, as they believed that purchasing any additional bag would cause a considerable reduction in their sugarcane income. They were of the opinion that though fertiliser has been vital to yield, moisture was more important and without adequate rainfall yields will always be suppressed. Most of these families were from the low income group.

In 2006, roughly 75 per cent of the industry-recommended fertiliser applications were applied by the families. In the Trelawny region, families applied approximately 180 bags from a recommended 250, while for Monymusk, of the 265 bags recommended only 210 bags were applied.

Crop Protection

A combination of chemicals and manual labour were employed by the families to manage and control weed growth. Although the families were aware of the reduced costs associated with herbicide applications, they explained that the practice of manual weeding was more convenient and, to some extent, it was difficult to resort totally to the use of chemicals. The families were of the opinion that even with herbicidal treatment, revisits to the fields were inevitable so as to achieve proper weed eradication.

The families noted that pre-emergence herbicides, which were recommended for early application, were very expensive and required moisture to be effective; hence, they resorted to the more affordable post-emergence herbicides. They argued that though the herbicides were useful they still have to revisit their fields to do manual weeding which was also very expensive. The families added that with the nature of growth for most indigenous weed species, herbicides alone cannot eradicate the coverage. According to the families, most of the

troublesome weeds (mainly grasses) needed two to three cycles of herbicide treatments and other weeds took two to three manual weeding to even allow average cane growth. This was not carried out. On average, most families have been applying one herbicide treatment and attending to no more than two to three manual weeding.

When asked about the timeliness of their weed control operations, the families said that manual practices were paid for from their own pockets, which often led to delays. They explained that with the arrangement of the sugarcane payments (see Section 6.5.5 below); they were not able to attend to weed management early enough. The families said from experience that the longer it took to deal with weeds the more expensive the programme became.

The families viewed weed management as one of the priority practices among their cultivation management. However, they believed that if they persisted with weed control, which was expensive or required endless effort, then most likely other areas of cultivation would be neglected. In addition, the families claimed that they have to manage the practice with great discretion and, for most part, use the recommendations as a guide rather than a blueprint.

Nonetheless, Lewis (1997) and Allen (1980) have shown that poor weed control in sugarcane production can reduce yields by 30 to 60 per cent.

In regard to insect pest infestation and disease conditions, families were unable to comment or give a precise account of the situation. The families reported that extension officers made visits occasionally in relation to entomological (insect) and pathological (disease) issues. SIRI (2006) reported that under its integrated pest management approach, insect pest populations have been relatively contained island- wide. The report stated that there was presence of the Ratoon Stunting Disease in the Monymusk region, but the incidence was low, and they planned to monitor this and keep farmers informed. The disease can cause yield losses between 15 and 60 per cent (Scarlett, 1980; Falloon 1988; Falloon and Henry; 2005).

Inter-row Cultivation

The practice of inter-row cultivation (moulding) was carried out at a minimum among the families. While the families viewed the practice as useful, they claimed that, with overall high costs of production any additional operation such as moulding would be regarded as a luxury.

Furthermore, they also believed that moulding should be carried out immediately following harvesting so as to make use of any moisture. The families added that without moisture in the

first four to six weeks after harvesting, it was pointless to undertake moulding. They noted that after the fifth week of growth when fertiliser was already added and drought came, then moulding would not make any difference in yield.

In comparison, families from the Monymusk region were more responsive to moulding. In 2007, for example, though three families in the Monymusk region failed to carry out the operation, in Trelawny there were six. Overall, only three (from Monymusk) of the families carried out the operation adequately, as recommended by the industry.

Drainage

Maintaining drains for most of the families was considered optional. The practice was mostly attended to during heavy rains. While all of the families reported that drainage management was a necessity, only half of the sample reported that they had carried out drainage maintenance in 2007.

Those families who did not attend to the practice said finance was the main drawback for not carrying out the operation. They added that drainage was a part of their cultivation budget but the payment received did not allow for the practice to be undertaken. All families, however, reiterated that drainage was essential in achieving improved yields.

Irrigation

Families in the Vere and the Mid Clarendon areas were in the most arid section of the island. This made irrigation necessary for the viable production of sugarcane in those areas. The irrigation system throughout these areas consisted of a network of canals which provided water to sugarcane plots along its path (the furrow system). Water was accessed through a control gateway to the families' holdings via trenches into furrows to the fields. Manpower was then required to control its movement within the fields.

The measured irrigation water reaching the individual field was calculated at the control gateway weir (Wilson, 1989). Logically, the quantity of irrigation water required by a particular family was dependent on the level of rainfall received during the growing period. However, families stated that the actual quantity of irrigation needed was never met, mainly because of the high costs charged.

The families were disgruntled about the irrigation system, which they said was inefficient and cumbersome. They believed that the system utilized excessive quantities of water which were left for the farmer to pay. The families added that the method was old and worthless and should be replaced with a new system which had improved efficiency.

Harvesting

Harvesting of sugarcane in Jamaica was normally carried out by contractors, who undertook the families' cutting, loading and transportation operations. Arrangements of payments for harvesting were negotiated between the estate and the contracting party (usually two weeks following cutting). The cost of each operation was an agreement between the All Island Jamaica Cane Farmers Association (AIJCFA) and the contractors. Sugarcane harvesting contractors almost always handled all three operations as a single package. Even if family members were involved in cutting, they would still be paid by the contractors.

Cost of Production and Returns

Although no survey of the cost of production was undertaken (mainly due to the lack of proper record keeping), discussions with the families and extension officers provided some picture of their production costs.

In 2007, the average sugarcane price paid, the tonnage delivered and the payments received shed light on the approximate cost of production. In the Monymusk region, families received approximately \$35 per tonne, while for the Trelawny region it was \$34 per tonne. Based on the delivery profile, the cost of production (cultivation, maintenance and harvesting) of the sample averaged \$1,642 in Monymusk and \$1,091 in Trelawny.

The returns to the families from sugarcane were based on the direct payments from the respective factory. Attempts were made to investigate further into the families' miscellaneous costs but there were no records, hence, little progress could be made in calculating the return on investment. Discussions with families, however, showed that families in the sample averaged \$278.5 per hectare: \$234 for the Trelawny region and \$323 for the Monymusk region. It should be made clear that these figures were what families received after deduction of major costs. Miscellaneous costs, ranging between 15 and 20 per cent were not taken into account by the families.

Overall, families in Monymusk were found to be more responsive in regard to cultivation management. This was not the choice of the Monymusk families, but based on the fact that irrigation management demanded a level of follow up practices that was not emphasised in the rain fed Trelawny region. The families in the Monymusk explained that they have to ensure that certain practices were carried out so as to realise the benefit from the moisture applications. Practices such as inter-row cultivation, proper drainage, weed control and supplying were areas of cultivation that required particular attention for irrigation to be

effective. Weed control management, for example, which was very expensive, called for careful monitoring due to the rapid growth of weeds as a result of irrigation applications. This explained the reason the Monymusk families reported more cycles of herbicides and manual weeding than the Trelawny families.

Although Monymusk families spent more and recorded higher yields, they did not end up better off than the families in the Trelawny region. As shown below in this chapter, the better off families in the sample had to do with incomes other than sugarcane returns. This provided evidence that sugarcane was not the solution for these families.

In the following section the interviews were extended to include the families' livelihood systems. A checklist of questions (Appendix A.9) was adopted from the DFID sustainable livelihoods framework which was selected as this study's theoretical and analytical structure. The checklist of questions was used as the interview guide to investigate and gain insights in the livelihood system of the sample families.

6.4 The Livelihood System of the Sample Families

This section aimed to provide an understanding of the livelihood system of families operating on small sugarcane farms in the Monymusk and Trelawny sugarcane growing regions in Jamaica. In so doing, the section sought to address research questions one and two (see Chapter 1 Section 1.5). Addressing both research questions should also shed light on dealing with research question three, which centres on identifying strategies to improve the livelihoods of families operating small sugarcane farms in Jamaica.

The information gathered and the interpretations provided were in relation to the five components of the sustainable livelihood framework. The five components of the sustainable livelihood framework, as presented in Chapter 4, comprised: 1) the vulnerability context, 2) livelihood assets, 3) transforming structures and processes, 4) livelihood strategies, and 5) livelihood outcomes. The findings and interpretations of the sample families are presented below.

6.4.1 Livelihood Assets

The sustainable livelihood framework identified five categories of capital (building blocks) upon which livelihoods are built. These include human, financial, social, physical and natural capitals. The sample families' access to, and control over, each of the five categories of capital assets was as follows.

6.4.1.1 Human Capital

Human capital, as defined by the sustainable livelihoods framework, is the skills, knowledge and health status of people.

The information and interpretations provided in relation to the human capital was based on the sample family's educational attainment and skill levels. Children's enrolment and school attendance rates were taken into account. In addition, information on the families' access to potable water and sanitation were gathered (see above Section 6.3). Common knowledge shared and sources of valuable information among the families were also analysed.

Education Attainment

All the adult members in the sample reported that they have attended school at some level. However, more than half (55 per cent) did not go beyond the primary level.

While some 34 family members reported that they commenced secondary education, 20 members said that they did not complete the programme. Pregnancy was the main explanation for the female drop out, while responding to personal needs and responsibilities were explanations for males.

Although there were higher secondary drops outs among the females, far more tertiary trained (or in training) members were females. While members who reported that they were drop outs belonged to the low income group, all the tertiary level members were from the upper income level. This was a marked distinction between the poor and better off families in the sample.

It is normal in Jamaica for children to commence school at age three. Ninety five per cent of the children (3-18 years old) in the sample were reported as enrolled in school. All those who were not enrolled were secondary drop outs. When asked about their level of attendance, the responses were that the younger ages, infants and 11 years and below (primary age) had a better record when compared with the 12-18 (secondary age) age group.

The families explained that the infant and primary schools were in closer proximity to their homes than the secondary schools, and sometimes transport fares for the latter were difficult to obtain. They added that even with the Government assistance in place, the Programme of Advancement Through Health and Education (PATH), it was still a challenge to find money each day. The families noted that as a rough estimate, attendance levels were about 90 per cent for infants, 85 per cent for primary and 80 per cent for secondary age children throughout 2007.

Skill Level

The majority of the adults in the sample reported that they have skills but without certification. The members claimed that with long experience and involvement in the world of work, they were capable of handling specific tasks at a proficiency level. Common among the trades males said they were acquainted with were masonry, carpentry, welding, plumbing, barbering, cobbling, tailoring, painting and driving. Females, to a lesser extent, said they were familiar with dressmaking, baking and culinary arts, house keeping, hairdressing and cosmetology. Some male members said they even had the ability to perform up to three or four trades.

Although the members gave the impression that they were skilful at multiple tasks, only 15 out of 82 were certified. Of these 15 reported certifications, teachers accounted for 33 per cent. The other certifications were in business management, housekeeping, building construction (Trelawny), and masonry, electricians (2), clerical principles (2), cabinet making and cosmetology (Monymusk). Apart from the teachers, there was almost an even mix of female and male with certifications. All but one of the certified skill members were from the upper income group. This was another critical factor that distinguished the poor from the better off in the sample.

Health Status

On the health side, 18 families complained that arthritis, diabetes, heart problems and hypertension were common among elderly members. The families explained that though the elderly were the main victims, younger members were also diagnosed with these illnesses.

Eight of the families reported that members outside of the elderly age group were diagnosed with diabetes, heart disease, hypertension and respiratory related illnesses. Most of the families declared that respiratory related illnesses (mainly asthma) were the main problems among the children. Four of the families also reported that children were victims of heart-related illnesses. All families stated that dysentery was a common sickness among the children. There were no reported cases of family members with HIV/AIDS. Analysis has shown that illnesses were reported equally among better off and poor families and, therefore, was not a critical factor to explain income differences in the sample.

The availability of potable water and sanitary facilities were also analysed as part of the health status. As mentioned in Section 6.3 (household facilities), all of the families had access to sanitary conveniences (toilets and bathroom). Some 70 per cent had access to potable piped

water connected in their homes, while the remaining 30 per cent were within walking (1 km radius) distance to public stand pipes. The families explained that in the case of water lock-off for extended periods, they resorted to water hauled by trucks both for free (Government) and purchased (private truckers).

Knowledge and Information

For knowledge shared among family members, costs of living, unemployment and crime were the most frequently discussed. The families said that the news media, friends, community members and extension officers were the main source of valuable information. Radios were reported in all households; while over 80 per cent had the use of televisions. However, only members from five of the families said that they were regular readers of daily newspapers and all were from the upper income group.

6.4.1.2 Financial Capital

The sustainable livelihood framework refers to the inflow of money and the availability of stock as financial capital. The framework recognises that financial capital is one of the most flexible assets. Consistent with the definition, information was collected on access to appropriate financial institutions, forms of savings, pensions and other Government transfers and remittances.

Financial Institutions and Savings

In Jamaica, commercial (and appropriate) financial institutions are accessible through an application form which requires personal details and photographs. It is also a requirement for the photographs and the form to be signed and verified by a notary public (usually a Justice of the Peace) for a cost of \$7. Children under the age of 12 as applicants are required to be accompanied by a trustee, preferably a parent or guardian.

Among the adult population, 30 individuals from 16 families reported that they had accounts with commercial banks. None of the children were reported to have an account. Eleven of the households were headed by females. Overall, there were a larger number of females (18) operating accounts with commercial banks than males (12); but this difference was broadly proportional to the overall adult female to male population.

Among the families who had accounts with commercial banks, six of the families claimed that saving with the banks was carried out rarely. When asked why they became members, they admitted that it was a sense of personal-development and self-worth. Members of five of the families declared that it served as a convenient and appropriate place to handle financial

transactions, such as remittances, transfers and wage transactions. When asked about their form of saving, they commented that they tried to save with the bank but could not accumulate any meaningful amounts since they had to keep withdrawing. They also explained that whenever they put savings in animals, crops or business it was highly risky. Conversely, the remaining five said that it was for savings and business reasons. These five families who relied on commercial banks for savings were members of the upper income group.

The 14 families in the sample who did not have accounts with commercial banks noted that it was pointless to deal with banks without money. When asked about their forms of savings, six (three from each regions) said they are participants in informal community saving plans and where possible try to invest earnings from one entity to another in an attempt to make savings. The remaining eight concluded that they had nothing to save. All members of these fourteen families belonged to the low income group.

Queries were made about institutions as it related to micro-enterprise loans or agricultural credit loans. The families said they have no interest in dealing with those organisations as there was no benefit.

Remittances

Unearned income was divided into remittances and transfers - which includes PATH and pensions. Remittances were responsible for the major share. In 2007, more than half of the families in the sample received remittances. Most of the remittances were sourced from abroad (Table 6.12).

Table 6.12: Remittances Profile of the Sample Families, Jan-March, 2008.

Region	International	Local	Local/International	Total
Monymusk	5		2	7
Trelawny	3	4	3	10
Total	8	4	5	17

Among the major remitters locally were children and fathers of children, while children, close relatives and friends were the main international remitters. Remittances were mainly in the form of cash although appliances, tools, furniture, household fixtures, food and clothing items were also reported. Local remittances were sent more regularly and were mainly in the form of cash and food for assisting with utility bills and children's school costs. International remittances, in contrast were sent mainly during holiday periods, of which cash constituted the main package. Income from remittances among the families was spread across income levels and was not a critical income source distinguishing the poor from the better off.

Transfers (Pension and PATH)

Pensions and the Programme of Advancement Through Health and Education (PATH) were the two other sources of non-earned income among the families. The bulk of transfers were sourced from PATH (see Chapter 2). Some 18 of the families were a beneficiary of PATH. In both regions, children accounted for nearly 70 per cent of this income. The elderly accounted for the remaining portion. There was a strong association with PATH and the low income group. Beneficiaries of PATH were found only among the poor families. Income from PATH was identified as a critical income source distinguishing the poor from the better off among the families.

For pensions, members of six families said they were beneficiaries. There was no positive association between the income levels and pension. Beneficiaries of this income were proportionally spread across the income groups.

6.4.1.3 Physical Capital

The adopted framework emphasises the accessibility and appropriateness of infrastructures when analysing physical capital. Information was collected and analysed on the families' perceptions on access to, and appropriateness of, the important infrastructures serving them. To strengthen the analysis, observations by the researcher were also taken into consideration.

Access to Infrastructure

The sample families' access to the main infrastructures was observed and estimates of distances were discussed. Distances to schools (infant, primary and secondary), post offices, hospitals (and health clinics), police stations and town centres were among the list of main infrastructures examined.

In regard to education access, there was an infant school(s) in all the villages visited. Nearly all of these schools were privately operated institutions. All the infants were within walking distance of school. However, all of the primary schools the children of the families attended were public. It was observed that nearly 90 per cent of the families were living within a two to two and a half km radius from these schools. The remainder were living within a three to three and a half km radius. Analysis showed that some of the better off families sent their children to school of choice compared with poor families who accessed school in close proximity.

The majority of the primary scholars walked to school as their daily routine. For the secondary cohort, there were differences in modes of travel. Nearly three-quarter travelled by bus to school, while the remaining lived close enough to walk.

With reference to health access, there was a clear distinction between those who relied on public hospitals and private practices. All families from the upper income group said that private practice was their main source of primary health care. This was in contrast to most poor families, who depended on public hospital for health care. The average distance of travel for family members to general hospitals in both regions was 12.5 km, ranging from eight to 17 km.

Post offices were found in close proximity and within walking distance of the sample families. They said that it is the usual duty of children to maintain regular postal checks while returning from school.

Police stations were moderately distributed throughout the regions. On average, family members were 6 km of travel from the facility. The average distance was the same for both regions.

Small town centres were sited along the respective regions' main thoroughfares. In some instances families walked to these towns. However, when the main townships (parish capitals) for major businesses and other economic activities were taken into account, the average travel distance was 9 km. Based on the explanation of the families, there was an inclination for the better off to carry out their shopping at the main townships as compared with poor families who resorted to shopping nearby.

Appropriateness of Infrastructure

The analysis of infrastructure appropriateness was based on the families' perceptions, and partly by the researcher's observation. On average, the families reported that some of the infrastructures were suitable and, to some extent, provided the needed service. However, they all complained about the deplorable road conditions (both in local and main thoroughfares) and the high cost of transport servicing commuters.

While the families said the infrastructures needed expansion and more classroom facilities were needed in the public school system, they also complained about limited space and inefficiencies in the public health care system. They argued that the general hospitals cannot house and handle the number of patients requiring close medical attention; therefore they were forced to be dealt with as outpatients. This they said was risky and precarious. However,

according to the PIOJ (2008), in 2007, in-patient care provided by the 24 public hospitals had an average of 4,207 beds with bed occupancy of 60.9 per cent.

Half of the families (9 from Trelawny) cited their post offices as being inefficient, beyond repair and needing to be replaced. They reported that the facilities have been broken into on several occasions and community members have lost trust in their services. The remaining half said that the facilities were fairly suitable, but argued that there was the need to implement some form of security system at each location.

The position the family members took on the quality of the police station lock-ups (jails) was discouraging. When the question about appropriateness of police stations was raised, their primary concern was the conditions that accused persons faced. Over crowdedness, insanitary conveniences and inhumane brutality among inmates were a few of the descriptions. The few male members who lamented much on this issue said that the situation was unbearable and that the punishment does not fit the criminal and accused. This has implications for human rights.

6.4.1.4 *Natural Capital*

The adopted framework refers to natural capital as the natural resources from which flows and services are derived. To analyse the natural capital of the families, information was collected in relation to access to, and productivity and versatility of natural resources, together with evidence of conflicts over resources.

Apart from land, most families had access either to the sea, rivers or woodlands. In terms of productivity, all families observed that there were significant declines in land productivity (in terms of sugarcane yield) over the years. The families having access to woodlands also claimed that the overall vegetation cover had been depleting, particularly in the Monymusk region. When the families with access to rivers were asked about the stock of fish, they said there has been a gradual decline in population and extinction of some species compared with earlier years. The families having access to the sea shared similar views.

In terms of conflict over resources, all families declared that cattle damage to sugarcane had stirred deep grievances among community members across the regions. They added that the problem of cattle and goat damage had been a long term issue to families operating on sugarcane plots and this has led to an on-going battle that seemed endless. The families described the conflict as a vicious cycle that at times gets out of proportion. For example, where cattle were impounded or goats killed for the damage done to sugarcane, sugarcane fields would then be put on fire. In addition, eight (six from Monymusk) of the families

reported that trivial land boundary disputes sometimes came into play but were usually and quickly settled by the authorities.

Families with access to woodlands in the Monymusk region said there were limitations to its use due to high competition for materials such as logs, charcoal materials and rails. They pointed out that because of the relatively small size of the woodland area, along with the competitive nature of the common users; they did not rely on its use. The families who cultivated the woodland in the Trelawny region added that disputes over praedial larceny were common. The families with access to the sea stated that once fishing nets were set by fishermen, disputes were common.

Regarding the versatility of resources, the users of the woodlands in the Monymusk region reported that stones, herbal materials and ornamental species were sometimes taken from the woodland for personal household use. They noted that stones from the woodland were also used in the construction industry. The Trelawny families acknowledged the benefits derived from the woodland with its numerous ornamental, birds and animal species.

6.4.1.5 Social Capital

According to the adopted framework, social capital is developed through connectedness or memberships of organisations or groups. Therefore, information collected on families' involvement and participation was the basis of analysis of the families' social capital.

All families had one member who had been a representative of the All Island Jamaica Cane Farmers Association (AIJCFA). Beside AIJCFA representation, based on adult's involvement and participation, 13 (eight from Trelawny) of the families reported that they were not members of any organisations or groups. All were poor families.

For those who reported membership or connection with groups, church represented the largest group, while members of sports and youth clubs followed. Christianity was the only religion reported, though there were different denominations. Some nine (five from Monymusk) members among the adult population were Rastafarian (all males), who declared that they visited "nyabingi" meetings, held five to six times yearly around the island.

In addition, all school teachers in the sample said that they were members of the Jamaica Teachers Association. The two families in the Upper Clarendon area of Monymusk who were citrus growers noted that they were members of the Jamaica Citrus Growers Association. Another family involved in coffee farming in Trelawny were members of the Coffee Growers Cooperatives.

Members of three families said that they were active members of political parties. Members of four of the families said they were fraternity members in social clubs such as Lions and Kiwanis clubs in their respective regions.

Analysis showed that there was positive association between the professional group membership and the upper income group in the sample. The families in the upper income group tended to report more on their connections with professional groups. However, when friendship was examined across income group, there was no difference between the poor and the better off. Though the poor referred to friends more than the better off, it appeared that there were also strong links between the better off and friends from their various groups and associations membership. The relationship between social capital and income levels was, therefore, complicated. There exists the need to investigate this asset category further to gain an understanding of this variation.

6.4.2 Transforming Structures and Processes

The institutions, legislations, policies and organisations are the transforming structures and processes within the adopted framework. The data collected and analysed were based on the perception expressed by the families in relation to the effectiveness of the structures (public and private) and processes and how it impacted on their livelihoods. Discussions on the families' level of political and human rights were also taken into account.

To gain the insights that were relevant to the study, families perspectives on aspects of political power, organisational (both public and private) behaviour and efficiencies were sought. It was believed that the analysis in relation to these views of the families would provide an understanding of the interactions that exist between the families (micro) and the Government (macro) levels, which was consistent with one of the major principles of the adopted framework.

As a starting point, families were asked how they viewed political power. The analysis of data were categorised into: 1) those families who viewed political power as being reasonably and fairly exercised, 2) those who viewed it as being reasonable in relation to some issues but unreasonable in relation to other issues and 3) those who perceived it as always being biased.

The analysis showed that 18 of the families viewed political power as biased. The majority of the families who shared this view were from the low income group. Of the remaining families nine expressed the view that it was reasonable in relation to some issues and unreasonable in relation to other issues, while three noted that political power was integral to people's

livelihoods and that it was reasonably exercised. Most of the nine families were from the upper income group.

When asked why they perceived political power as biased, their explanations pointed mainly to the uneven distribution and share of benefits. As members of a poor family in Monymusk put it, “there is no way that political power in Jamaica can be exercised fairly. Politics in this community are built on favouritism. For us, politics is a mutual relationship, where, if we vote and the party wins then we are dealt with good; if you don’t vote then you know that there will be no help. Similarly, if you vote and your party lose then you have nothing to achieve. The affair is one-sided and the equation cannot be balanced”.

The families who perceived political power as reasonable in relation to some issues and unreasonable in relation to other issues pointed mainly to the democratic systems and compared the Jamaican political system with other systems of governance. They argued that the democratic political system allowed people to vote and possibly have a voice. However, they admitted that there were gaps to be filled and issues to be resolved by those who were in control. They are of the belief that politicians should take time to implement measures that can assist and ease the economic pressure from people.

For those who perceived political power as exercised fairly their head of households were political party members. These families took the stance that politics was a necessity and was a vehicle designed to provide leadership among people. Members of a Monymusk family explained that “politics is the driving force of the community. It therefore means that people must depend on it for survival in one way or another. Some people view it as bad and dangerous while some see it as good. For us it is good”.

The families’ views on political power offered the insight necessary to examine the effectiveness and efficiency of the organisations they were served by. To determine organisations’ effectiveness and efficiencies, the families were asked to comment on the access, the quality and delivery of services provided. It was believed that the discussion allowed for a better understanding of the policies impacting the livelihoods of the families.

The data analysis focused on two categories, those families who viewed most organisations as effective and efficient and those who viewed most organisations as ineffective and inefficient. Even though all families viewed most organisations as ineffective and inefficient, some two-third maintained that it was the result of Government policies that fuelled the overall downturn. The families explained that private organisations endeavoured to be effective and efficient but were suppressed by Government policies and regulations. They still believed that

there were a few private organisations that made the effort to provide standard services but, disappointedly, they were disrupted while doing this.

The families complained especially about the management style of the Government, which they believed had failed to deliver the services needed. They believed that any potential that private organisations possessed to be effective and efficient will be challenged by Government intervention. In addition, the families said that the Government lacked the ability to create the type of business environment necessary for organisations to function effectively and efficiently. As members of a Trelawny family pointed out, “taxes, unemployment, crime and widespread social disorders, inefficient service providers, relatively low salaries, low level of foreign investment, the continuous sliding of the local currency, high debt, undermined development practices, and high costs of living are the characteristics of the current Jamaican’s living environment; such conditions cannot favour organisational efficiency and effectiveness.”

Families questioned the purpose of Government. A family member from Trelawny argued that “Government is the ultimate authority in any system and should be controlling prices and contributing to the improved conditions of its people. If they cannot manage, then, why go ahead and take responsibility”. For example, they said it was a tendency for local grocery operators to increase food items because there was an increase in taxi fares. The families said the grocery operator claimed that it is the taxi fare that made the items increase. They believed Government should ensure that if they were not controlling prices then there was the need for some kind of system to reduce this distorted behaviour. While members in the upper income group tended to make suggestions about improving the system, poor families blamed the Government for their situation.

When asked specifically about development assistance organisations, all affirmed that development organisations, both Government and non-Government organisations, were sometimes supportive. However, they added that though they were appreciative of development organisations efforts, only minor gaps were being filled. The families were strongly convinced that the effort of the different development bodies were too often derailed and failed to achieve their objectives. Similarly, members of the community group discussions perceived development assistance organisations as frequent failures in accomplishing the core tasks at hand. In the community group discussion, members pointed out that there was confusion in policy setting between the various bodies including Government, non-Government, private and civil organisations, and the people.

While families and members of community group held discussions to express their views on the institutional and policy environment, a key informant (head of the Sugar Transforming Unit) in the Ministry of Agriculture gave an update of the current plan for the families instituted under the Sugar Area Development Programme (SADP). The SADP was implemented in 2008 as a result of the announced EU reduction in raw sugar prices. The key informant said the cut in raw sugar prices would lead to high cost sugar producing factories unable to continue operations and that the dependent areas would be affected by reductions or losses of income. The Government would address this fall-out under the SADP. The project would be sponsored by the Government, the private sector and the EU Commission.

According to the PIOJ (2006), following the announcement of the reduction in raw sugar prices, the EU has provided a compensation package as part of its accompanying measures to African, Caribbean and Pacific sugar producing states that would be affected by the reform. The project was scheduled to start in 2008 and end in 2015 as a part of the restructuring plan of the Jamaican sugar industry (PIOJ 2006) (see Chapter 3 and Appendix 5).

The key informant explained that the SADP project would integrate the social, economic and environmental factors in an approach towards sustainable development. The SADP would ensure that there was a widening of the economic base and make arrangements to design facilities for businesses and investments, as well as encourage crop production on land to be taken out of sugarcane. He added that efforts would be made to strengthen and improve on existing infrastructural facilities such as roads, health clinics, schools, water supplies and sanitation. The key informant elucidated that the SADP would be responsible for informing and heightening the awareness of the residents of affected areas of the plan and intention of the Government. He said that the plan was in its preliminary stage and should be ready for review at the end of 2009.

When the discussion on families' awareness of their political and human rights was raised, members said they were aware of some basic aspects. When asked to rate themselves on a scale of 1-100, on average, the families believed that they were aware of about 40-45 per cent of their basic rights.

6.4.3 Livelihood Strategies

The adopted framework defines livelihood strategies as the activities and choices that are undertaken by people to achieve their livelihood objectives. In the analysis of the livelihood strategies, the livelihood activities of the families, the share of income from the different activities, and their views on the choices they were making was taken into account.

As such, the analysis of the strategies employed by the families focused on the various income sources. The families were engaged in a mixture of agricultural and non-agricultural activities as a means of living. The activities of the families were relevant to the production of sugarcane, other crops, livestock rearing and employment, as well as non-earned income such as remittances and transfers (Table 6.13).

Table 6.13: Income Sources of the Sample, 2007

Source of income	Percentage of income		
	Monymusk	Trelawny	Total
Sugarcane	6.4 (0-10)	5.1 (0-14)	5.75
Other crops	4.4 (0-20)	11 (0-35)	7.70
Livestock	1.5 (0-7)	1.4 (0-9)	1.45
Employment	71 (20-100)	68 (24-99)	69.50
Remittances	11.7 (0-60)	10.7 (0-31)	11.20
Transfers	5 (0-15)	3.8 (0-10)	4.40
Total	100		

NB. Two families were not involved in harvesting of sugarcane in 2007.

The families reported that often the income from remittances and transfers allowed them to reinvest in self-employment activities which accounted for a significant share of their income. The self-employed activities were in relation to small scale manufacturing and commercial activities. The main strategies employed by the families are outlined below.

Sugarcane Activities

Sugarcane was the major crop grown by 28 of the families. Coffee was the dominant crop grown by one of the families in Trelawny, while citrus was grown by another family in the Monymusk region. All families except one reported that they were involved in cultivation practices; the exception was from the upper income group in the Monymusk region. However, to be flexible with other employment opportunities and to deal with some aspects of cultivation practice, the families said that they relied on hired labour. There was a tendency for the better off families to depend more on hired labour. On average, nearly half of the required cultivation work was carried out by hired labour. According to the family members, sugarcane production was labour intensive and required some level of expertise to carry out some core practices.

Among the sample, there were more members participating in the cultivation of sugarcane from the poor families, averaging two persons per family. This compared with one person among the better off families. There was also more participation of family members in Trelawny compared with the Monymusk families. While adults were the main source of labour for the crop, most of the cultivation was undertaken by men (3:1 ratio). Although

participation by children was quite low, some poor families reported that they were involved in cultivation but normally attended to only minor tasks. Although the better off families spent less time in cultivation, overall, it was estimated that 25 per cent of the dedicated family members' working time was spent on the crop.

Since sugarcane harvesting is carried out in Jamaica over a six month period, it is during this time in the sugarcane growing communities that seasonal employment opportunities increase. The main members, particularly from the poor families attending to cultivation practices, were aware of this and prepared themselves by managing their fields while, at the same time, attending to other employment. With such a reality, the families admitted that often their priorities cannot be determined. The option to hire or to be hired can be a puzzle for members of poor families. Nevertheless, the families said discretion, though it cannot be anticipated, should always prevail.

Some 27 of the head of households were fully in charge of the sugarcane business. Even though the majority of the heads of households were in charge of the crop, it was observed that all who were not involved in cultivation practices were females. Nonetheless, the families explained that most of the rewards for those who participated in cultivation were in reciprocal forms; cash was seldom involved. The families said that members were aware of the high cost of production and in an attempt to reduce cost efforts were made where possible to avoid hired labour. All of the hired labour, however, was paid in cash.

Beside sugarcane, families reported that they were involved in other activities as a means of living.

Other Crops

As mentioned in Section 6.4, other crops were cultivated aside from sugarcane by the families. Twenty five (14 from Trelawny) families reported that earnings were generated from crops other than sugarcane, in 2007. However, 10.8 hectares out of a total of 17.8 hectares allocated to crops other than sugarcane were grown by just two families. Accordingly, these were treated as outliers in regard to income from other crops. The family mentioned in Section 6.4 who cultivated coffee as a major crop in the Trelawny region reported earnings from other crops (including coffee) that accounted for 28 per cent of the sample total earnings from other crops in 2007. Another family in the Trelawny region estimated that some 35 per cent of their income came from other crops and this accounted for 18 per cent of the total earnings from other crops in the sample.

For the remaining 23 families with crops other than sugarcane, the average area of these crops was 0.3 hectares ranging from 0.2 hectares to 2.8 hectares. Earnings from other crops of these 23 families averaged 6.2 per cent as a percentage of the sample total income.

But even without the two outliers, the analysis showed that the contribution of other crops to total income exceeded that of sugarcane. While earnings of the families in the Monymusk region from sugarcane surpassed that of other crops in 2007 by 18 per cent, earnings from other crops in Trelawny were 22 per cent more than sugarcane. This can be largely explained by the access which Trelawny families have to woodland. Of the nine families operating in the Long Pond area, five reported that they were users of the woodlands, mainly to cultivate root crops – chiefly yams. Four of the five families had earnings from other crops that were higher than that of sugarcane in 2007.

Although the families said that cultivated vegetables, legumes and root crops made major contributions to their overall earnings from other crops, cash sales from yard fruit crops were also significant. Crops grown around the homes such as ackee, mango, breadfruit, tamarind, guinep, cashew, june plum, avocado, sour sop and nesberry were among the common fruits mentioned.

All families who earned from other crops said that there had been a demand for those yard fruit crops since the operation of food processing plants. The demand for these fruits was a result of the Jamaican diaspora, particularly residing in North America and the UK, who had been requesting these items. The families clarified that these fruit tree crops were traditionally a part of the household's natural vegetation. They said that little emphasis had been placed on cultivation practices of these yard fruit tree crops. Though the analysis showed that other crops beside sugarcane played an important role in the on-farm income portfolio of the families, other crops was not a distinguishing factor in explaining income variations in the sample.

Livestock Production

Nineteen of the families reported that they were involved in livestock rearing. Broiler chickens, goats, cattle, pigs, bee and yard fowls (common chicken) were reported among the classes. Broiler chickens were the most common among the stock followed by yard fowl, goats, pigs, cattle and bees.

Eight of the families were engaged in broiler production. However, the families involved complained about the relatively high price of feed. Broiler production among the families was

strictly for marketing. Offal such as the feet, liver and gizzard were used for their own consumption. Yard fowls were raised primarily for eggs by seven families, three from Trelawny. Eggs produced were used for their own consumption and where extras were produced they would be marketed or given to community members as part of the social network.

Though praedial larceny is a major hindrance to livestock development, the families shared the view that owning livestock was one of the popular forms of savings. Although goat rearing was the most affected by praedial larceny, it was the most popular of the stock among the families in the Monymusk region. The popularity of goat production was explained by the high demand and lucrative prices received for the meat. Also, the families added that the ease at which the production system was designed compared with other stock classes made it more attractive. When other families were asked why they were not involved in goats given its lucrative returns, they expressed the desire to be engaged but said that they were fearful of the perpetrators of larceny.

All the families who were involved with pig production expressed dissatisfaction over the prices they paid for feed. They explained that markets were sometimes a problem coupled with purchasers of the stock who often delayed payments. The pig producers also reported that frequently the stock becomes a target for praedial larceny.

Of the 37 cattle reported, 35 were from the Trelawny region in which one family accounted for 30. Although most families recognised that cattle production was a viable concern, they also noted that the lack of land space and praedial larceny were hindering factors. Most of the members believed that cattle production was too much of a burden and that it demanded a lot of their time and money. They were also concerned about the social problems and conflicts associated with cattle and sugarcane production.

Only one of the families, from Monymusk, was involved in honey production. The family members reported that the industry was under threat from disease and production had been declining since 2004. All in all, livestock production was distributed proportionally across the different income groups of the sample.

Employment

Although employment activities contributed to the bulk of the families' income, only 11 members were in full-time employment. The active workforce of the families was made up of 82 persons between the ages of 19 and 68. The employment status of the families was based

on the active workforce during the fieldwork exercise, where family members were asked to give an account of their work schedule, if any, during the week of the interview.

There were 30 members, 23 from Monymusk, outside the workforce. As defined by STATIN in Chapter 2 Section 2.4.4, those outside the workforce were reported as full time students and those incapable of working - mainly the elderly.

Some 25 of the 82 active workforce members reported that they were not in a job at the time of the interview. Of the 25 unemployed members all were from poor families of which 20 were females. Overall, the remaining 46 members of the workforce were contingency (part-time, self-employed and irregular employment) workers.

When asked to comment on activities apart from their own sugarcane, other crops and livestock production the members' discussions encompassed a combination of farm and non-farm engagements. Five of the 11 full time workers were Government school teachers (all female). One female was employed as an administrative clerk in the Government agricultural service industry, and another female was employed full time in the private hotel and tourism sector as a housekeeper. Four males were employed full time in private employment as taxi operators and security personnel.

In terms of the contingency engagement, the sugar factories (both factory and field employment), the cottage industries, community and personal services, the restaurant and retail industries, the agro-processing industry, and the construction industry were prominent industries employing most of the part-time workers.

Tradesmen and artisans including cabinet makers, cobblers, barbers, dressmakers, tailors, welders, auto mechanics, butchers, bakers, plumbers, fishermen, charcoal burners, bus loaders, retail shop keepers and cooks were among those who were self-employed. However, petty traders (vendors) head the list of member's involvement in self-employment. Some 19 family members who reported that they resorted to petty trading for a living all belonged to the low income group. The artisans explained that because they were seldom called to tasks, they have to resort to vending for a consistent income. They were of the view that the unemployment rate would have been higher if there were no remittances. The members explained that part of remittances was usually invested in vending even though the returns were low. They perceived vending as a means to break unemployment cycles and to avoid the burden of dependency.

Most of those who reported irregular employment during the interview period, said they were involved in building construction tasks and community personal services and farm-related activities. Those members who reported irregular employment declared that they were actually unemployed and most admitted that with the level of hardship they were faced with, they are willing to accept illegal offers.

When queries surrounding illegal activities such as peddling, gambling, larceny, prostitution and pimping were raised, most of the families said that they were not engaged or supporters of illicit practices. With caution, nonetheless, members of four families whispered that they occasionally cultivated small plots of marijuana. Two families accepted that they were illegal sellers of lotto (gambling) and when available they retail marijuana. Three males and two females also accepted that they were small traders of marijuana. A vendor noted that without selling marijuana at her stall there would be no business. Members of two of the families said that on weekends they operate a gambling den just to send the children to schools. They explained that a small fee was collected for using the facilities. In addition, four of the middle-age females disclosed that they are not commercial sex clients but when needs arose they were available for business. Another male said that on weekends he was a regular tout for horse racing. Two families in Monymusk and one in Trelawny also disclosed that their electricity source was illegally connected. Two families, one from each region, said their piped water connection was also illegal. All explained that these activities made a significant contribution towards their livelihoods. All were members of poor families.

Community discussion groups from Monymusk revealed that the Vere area was the hub for the parish's drugs and gun smuggling ring and that prostitution, though carried out discretely, was a common practice throughout the main townships in the parish. The community discussion groups in the Trelawny region also mentioned an increase in extortion behaviour as a lucrative money earning activity for youth in the town centres.

Central to the community group explanations was that drugs trade has been the nucleus of the gun trade and the build-up of gangs, as it was said to be highly rewarding. Prostitution was also common and was an integral means of survival for females and pimps while extortion has been the catalyst and supporting element for corrupt lifestyles. The members stressed that all three major engagements reflect each other with consequences such as HIV, murder, and abduction and were consequently a precarious living. They concluded that the network of prohibited activities sometimes included the innocent. This the community members believed, will certainly impact negatively, particularly, on the socio-economic structure of these townships in the medium to long term.

How the families organised their farm activities and work schedules in relation to the time of the year are presented in a seasonal calendar form (see Appendix 11). Although the calendar did not deliberately include dates regarding non-farm activities it captured the various management strategies that were employed by family members.

Options and Choices of the Families

Members of 24 of the families believed that employment and migration were currently their choice to overcome the struggles they faced. They claimed that they do not have a choice over what they are currently pursuing as a living. The members pointed out that there were limited, if any, employment opportunities in the regions, which forced the majority of persons to be contingency workers. These contingency workers were characterised by low incomes. The members observed that without remittances, transfers and, for some, illegitimate lifestyles, children would most likely not be able to attend schools regularly and on occasions would have to settle for low nutritional intakes.

For those six families who did not suggest migration, four reported that upgrading their qualification and the development of their career was a priority, while the remaining families said business expansion and crop diversification were the choices. The families who chose to upgrade their qualifications all had members who were trained teachers. All the members who did not suggest migration as an option were from better off families in the top 60 per cent of the upper income group.

6.4.4 Livelihood Outcomes

The livelihood outcome component of the adopted framework focuses on the result of the livelihood strategies. While reduced vulnerability and increased well-being were the aspects of the component relevant to the families, the analysis focused on issues on the families' security against violence, crime and assets, factors affecting set goals and changes of income over time.

In regard to security against violence, crime and their assets, all of the families expressed grave concerns about the risks of violent crime they are faced with. Murder, robbery, shooting, rape, carnal abuse, abduction, break-ins and praedial larceny were the types of crime they faced frequently. The families said that they were living among the perpetrators in their respective communities, and it was extremely difficult to cope with such level of crime which trended upward from year to year. They shared the view that they were not secure against

these actions, as members of the community discussion groups said “even if you are bodily armed and police are living next door, you are equally a potential victim”.

Moreover, 26 of the families added that their assets were not secured against such actions as physical damage or natural disaster. The families pointed out that there was the access to insure their assets against damage and disaster but they were not financially capable of doing so. The remaining four were members of the upper income group who disclosed that their houses were insured but not their farms.

In response to the factors affecting their set goals, the families declared that, among the several obstacles the lack of employment, crime, inadequate land and Government policies have been the four major factors preventing them from achieving their livelihood objectives. They explained that without employment, in the first place, there was no scope for economic and social development. Although, the families were aware of the limited access to resources, together with the high cost of living relative to income, plus the larceny, crime and violence, they maintained and emphasised that Government should be the decisive factor in determining their quality of life. They were of the opinion that the Government lacked the initiative to create and implement employment opportunities, particularly for the youth. The families added that failure by the Government to support and provide assistance to small farmers reflected negatively on their livelihoods.

Members of the community group discussions acknowledged that there may be assistance for farmers, but for the most part small farmers neither received nor benefited from such undertakings. They recalled a replanting loan programme in 2001-2002, where most small farmers could not meet the criteria for accessing the loan. The members said the criteria were set at relatively high sugarcane yields that could not be met, as well as the farmers were reluctant to jeopardise the collateral needed. They were of the opinion that, over the years, Government have documented plans for the small farmers, but in reality they have never been executed.

In the analysis, income and cost of living were the focus of changes that had taken place over time. The families agreed that livelihoods were much better up to the mid 1990s. They observed that Government agricultural programmes up to the mid 1990s were structured around assisting small farmers; this trend they said has changed. In comparison, the families reported that the cost of living has been outstripping income increases particularly over the last ten years. They explained that any increase in income has stemmed from the devaluation of the local currency since the mid 1980s; with the equivalent cost of goods and services

increasing at a much higher rate. For example, the families observed that previously they could adhere to all the recommendations in sugarcane production and still see a reasonable return, but currently this was impossible. They complained that the high cost of inputs compared with the prices received for sugarcane automatically made the business discouraging.

In terms of income distribution, 20 of the families averaged \$802 per capita or \$2.1 per day in 2007. Females were the head of 12 of these households of which six were from the Trelawny region. Members of these families complained angrily about the high cost of living and explained that their income was evident of hardship as they outlined the difficulties they faced in providing for their basic day to day household needs. They viewed themselves as being poor.

The per capita income of the sample averaged \$3.52 per day; \$3.62 in Monymusk relative to \$3.42 in the Trelawny region. Annual income per capita ranged from a low of \$1.7 per day to a high of \$22.5 per day (Table 6.14).

Table 6.14: Income Distribution of the Sample Families, 2007

Income level	Number of families		Range (\$)	Average (\$)
	Monymusk	Trelawny		
Upper Income	6	4	5.2 – 22.5	8.8
Middle Income	3	7	2.1 – 3.1	2.3
Low Income	6	4	1.7 – 2.0	2.0

As stated in Section 6.3, there was great disparity between the better off and the poor families in the sample. The difference between the average per capita income of the upper income group and the middle income group was \$6.5 per day compared with a difference of 30 cents per day between the middle and low income groups. These patterns of income distribution have shown that there was a clear difference between the 10 families of the upper income group and the remaining 20 families. This distinction defined the better off (upper income group) from the poor (low income group) in the sample. The average per capita income of the top 10 per cent of the families was eight times higher than the lowest 10 per cent.

Overall, on a comparison basis, the better off families had fewer children per household, smaller household size, higher education achievements, more access to complete house facilities, established membership with professional groups, participated in non-farm lucrative employment, depended less on sugarcane for a living, resorted to private practitioners for primary health care and spent less, as a percentage of their income, on food than the poor.

Food security and purchases will be dealt with in the following section under the vulnerability context component.

While the majority of the poor participated in the informal sector by petty trading, vending and illegitimate activities, the better off were involved in the formal sector as teachers and certified skill workers. Illegal involvements were not reported as part of the activities portfolio of better off families. Most of the better off had savings with commercial banks as compared with informal partnership savings plan of the poor. It was also revealed that the most of the better off resorted more to the printed media for valuable information. The children of poor families relied on nearer schools when compared with the better off who tend to send their children to school based on choice. The poor families were also beneficiaries of the national social safety net programme (PATH) that the better off were not part of. Unlike the better off who explained that there was room for improved governance, it was the tendency of most poor families to attest the blame of their failures on the Government.

6.4.5 The Vulnerability Context

Based on the sustainable livelihood framework, the vulnerability context refers to the environment in which people exist. The environments in which people live are often affected by shocks, trends and seasonality over which they have no control.

Given that the components of the adopted framework is interactive and overlapping, insights about the nature of vulnerability of the families were, in part, provided in the above four components. However, to gain a full understanding of the risk they faced, the analysis was extended to include marketing trends of produce and price variation, income opportunities, the proportion of income spent on food, and the most difficult time of the year.

In terms of marketing trends, as mentioned in Chapter 1, the EU preferential sugar market of which Jamaica is a supplier began reducing its prices by 36 per cent starting in 2006 and this will take full effect in 2010. The families shared the view that the magnitude of the price cut will cripple all the management strategies implemented. They made reference particularly to the increasing and relatively high cost of production and acknowledged that the reduction in cultivation practices have already been reflected in their yields and, consequently, a significant reduction on their returns. The family members noted that any reduction of sugarcane price will lead to families leaving the industry. The key informants (head of the sugar transforming unit and chairman of the AIJCFA) agreed that some small farmers will definitely be unable to survive the sugar reform. As discussed above plans were ahead to

incorporate those farmers under the Government Sugar Area Development Programme (SADP).

In addition, the families recognised that though the crop was marketable, they can be faced with problems such as natural disasters (hurricane and/or flood), fires, cattle damage and, to a lesser extent problem with the factory or harvesting contractors. They said that in the event of a problem meaning they were unable to harvest for a year, then their returns would affect the following harvest. The analysis showed that for the four year period 2004 to 2007, nine of the Monymusk families reported that their sugarcane was harvested only three times. For the Trelawny families, the situation was more severe - only five in 2005 and eight in 2004 had completed their harvesting. This was as a consequence of illicit fires, cattle damage, a hurricane in 2004 and floods in 2005 as well as a factory stoppage in 2005.

In terms of price variation, throughout the JSI the prices paid to farmers for sugarcane were in three payments. The families observed that the first payment, which was a week following harvesting, was usually absorbed by harvesting and fertiliser costs. They said the second payment, which was received following the termination of the harvesting season was usually just enough to cover the 'out of pocket expenses' incurred during cultivation of the crop. This, they explained, left them without funds to cultivate. The Chairman of AIJCFA and members of the group discussions also shared this view. The families further explained that there was no profit derived instead the returns were a form of saving. The families stated that what funds they will use to cultivate the cane was always a challenge.

For the marketing and prices of other crops, the families complained that praedial larceny was a major drawback. They added that during the drier months there was a reasonable demand especially for vegetables, but families were sensitive to the problem of praedial larceny and were reluctant to invest. There were fluctuations in prices for the crops produced, which usually have a spike period during the drier months.

In regard to livestock production, the families said that the marketing of broilers was inconsistent as most customers such as shopkeepers and cook shop operators took long times to make their payments, which affected their ability to maintain the production cycle. As stated in Section 6.5.3, they complained resentfully about praedial larceny problem with livestock as well as high cost of feeds.

With respect to food security, on average, families' own production accounted for about 27 per cent of their total food needs in 2007. While there was a higher share of own production to total food needs among the Trelawny families, food purchased as a share of income by the

Trelawny families was also higher. The analysis showed that families in the Monymusk region spent an average of 55 per cent of their income on food compared to 60 per cent for the Trelawny families. However, the analysis has shown that poor families spent a higher percentage of their income on food. Food purchased as a share of income by poor families was 65 per cent compared with 40 per cent for the better off. There was no difference between the poor and the better off families in relation to the share of own production to their total food needs.

When asked about the most difficult time of the year, 18 of the families declared that destitution was an everyday phenomenon with no seasons easier than others. Having recognised the various difficulties, these families lamented that each day was a new challenge to provide food and for the day to day needs of their households. All of these families were from the low income group. There was a mixture of responses from members of the remaining 12 families, half saying that preparing to send children back to school was the most difficult time, while the other half identified the out of crop seasons as the most challenging times, that could be very stressful.

6.5 Conclusion

The integrated data interpretation and analysis process led to the identification of five key insights. While the study commenced with the observation that small sugarcane operations in Jamaica were on the verge of collapse, the multiple sources of evidence and triangulation of methods have created the necessary insight to offer balanced views of the situation. The insights in relation to the five components of the sustainable livelihoods approach were incorporated into a framework centred on addressing the research questions. In doing so, themes were gradually identified as the interpretation and analysis process progressed. These include:

The nature of vulnerability - Families operating small sugarcane farms in Jamaica are faced with numerous problems that have reflected negatively on their livelihoods.

Access to Assets - For Jamaican families operating small sugarcane farms limited access to assets is a major constraint towards achieving their aspired livelihoods outcomes.

Livelihood Strategies - Families operating small sugarcane farms in Jamaica with limited resources are not exposed to privileges or options to pursue strategies for meeting their desired livelihood outcomes.

Transforming Structures and Processes - The livelihood outcomes of families operating small sugarcane farms in Jamaica are influenced by Government policies.

Livelihood Outcomes - Families operating small sugarcane farms in Jamaica with vulnerable livelihood systems require far reaching organisational and legislative support to effect positive changes.

These five insights will form the basis of a comparison with the initial insights developed in Chapters 2 and 3 as well as the theoretical developments in Chapter 7. This framework of comparison provides the structure for the discussion in Chapter 8.

Chapter 7

Livelihoods Studies – A Review of Literature

7.1 Introduction

This chapter examines the relevant livelihoods literature to provide a theoretical perspective to the main observations of these studies. As discussed in Chapters 1 and 5, to be consistent with the principles of grounded theory adopted for the theory building process in this study, it was decided between and at the end of fieldwork to look at similar studies of livelihoods to discover their key findings as a basis for comparison and contrast.

Since the literature on livelihoods is central to poverty reduction, the review is primarily based on a number of relevant studies undertaken mostly in Africa, Asia, South America and Europe. The main criterion used for selecting the studies was based on their focus on livelihood strategies. Since livelihood strategies are treated by authors as one of the important dimensions for understanding poverty, the decision was taken to use this as a starting point for conducting the search. How the authors present their findings concerning poverty not only allows the researcher to explore the various components of livelihoods and seek out supporting or contradictory information, but also to examine the policy environment that could shed light on possible answers to research question three.

The chapter starts with a synopsis of the livelihood studies discourse. The importance of understanding livelihood strategies and their interlocking nature with the other four livelihood components follows. The three groups of livelihood strategies – agricultural intensification/extensification, livelihood diversification and migration - based on Scoon's (1998) categorisation are then explored. Next, the interacting nature of livelihood assets and livelihood outcomes, the transforming structures and processes, livelihood outcomes, and the vulnerability context components, are presented. A briefing on the poverty reduction strategies in Jamaica is then reviewed. Development of four theoretical statements concludes the chapter.

7.2 The Discourse of Livelihood Studies

Poverty, rural livelihoods and rural development have been the dominant areas of livelihood studies since the mid 1990s (Farrington et al 1999; Scoon 2009). Although the ideas and themes in rural development have been well documented, particularly since the 1950s, the

perspectives on livelihoods did not gather momentum in the development discourse until the early 1990s (Ellis and Biggs 2001).

Even with the pioneer contributions from Chambers and Sen in the 1970s and 1980s (Haug 1999; Ellis and Biggs 2001), it was not until the notion of sustainable livelihoods was introduced in the Brundtland Commission report in 1987 that numerous responses were sparked. As was presented in Chapter 4 (also see Appendix 8), there was a string of early studies exploring livelihoods and its determinants during the early 1990s (Solesbury 2003). According to Solesbury (2003) and Lynam (2005), the livelihoods concept was put together by Chambers and Conway following their publications on Sustainable Rural Livelihoods, in 1992.

The bulk of livelihoods studies, however, was conducted following the British White Paper in 1997 on international development to reduce by half the number of people living in poverty worldwide by 2015 (Farrington et al 1999). This target prompted numerous reactions, of which a myriad of SL frameworks was one of the notable outcomes. Several studies and projects were carried out in the areas of rural development and rural livelihoods as well as a concerted effort expended on the overall alleviation of poverty.

7.3 Livelihood Strategies and the Interlocking Nature of the Components of Livelihoods

Livelihood strategies and assets, together with the transforming structures and processes lie at the centre of livelihood studies. Understanding the strategies of rural people has huge implications for policy management and development (Allison and Ellis 2001). The overlap between the assets people have and the activities they pursue in making a living is the underlying concept of livelihood strategies (Ashley and Carney 1999; Ellis 2000; Carney 2002). Scoon (1998) argues that the key role in investigating livelihood is to grasp an understanding of the different combinations of strategies that the poor pursue for a living. Basically, as was defined in Chapter 4, livelihood strategies refer to the range and combination of activities and choices that people make to meet basic needs (DFID 1999; Baro 2002; Owusu 2009).

The activities in the Chambers and Conway (1992) livelihood definition are essential in understanding the links that exist between capital assets and the choices people make to generate the income necessary for meeting their desired livelihood outcomes (Ellis 2000). The natural, economic, social and institutional environment that people operate in is a major determinant of the options people make in search for positive livelihood outcomes (Ellis

2000; Goodrich 2001; Conway et al 2002; Thomson 2003). The natural, institutional, economic and social environment can provide opportunities as well as pose considerable challenges for people to achieve their set goals (Goodrich 2001; Kolmar and Gamper 2002). An understanding of the interaction between the components of livelihoods, therefore, suggests that people's access to assets, their capabilities, the income earning activities they pursue and the institutional environment will determine the nature of vulnerability that influence their livelihood outcomes. Here, capabilities are the ability of people to recognise their potential in terms of health status, skill development and social participation (Ellis 2000).

It is established in the livelihood literature that rural households engage in a diversity of activities as a source of income in order to meet their daily needs (Ellis 2000; Koczberski and Curry 2005; Babulo et al 2008). Ellis (2000) believes that the multiple causes of the various livelihood strategies are complex and the associated poverty reduction policy management should be reliably informed of the multifaceted nature of the interactions.

While there are numerous activities rural households pursue, Scoon (1998) identifies that livelihood strategies may be broadly grouped into three categories: agricultural intensification/extensification, livelihood diversification and migration. The ability of rural people to pursue one or a combination of strategies is based on their access to assets (Scoon 1998; Dolan 2005; Freeman and Ellis 2005a). Scoon (1998) adds that the distinctions in socio-economic factors such as age, income levels, gender, religious connection and social relations are major influences on their strategy options. While the degree of livelihood strategies pursued is dependent on the availability of capital resources and socio-economic differences, the level of risk associated with the choices that rural people make is also taken into account (Hussein and Nelson 1998; Scoon 1998). The importance of resource accumulation, income earning activities spread over time and changes in the combination of activities are some of the alternative options that rural people employ as strategies to confront the risks they face (Scoon 1998).

Hussein and Nelson (1998) point out that the nature of livelihood strategies are context specific as diversification strategies for some may be intensification strategies for others. They observe that migration and agricultural intensification strategies are normally combined with multiple income diversification activities to realise overall rural livelihood strategies.

The underlying issue in the literature, however, is whether the institutions and policies relating to these livelihood strategies provide the support necessary for rural livelihoods.

There is an agreement in the literature that the institutions and policies are prime factors in shaping the options required to achieve a sustainable livelihood. Against this background, findings relating to the different livelihood strategies and implications for policy relevant to improving rural livelihoods and reducing poverty are the focus of this review.

7.3.1 Agricultural Intensification and Extensification

Agricultural Intensification

Agricultural intensification is defined as “the increased average inputs of labour or capital on a smallholding, either cultivated land alone, or on cultivated and grazing land, for the purpose of increasing the value of output per hectare” (Tiffen et al 1994, cited in Carswell 1997:3). Carswell (1997) noted that intensification is often driven by an increased demand for produce. The author identifies that increases in output, moving to more valuable production, as well as development associated with productivity improvement, may lead to the agricultural intensification strategy. The FAO (2005) adds that Government policy, trade arrangements, technological breaks-through and public infrastructures can facilitate and strengthen agriculture intensification.

Agricultural intensification strategies for rural households are facilitated mainly by improved technologies (FAO 2005). Technologies, such as the use of inorganic fertilisers, herbicides, high yielding crop varieties, irrigation, farm credit and mechanisation, are stimulating factors that aim to combat food shortages, increase land productivity and improve the income of farmers (Carswell 1997; Gari 2003; FAO 2005).

Indeed, there is evidence of agricultural intensification technology even from the pre-historical period (Johnson 2003; Bandy 2005; Stanish 2007; Fisher 2007). However, the use of advanced technology to improve agriculture productivity became popular following the green revolution of the 1960s.

The contemporary literature on agriculture intensification strategies is strongly linked to the green revolution packages of technology used to increase yields in both crops and animals. There is a distinction in the relevant literature on the impact of agricultural intensification on livelihoods: findings showing that rural people benefit from the strategy relative to views that the strategy is detrimental. However, although there are several findings demonstrating that the strategy is of benefit to rural smallholders, each study gives recommendations for policy improvement. This is specifically taken into account.

With growing populations and the need to provide sufficient supply of food it is evident that agricultural intensification plays a critical role in the growth of the rural economies of developing countries (Hazell 1995). Several studies show that agriculture intensification technologies foster and provide benefits for rural livelihoods. Among these findings, Larson and Frisvold (1996), Wallace and Knausenberger (1997), Kelly et al (2001), Bamire and Manyong (2003), Morris et al (2009) outline the benefits derived from fertiliser use in the intensification process. Common among these findings are increased yields of several crops and hence improvement in income levels and general well-being of rural people.

Bamire and Manyong (2003), for example, show that the use of inorganic fertiliser among smallholder maize farmers in Nigeria provides not only higher yields and the associated monetary benefits but the impetus to continue with cultivation. They advise that policies should target research that promotes profitability so as to encourage intensification technologies. While technology adaptation by rural poor has received some attention in the literature, Tarawali et al (2002) conclude that technologies first need to realise some form of benefits before the practice can be perceived as reliable.

For irrigation, Dey et al (2006), Mukherji (2007), Bhaduri et al (2007), Sharma (2008), Alauddin and Quiggin (2008) among others emphasise the vital role irrigation plays in poverty alleviation. Similar to the findings from authors who focus on fertiliser use in the intensification process, enhancing income, increasing yields and reducing food insecurity are the usual results. While the authors accept that irrigation is a key element in the intensification process, they pay attention to equity of water distribution, reliability and sustainability of the irrigation system and policy issues relating to poverty reduction.

Mukherji (2007), for example, reports from a collaborative study conducted in China, Pakistan, India, Bangladesh, Vietnam and Indonesia that irrigation schemes offer benefits to employment generation, improvement in crop productivity, consumption, wages, and income, and serve as a linkage between the non-agricultural sector and farming. The author observes that in these six countries the average poverty level in non-irrigated areas is twice as much as in irrigated regions. In support of irrigation in poverty reduction, Mukherji (2007) advises that there must be on-going evaluation in infrastructural maintenance, fairness in water distribution/allocation, efficiency and productivity of water source, as well as sustainability of the environment.

High yielding varieties of crops is another aspect of the intensification literature which impacts on the poor and deserves some attention. Bourdillon et al (2003) assessing the effect

of high yielding maize varieties in Zimbabwe, found that there was improvement in the nutrition and health status among children in the project. Incomes were marginally higher from the high yielding varieties, and participants were able to reinvest in livestock which reduced vulnerabilities of households during time of drought (Bourdillon et al 2003).

Dobermann (2000) believes that improved high yielding varieties are the answer to the Asian irrigated rice yield target of 7 tonnes per hectare by 2020. While improved crop management (nutrient/soil and pest management) is essential to achieve yield increases, Dobermann (2000) states that in the future, where improved technical efficiency most likely will be small, an increase in yield will be largely dependent on higher yielding varieties.

With growing concern in the literature on the potential of agricultural intensification, authors have presented findings of the benefits of the different farming systems on rural livelihoods. Livestock intensification, mono-cropping intensification and integrated crops systems are among those commonly cited. Harris (1996), Hallman et al (2003), Erenstein et al (2007), Aune and Bationo (2008) and Tittonell et al (2009), for example, show that the integration of crops and livestock intensification strategies benefits households in rural areas. Central to their findings is that the interaction of crops and livestock production normally allows households to spread market risk which decreases overall vulnerability and contributes to the stability of total household earnings. Overall, the main ideas for policy intervention were better access to markets and finance, improved infrastructures, heightening the awareness of rural people through demonstration and training, plus providing advanced research knowledge to create options for managing the various intensified farming systems.

Though agricultural intensification strategies appear to be a workable solution for sustaining rural livelihoods, they can be affected by changes in market prices, environmental degradation, labour constraints and lack of capital, as well as foreign exchange earnings (Pender 1998; Lutz et al 1998; Srivastava et al 1998; FAO 2005). Carswell (1997) outlines some consequences of agricultural intensification while examining the effects of the green revolution on rural livelihoods. Among the author concerns are: a) joblessness and environmental problems in rural areas, b) yield declines and the slowing of intensification growth rate, and c) the transformations were not evenly distributed with little emphasis placed on rain-fed farming.

Other authors also express concerns pertaining to the impact of the green revolution and agricultural intensification on livelihoods. Horne and McDermoth (2001) accuse agricultural intensification strategies of endangering rural communities, farmer's livelihoods and

important natural resources such as water and soil. Zwerdling (2009) observes that agricultural intensification is placing Indian farmers into a debt trap. He observes that incurring high costs of inputs, particularly irrigation, is forcing farmers out of business.

Moore and Parai (1996) mention that the process of agriculture intensification is becoming more expensive and less efficient due mainly to high input costs relative to product prices. As a consequence, high yielding rice cultivars in the Philippines have shown productivity declines by almost 40 per cent over a 20 year period (Moore and Parai 1996). They add that the use of machinery, pumps for irrigation and herbicides have replaced the rural labour-force resulting in heavy migration to urban centres, where employment opportunities are also lacking.

Joshi (1999) argues that with average cultivable land in India less than two hectares, the productivity gains from agricultural intensification are not sufficient. The author believes that intensification offers no benefits to farmers particularly in non-irrigated areas. The need to explore the potential of dry land farming, increase investments in the farming sector (including research) and to implement agricultural reform targeting small farm development are the main recommendations of the author.

Ahmed et al (2004) conclude that agricultural intensification strategies lift farm production and have improved employment situations in Pakistan but there is a need for Government policy to support agriculture development in a sustainable manner. The authors identify that no effort was made to help transform farmers traditional thinking, there was an uneven distribution of farm credit, a lack of market facilities and provisions, instability of farm prices and lack of agro-industry facilities to absorb production surpluses. They recommend that an economic model focusing on long term development should foster an effective and efficient farming sector.

There is the evidence that agricultural growth and intensification in the developing world can provide an escape from poverty more than growth in any other sector (Staatz 2007). However, Jhamtani (2009) observes that while Asia benefits from agricultural intensification, of the 500 million reported cases of hunger in Asia, more than 400 million are residents of farm households. Some small farmers in Asia are revisiting traditional ways of cultivation by placing less emphasis on high cost intensified inputs which do not guarantee an increase in yields (Jhamtani 2009). Staatz (2007) believes the link between agricultural growth and poverty reduction rests on technology and institutions, with emphasis placed on markets, trade and research.

In assessing the effect of the green revolution on livelihoods between 1960 and 2000, Evenson and Gollins (2003) conducted research for the International Agriculture Research Centre and found that high yielding crop varieties contribute to increased productivity but vary with location and type of crops. They observe that consumers are usually the beneficiaries of food prices while farmers gain only where the cost reduction goes beyond reduced prices. They believe the green revolution should be widened in scope to ensure that farmers benefit from technology of intensification strategies.

Agricultural Extensification

The livelihood literature normally refers to agriculture extensification as the expansion of cultivated or grazing areas. An agricultural extensification strategy may be viewed as the traditional way of rural farming driven by shifting and rotation cultivation along with rangeland grazing. Comparatively, while intensification seeks to increase or maximize productivity from a particular unit of land, extensification brings other areas into production for realising an increase.

Though agricultural intensification is the emphasis on contemporary agriculture production, extensification strategies are still widespread in developing countries (Goldman and Smith 1995; Ereinstein 2006). The concept of traditional cultivation and extensification is relevant to subsistence farming where the majority of production is consumed by smallholders. However, with the changing market environment resulting mainly from population enlargement, smallholders have extended their objectives to provide for both the household and the output market (Sokoni 2008).

The majority of the livelihood literature perceives smallholder's agricultural extensification as a strategy which lacks the use of technology, inputs, and consequently expanding production to maintain productivity. This continuous expansion of production into different locations, particularly in hilly areas, has led to an increase in deforestation and soil erosion resulting in land degradation, loss of biodiversity and carbon sequestration as well as depletion of soil nutrients (Knickel 1990; Southgate and Graham 2006; Adams 2009).

Authors such as Elnagheeb and Bromley (1994), Angelsen (1995), Grainger et al (2003) and Wood et al (2004), present findings relating to livelihoods and the effect of extensification on forest cover. Though their objectives and results differ, emphasis was laid on understanding the link that exists between Government policies, forest and environmental interests and agricultural development programmes. The issues of land use change, exploitation of intensification technology including capital investment, together with off and non-farm

employment, are found to be a recurring policy consideration for reducing the level of deforestation.

Angelsen (1995), as a case in point, in a study from Indonesia questions the share of shifting cultivation on the level of deforestation. The author says shifting cultivation accounts for a significant portion (up to 45 per cent according to the UN, in 1992) of deforestation in developing countries. Efforts to reduce this strategy have been futile. Angelsen (1995) believes a land rent approach to improve the understanding of extensification strategies should provide sufficient guidance in deforestation policy design. Progress in technology, encouragement of off-farm activities and intensification incentives (though they may be small) and promotion of Government projects are the main focus of the author's design for forest policy development.

Despite the general view of most of the livelihood literature on the detrimental effects of extensification on the environment, there are cases where authors demonstrate that the strategy is followed in combination with intensification to yield positive results. Tachibana et al (2001), for example, show where shifting cultivation led to severe deforestation in the hilly northern section of Vietnam prior to the 1980s. With the beginning of land rights policies and the intensification of technology in the 1980s, the rate of deforestation was significantly lowered resulting in high levels of reforestation. They found that land rights in forested area will reduce the level of deforestation – which is caused by population pressure on the lowlands. The strengthening of both property rights and intensification technologies were the author's major implications for deforestation policy.

7.3.2 Livelihood Diversification

Ellis (2000:15) defines rural livelihood diversification as the “process by which rural households construct an increasingly diverse portfolio of activities and assets in order to survive and to improve their standard of living”. As the definition implies, livelihood diversification refers to the numerous sources of income earning activities for survival in a rural context.

The literature categorises these income earning activities into three broad groups: on-farm, off-farm and non-farm activities. Ellis (2000) explains that on-farm activities are farm families' own account of agricultural production which is crop cultivation and livestock rearing; off-farm activities are concerned with agricultural wages obtained apart from own production; while non-farm consists of all activities other than agricultural engagements.

Non-agriculture wages and self-employment as well as remittances and transfers are categorised as non-farm activities.

Although traditional thinking about rural survival rests on farm earning activities, Ellis (2000) shows that rural families' own-account farming is steadily declining. Ellis (2000) and Barrett et al (2001a) report from studies conducted between 1970s and 1990s that on average non-farm earning activities account for almost 40 per cent of rural household's total income in Africa, Asia and South America. There are also findings from the post communist states in Europe that there is a declining role of agriculture in the rural economy (Davis and Bezemer 2004).

Reardon (1997), however, informs that there is a poor distribution of non-farm earnings among rural households in Sub-Saharan Africa following 23 field studies. Reardon (1997) findings reveal that earnings from non-farm income as a contribution of total income range from a low of 15 per cent in Mozambique, in 1991, to a high of 93 per cent in Namibia, in 1993.

The great disparity that exists between non-farm incomes among rural households in the sub-Saharan Africa suggests difficulties that can lead to uneven distribution of assets, mainly land, in rural Africa (Reardon 1997). According to Reardon (1997), the upper income households' share of non-farm earnings in total income is two times higher than those in the lower income households. In essence, the author gathers that the rural non-farm activities failed to include most rural households. These findings have triggered numerous responses in the literature on barriers to entry of the non-farm economy that further underscores relevant features of livelihood diversification as a strategy for smallholders.

Block and Webb (2001) express concerns over non-farm earning inequalities in post-famine Ethiopia. The authors argue that they recognise the importance of income diversification for improving wealth status and reducing risk factors in Ethiopia. However, their findings support Reardon's (1997) belief that there are inequalities in the share of non-farm earning activities among rural households. Block and Webb (2001) explain that though there are gains from income diversification in the sample, the poorest households are confronted with numerous challenges in realising their diversification choice. With such findings, Block and Webb (2001) caution about intervention into non-farm earning opportunities with the expectation that benefit will be equally distributed. They add that there is a need to understand the differences that exist between household choices and opportunities for intervention so as to capitalise on benefits of non-farm activities in the marginalised areas.

In addition, Abdula and CreoleRees (2001) found similar findings, as demonstrated in the studies of Reardon (1997) and Block and Webb (2001). From studies conducted in Southern Mali, Abdula and CreoleRees (2001) find that poorer households are exposed to fewer opportunities in the non-farm economy and, consequently, receive less income. Households in isolated Mali also take part in fewer non-farm earning activities as do illiterate heads of households in the study (Abdula and CreoleRees 2001). It is the opinion of the authors that the lack of capital and other resources might be a major contributing factor preventing the participants moving from on-farm earning activities. For promoting diversification of the rural economy, it is the role of the Government to provide the infrastructure and resources necessary for supporting poorer households (Abdula and CreoleRees 2001).

Lanjouw et al (2001) also support Abdula and CreoleRees's (2001) recommendations that infrastructures as well as education are special needs for rural households to exploit non-farm earnings opportunities. Findings from the Lanjouw et al (2001) study dealing with non-agricultural earnings in peri-urban areas of Tanzania disclose that income by poor households from non-farm sources are not explicitly higher in a rural context. Lanjouw et al (2001) state that increases in incomes from non-farm activities are closely related to quintile levels. They stress the importance of infrastructural development and access to training and education for lower quintile households in rural Tanzania for realising optimal benefits from the non-farm sector.

A rural Peruvian study on determinants of livelihood diversification, conducted by Escobal (2001), also accentuates the importance of public infrastructure and services as well as education and credit in the diversification process. The author highlights that the decision for self-employment versus wage employment will depend greatly on education level and credit facilities along with public infrastructural facilities. While some 51 per cent of rural Peruvian total income derives from non-farm activities, Escobal (2001) points out that most well-off household depends more on these activities than poorer households.

In a study of rural non-farm and poverty on the transition economies of Armenia, Georgia and Romania, Davis et al (2004) note that 65 per cent of rural households income is sourced from non-farm activities. They said a significant portion of rural non-farm income has been sourced from remittances and social welfare transfers particularly in Armenia and Romania. Higher income households are more able to participate in non-farm wage activities relative to the lower income households and that the major determinant of non-farm engagement depends on the different forms of capital (Davis et al 2004).

Changes in exchange rates and taxation policies, opening of factories, upgrading of infrastructure, the incorporation of credit with training, expansion of farmers' association, greater collaboration between Government and NGOs for strengthening micro-financing as well as empowering local Government fiscal capacity for investing in rural areas are among the recommendations suggested by Davis et al (2004) for promoting the non-farm sector in rural areas.

Results from studies carried out in Ireland also show that there is a reverse trend in the contribution of farm income to household income. Phelan (2005) observes that non-farm income contributions to household income increased from 30 per cent, in 1973, to 60 per cent, in 2000. The study reveals that most of the non-farm income earned over the period centred on low skilled and vulnerable income earning activities. The changes, according to the authors, are a result of the agriculture reform programmes following Ireland's accession to the EU in 1973. Farm income prior to the 1970s concentrated on a heavily subsidised farm sector, which suggests that there was no need to enter into the non-farm or off-farm sector to realise a suitable lifestyle.

Furthermore, a study on patterns of determinants of livelihood diversification by Smith et al (2001) illuminates that in rural Uganda wealth status, gender and occupations are the main factors influencing livelihood choices. The level and form of diversification are found to be determined mainly by environmental and historical issues together with necessary public services (Smith et al 2001). They suggest that diversification policies should be formulated around changes in economic terms rather than conventional agricultural orientated activities where most emphasis is placed.

While Smith et al (2001) identify gender as one of the influences on livelihood diversification Canagarajah et al (2001) recognise that the contribution of non-farm incomes to rural livelihoods is less among female-headed households. This result came from a study conducted in rural Uganda and Ghana. Among the observations of Canagarajah et al (2001), self-employment was the main cause of inequality which was found pivotal in the non-farm sector. Of note, the rural sector in Ghana and Uganda lacks public and social infrastructure which restricts the potential for rural livelihood diversification (Canagarajah et al 2001). Based on their analysis, education, the participant's age and location as well as distance to market come to the fore as the major determinants of non-farm incomes.

Dolan (2005) realises also, from a study conducted in Uganda, that there is a dominance of female-headed household's participation in self-employment activities. The author finds that

self-employment engagement which has low entry barriers and returns does not offer gainful opportunities as most female-headed households involved in self-employment activities are in the lowest income group.

Although findings from these studies demonstrate a tendency for income derived from non-farm activities to show levels of inequality among rural households, Barrett et al (2001b) believe it is a result of policy management. A study on income diversification and policy in Kenya and the Cote d'Ivoire by Barrett et al (2001b) confirms this view. In the Cote d'Ivoire, Barrett et al (2001b) observe that barriers to on-farm opportunities prevented poor households from achieving a positive outcome as a result of devaluation of exchange rate. At the time of the reform, the better off households with accumulated resources took advantage of the slide. Conversely, in Kenya, Barrett et al (2001b) find that food for work programmes lessen the debt burden and allow poorer households to enter into profitable agriculture venture as well as entry into meaningful non-farm earning activities. They are of the view that investigating how policy affects diversification activities can provide opportunities for rural livelihoods.

The Nature of Livelihoods Diversification and Policy

The importance of the non-farm sector to rural livelihoods cannot be overstated. However, while Reardon et al (1992) and Reardon (1997), among others, point out the various barriers and determinants to livelihoods diversification which is critical in informing appropriate policy intervention, attention is also paid to the nature of livelihood diversification in the policy development process. For example, Ellis (2000), Dovie et al (2003), Koczberski and Curry (2005), Bryceson (2005) and Anderson and Deshingkar (2005) sought to provide an understanding of the dynamic and complex nature of diversification strategies towards policy development.

Ellis (2000) found from a case study conducted in three Tanzanian villages, that what was thought to be the mainstay of the poor households was actually not. Instead of coffee, which was perceived to be the major income earning activity, it was milk production. According to the author this result was contrary to villager's popular belief that dairy activities were out of the reach of the poor. The nature of milk production as a diversified strategy would certainly be undermined if a thorough investigation is not carried out as it has great implication for policy intervention.

Similarly, Dovie et al (2003) report that it is important to attach monetary value to produce that is non-marketable when examining diversification as a strategy in the overall portfolio of rural households. Their findings are linked to a study conducted in a semi-arid rural village in

South Africa where own-crop production which is not included in national statistics was found to be integral to household food security. Own production of crops, which are central to the diet of villagers, were not noted as particular livelihood strategies due to the non-monetary value placed on output. This could be misleading for policy intervention that focuses on food security and rural livelihoods diversification.

Insights on the dynamic nature of livelihoods diversification are also provided by Koczberski and Curry (2005). While investigating livelihood strategies among oil palm settlers in Papua New Guinea, they realised that there were remarkable changes over the years in activities pursued by householders. Koczberski and Curry (2005) identify that the ability of members to diversify their on-farm activities provide opportunities to re-invest back into oil palm and food production. They report that palm oil and food crop production activities remain the major source of income with only a small proportion of these households sourcing income from the non-farm sector. Koczberski and Curry (2005) identify that there is the need for intervention to provide a linkage between the non-farm and the palm oil sector to encourage improved employment.

In a study carried out in Sub-Saharan Africa, Bryceson (2005) explains that while the upper-income group head of households report agriculture as their main occupation, income from the non-farm activities is, in fact, their major source of earnings. The potential the upper-income group head of households had (in terms of human capital and other assets endowment) to enter into the non-farm sector provides the opportunity for them to reinvest back into agriculture hence, they report farming as their main occupation. The author declares that the future of rural Africa's labour force lies in participation in the non-farm economy in which education and skill would be integral for entry to provide adequate income and to increase the labour productivity of their countries.

Anderson and Deshingkar (2005) also found from a study conducted in rural India that, though income diversification was lower than that reported in most African studies, income diversity is higher in households with reasonable amount of assets. They also found that households mainly used their earned income from diversification as a form of insurance and that remittance and transfer (unearned income) usually reduce the demand of that form of insurance.

Policy issues are always a concern of diversification in the rural non-farm sector. Davis and Bezemer (2004) and Davis (2004) stress the importance of having a clear understanding of

rural participation in the non-farm economy. The reasons why, and the motives for, entering the non-farm sector are treated by authors as prerequisites for the policy process.

7.3.3 Migration

Migration is viewed by the livelihoods literature as the movement or redistribution of people from one place to another. Migration studies in a livelihood context, which link the pattern of and reasons for mobility as a strategy are usually extended beyond the movement to include the interconnectedness of place of origin and destination (McDowell and de Haan 1997).

Since migration may be voluntary or involuntary, national or international, and short term or long term (McDowell and de Haan 1997; Morris et al 2001; Ellis 2003), authors tend to present their findings relevant to the causes, form and nature of particular migration, which becomes the basis to inform policy. In an effort to reduce vulnerability caused by economic and/or political instability, as well as environmental and social-related disturbances, migration has become a common strategy for the rural poor (Young 2006; Boyle 2009). Features of the empirical findings, though context specific, are mainly about measures to improve the living and institutional conditions of migrants with particular focus on recommendations for policy interventions.

From a policy perspective, tracing the literature on population movement as a strategy for rural poor revolves around three issues: 1) the cost (detriments) and benefit (remittances) of migrating 2) the conditions of destination and 3) those left behind. These three broad issues summarise the connection that exists between migration and rural poor. Though policy recommendations vary with locations, insight of this linkage provides the understanding necessary to focus on interactions that exist between migration and the rural poor.

In total, the majority of the literature views migration as being pivotal in enhancing rural livelihoods and demonstrates the important role the strategy plays in alleviating poverty (Ellis 2003; Hall 2005; Rigg 2007). Whether voluntary (of choice) or involuntary (forced) migration, rural poor resort to movement not only in adverse circumstances such as war and famine but also to strive for desired livelihood outcomes mainly through employment and better job opportunities (Waddington and Sabates-Wheeler 2003; Hamid 2007). Deshingkar and Start (2003) and others claim that migration from rural areas for employment is one of the most resilient of the livelihood strategies. While migration is widely viewed as a favourable strategy for rural livelihoods, in nearly all the cases reviewed aspects of its downside are underlined.

Findings from Deshingkar and Starts (2003) migration (internal: rural to rural or rural to urban) study in India, for example, shows that though migration investment is highly risky the venture proves to be profitable. The authors recognise that women are increasingly becoming migrants, that there are opportunities in the non-farm economy with better wages, and that migration is associated with increased skill capacity. However, findings also show that migrants are highly exposed to work accidents and substandard dwelling conditions in their destination. The authors recommend that migration should be reduced through special employment arrangements in the places of origin or structures put in place that can support their needs. Programmes to monitor minimum wages and compensation for injury along with elimination of sexual exploitation are among the authors' suggestions for policy development.

In another study on internal migration (related to war conflict), Opel (2005) looks at rural to urban migration in Afghanistan and finds that although access to employment in the cities was extremely difficult, rural migrants in the cities view themselves as successful just by migrating from the rural areas. The author findings show that the lack of social networks are one of the deterrent factors for employment among migrants and that construction is the major source of employment. Establishing projects to encourage employment in the rural non-farm sector, provision of low income housing and skill opportunities in urban areas supported by a poverty eradication programme are the major recommendations of this author.

For international migration, Asfar (2009) investigates workers in the Gulf States from Bangladesh with a focus on working conditions and workers rights. From examination of the losses and benefits of the migration programme, the author concludes that the Government of Bangladesh should create and negotiate for a clearer recruiting procedure for emigrants. Migrants should also be facilitated with departure and housing loans, either from the Bangladesh public banking sector or NGOs and that overseas interest among the Gulf States could operate welfare centres to cushion adverse conditions that migrants are often confronted with (Asfar 2009).

Nwajiuba's (2005) study on international migration in Southern Nigeria shows that the strategy impacts positively not only on migrants but also on their families, the community and the country as a whole. The major downside to the author findings, however, is that migration contributes to the loss of the more competent and trained persons (brain drain) from the areas studied.

The HelpAge International/United Nation Children Fund (2008) also shows from a study in Moldova, that migration has immense benefits to offer children, such as spending holidays

overseas, better living facilities (due to remittances), computer and mobile phone access. However, in contrast, they find that children of migrants are frequently depressed with symptoms of isolation and a sense of disconnection as well as the psychological burden left on elderly family members to manage situations. They suggest that children in such situations should be given priority in government policies in the provision of trained psychologists in schools and at community level in the implementation of social services for counselling, educational and recreational support and in the adoption of social policies for caregivers (mainly grandparents) of the children left behind by migrants.

Whether international or national, migration for the poor can involve times of disappointment and stress (de Haan 1999). McDowell and de Haan (1997), de Haan et al (2002) and Ellis (2003) among others report that the particular circumstances under which migration is undertaken will likely determine the outcome as the migrants' failure or success rests mainly on institutional factors which are specific to locations.

Remittances

Based on the literature, other than personal and individual achievements, the positive outcome of migration is characterised by remittances. Both national and international remittances have been playing an important role in developing countries rural economies and the overall alleviation of poverty. Though early researchers viewed remittances as negative (in terms of increasing dependency of recipients), contemporary literature provides a better understanding of the situation by explaining that decisions are mainly taken at the family level to invest in migrants (Adger et al 2002; Nwajiuba 2005).

Family loans, altruism, and self-interest are among the main motivation for migrants' remittance behaviour (Page 2009). A sense of caring (altruism) for family members left behind could be the most popular motive for migrants sending remittances (Rapoport and Docquire 2006). Remittance behaviour though tends to be a mix of motivation, with the majority of the studies viewing altruism as main determinants of remittance behaviour.

Several developing countries have taken steps to promote international migration as part of their poverty eradication programme with the aim to generate remittances (Nwajiuba 2005). Remittances to developing countries increased from \$94 billion in 2004, to \$150 billion in 2005, and reached approximately \$221 billion in 2006 (Freund and Spatafora 2008; Adams 2009; Gupta et al 2009). These remittances nearly doubled the aid/grant flow to developing countries from the Organisation of Economic Corporation and Development states (Adams 2009; Gupta et al 2009). Remittances are used as a development device for addressing the

over-arching problems of poverty and possess vast potential to stabilise the macro-economy in developing countries.

However, there was a mix of views in the literature on the impact of remittances on poverty. In the Pacific Island of Samoa and Tonga, for example, Brown (1997) reveals that remittances had greater importance to the economies of the islands than that suggested from the balance of payments data. The author is concerned with policy that can generate and maintain a flow of remittances which he finds is strongly linked to migrants' remittance behaviour and foreign policy. He views remittance and migration as significant sources of development assistance and recommends that policy governing immigration and aid-related programmes should be consolidated to encourage development and not restrict migration prospects.

In another remittance-poverty impact study conducted in 10 Latin American and Caribbean countries, Acosta et al (2008) find that remittances had only a small poverty-reducing impact on the overall sample. From analysis, only households that receive the higher levels of income from remittances experience a reduction in poverty. They estimate that for every one per cent increase in remittance to GDP ratio, poverty (headcount) would decline by almost 0.4 per cent. While the authors acknowledge the importance of remittances, they recommend that those who make policy should look at alternative means to deal with the soaring level of poverty in the region.

For sub-Saharan Africa, Gupta et al (2009) report that the region is an exception to other developing countries whose remittances exceed official foreign aid. With the region being recipient of a small portion of global remittances, the authors recognise the positive impact the flows had on smoothing consumption, reducing budgetary constraints in the respective households, and the positive role it plays in financial development. In contrast to policy recommendations of Acosta et al (2009) relating to alternative means for development in Latin American and Caribbean countries, Gupta et al (2009) are of the opinion that, other than remittances, there were no current alternatives for sustainable development effort in Sub-Saharan Africa.

7.4 Livelihood Assets and Livelihood outcomes

The literature on livelihoods treats access to assets as the foremost determinant towards achieving a sustainable livelihood. All of the studies reviewed show that positive livelihood outcomes are directly associated with and dependent on the asset status of households.

The result from most poverty case studies shows that assets play a key role in poor household's strategies to enhance their capabilities and make their way out of poverty. The more accessible households are to the stock of assets, the better their economic welfare and living standard (Bebbington 1999; Bird and Shepherd 2003; Barrett and Swallow 2005; Ellis and Freeman 2005b).

Although income is used commonly to measure economic well-being and to establish the poverty line, understanding the overall assets status is widely used qualitatively to explain poverty levels of rural households (Lyam 2005). Access to the physical, human, financial, natural and social capitals normally provides a more rounded picture of the rural livelihood system, particularly as it relates to the policy environment.

Having insights of the stocks of assets that people have access to and control over are demonstrated in the literature as critical in poverty reduction policy design. As discussed in the above section on livelihood strategies, the implication for policy intervention is centred on strengthening access to assets. In the development of poverty reduction policy, there is a need to identify the key assets that rural people depend on for examining their livelihood outcomes (Barrett and Swallow 2005; McDonagh 2005; Allison 2005). It is usual in livelihood studies for authors to examine livelihood outcomes by relating assets holdings to income levels (eg Ellis and Bahiigwa 2003; Ellis and Mdoe 2003; Ellis et al 2003; Freeman and Ellis 2005a; Ellis and Freeman 2005b; Kristjanson et al 2005).

When relating asset endowment with income levels the authors are able to identify the major difference between the poorer households and the better-off ones to inform policy on areas that need specific attention. Ellis and Freeman (2005b:37), for example, gather from comparative studies conducted in four African countries that higher income households were associated with more land and livestock ownership. The authors observe that households considering themselves "well-off" are those with access to land, livestock, hired labour, education (primary level and higher), tools, food, brick houses with metal roofs and having the capacity to also participate in numerous non-farm and farming activities. For the poor households, Ellis and Freeman (2005b) recognise that there is little or no access to land, there are no livestock, they live in mud houses with thatch roofs, they rely on safety nets and selling their labour, and food is insecure for the most part.

While livestock is the common asset found in all the top income earning households of the sample, Ellis and Freeman (2005b) observe that earnings from non-farm activities are responsible for their position in the highest income group. The authors explain that returns

from livestock allows households to invest in other areas such as children's education, non-farm activities and land, thus widening their scope for generating higher income that could be reinvested to increase livestock herds. They reiterate that securing sustainable livelihoods requires a process that builds assets that can be spread across the farm and non-farm sectors in which cash earnings are critical for investment.

In addition, remoteness from, and deprivation of, key capital assets is prominent among the many factors cited in the literature hindering access to resources. For example, Bird and Shepherd's (2003) results from a study carried out in Zimbabwe show that there is pervasive chronic poverty among the isolated population residing in remote rural areas. They find that remote areas inaccessible to natural, human, physical and social capital are distant from viable economic activities, proper communication and infrastructural access. Improvements in the financial, social and human capitals are targeted areas among the authors' recommendation for policy intervention.

7.5 Transforming Structures and Processes (Policy Institution and Process) and Livelihood Outcomes

The assets the poor access and the strategies they pursue for gaining a sustainable livelihood are mediated by policy, institutions and processes (Scoon 1998; Ellis 2000; Carney 2002; Freeman and Ellis 2005b). There is a tendency for authors to underscore the institutional environment in poverty reduction strategies.

The central theme in the reviewed literature on policy formulation and implementation for rural poverty reduction strategies focuses on improving institutions that can support livelihoods. After identifying the assets and the strategies that rural people employ for their livelihoods, recommendations normally target institutional and policy issues with the aim of reducing poverty and increasing well-being.

From the perspectives of the authors, there is the need to have appropriate institutional changes in order to support poverty reduction strategies in rural areas. Authors believe that to create an enabling environment, suitable institutional reform is needed to achieve positive outcomes for the rural poor. The structural adjustment programme, Governments' decentralization policies and taxation are areas that have drawn considerable attention.

In assessing the impact of structural adjustment programmes, Ahmed and Lipton (1997) observe that there is no improvement (or decline) in rural livelihoods from such policy and institutional reforms. Bryceson (2005) declares that the adjustment policies have dismantled marketing boards in Africa and undermined subsistence production by removing subsidies

from basic farm inputs as well as from education and health. The structural adjustment programmes tend to focus on issues of pricing with less emphasis placed on technological development which is critical in the productive agricultural system in rural areas (Ahmed and Lipton 1997).

Authors, including Ellis and Mdoe (2003), Dasgupta et al (2004), Ellis and Freeman (2005b) and Cross and Kutengale (2005), observe that decentralisation as an institutional reform intended to support rural livelihoods is rather slow and did not effectively meet its objective. Cross and Kutengale (2005), in results from a study carried out in Malawi, have shown that there is little improvement in the livelihood of rural poor following decentralization of the public sector. The state has to create an enabling environment by changing laws that would foster economic freedom in rural households and reduce the power of the local elites who constantly abuse the poor (Cross and Kutengale 2005).

Taxation policies are viewed by authors as one of the major barriers to improving rural livelihoods. Many authors find that tax policies are important as factors impeding to poverty reduction programmes.

Ellis and Freeman (2005b) observe that the institutional environments such as gratuity fees and commodity taxes, as well as burdensome licensing, are the major factors restraining the generation of cash and, consequently, weakening the economic growth in the sampled areas. These authors found that multiple taxes imposed on rural people, from a comparative study conducted in Sub-Saharan Africa were obstructive to activities that were essential for achieving positive outcomes. Access to businesses and the ability to capitalise on opportunities in Sub-Saharan African rural areas are depressed by tax policy measures enforced by both Government and traditional influences (Ellis and Freeman 2005b).

Ellis and Bahiigwa's (2003) study in Uganda reveals that systems of taxation in rural communities are unfavourable for enhancing sustainable livelihoods. The authors recognise that the collection institutions, as perceived by rural citizens, are the most disabling factor to poverty reduction strategies. There is a diversity of taxes in rural Uganda, which impacts all monetary transactions of the poor. According to Ellis and Bahiigwa (2003), the tax regime is complex with many business activities subject to a wide range of tax payments ranging from daily bills to long term annual licenses. The authors note that the tax system in rural Uganda discourages households from pursuing particular activities which are crucial in families' upward income mobility and poverty reduction.

Francis and James (2003) add that taxes are mostly felt by poor farmers in rural Uganda, which is incompatible with the primary aim of the Government's poverty reduction policies. The authors explained that the ultimate aim of the Government to guide and encourage farmers towards commercialisation as part of the development need in rural Uganda was not met. Francis and James (2003) argued that the combination of private and public taxes disallowed expansion of commercialisation and peasants did not benefit from taxes collected from them.

Bahiigwa (2005) believes that to create an enabling taxation environment there was the need to accentuate the trade-offs between the Government's role and the revenue generated by rural people in Uganda. The author says there is the need for reform in the tax regime, which is proportionally larger on the earnings of the poor than the wealthy. According to Bahiigwa (2005), the system is not equitable, as the rate of payments is flat and poorer households bear more of the burden of taxation.

Similarly, Wang and Piesse (2009) show that the fundamental cause of income inequality in China is a result of a biased tax system. They note that the rural poor pay more taxes compared with the urban better off who receive subsidies. The authors find that the urban population is able to avoid most tax payments due to high thresholds and the absence of policies to implement the appropriate tax measures. While the urban population receives welfare payments and subsidies, there are few benefits to be had by rural households in terms of public services and transfers. Based on Wang and Piesse's (2009) results, excessive taxation of the rural population will lead to reduction in livelihoods and a disincentive to economic growth.

In Jamaica, Buddan (2010) also highlights the level of inequality in the taxation system. The author observes that the stimulus package provided by the Government during the global economic crisis, in 2008, did not offer as much to the poor as it did to the wealthy. Conversely, the subsequent taxation measures imposed in 2010 will have a more far-reaching impact on the income of the poor than the rich. Moreover, Spaulding (2010) reported that the extraordinary taxes imposed on the cigarette industry in Jamaica will shrink development outreach programmes that target marginalised communities. Spaulding (2010) acknowledges the important role the cigarette industry plays in sustainable development as the sector questions whether the Government can fill the gaps should the industry withdraw their support.

In addition, Barry et al (2007) examine the effect of cashew production on poverty in Guinea-Bissau and find that tax arrangement is largely an explanation for low market prices. The authors report that cashew production is Guinea-Bissau's main export crop and main farm activity, as well as the major source of income in rural communities. According to Barry et al (2007), the taxes imposed on the export of the commodity, reflected in low farm-gate prices, has detrimental effects on farmers. They observe that an increase in export tax of 10 per cent is equivalent to a reduction in the farm-gate price of about 15 per cent. This scale of reduction would certainly have adverse impact on the livelihoods of households who rely on cashew production in Guinea-Bissau.

7.6 The Vulnerability Context

Vulnerability is the risk people are confronted with in their day to day living. Chambers (1989), in defining vulnerability, distinguishes between an internal side and an external side of risk. According to Chambers (1989:1), the internal side is defenceless to cope without damaging loss, and the external side is the shocks and stress to which an individual is subject.

Findings from the studies reviewed show that poorer households are more vulnerable to shocks and stress. Moser (1998) argues that vulnerability is directly linked to assets as the more assets people have and control the less vulnerable they are. Morris et al (2001), for example, in findings from a study in Tanzania, show that high level of poverty is linked with reduced holdings of particular assets: less access to land, labour, implements, credit and finance, as well as low education levels and being more vulnerable to ill-health. Children from poorer households receive less education as they attend two-thirds less often than children from better-off households (Morris et al 2001). This suggests that those children from poor households are likely to be exposed to vulnerabilities in the long term.

Authors tend to examine assets that can be readily substituted or liquidated in assessing vulnerabilities, particularly in response to crisis. In addition, understanding the sequence of responses to a crisis, and the overall management of resources, are among the major consideration in relation to policy improvement. According to Ellis (2000), households responding to an unplanned crisis over a short-period apply coping strategies, while in responding to adversity over a long-period households resort to adaptive strategies. It is the need for policy to identify and understand negative adaptation so as to take the necessary steps to reduce risk (Ellis 2000). Food insecurity, disease outbreak, natural disaster, social conflicts, low market prices and poor linkages, low yields and poor harvest were among the cited perturbations that increase vulnerabilities of the rural poor.

7.7 Poverty Reduction Strategies in Jamaica

The enacting of the Poor Relief Act in 1886 marks the beginning of development efforts to reduce poverty in Jamaica (Osei 2002b). An assessment of the Poor Relief Programme, which targeted the neediest in the Jamaican society, reveals that management was not compatible with international developmental standards and, hence, should be reviewed (Osei 2002b).

The two world recessions in 1974 and 1978, coupled with effect from the structural adjustment programme conditionality (see Chapter 2) exacerbated the living conditions of Jamaicans with soaring levels of poverty noted across the society (Anderson and Witter 1994). With the rising unemployment rate and signs of destitution among the population during the 1980s, measures were taken to design methods to identify the poor and put in place effective social protection programmes that could address the hardship. This has given rise, in 1984, to the introduction of the Food Stamp Programme which targets low income households comprising some 400,000 persons (McDonald 2002). There was a significant decline in the number of beneficiaries due to constraints on Government budgets and in 2000 some 248,580 were registered as active beneficiaries receiving around \$28 per person per annum (McDonald 2002). Feedback from assessment by McDonald (2002) shows that there were high levels of dissatisfaction expressed among beneficiaries in relation to the inadequate value of the stamp which was far below the minimum wage and cost of food needs.

These programmes were coordinated into a multi-project developmental approach – the National Poverty Eradication Programme (NPEP) - introduced in the 1990s. It was not until the mid 1990s that the concerns of poverty gained prominence in Government planning and become the focus of attention among numerous local and international development policies (Anderson 2001; Osei 2002a; Mills 2005).

Of note, in 1989 the first attempt to measure poverty at the national level was conducted by Derek Gordon based on the absolute principles in which consumption expenditure at the household was used (Osei 2002b). Since then, STATIN has been collecting consumption data at the household levels to provide estimates on the incidence of poverty within the Jamaican population. Households that fall below a certain level (poverty line) based on consumption expenditure (basic food and non-food expenditures) are classified as poor.

Arguably, much progress has been made towards explaining some causes and effects of poverty as well as identifying the poor in Jamaica. In 1991, 45 per cent of the population was living below the poverty line - the highest since the official survey began in 1989. This high level of poverty spurred several local and international responses which led to the

implementation of ten poverty reduction programmes between 1995 and 1996 (Mills 2005). Operation Pride, Secondary School Fee Assistance Programme, Skill 2000, Special Training and Employment Programme and the Integrated Community Development Programme began in 1995. In 1996, other interventions included the Bauxite Community Development Programme, the Strategy to Rehabilitate Inner-city Communities through Viable Enterprises, the Jamaica Drugs for the Elderly Programme, and the Jamaica Social Investment Fund (Mills 2005). The NPEP and the Social Safety Net Reform Programme has been the umbrella for coordinating poverty reduction activities in Jamaica, which focuses on social assistance and infrastructural development, skill training and community development (PIOJ 2008) (see also Chapter 2).

As discussed in Chapter 2 the coordinated effort between the various local Government agencies, local and international non-Government actors, international donors, and churches, as well as remittances, led to a gradual decline in poverty from 45 per cent, in 1991, to 14 per cent in 2007 (Osei 2002b; PIOJ 2008). According to Mills (2005) growth of real wages, control of inflation, price stability, and growth in the informal sector are some factors that have contributed to the decline. However, several authors such as Anderson (2001), Osei (2002a), McDonald (2002) and others have questioned the sustainability of the decline taking into account the complex and changing nature of poverty.

The literature on poverty in Jamaica explains that unemployment which leads to social and economical upheaval is one of the main causes of poverty. Qualitative findings on poverty in Jamaica have pointed to the lack of employment, low wage employment, too many dependencies (mainly children), financial difficulties, housing problems, lack of education and skills, poor access to social services, limited market access and low market prices (Anderson 2001; Henry-Lee 2005; PIOJ 2007).

While the reduction of poverty seems rather encouraging in Jamaica, several authors including Anderson (2001), Osei (2002a) and Henry-Lee (2005), argue that public policy decisions should be more responsive in the reduction process. Anderson (2001) in a study conducted on the labour markets identifies that the possibility for the current policy to reduce poverty is slim based on the extreme risk faced by the disadvantaged group. Osei (2002a) in assessing the policies and programmes stipulated under the NPEP realises that there is a lack of policy coherence on the part of the various Government agencies and relevant partners. Improved measures in targeting the individuals, groups and households in the marginalised society along with Government institutional strengthening are central among the suggestions of analysts.

The PIOJ (2007), recognising the main challenges and limitations of the NPEP which includes fragmented agendas, poor supervision and lack of understanding among partners, advises that attention should centre on institutional and programme development, resource management, population changes and reasonable access to opportunities.

As set out in the Jamaica “Vision 2030” poverty reduction strategy plan spearheaded by a Task Force with representations from the public and private sectors, there are five broad strategic objectives for persons to realise a sustainable and socially acceptable standard of life (PIOJ 2007:12). These are: improved poverty measurement, reasonable access to services and goods, appropriate public policy, and the creation and expansion of economic opportunities along with promoting the inclusion of the poor.

7.8 Conclusion

Based on the above review of the literature, the interacting nature of the five livelihood components allows for the development of four theoretical statements that cover the relevant aspects of rural livelihoods. These four statements are the second form of the theoretical sensitivity process which will be used as a comparative framework with the empirical findings from fieldwork. The four statements, though presented independently, are highly interactive and can be viewed as a system with each statement impacting the other. These statements are:

Livelihood Studies (LS) 1: Assets and incomes are mutually related.

LS2: While livelihood strategies of rural people are diverse, variations in their options and choices for achieving desired outcomes are determined by the stock of assets.

LS3: Taxation policies can be a hindrance to poverty reduction effort.

LS4: The higher the stock of assets the less vulnerable rural people are to shocks and stress.

Since livelihoods are primarily concerned with poverty which is dynamic, complex and multidimensional in nature, it was necessary to focus on the livelihood strategies in the review. An understanding of the livelihood strategies provides the basis to explore the dimensions and components of livelihoods as well as to examine the relevant policy issues which are believed decisive in dealing with improved livelihoods.

Chapter 8

Discussion

8.1 Introduction

This chapter compares the key themes developed from the fieldwork with the theoretical statements developed in Chapters 2, 3 and 7, with the aim of gaining theoretical insights. The product of this comparative framework is a novel contribution to the existing literature on poverty reduction. The discussion is based on the livelihoods of families operating small sugarcane farms in Jamaica.

The chapter is organised using the five components of the SL framework; namely, the vulnerability context, livelihood assets, livelihood strategies, transforming structures and processes and livelihood outcomes. For each component there was a corresponding key theme that emerged from fieldwork. The seven theoretical statements developed in Chapters 2, 3 and 7 were then incorporated under the relevant components, which allows comparisons to be made between fieldwork findings and theoretical statements.

Of the seven theoretical statements, three were related to Chapters 2 and 3 and were presented as world view statements, coded IF, as shown in Chapter 5. The remaining four theoretical statements were developed at the end of Chapter 7 and were presented as livelihood studies statements, coded LS. Three of the theoretical statements were incorporated under the vulnerability context component, while two were integrated under the livelihood assets component. For the remaining two statements, each was placed under the livelihood strategies and transforming structures and processes components, respectively. Since the livelihood outcomes component of the SL framework was a synthesis of the other components, there was no need to present a specific theoretical statement.

Policy implications for answering question three: what strategies can be identified to improve the livelihood of families operating small sugarcane farms in Jamaica was then presented. This is followed by a brief conclusion of the chapter.

8.2 The Vulnerability Context

Given that the nature of vulnerability is linked to the external environment and is associated with trends, shocks and seasonality, the literature treated this component as a phenomenon outside the control of the poor. Seasonality of prices, production, employment opportunities

and shocks such as social conflict, natural disaster, ill-health, crops/animal disease outbreaks, as well as domestic and international economic trends, were highlighted in the literature as some major causes of increases in vulnerability.

Based on the vulnerability context, the key theme relating to findings from the fieldwork shows that *families operating small sugarcane farms in Jamaica are faced with numerous problems that reflected negatively on their livelihoods*. Assessing the local conditions under which the sugarcane crop was produced and identifying the main causes limiting the livelihood outcomes of the families is pivotal to the background and objectives of the study. The family stories suggested that the risks they are exposed to are complex and may be viewed from two angles. Low sugarcane yields and low returns as a consequence of relatively low market prices, coupled with high production cost, were the main problems associated with sugarcane production. The families also viewed the social and macroeconomic environment as obstructive towards development. High cost of living, sliding exchange rates, high unemployment rates, rampant crime and violence were among the reasons given by the families.

Three theoretical statements were integrated under the vulnerability context components. These were:

Statement IF1 developed in Chapter 3 which states that *the livelihoods of Jamaican sugarcane farmers are threatened as a result of adverse market trends (particularly low market prices)*.

Statement IF3: *The high debt-to-GDP ratio prevents the Jamaican Government from adequately investing in priority areas of national development.*

Statement LS4: *The higher the stocks of assets are, the less vulnerable rural people are to shocks and stress* developed in Chapter 7.

Sugarcane Prices and Livelihoods of Families Operating Small Sugarcane Farms in Jamaica

In the first instance, statement IF1 paralleled the fieldwork findings on the effects of sugar market prices on families' livelihoods. The literature about the world sugar market, reviewed in Chapter 3, showed that while Jamaica has been receiving preferential market prices for raw sugar of almost two to three times higher than the world market prices, the families explained that they were still faced with lack of funds to follow recommendations. A cut in raw sugar prices by 36 per cent effective in the 2009/2010 marketing year will certainly have adverse effects not only on families operating small sugarcane farms but also on the entire JSI.

Although it appeared that returns from two hectares and less of sugarcane may be insignificant to families, especially larger households; it should be borne in mind that rural families' income earning activities were diverse and each played a vital role in the overall income portfolio of the household. Findings from the fieldwork revealed that income from sugarcane cultivation (of sample) averaged 5.75 per cent of total income. But there were families of six and eight in the sample whose incomes from sugarcane accounted for 14 and 12 per cent of their total income, respectively. In fact, sugarcane income contributed 8-12 per cent to total income for half the families in the lower income group whose income averaged \$2 or less per day. This particular result has implications for targeting the neediest in the Jamaican sugarcane growing communities, while embracing the social protection selection process.

Assuming that the livelihood income portfolio of the families in 2008 resembled that of 2010, when the 36 per cent reduction in sugar prices took full effect, then the 20 families that averaged \$2.1 or less per day will most likely fall closer to the chronic income poverty line of \$1 per day. As shown in Chapter 6, the average price received for sugarcane, in 2007 was \$34.5 per tonne. A further 31 per cent reduction (a 5 per cent reduction took effect in 2007) of this price will see families receiving around \$23.81 per tonne in 2010. A reduction of such magnitude in sugarcane prices will further add to farmers' inability to invest adequately in cultivation practices. Families explained that they have to reduce all recommended inputs and cultivation practices as a strategy to cope with current costs of production. This they observed has been reflected in the subsequent low yields and returns.

The average cost of production for the sample was calculated at \$1,367 per hectare, taking into consideration that replanting and miscellaneous costs were not included. Though the return on investment was difficult to calculate due to the lack of proper record keeping, especially the absence of replanting expenditure, insights from payments received from the factories were used as a proxy for returns. Following the deduction of the major costs, including harvesting, fertilization, herbicides (and irrigation in Monymusk), the average return was roughly \$278 per hectare. This return was based on an average yield of 47.7 tc/ha, an average price of \$34.5 per tonne and average production cost of 1,367 per hectare. The families argued that if recommended practices were followed most likely between 15 and 20 per cent of the payments would be used up in cultivation. For this reason, the families said they preferred to use the payments from sugarcane to reinvest in other income earning activities or as savings.

The response from families suggested that yields will continue to decrease. This situation will be exacerbated following the reduction in prices to an estimated \$23.8 per tonne. But even if one assumed that the cost of production remained fairly stable, which is unlikely, and that productivity decline was arrested (for example received above average rainfall), then the price will still pose a threat in 2010. To at least break even at the reduced price, the average field productivity will need to be about 57 tc/ha, a yield that required proper field maintenance and input management.

The fieldwork findings can be cast in the Porter (1990) diamond framework with its emphasis on competitiveness of nations and industries in international trade. While investigating the competitiveness of the Jamaica sugar industry (JSI) in international trade using the Porter diamond framework, it was found that sugar prices have been the root cause of the poor performance of the JSI. This is because the high prices permitted the high cost of production which allowed the industry to continue without making technological improvements.

Production efficiencies and losses have been traced to the lack of investment in the functional and dependable agricultural and factory equipment and machinery. Observation from the investigation has shown that the impending cut in price, coupled with the reduction in market access, will position the JSI into an even more depressed situation. Logically, if the industry's only advantage (preferential market) has turned around to be a disadvantage, then quite clearly any restructuring plan may prove futile. The plan, as put forward by the JSI, targeting a 32 per cent increase in field and factory productivities, is possible but is likely not workable in the short to medium-run.

The chance for the JSI to realise the targeted increases was through a massive process of investments and upgrading of factory facilities and field conditions. This particular investment (in the short-term) cannot be afforded by the Jamaican private sector or the Jamaican Government but must be sourced from foreign direct investment. But even with foreign direct investment, was it possible to produce at a profit when taking into consideration the high cost of production?

The cost of producing sugar in Jamaica was among the highest globally and was considerably greater than other ACP countries. In 2001, for example, the JSI cost of production exceeded the average cost of other ACP countries by nearly 60 per cent (Seaga 2006). In Porter's findings, cost leadership is one of the two broad alternative strategies for creating competitive advantage. Basically, and in a JSI context, cost leadership is the ability of a company to produce sugar and its- derivatives at a lower cost than its rivals. The serious problem of

Jamaica being one of the highest cost producers of raw sugar has limited its ability to innovate and upgrade at a level that would challenge and compete with world standard sugar industries.

The investigation using the Porter's diamond also concurred with the field findings, which identified that the JSI was affected by low productivities both in terms of factory output and sugarcane yields. The low cane yields, as articulated by the families, was a result of improper land preparation, under fertilisation, untimely and imbalanced weed control, inadequate inter-row cultivation, substandard drainage systems, low rainfall and high cost of irrigation, difficult credit facilities and, even more important, inadequate replanting and the lack of proper cultivation and maintenance to sugarcane fields. Sugarcane growing, therefore, has been unprofitable despite prices being two to three times the world price.

The failure to replace and upgrade the major processing equipment, as well as low labour productivity, were the main reasons for poor factory performance and low output. The key areas of cane handling and milling, steam and electric power generation, and sugar fabrication, were far from world standard sugar factory operations in countries such as Brazil, Columbia, Australia, and India (McDonald 2004).

The thesis therefore argues that the low sugar prices have been the main cause for the lack of substantial improvements in production activities and, consequently, this has led to the industry's decline. Failure to upgrade production activities has resulted in negative repercussions in all areas of the operation. The deteriorated factory facilities and field conditions have placed the industry well below the level of a standard competitive entity.

The Social and Macroeconomic Environment and Livelihoods of Families Operating Small Sugarcane Farms in Jamaica

Though aspects of macro-economy were normally treated in the literature under the transforming structures and processes component, it was necessary to integrate the statement IF3 here under the vulnerability context component. The families showed anxiety, and were persuasive in discussing issues relating to the social and economic conditions, while exploring the vulnerability component. The thesis provides ample evidence to support the IF3 statement.

The literature on livelihoods showed that rural people in most developing countries were the main victims of social and economic instability (Morris et al 2001; World Bank 2001; Sen 2005; Bird and Shinyekwa 2005). Traditionally, rural economies in developing countries were fuelled mainly by agricultural activities and the labour market depended largely on engagement in various farm-related businesses (Bryceson 2005). The society of developing

countries rural communities was characterised mainly by a scarcity of public goods such as education, health care, transportation and roads, as well as a lack of employment (Bird and Shinyekwa 2005; Ellis and Freeman 2005b). As a consequence, inaccessibility to markets, low educational attainment, inadequate health services, high unemployment levels, low wages, and exploitation of the natural resources base are the main plight of rural people. Poverty has, therefore, been a phenomenon in developing countries rural economies.

Across the developing world, the rural economy became a theme in development policy during the 1950s (Lefranc 1994; World Bank 2001; Bryceson 2005). Since then, attempts to encourage sustainable development and reduce poverty have been key elements of both donor and loan projects by governments and non-government programmes. Efforts to meet sustainable development targets led developing country governments to resort to lending agencies, mainly the IMF and World Bank. In response to loans accumulated leading up to the mid 1980s, the IMF, through a stabilisation process, and the World Bank, by way of a structural adjustment programme, implemented guidelines and made recommendations in relation to loan repayment. The liberalisation of currencies was among the major recommendations of the IMF. The aim of this recommendation was to encourage devaluation of developing countries currencies against the US dollars so their exports could become more attractive and competitive in international trade.

In Jamaica, the successive borrowing and subsequent repayment, as well the liberalisation of the dollar caused most of the problems faced by the families in the sample. Debt payments since the 1980s have been haunting the Government budget, which absorbed, on average, 45 to 50 percent of its annual expenditure. As discussed in Chapter 2, Jamaica's stock of external debt increased from \$3.91 billion in 1999 to \$10.3 billion in 2008. In 2008, total public debt represents some 130 per cent of GDP which the CIA (2009) classified as the fourth highest per capita globally (see Chapter 2).

The high level of indebtedness has constrained major Government policy options that set out to meet sustainable development targets, including poverty reduction. Most of the Jamaican Government budget available for the provision of public goods and services has been earmarked for remuneration. Education, for example, accounted for 12.7 per cent of Government expenditures, in 2007, of which 91 per cent were used for salaries (PIOJ 2008). The remaining nine per cent was inadequate for the provision and maintenance of facilities needed. The situation was similar for other public departments.

The devaluation of the Jamaican currency did not turn out to be what the IMF anticipated. The high dependency of Jamaica on imports (oil, basic food items, raw materials etc) and an economy with a small productive sector resulted in the collapse of its dollar. As shown in Chapter 2, imports could not keep pace with exports as the trade account remained in deficit. The trade account moved from negative \$1,440 million, in 2000, to reach negative \$3,526 million, in 2007. Reminiscent of the trade account, the Jamaican dollar has been depreciating at a rapid rate, sliding from J\$5.50=US\$1 in 1985, to reach J\$72.2=US\$1, in 2008 (Huber and Stephen 1992; PIOJ 2008; CIA 2009). This collapse of the Jamaican dollar has been a major hindrance to growth in all spheres of national development. The manufacturing and production sector, for instance, which depended on the importation of raw materials, has been severely affected. This has led to massive downsizing exercises as well as closure of several factories. As a consequence, the labour market became distrustful, resulting in high levels of unemployment.

The low value of the Jamaican dollar, as described by the families, has been a disincentive in their overall livelihoods. Their major concerns were that there was an imbalance between incomes and prices of basic goods and services – a high price financial system. Prices of goods and services continuously outpaced income. Vending and petty trading, which were associated with low income, were usually the mainstay for the bulk of the active working group in the sample. Findings from the fieldwork suggested that the high price economy matched against low incomes, as outlined by two-thirds of the families, was evidence of destitution.

The families and particularly members of the community discussion group stated that the unemployment level, coupled with the soaring prices, were the main causes of crime and illegitimate activities. The members of the community discussion group explained that because there were little or no employment opportunities and the high cost of living, particularly for young people trying to earn a living, they were frequently involved in crime or illicit activities.

Crime has been a plague in the Jamaican society, especially since the 1970s, marked by political-related upheaval (LeFranc 1994; Anderson and Witter 1994; Figueroa 2000). However, the families declared that there has been a change in the pattern of crime since the 1990s. They claimed that the acts of criminality have surpassed those prior to the 1990s where the majority of the crime-related incidences were associated with inner city communities in the corporate area. This, they noted, has now spread to rural parishes and has taken hold of the

entire island. Murder, rape, abduction, shooting, break-in and especially praedial larceny were frequent occurrences in everyday life.

This study highlights the need to take into account the macroeconomic and social environment when designing policy for poverty reduction. The community discussion group pointed out that youths were engaged in diverse illicit income earning activities of which drugs and gun smuggling has been at the centre – a cyclic and fatal engagement. This sector, they explained, was extremely precarious to their livelihoods as the innocent were frequently mistaken and hence become victims. Since 2001, Jamaica is being classified among the highest homicide rate worldwide (Chang 2008). The country murder rate increased from 35 per 100,000 population, in 2000, to 59 per 100,000 populations in 2007 (PIOJ 2008; Chang 2008).

Shocks, Stresses and Livelihoods of Families Operating Small Sugar Farms in Jamaica

Shocks and stresses are regarded as a function of vulnerability in the livelihoods literature. In analysing the vulnerability context it was usual for authors to use the asset status of subjects to measure their ability to cope with shocks and stress. Given that a livelihood is sustainable when it can recover from and cope with shocks and stress, then the fieldwork findings have provided considerable support to the LS4 statement.

In regard to sugarcane production and economic welfare, the findings from the fieldwork were synonymous with statement LS4. Families that were endowed with higher levels of assets in the sample, though important, showed less enthusiasm towards sugarcane production. The families endowed with higher level of human capital, such as teachers and certified skill workers, demonstrated resilience and were more capable of coping with the low sugarcane prices. This was evident in the sample where most families who belonged to the upper income group had reduced their land area of sugarcane production. That the returns from sugarcane did not merit the effort and time spent on the crop was central to their explanation. The largest percentage of reduction in sugarcane land area was most noticeable among the two highest incomes per capita in the sample.

Comparatively, most families in the middle and lower income group utilised their land to full capacity in sugarcane production. They were mostly concerned about price movements and questioned the viability of the industry while showing distress at the situation. When asked about alternative crops, they explained that the sugarcane crop has several advantages relative to other crops. Being hardy to drought and fairly resistant to pests/diseases, it has not been affected by praedial larceny and most importantly, it has a ready market. These families

were found to be less endowed with assets particularly education attainment. Asset endowment of the families will be discussed more under the livelihood assets component.

Results of this study provided support for the asset/vulnerability concept presented as statement LS4. As a contribution, this thesis presents that the families operating small sugarcane farms in Jamaica which had members having qualifications and skill certifications were coping better with low sugarcane prices and overall economic stress.

However, although the research provides support for the LS4 statement in terms of sugarcane prices and economic welfare, there were aspects of the social environment that merit attention here. There was no clear evidence that the assets of the families were linked to their ability to cope with the stress and recover from the shocks of crime and violence. Empirical findings showed that the families were confronted with a crime situation where there were no coping or adapting strategies among the families. All families in the sample declared that the nature of crime and violence have immensely impacted on their ability to achieve desired goals.

This thesis, therefore, extended on the asset/vulnerability view of LS4. Findings showed that the asset status of families operating small sugarcane farms in Jamaica did not link with their ability to cope with stress and recover from shocks of crime and violence. Although families in the upper income group demonstrated greater levels of resilience to low sugarcane prices and economic instability, they shared the same view as other families about praedial larceny. All the families emphasised that even if agricultural production was diversified then they had to ensure that the choice did not attract to praedial larceny; which was difficult to achieve. The more lucrative the entity, the more attractive it was to praedial larceny. They said effort by the Government to alleviate the problem has waned as the practice was still a major ruin to families. As for other criminal activities, the families were equally at risk.

8.3 Livelihood Assets

Basically, the literature perceived the poor as those having limited access to and control over their assets. Understanding how the poor combine both tangible (natural, physical, human, financial) and intangible (social relations) assets to meet their goals has been crucial in policy designs and projects. Asset endowments were viewed by authors as an essential component in poverty reduction strategies and as the strength in the process of constructing a sustainable livelihood.

The key theme of fieldwork relevant to the livelihood assets component states that *for Jamaican families operating small sugarcane farms limited access to assets is a major*

constraint towards achieving their aspired livelihood outcomes. An understanding of what resources were available and how the families accessed them demonstrated how vulnerable they were. Almost two-thirds of respondents believed that their set goals and objectives would have been met if they had enough resources or more access to assets. They pointed out that their limited access to assets impacts their entire livelihoods. Family members were of the view that once there was a lack of or limited access to resources, improved livelihoods is improbable or is extremely difficult to realise without substantial help.

The theoretical sensitivity statements IF2 and LS1 were drawn on here. Statement IF2, developed in Chapter 3, states that *based on Porter's diamond framework, the JSI operates within (physical resource) limits that prevent Jamaican sugarcane farmers from attaining benefits enjoyed by many sugarcane farmers worldwide.* Whereas statement LS1 affirms that *assets and incomes are mutually related.*

Physical Resource Limits and Livelihoods of Families Operating Small Sugarcane Farms in Jamaica

Findings from the fieldwork have agreed with the IF2 statement. The ultimate aim of applying the Porter's diamond framework to this study was based on two reasons. First, to look at how competitive has the JSI been in international trade, and second, to identify if there were opportunities or a competitive advantage in producing sugar in Jamaica. For the former, the overall investigation using the Porter's diamond framework showed that the preferential market was the only visible advantage Jamaica and the JSI possess. The latter was more concerned with the IF2 statement. This includes an analysis of the factors of production which Porter (1990) categorised as human resources, physical resources, infrastructure, knowledge resources and capital resources.

The factor determinant in Porter's framework is closely related to the asset components of the sustainable livelihood framework. Although analyses were carried out at different levels (industry and family), the integration of frameworks served to better the understanding of the families' (smallholders) situation operating in an industry that relied on international trade. This particular methodological feature of the study made an important contribution to the literature on sustainable livelihoods.

The IF2 statement was particularly relevant to physical resources. Porter (1990) defines physical resource as the availability, quality, location, size and accessibility of land as well as climatic conditions. This definition overlaps with aspects of physical (tools and infrastructures) and natural (land and water availability) capital definitions in the sustainable

livelihood framework. The fieldwork findings provided evidence that there were limitations among the families in terms of physical resources.

Some 60 per cent of sugarcane farmers operated on two hectares or less in Jamaica (PIOJ 2006). Beside the small land size, the major physical limitations among the explanation of the families were low land productivity, poor sugarcane road network, deteriorated factory facilities, inefficient machinery for crop cultivation and poor irrigation infrastructure.

The investigation using Porter's framework showed that since the late 1990s Jamaica has been cultivating between 30,000 and 35,000 hectares of sugarcane with little scope for further expansion in land area. Areas that were established in sugarcane during the production peak years of the 1960s have responded to population growth and were currently occupied mainly with housing development (Sirjue et al 1994). This size of production was very small relative to several cane sugar producers and posed a great challenge to achieve the economies of scale necessary to compete effectively at the global level.

The size of land for sugarcane in Brazil during 2008 was approximately seven times larger than the total land area of Jamaica (Barros and Auty 2009). Other major cane sugar exporters during 2000, such as Thailand, Mexico, Australia, South Africa and the USA, had land in sugarcane cultivation 10 to 30 times larger than in Jamaica (see Chapter 3).

But even with Jamaica's small land size, the sugarcane yields of most of the major producers happened to exceed that of the island. The investigation using the Porter's framework found that the island had no specific physical advantage over other cane sugar producers. The crop is suitable to tropical climates with economic yield varying from country to country. Based on the latest available data, sugarcane yields as measured by tonne cane per hectare (tc/ha) ranged, in 2000, from a low of 35.4 tc/ha in Pakistan to a high of 110 tc/ha in Egypt. Egypt has land in sugarcane approximately three times larger than in Jamaica. Although sugarcane yield depends on management practices, land productivity is a major physical factor that determines field output. In 2000, Jamaica's sugarcane yield averaged 64 tc/ha which was significantly lower than the yields of major cane sugar producers such as Australia, the USA, South Africa, Mexico, Brazil and India (see Chapter 3).

Similarly, sugar yield as determined by tonne sugar per hectare (ts/ha) has also been much lower in Jamaica than in most major producers. Australia, with one of the highest ts/ha, averaged two and half times higher than in Jamaica (see Chapter 3).

Findings from the fieldwork showed that families sugarcane yields averaged 47.7 tc/ha in 2007 and were below the national average. The family with the highest yield was located in the irrigated region, which averaged 65 tc/ha, while the lowest was 29.1 tc/ha located in the rain fed region. Families expressed the views that though sugarcane yield was to some extent manageable, low land productivity and inadequate rainfall was also responsible for the low yields. The families added that the sugar yield (ts/ha) is an inherent factor and is determined by location. References were made to Worthy Park area, as families explained that farmers in that area were carrying out similar practices yet they have been enjoying much higher sugar yield per hectare. As discussed in Chapter 3, sugar yield has traditionally been highest in a sheltered valley region of Jamaica, referred to as Worthy Park, with ts/ha averaging around 10 annually. The other six regions have been receiving ts/ha ratios well below this figure, with an overall island ratio of 5 to 6 ts/ha. As was also discussed in Chapter 3, sugarcane payments in Jamaica were based on the Jamaica recovery cane sugar (JRCS) – an index for sugarcane quality indicating available sugar in sugarcane, which is related to ts/ha.

It is, therefore, the position of this thesis that families operating small sugarcane farms in Jamaica with limited physical resources and insufficient economies of scale were unable to compete effectively at international levels. In addition to land size, climate and low land productivity, findings from the fieldwork well supported McDonald's (2004) argument regarding the run down facilities in the JSI. The families believed that the poor sugarcane road network has been one of the major contributing factors to the high cost of transportation. Beside the soaring prices, the families in the Monymusk region said the irrigation system was very unreliable and highly inefficient. All the families said there was a lack of machinery for crop cultivation and, when available, it was grossly inappropriate or very cumbersome. Factory breakdown was a common occurrence that families also believed were signs of a weak industry.

Assets and Incomes of Families Operating Small Sugarcane Farms in Jamaica

Authors have primarily referred to the asset possession of the poor to explore livelihood. In Chapter 4, the sustainable livelihood framework treated assets as the building block of livelihoods. Livelihood sustainability among rural people is characterised by a combination of the types of assets accessible to them and how these assets are organised for increasing well-being (Chambers 1987; Chambers and Conway 1992; Scoon 1998; Ashley and Carney 1999; Carney et al 1999; Ellis 2000; Carney 2002; Freeman and Ellis 2005a; Ellis and Freeman 2005a). To gain a better understanding of livelihood sustainability, authors have gone on to associate the asset status of rural people with income levels. This association has helped to

explain income variations among rural people which in turn serve to inform policy on critical assets required for livelihood sustenance.

Studies have shown that higher assets and higher incomes are mutually related. Authors such as Ellis (2000), Ellis et al (2003), Ellis and Mdoe (2003), Kristjanson et al (2005) and Ellis and Freeman (2005b) have found that there were positive associations between the rural better-off (income) and higher asset endowments. They identified that access to livestock, land, education, labour, distance to major towns, transport, implements and tools were some of the key assets distinguishing the better off from the poor.

This research finding provided evidence which generally supported the LS1 statement. An examination of asset status of the families according to income levels supported findings that certain assets endowments were positively related to income groups and were critical to explaining income variations. Education achievement (teaching diploma and skill certification), house, land, crop production, social relations, and labour were identified as the main assets among the families.

In terms of educational achievements, all families with members holding a teacher's diploma were found in the upper income group. The upper income group was also characterised by families with skill certifications. Of the 10 families identified in the upper income group, four were families with teachers, while the remaining six were families with members having a skill certification.

The research found that the family with the highest per capita income had two teachers and a certified skill member. The family with the third and the fourth highest annual per capita income also had combinations of a teacher and a certified skill member. But even with high dependency ratios, members having a teacher's diploma were still capable of maintaining a livelihood that could be considered sustainable based on the income poverty line. The youngest head of household, for example, having two young children and a disabled mother, was a teacher and had the seventh highest income per capita in the sample.

All but one of the certified skill members in the sample were found in the upper income group. The only family with a certified skill member outside of the upper income group had the highest income per capita in the middle income group. The distinction between the families of the upper income group and other families in the sample was clearly marked by the higher education and certified skills attainment.

Housing was next to explaining income variations of the families. Fieldwork findings have shown that housing was a noticeable asset variable for distinguishing the poor from the wealthier families sampled. Since house tenure type and house facilities were judged desirable for assessing a sustainable lifestyle, house ownership and completed houses were taken into account. Completed houses here mean all the facilities (living, dining, bedroom, bathroom, kitchen and toilet) were constructed under one roof with supply of piped water and electricity. The patterns were not as clear as those for education and certified skills attainment. For clarity, the causative factors for housing in explaining income variation were that the families had good housing because they had good incomes. So what this mean is that assets such as higher education lead to good incomes and good incomes then lead to good infrastructure assets.

While most families in the upper income group owned their houses, half of the families of the middle and lower income groups reported that they were owners of their houses. This relationship between house ownership and income is therefore complex.

However, it was safe to say that household facilities are associated with higher incomes in the context of families operating small sugarcane farms in Jamaica. Analytically, this can be explained by the fact that all except one of the families in the upper income group were living in completed houses. To further support the LS1 claim, analysis has shown that incomplete houses have been a feature among the families below the upper income group – of the 18 incomplete houses 17 were dwellings of the middle and lower income groups.

While this research finding showed that teacher diplomas and certified skills (human capital) was the distinguishing asset category between the poor and the wealthier families, Ellis et al (2003), Ellis and Mdoe (2003) and Ellis and Freeman (2005b) identified livestock as the critical asset. Ellis and Freeman (2005b) found livestock to be the critical asset in explaining income differences in their comparative Sub-Saharan Africa studies (Kenya, Tanzania, Malawi and Uganda). Education attainment, labour, land, implement and tools were the other key assets. Ellis and Freeman (2005b) explained that though livestock was the critical variable distinguishing the poor from the rich in their sample, it was not a causative factor for higher income. They observed that the higher incomes came from the non-farm sector which allowed households to invest in livestock which further led to investment in other areas such land, children education and small businesses.

Similar to the housing situation in this study, Ellis and Freeman (2005b) findings showed that land ownership was also a key asset but was not clear explaining income variations as

livestock ownership. They observed that there was a steady rise of land area with increased income in three of the countries - Kenya, Tanzania and Uganda; however, in Malawi this pattern never became apparent until the highest income level. Ellis and Freeman (2005b) noted that in Tanzania and Uganda samples those with little or no land were found in the lower income group.

Land was also a key asset of the families operating small sugarcane farms in Jamaica. The relationship between land and income levels was more complex than both the housing facilities situation of this research and the land situation in the Ellis and Freeman (2005b) Sub-Saharan study. There was the need for some repetition here. As discussed in Chapter 5, during the selection of families for interview, the study targeted families operating on two hectares or less. However, at the onset of the selection process extension officers made it clear that though all of the selected families were operating two hectares or less for sugarcane there were cases where some had more land than what was established in sugarcane.

The extension officers explained that land holdings with sugarcane have been declining due mainly to low returns and, consequently, the lack of interest. This situation was highly relevant for the research as it provided an opportunity to probe into alternative strategies of these families reducing sugarcane production and at the same time to look at changes over time. Ten families operating on more than two hectares of total land were identified among the 30 families selected.

Most (seven) of the ten families with more than two hectares belonged to the upper income group. However, the family with the highest per capita income was not in this group of ten. In addition, the family with the third highest per capita income had the smallest plot of land in the sample and the family with the fourth highest per capita income was also not a member of the 10 families having more than two hectares. These patterns, therefore, illustrated that more land area was not associated to increased income for families operating small sugarcane farms in Jamaica.

Even though most families with land larger than two hectare were in the upper income group, it was difficult for this research to support the claim that more land was connected to greater income. The explanation lies in the fact that families operating small sugarcane farms in Jamaica cannot rely on the small land area for a living. These families were engaged in multiple activities in the non-farm economy from which their incomes were mostly obtained. Activities of the families will be explored more under the livelihood strategies component.

A similar pattern was observed in crop production. That is, more crop production was not necessarily associated with higher income. The explanation also mirrored the land situation where the families relied largely on the non-farm economy for livelihoods.

Unlike the comparative Sub-Saharan study conducted by Ellis and Freeman (2005b), social relations were another key asset identified among the families of this study. All families had at least one member of the AIJCFA which provided an association with sugarcane production. The social network of the families spread across various groups, associations, party (political) memberships and friendship.

Although social capital is intangible and can be difficult to measure, the findings of this study revealed that the nature of the relationship between social capital and income levels yielded two distinct patterns. The first was the relationship relevant to groups and associations memberships, and the second was friendship.

Attempts in this research to relate the social relations of the families with income level found that members of the upper income group tended to have ties with more professional groups and organisations. Teachers in the sample, largely, explained this phenomenon. All families in the upper income group had members connected to organisations other than the AIJCFA. There were also families in the middle and lower income groups who were members of organisations other than AIJCFA. There was a pattern that families, who had no other representations with organisations and groups other than the AIJCFA all belonged to the lower and middle income group. The analysis here has painted a picture that supports the LS1 statement.

However, examining a family's connection with groups and organisations in relation to income levels did not address individual friendship. Friendship was identified as a critical indicator of social capital among the families in the sample. In fact, it was those families with the least involvement with groups and organisations who repeatedly referred to friends as their key social connection. When friendship was examined across the different income groups, a different picture developed. There was no positive association between friends and income levels. No attempt was made to combine friendship with organisation and group memberships. This would have required an analysis that took into account trade off between the dimensions of livelihoods (Bebbington 1999) as well as the benefit or detriment of the relation and the aspirations of families. This approach would require analysis using panel data.

It is therefore the argument of this thesis that friendship, as a critical indicator of social capital, must be incorporated with organisation and group participations for explaining income differences. The complex web of social relations that existed among the families operating small sugarcane farms in Jamaica suggested that friends were pivotal to upward income mobility of poor members not affiliated with groups and associations. This has implications for further research particularly for poverty reduction interventions and the development process.

Labour was the main asset of families operating small sugarcane farms in Jamaica. The amount of labour ranged from one to six in the sample. While the average amount of labour was three persons, the lower income group had the family with the most labour. The pattern showed different amounts of labours between the ranges across the different income levels and labour was not a critical asset explaining families' income variation. Ellis and Freeman's (2005b) comparative Sub-Saharan Africa study had also found labour as well as education attainment, implements and tools, were not as clear as livestock or land in explaining income differences.

This thesis therefore extended the LS1 statement in terms of labour as an asset. More labour was not positively associated with higher income among families operating small sugarcane farms in Jamaica. The teachers and other certified skills members that made up the sample with considerably higher wages largely explained the complex relationship between labour and income levels. The value of activities that members undertook had impacted on the relationship between labour and income levels.

A better understanding of the activities undertaken by the families forms the basis of the livelihood strategies component which follows.

8.4 Livelihood Strategies

At the beginning of Chapter 7, it was shown that an understanding of the activities pursued by rural people was pivotal for designing policies for poverty reduction. Livelihood studies have sought to gain insights into the various activities of people with the aim of identifying the positive aspects (and negative influences) so as to build on their choices (DFID 1999; World Bank 2001; Carney 2002; Ellis and Freeman 2005a). Building on the choices of the poor has scope for opening of opportunities to enhance improved livelihood and action for environmental and community development.

The theme that developed from the fieldwork in relation to livelihood strategies stated that *families operating on small sugarcane farms in Jamaica with limited resources are not exposed to the privileges or options to pursue strategies for meeting their desired livelihood outcomes*. The portfolio of the different activities of family members provided the insight to examine their access to assets as well as their livelihood strategies. Although their livelihood system was characterised by a mix of activities, these activities and strategies were chosen from a limited set of options. Members of most of the families were engaged in contingent (part-time, self or irregular) employment and illegitimate practices to provide for their household needs. The families insisted that there were limited opportunities for formulating strategies that can maintain a sustainable lifestyle. They explained that they do not have a choice of their current engagement as they have to settle for what the system has to offer.

Statement LS2 developed from the literature was incorporated under the livelihood strategies component. Statement LS2 states that *while the livelihood strategies of rural people are diverse, variations in their options and choices for achieving desired livelihood outcomes are determined by the stock of assets*.

Assets as a Determinant of Livelihood Strategies

Rural people livelihoods are characterised by a diversity of income generating activities. These activities ranged from own-agricultural production (intensification and extensification), wages and self employment (diversification), as well as migration and transfers. The ability to realise the aspired livelihood outcomes from these engagements depended largely on the asset status of households (Ellis et al 2001; Morris et al 2001; Freeman and Ellis 2005a).

Findings of this study supported the LS2 statement. For policy attention, comparing the income from the various sources of the families across income groups suggest that asset status had been held accountable for their success or failure. The families' income was sourced from on-farm activities, wage employment activities and transfers (remittances, pensions and the programme of advancement through health and education [PATH]).

Income from on-farm activity was first examined. Beside sugarcane production, crops and livestock production were the families' on-farm activities. Income from neither of the on-farm activities nor the on-farm activity as a group was identified to be positively associated with the income groups. Even though it appeared as if other crops had a positive relation with the upper income group, income from other crops activities were distributed across the income groups and was not a distinguishing variable to explaining variation in income levels.

Unearned incomes from remittances among the families were also found not to be positively related to income levels. While nearly half of the recipients of remittances were from the lower income group, the remaining recipients were distributed between the middle and upper income groups. For pensions, the distribution of income was also spread across the different income groups and could not be considered a critical variable for explaining differences in income. However, with regard to income from PATH, only families of the middle and lower income groups were recipients. This pattern therefore has shown that income from social safety net was positively associated with income groups. None of the families in the upper income group was beneficiaries of this social safety net programme. This suggests that one of the PATH objectives of targeting the neediest in the Jamaican society was met.

For income earned from wages, all except three of the families' major share of income came from wage employment. Two families received remittances whose contribution to their total income exceeded that of wage earnings, while the other family received income from other crops that surpassed that of wage employment. The two families whose remittances share of income was larger than that of wage income belonged to the middle income group, whereas the family with the higher share from other crops to total income was from the upper income group.

While income from on-farm activities, remittances and pensions was not critical explaining the families' income variation, like PATH, there was a positive relation between aspects of wage employment and income levels. Although all the capable working members reported that they had affiliation with employment (non-farm activities), their level of engagement was critical to achieving the aspired livelihood outcomes. The level of participation in non-farm activities gave rise to two patterns. First, there were members of families who participated in high income non-farm activities and, second, those who participated in low income activities. As discussed in Section 8.2, members who were endowed with education and certified skills had the options and choices to enter into higher wage earning activities than their counterparts. These livelihood asset and strategy dynamics have distinguished the upper income group from the middle and the lower income groups in the sample.

The families viewed the non-farm (employment) activities as a necessity given that their land area was insufficient to meet their living needs. There were two aspects of the non-farm economy that were taken into account. 1) Activities that required particular skills and educational level and were attractive to high income. 2) Those activities that had low entry barriers and were likely to be less remunerative. The analysis showed that members of families in the upper income group were characterised by formal sector employment. There

were also some formal sector employment in the middle and lower income groups but non-farm employment was mainly through activities related to the informal sector. While teachers and certified skill members dominated the upper income group, petty traders and street vendors were common among the middle and lower income groups.

According to families of the middle and lower income groups, their opportunities to enter into lucrative engagements were sparse. Their choice was basically to participate in employment activities that required no particular special skills and/or education. They said that to support household needs their only option was to partake in petty trade that had low entry barriers and required little financial start-up capital with the expectations that returns were low. For these reasons, some families within these groups have participated in illegitimate engagements to meet their desired goals. As mentioned in Chapter 6, cultivation of marijuana, retailing and trading of marijuana, prostitution, illegal gambling houses and illegal tapping of electricity and water were part of the middle and lower families' activity portfolio. These choices and options of engagements were a major difference between the upper income group and the middle as well as the lower income group. None of the families in the upper income group reported illegitimate activities as a choice or options to meet their desired livelihood outcomes.

The findings of this study showed that although family members operating small sugarcane farms in Jamaica depended on the various strategies, their choices and options of engagement for meeting desired outcomes varied. This was consistent with evidence of other livelihoods studies (e.g. Barrett et al 2001a; Barrett and Swallow 2005; Dolan 2005; Bryceson 2005). The asset portfolio of the household or family was central in explaining this phenomenon. Families' asset endowments were crucial for decisions taken to pursue particular activities. As discussed under the vulnerability context (Section 8.1), most families of the upper income group endowed with human capital were reducing sugarcane cultivation. This was compared with families from the middle and lower income groups who appeared to depend more on returns from sugarcane and chose not to reduce sugarcane operation. Similarly, families in the lower income group also expressed the desire to emigrate relative to families with teachers in the upper income group whose options were to remain and upgrade their qualifications.

However, from a sustainable livelihood perspective, this study extended the LS2 statement. Poorer families operating small sugarcane farms in Jamaica with low asset endowments were most likely to engage in illegitimate practices as an option in an attempt to meet their desired goals. Sustainable livelihood studies have tended to investigate the activities profile of households with a focus on legitimate non-farm and on-farm engagements (e.g. Block and

Webb 2001; Abdulai and CreoleRees 2001; Escobal 2001; Deshingkar and Starts 2003; Dolan 2005; Freeman and Ellis 2005a; Anderson and Deshingkar 2005; Nwajiuba 2005). These studies and others have shown that the activities of households and rural people were diverse and their engagements were multiple and interlocking. Causes and consequences of the various activities and strategies were clearly understood but usually fall short of reporting on illegitimate engagements of rural people. If the choices and options of rural people are critical in policy intervention (eg Ellis 2000; World Bank 2001; Carney 2002; Freeman and Ellis 2005a) then all engagements must be taken into account. While illegitimate involvements of people were sensitive issues, the fact that an investigation was carried out should at least make mention of the role specifically for policy purposes. This study has filled that void.

The investigation carried out in this study pertinent to the families illegitimate engagements, did not include aspects such as income earned, or its contribution to total income. But it uncovered that these engagements were options and choices of the poorer groups in the sample for whom development interventions prioritised. This was not to say that policy will be built on the illegitimate choices, but needs to be taken account of so that development interventions and practices were compatible and supportive of an enabling environment - the SLA expressed objective. An account of the frequency of practices and income earned from illegitimate engagements would serve to strengthen policy prescriptions by providing insights on the families' level of reliance to these practices. This has implication for further research.

8.5 Transforming Structures and Processes (Policy Institution and Process)

Beside the asset and activity portfolios, the likelihood for rural households to fall into or move out of poverty rested on the policy, institution and process (legislation) environment in which they operate (Carney 2002; Freeman and Ellis 2005b; Bahigwa 2005). The World Bank (1990, 2001) argues that the reduction of poverty is heavily dependent on policy and institutional environments. Economic growth, improved social services such as education, nutrition and health, together with the working of markets, organisation behaviour, improved technology and infrastructures, were cited as supportive measures for creating an enabling environment for sustaining poverty reduction (Dasgupta et al 2004; Sen 2005; Cross and Kutengule 2005; Freeman and Ellis 2005b). As stated in Section 8.2, governments of most developing nations were challenged with the task of providing for such an environment.

Having discussed the macroeconomic and social environment in Section 8.2, attention was then given to the view of the families on political power and the organisation serving them.

These responses have provided insight on the extent of the link that existed between the micro level (families) and the macro level (Government) along with identifying the policies that were considered most detrimental to their livelihood.

While government policy implementation takes the form of a top-down approach, governments were encouraged by the international donor community and lending agencies to establish local governments through a decentralisation process (Dasgupta et al 2004). That improved the relationship between the micro level and the macro level. It was expected of these donor organisations and lending agencies that decentralisation would support a bottom-up approach to tackling poverty by empowering the poor through increased participation in economic, social and political activities, thus reducing poverty (Dasgupta et al 2004; Cross and Kutengule 2005). The views expressed by the families operating small sugarcane farms in Jamaica well supported findings of Dasgupta et al (2004) conducted in India, as well as Cross and Kutengule (2005) carried out in Malawi that decentralisation has failed to bring about this change.

The key theme developed from the fieldwork maintained that *the livelihood outcomes of families operating small sugarcane farms in Jamaica were influenced by Government policy*. Policies have played an integral role in the livelihood of families operating on small sugarcane farms, and the production of sugarcane in Jamaica. The relationship between policies, the livelihood of families operating on small sugarcane farms and sugarcane production in Jamaica gave an understanding of the livelihood systems and the link between the community level and the national level. According to the families, together with a key informant perspective (the Chairman of AIJCFA) and views from group discussions, the links that existed between the local level and Government must be sought and understood to create an enabling environment for these families. Family members insisted that without proper and reliable policies in favour of families there will be no progress.

An account of the theoretical statement LS3 was included under the transforming structures and processes component. LS3 affirms that *taxation policies can be a hindrance to poverty reduction effort*.

Taxation and Livelihoods of Families Operating Small Sugarcane Farms in Jamaica

As discussed in Section 8.2, economies of most developing nations have been burdened with huge debts. The imposition of tax measures to enhance revenue and to restrain fiscal deficit have been the usual policy options of these governments. In so doing, an institutional

environment has been created where the economic pressure and effects were felt most by the marginalised population.

Authors such as Ellis and Bahaiigwa (2003), Ellis and Freeman (2005b) and Bahaiigwa (2005) argued that the tax systems in Sub-Saharan Africa were disproportionate and inconsistent with the Government poverty alleviation programme. They described the tax regime as unjust as the system encourages the imprisonment of defaulters, and schedules for collection were not aligned with the seasonal nature of earnings.

Fieldwork findings corroborated evidence from the LS3 statement. Investigation of this study showed that one of the families' foremost concerns towards achieving targeted livelihood goals was the tax regime imposed by Government. The principal tax system in Jamaica was categorised in four groups. 1) Income tax, 2) transactions tax which included general consumption tax, transfer tax, customs duties and stamps duties, 3) pay as you earn tax which is another form of income tax relevant to contributions to national insurance, national housing trust, education tax and human employment and resources training, and 4) other taxes such as motor vehicle licence, construction operation, company registration and travel (Price Waterhouse and Coopers, Jamaica 2009).

It was the opinion of the families that nearly all of these taxes had repercussions on their livelihood outcomes. They expressed particular dislike for the general consumption tax which is a levy imposed on goods and services targeting end consumers which has kept increasing. At the time of the first phase of fieldwork, in 2008, general consumption tax was 15 per cent as compared with 16.5 per cent in the second phase in 2009. The Jamaica Gleaner (2010) reported that the general consumption tax increased to 17.5 per cent in January 2010. The families explained that the general consumption tax, which was a standard rate across the population, was proportionally higher on the earnings of the marginalised and had more severe effects on the poor than their wealthier counterparts. This explanation coincided with findings in the Bahaiigwa (2005) Uganda study.

The families recognised that though they had not initially intended to be targets of some of the taxes, in the middle to the long term they became the victims of the circumstances. The effects of measures implemented to offset defaulters, such as advance and special duties and taxes, eventually trickled down to final consumers. The intensity of tax measures reflected its broad socio-economic base. The middle and lower income families of the sample were least able to cope with taxation challenges. However, the families of the upper income group

experienced great difficulties in absorbing the pressure exerted by the pay as you earn component.

While the families complained about the general consumption tax measures and the multiplier effects of the overall tax policies, families that were employed to the formal sector criticised the pay as you earn tax component. The pay as you earn tax system has been associated with deduction amounting to 33 per cent of the gross income of family members. This suggested that taxes (both general consumption tax and income tax) have been responsible for almost half of the income of formal sector employees in the sample.

Aside from the Government tax measures, the vendors, self employed and petty traders in the sample, in particular, were faced with a precarious and illegal tax regime. There were illegal extortion charges that were detrimental and threatening to their livelihoods. The extortion activities are in effect an illegal tax imposed by extorters on the families. The extortionists were linked to gang-related activities and claimed that they had to offer protection from perpetrators, hence, laid charges based on the value of business. If there was resistance to payments, then most likely respective family members would be victimised.

Families in the upper income group were also victims of illegal taxation through extortionist behaviour, but at a different level. Due to the high level of crime, members of the wealthier families were often approached by extortionists who tried to negotiate an offer for providing property and personal security. A direct fee has never been the norm, but the frequency at which the practice (which can be regarded as begging) has been carried out had impacts on their budget. Not responding to these negotiations can be problematic and detrimental to their livelihood. All the families perceived this extortion behaviour as stemming from economic destitution which had grown to become the livelihoods among young unemployed males.

This thesis provided examples to support the mainstream literature that taxation systems can be obstructive to sustaining poverty reduction. Analysis has shown that the incomes of families operating small sugarcane farms in Jamaica were severely affected by tax policies. Taking into account the high price economy, the families concluded that the tax system posed serious threats to them reaching set livelihood goals. The families were exposed to both Government taxation and illegal fines that were influential across income levels.

8.6 Livelihood Outcomes

The relationship between people's aspirations and level of achievements has helped authors to define the needs of the poor. This has been crucial to understanding livelihood outcomes and,

subsequently, informing policies. Also crucial were issues of sustainability, indicating the institutional, social, economic and environmental factors which were decisive to achieving positive outcomes. But even with positive livelihood results, there were queries of how sustainable these outcomes were (DFID 1999; Carney 2002; Clarke and Carney 2008; Scoon 2009). Since poverty is dynamic and complex, ensuring that achievements were sustainable has been a policy challenge in development intervention.

The key theme that developed from the fieldwork relevant to the livelihood outcomes component stated that *families operating small sugarcane farms in Jamaica with vulnerable livelihood systems require far reaching organisational and legislative support to effect positive changes.*

This theme corresponded with most recommendations for sustaining poverty reduction observed in other livelihood studies. Though livelihood studies were context specific and there were variations in circumstances, implications for poverty reduction were almost always directed at legislative reforms and organisational effectiveness. Authors such as Ellis and Freeman (2005a), Freeman and Ellis (2005a), Sen (2005), Cooksey (2005), McDough (2005) have emphasised the importance of Government and institutional reforms in poverty reduction strategies. Reduced vulnerability, increased well-being, increased food security, larger incomes, and the sustainable use of natural resources were among the highlighted indicators of positive livelihood outcomes. Identifying the asset categories that needed to become more accessible, or the options and choices to be built on them, as well as the institutions to be strengthened, were at the heart of implications for policy.

8.7 Implications for Improving the Livelihoods of Families Operating Small Sugarcane Farms in Jamaica

The foregoing discussion suggests certain policy considerations relevant to improving the livelihoods of families operating small sugarcane farms in Jamaica. The first and foremost relates to crime and violence. The second is the expansion and reinforcement of skill training and education. The third is the importance of investment in domestic crop production and micro and small business entrepreneurship. All three considerations are intertwined and require substantial on-going Government and development stakeholders support, including all of planning, implementation and monitoring, for sustainable poverty reduction.

Crime and violence

In a society plagued with the elements of crime and violence, it is particularly difficult for people to achieve their set goals. Despite efforts over the years of international assistance and

the implementation of several crime fighting strategies, the level of criminal offences in Jamaica has continued to soar. In 2009, the highest rate of murder was recorded in the history of Jamaica – some 1,680 persons including 11 police were killed (Jamaica Gleaner 2010). This surpassed the 1,674 persons murdered in 2005. Representatives from the Scotland Yard police in Britain were brought in 2005, several police squads were formed and crime - combating initiatives were implemented. All these measures have proven futile as the conditions deteriorated. As described in Chapter 2, the Jamaica Gleaner (2010) reported that nearly half of these fatalities were gang-related. Other elements of crime such as abduction, shooting, extortion, break-in and praedial larceny were usual activities among gang members. Since gang-related engagements spanned several illegitimate activities and spilled over into communities, any solution to the crime situation must be designed with a focus at the community level. Understanding the behaviour of activists and perpetrators is crucial in managing the crime problem which requires intensive research. Based on the nature of crime faced by the families, there is the need for the Government to spearhead a sustainable system of partnership between communities-based groups, private sector organisations, the Jamaican diasporas and development actors.

This partnership system management approach must incorporate the following:

- A call for all Jamaicans both local and international (the Jamaican diaspora) to assist in the fight against this ‘monster’ of crime. The crime problem is out of proportion and requires the full participation of every Jamaicans. History has shown that the combined efforts of policing, the Government, the judiciary and international assistance are insufficient to turn the situation around. Indeed, the people (human resources) are far more capable of supporting a progressive network for a safe and peaceful environment than any other social actors. Without the assistance of the people, the effort expended by Government and other social actors will not be progressive.
- Strengthening the resource base of the police force. Upgrading technology, revision and restructuring of intelligence units, facilitation of on-going training and re-training, enhanced communication, report and record management; provision of appropriate tools/equipment and ensuring a concrete relationship by way of intellectual dialogue between policing and the people should support a modernised approach towards managing the state of crime.

- Instil a culture of proper attitudes and values among the people. While there have been ‘Peace and Love’ programmes in schools and programmes to encourage proper parenting skills, as well as participation of adults in the judicial system, there must be additional manageable mechanisms to augment proper attitudes and values for a just society. It would not be possible to eradicate the vengeance and reprisal culture in the Jamaican society without a comprehensive coherent policy based on the outcome of research relevant to attitudes and values. The values and attitudes required for achieving and sustaining a safe environment goes beyond those programmes and should be supported by practical objectives that can be measured, thus determining priorities. It is therefore imperative that any programme addressing proper attitudes and values must begin with an understanding (which requires research) so as to inform Government at the decision making level. The Government should then partner with all stakeholders with an agenda outlining the practical objectives, priority settings and performance criteria. Indeed, the means of management and the arrangement of intervention are critical and serve as the basis of such policy plan. Although this approach requires considerable resources, it would provide the opportunity for prompt feedback that could allow for relevant adjustments. Justified reasons for changes in the judicial system, institutional reform and even amendment in the constitution most likely would be the priority for policy relevant to change attitudes and values.

Given that praedial larceny was the major deterrent in responding to alternative farm opportunities among the families, policy options to reduce this deprivation are of particular interest. Regulations in transporting and marketing produce, as well as increased penalties have been major policies implemented by the Government. Several attempts (receipt book and certification systems, increased fines) made by the Government to identify offenders have failed to meet the overriding objective of reducing the practice. The families believed that the strategy of tracking thefts by tightening security along transportation routes through increased police patrol that would embrace the receipt book system would provide for a more effective system. Again, strengthening the resource base of national security was paramount in reducing the extent to which this practice is carried out.

Education and Skill Training

Human capital was the distinguishing asset category explaining differences in income levels in the sample. This showed that viable employment and income generating strategies for families operating small sugarcane farms in Jamaica will require supporting education and, particularly, skill training programmes. In fact, the Government, international development

partners and the multilateral lending agencies have acknowledged that the strengthening of the education system is a key aspect of sustaining poverty reduction in Jamaica. Among the recommendations to strengthen the education system in Jamaica, upgrading the skills capacity of its working age population was the most relevant to this study.

This thesis builds on this recommendation since most families in the upper income group of the sample had members with certified vocational skills. There was an immediate need to strengthen and expand vocational programmes at the secondary school level. This meticulous intervention would serve to influence the popular thinking of most Jamaicans that vocational skills were for low academic achievers. Based on the view of most family members, the HEART - the national agency responsible for vocational training - programmes were to absorb secondary school failures. This belief appeared to impact negatively on secondary school graduates among family members entering formal training for vocational skills certification. A sense of pride may be the caused for the low number of vocational certified skills members relative to those reporting skills without certification.

In terms of economic welfare, there was a clear distinction between those who reported skills without certification and those who were certified as skilled. It is therefore critical for the education system to revisit the secondary school curriculum to ensure that areas of the vocational syllabus are integrated with the HEART programme. This integration would lessen attitudinal problems among secondary school leavers related to choosing vocational skills as a career.

Domestic Crop Production and Micro Enterprise Development

Although sugarcane occupied most of the land area in the sample, returns from domestic crops as a percentage of total income were higher. Even when the outliers (two families with larger percentage of land in domestic crops) were taken out of the calculation, returns from domestic crops were actually the same as for sugarcane. On a per hectare basis, domestic crop earnings were some three times higher than sugarcane.

At the onset of the study, it was stated that the 36 per cent EU sugar price cut effective in 2009/2010 would impact negatively on the livelihoods of families operating small sugarcane farms in Jamaica. As mentioned in Chapter 1 (Section 1.4), the cut in sugar prices will force small operations to look at alternatives outside the sugar industry. This study has shown that per hectare income from domestic crops is higher than that of sugarcane. But even the families that had all their land occupied with sugarcane were still able to realise some income from fruit crops adjacent to their homes. In fact, nearly all of those who reported having

income from domestic crops said fruit crops from 'yard' sales were a significant contribution to their total incomes. These yard fruits were mainly sold to food processors with export markets.

As discussed in Chapter 6, there were several fruits in demand with 'ackee' - the national dish - heading the list. This fruit has been in demand both nationally and internationally. The crop was seldom taken up as part of cultivation programmes and was found growing in homes, along thoroughfares and sections of woodlands. Since there are no institutional constraints relating to land use that prevent further planting of this and other feasible crops, expanded fruit planting are an alternative to sugarcane.

Although the families pointed to a number of advantages (see Section 8.2) about cultivating sugarcane relative to domestic crops, redirecting investments, in particularly ackee and other non-traditional export crops at small farm levels, should provide a strong incentive for the families. There was no comparative study to show that investment in sugarcane was more viable than other crops on small plots in Jamaica. The current strategies employed by the sugar industry for the families sugarcane to be harvested, supplied with fertiliser, chemicals, irrigation, land preparation, research and development and other cultivation activities, led families to conclude that sugarcane was the appropriate choice. However, if similar support and attention were given to domestic crops then families' perspective would likely be different. There existed a need for the Government to play a lead role by strengthening the relationship with the relevant commodity boards and/or associations to invest and expand into domestic crop areas that can be shown as being feasible. This intervention will serve to support and strengthen the agro-industry sector, create jobs for rural people, curtail the dependence on food imports and reduce food insecurity.

Small and micro business was another area identified that required substantial investment. Given that the majority of the poorer working family members have resorted to self employment and commercial petty trading, it is necessary to treat micro and small business development as a priority. Feedback from family members suggested that there were gross inconsistencies in programmes instituted to provide assistance to micro enterprise development.

The families said that the Micro Investment Development Agency (MIDA) - the state operated institution for providing loans to small businesses - and other micro finance services were never in a position to support their needs. According to the families, the programmes were always lacking funds. In addition, the families were suspicious that these microfinance

sources doubted their ability to service the loans and thus focused on the larger business players. For these reasons, the families involved in small enterprises said they preferred to manage their operations without assistance. This situation points to a deficiency in the effective networking mechanisms between microfinance services and the poor.

The most effective means for improving the efficiency of micro finance services for the families was for the Government to facilitate and invest in small business training and management. Empowering individuals managerial capabilities would encourage relevant family members to participate and become familiar with the business environment. Knowledge of business plan and proposal writing, business resuscitation, credit and banking systems, product development, market access and research and access to legal business counselling would help to promote the entrepreneurial skills of families geared towards an area of development need. Close collaboration and cooperation between the micro finance institutions and the Government, together with relevant training institution(s), should initiate a coherent network for supporting the small business operations of the families.

8.8 Conclusion

The chapter highlights the contribution of this study in relation to the existing literature on livelihoods. Evidence from fieldwork supported most of the theories of livelihoods in the literature. However, there were aspects of the fieldwork findings that extended or built on the literature due to the particular features of the families operating small sugarcane farms in a Jamaican context.

The vulnerability/asset concept that viewed higher asset status households to be less vulnerable to shocks and stresses was inconsistent in terms of the crime and violence faced by the families operating small sugarcane farms in Jamaica. On the one hand, the fieldwork findings agreed with this concept in regard to families that were coping better than others with the low sugarcane prices and overall economic situation. On the other hand, the storyline of the respondents revealed that none of the families showed more resilience to the elements of crime than the others. The study, therefore, extended on this concept.

Evidence from the fieldwork also showed that more land and labour, as key assets of the families, were not positively associated with greater income. The idea that higher assets and larger incomes mutually reinforce each other did not corroborate with the land and labour situation of families operating small sugarcane farms in Jamaica. The level of participation and the degree of reliance of the families on non-farm wages explained this phenomenon.

For livelihood strategies, the fieldwork findings relevant to the illegitimate activities of poorer families operating small sugarcane farms in Jamaica made a distinctive contribution to the livelihood literature. The important role illegitimate activities played in the poorer families' activities portfolio provided a deeper understanding of livelihoods that were not revealed in the literature. Indeed, a grasp of illegitimate activities of the families operating small sugarcane farms in Jamaica was critical to policy development issues for improving their livelihoods.

In sum, improvement in the livelihoods of families operating on small sugarcane farms in Jamaica requires a safe and just society free from crime and violence, strengthening and expansion of the education system, and investment in domestic crops and micro business development. Focusing on these areas of development needs will reinforce the poverty reduction effort in Jamaica.

Chapter 9

Conclusion

9.1 Introduction

This chapter provides a summary of the study. An overview of the chapters is presented first followed by answers to the research questions. A brief account of the methodological approach is then given followed by the limitations of the study. The chapter ends with implications for further research.

9.2 Overview of Chapters

Chapter 1 introduced the study. This study commenced with the observation that small sugarcane operations in Jamaica were on the verge of collapse. This observation was based on the existing situation together with the fact that the preferential market price Jamaica received from the EU for raw sugar would be reduced by 36 per cent in the 2009/2010 marketing year. This size of price reduction would certainly impact negatively on sugarcane production and would force small operations in particular out of business. Against this background, it was necessary to investigate and understand the livelihoods of families operating small sugarcane farms in Jamaica. As well as the problem statement and rationale of the study, Chapter 1 also presented the research aim, objectives, questions and scope. An outline of the thesis concluded the chapter.

In Chapter 2, the background of Jamaica relevant to understanding the livelihoods of the families was presented. The chapter started with a brief history of Jamaica. The history traced from the time of discovery of the island, in 1494, to the declaration of independence, in 1962. A description of the physical geography followed. The mountainous terrain is a marked geographical feature of the island. This makes only 400,000 ha of the estimated one million ha of land suitable for agriculture use. The chapter also examined the macro-economy and the socio-economic environment. The review revealed that economic growth was slow, with real GDP averaging 1.1 per cent between 1980 and 2008. For the socio-economic environment, youth unemployment, crime and inadequate economic and social infrastructures were the major challenges of the Jamaican Government.

The last section of Chapter 2 presented an overview of agriculture in Jamaica and the Jamaican sugar industry (JSI). Since the mid 1990s, the share of agriculture to real GDP has been declining. Agriculture, as a percentage of real GDP, decreased from 9.2 per cent in 1995

to 5.1 per cent in 2007. The sugar industry also recorded a decline. Raw sugar production reduced from 239,000 tonnes in 1996 to 158,000 tonnes in 2007.

The aim of Chapter 3 was to provide further insights into the external influences that impacted on the families. The world sugar market and economy, and the Porter (1990) diamond framework used to investigate the competitive strength of JSI, were presented. Given that sugar and alternative sweeteners make up the broader sweetener industry, a synopsis of the world sugar market situation with alternative sweeteners was also presented. Production, consumption, imports, exports and prices of the world sugar market were examined. It was estimated that more than 70 per cent of the world sugar production is consumed within the country of production. The remaining 30 per cent was traded internationally. Government and sugar policy reform as it related to the World Trade Organisation (WTO) rules and the impact of sugar policy on marketing were taken into account. Sugar commentators were of the opinion that the future of the world sugar market depended on the outcome of the WTO negotiations.

The competitiveness of JSI using the Porter (1990) diamond revealed that preferential markets were the only visible competitive advantage JSI had. With the WTO rulings, these preferential markets, in terms of quotas and prices, would be eroded in 2010. Although the Porter's diamond did not rely on empirical data, it supported the theoretical framework adopted for this research.

In Chapter 4 the sustainable livelihoods approach (SLA) – the theoretical and analytical framework selected for this study – was outlined. In addition to Chapter 2 and 3, to have a better understanding relevant to livelihoods of the families it was necessary to adopt a framework that focused on people's own view of their living situation. Aside from the participatory nature of such a framework, there was the need to identify what resources were available, together with the nature of the institutional and policy environment, and the strategies used by the families. Although there are critiques of the SLA concerning its theoretical capabilities to address poverty, this study has utilised the approach in a flexible manner to ensure that relevant issues were not ignored.

Chapter 5 described the research methodology, strategy and design for the study. To meet the stated objectives of the study and address the research questions, the constructivist-interpretive approach and aspects of grounded theory were the methodology of choice. The case study strategy was chosen as the appropriate approach to support the theoretical framework and the methodology selected for carrying out the research. The study utilised a

multiple case study design that defined the unit of analysis, the theoretical sensitivity process and the case study protocol. As part of the theory building principles of grounded theory, it was necessary to make explicit all theoretical sensitivity issues. As such, the three theoretical statements from Chapters 2 and 3 were highlighted in this chapter. These statements were the 'lenses' through which the researcher used to look at the world.

Chapter 6 summarised the case study reports. The chapter was presented in the form of an integrated case study report in which a cross-case study analysis was undertaken. Two of the seven sugarcane growing regions were purposely selected as case study sites. The report started with the background of each individual region and thereafter the reports were integrated. The demographic characteristics and household facilities, sugarcane production and management of the sample families as well as their livelihood system were analysed and presented. Key themes emerging from data were placed under the respective component of the sustainable livelihood framework.

Chapter 7 reviewed the literature on livelihood studies. The decision to look at other livelihood studies between and after the fieldwork was consistent with the principles of grounded theory. There were two phases in the fieldwork and the review started between the phases, with initial observation providing a 'lens' through which the researcher sought supporting or contradictory information from the literature. Understanding the livelihood strategies of the poor was paramount to this research. The review emphasised that the activities or strategies of people in pursuit of positive outcomes were dependent on their assets endowments and the policy and institutional environment in which they operate. Four theoretical development statements concluded the chapter.

Chapter 8 compared the literature findings from Chapter 2, 3 and 7 with the fieldwork results from Chapter 6. This comparative framework underscored the similarities and differences of the existing literature in relation to the families operating small sugarcane farms in Jamaica. Most of the fieldwork findings were in agreement with existing concepts in the literature. Differences observed were explained largely by the peculiarity of the families and the environment in which they operated. As such, relevant theories were extended or modified. However, while exploring the livelihood activities portfolio of the families, illegal activities were found to be a critical strategy to achieve positive outcomes among poorer households. This particular finding was lacking from the livelihood literature. Overall, the chapter teased out important theoretical insights relevant to the livelihoods of families operating small sugarcane farms in Jamaica that the study set out to achieve. Answer to the primary research question ends the chapter.

9.3 Addressing the Research Questions

This thesis was driven by three research questions. Answers to these questions are as follows:

Research Question 1: *What are the current livelihood systems of families operating small sugarcane farms in Jamaica?*

A combination of farm and non-farm activities characterised the livelihoods of families operating small sugarcane farms in Jamaica. Although sugarcane was the major crop and occupied more than two-thirds of cultivated land in the sample, it provided only 40 per cent of agricultural income and 5.75 per cent of total income. This was compared to non-sugarcane crops which accounted for more than half of agricultural income. Non-sugarcane crops earned three times more per hectare than sugarcane. Overall, the share of on-farm income was 15 per cent of total income. Even though on-farm activities were important to the families, evidence showed that they could not rely solely on it for a living. As a consequence, the families participated in a diverse portfolio of income generating activities to cope with their vulnerabilities and to meet their set goals.

The families relied heavily on diversification into the non-farm sector as an adaptive strategy for reducing their vulnerabilities. The largest proportion of income was sourced from employment activities, which accounted for 70 per cent of the families' total income. This included wage employment and self-employment. All the self-employment income and more than 90 per cent of the wage employment income were sourced from the non-farm sector.

Unearned income was also critical to the livelihoods of the families, accounting for 15 per cent of total income. It was usual for families to invest these incomes into non-farm productive activities as strategies to boost their net earnings, lessen vulnerabilities and contribute to family well-being. Remittances were responsible for more than 70 per cent of unearned income. The national social safety net programme (Programme of Advancement Through Health and Education [PATH]) and pensions were other sources of unearned income. Only poorer families were beneficiaries of PATH; a source of income that distinguished the poorer families from the better off in the sample.

Human capital (higher education attainments and certified skills) was the critical asset variable distinguishing the better off families from the poorer families in the sample. The families endowed with higher education (teachers) and skilled certifications were able to participate in lucrative non-farm activities compared with those without. Families with teachers and certified skill members had good incomes and were those belonging to the upper

income group. These families with higher education that lead to good income also had good infrastructure assets. Completed houses were also found to be strongly associated with the better off. The education status combined with good incomes and houses also led to connections with other assets such as social capital. Membership of professional groups was also found to be strongly associated with the better off. Additionally, there was the tendency for most of the better off families to rely less on on-farm activities, due to their participation in high value employment opportunities in the non-farm sector. The better off families were also characterised by participation in the formal sector.

Petty commerce, street vending and illegal activities characterised the poorest families. These activities defined the informal sector. Two-thirds of the sample families' adaptive strategies were related to these activities. Evidence from fieldwork showed that though families relied on diversification as adaptive strategies their level of achievement was determined by their higher education status. The families without higher education participated in activities with low entry barriers that did not require particular skills and were less able to generate good returns. As such, some members of these poor families resorted to illegal activities as a strategy to reduce their vulnerabilities and improve their economic welfare. This finding of illegal engagements as an adaptive strategy of the poor was lacking in the literature. Previous studies have focused on legitimate activities without serious consideration given to illegal activities, which has, in fact, been a significant part of the activities dynamics of livelihood systems. Although the study did not capture income from, and frequency of, illegal practices, the investigation has provided insight relevant to the role of illegal activities in livelihood systems. This will be a major implication for further research.

Analysis has shown that the poor families relied more on both on-farm and off-farm activities than the better off in the sample. More children and larger households were also strongly associated with the poorer families. Poor families also spent a larger proportion of their income on food. The majority of families with elderly members as heads of households were also found to be poor.

From an institutional and policy perspective, while the poor families held the Government responsible for their situation, the better off sought to make suggestions about the improvement of social and economic infrastructures through good governance. Given the characteristics of the livelihood systems just discussed, families believed Government policy should become more instrumental in involving the poor beyond development programmes targeted to reduce poverty.

Research Question 2: *What are the current strategies in place for these families?*

In terms of sugarcane production, there were reasonable arrangements in place to assist with cultivation and management. All the families were represented by the All Island Jamaica Cane Famers Association (AIJCFA). The AIJCFA supplied families with fertilisers, tools and herbicides through a credit scheme. Secondary tillage operations such as inter-row cultivation and drain construction were also negotiated between the AIJCFA and tillage contractors. Irrigation (Monymusk families) application was also part of the AIJCFA credit scheme. Harvesting, the largest cost effective operation, was negotiated between the AIJCFA, the sugar factories and harvesting contractors using credit. The replanting programme was also facilitated under a credit scheme normally operated by the Agricultural Credit Bank or the Sugar Industry Authority. All payments were scheduled following the harvest.

Other sugarcane production strategies were implemented through extension services, offered by the AIJCFA and the Sugar Industry Research Institute (SIRI). Input management, timeliness of operations, tillage use, disease and pest monitoring, soil and foliar analysis for fertiliser needs, demonstration and result seminars for herbicide use, maturity testing for harvesting, cane seed identification and selection for replanting and general advisory on crop husbandry were the services offered to the families. The families were also kept informed about management and cultivation on two radio programmes facilitated by the SIRI. Other strategies included field and factory tours, as well as an annual conference to update families on recent development.

Apart from sugarcane production strategies, the Sugar Area Development Programme (SADP) was implemented by the government in 2008, targeting sugarcane growing communities. This programme aimed to improve the living standards of the most vulnerable in the sugar dependent regions. Improved social services, diversification of economic activities that ensured the sustainability of natural resources in these regions were the main components of the programme.

There were other national programmes implemented for sustaining social and economic development in which the families were automatically included. At the time of the fieldwork, agricultural projects, areas of education and training, health, national security and microenterprise development were most relevant to the families. The ultimate aim of these programmes were to create employment opportunities, increase literacy levels and the skills capacity of the working population, improve health status, as well as increase community security and, hence, reduce poverty in rural areas.

Research Question 3: *What strategies can be identified to improve the livelihoods of these families?*

In terms of improving the livelihoods of families operating small sugarcane farms in Jamaica, the elements of crime and violence must be dealt with first. The perspectives of both the families and community group members suggested that crime was the major factor that hindered them in pursuit of a satisfactory or improved living. They believed involving people in crime planning, striving for proper attitudes and worth among the youth, and strengthening policing could make a vast difference to the crime situation.

Other areas deserving attention were vocational skills training and investment in training and management in small microenterprise development. There was evidence that investment in domestic crop production could provide both an incentive and a boost to on-farm profitability for the families.

9.4 Methodological Considerations

This thesis started with the premise that small sugarcane farms were on the verge of collapse and the livelihoods of relevant families would be adversely affected. However, in the early stages of the fieldwork it was revealed that the solution for positive livelihood outcomes of these families was likely to lie other than in sugarcane farming.

As a consequence the structure of this thesis may be seen as unusual in that the initial fieldwork led to a revision of the research questions. Accordingly, a considerable amount of the literature review was undertaken during a later phase of the thesis and the results were then analysed in relation to this literature. This approach is consistent with the research methodology propounded by Glaser (1978).

9.5 Study Limitations

This research has some limitations. Even though the study set out to capture diversity the research confined itself to an investigation of livelihoods of families in only two of the seven sugarcane regions in Jamaica. It must be acknowledged that the investigation of the other regions was beyond the scope of the project. Given the time frame and budget constraints, the research was limited in its ability to provide sufficient understanding from the two regions in a Jamaica context. However, it is hoped that most aspects of this comparative study will have implications for the other regions.

Since poverty is dynamic and complex and relevant issues of livelihoods are constantly changing, the study would have been able to obtain better insights if longitudinal data were available. Data in relation to income portfolios, social relations, activities portfolios, demographic characteristics, cost of production and the labour market need to be collected over a three to four year period so as to have a clearer understanding of how these variables change over time.

Another limitation was the unreliable secondary data sources. The nature of the study required a wealth of secondary data to complement the empirical findings to design the strategies necessary for improving livelihoods. The relevant data needed were either fragmented or extremely expensive. The library catalogues referring to most data were obsolete and did not match the scope of this study. In Jamaica, there is the need to catalogue recent and current experience of the failures and successes in poverty reduction.

Other limitations of the study were related to the behaviour of family members. Recruiting family members for the interview was challenging, resulting in 70 per cent of potential members participating. They disallowed the use of tape recorder which would have provided for greater accuracy of reported information and reduced the time spent on each session. Most families were reluctant to discuss sensitive issues such as incomes and illegal activities. This explained the reason for the researcher not probing further into illegal activities.

9.6 Implications for Further Research

While this primary research produced a range of information for analysis, it revealed opportunities for further research. Comparing similar data from other sugarcane growing regions in Jamaica, as well as from other countries, would assist in explaining the differences that were not clearly evident. Further research may include a set of panel data that could be collected and reported on in more depth. Issues relevant to gender differences, friendship integration in social capital analysis, changes in the labour market, changes in activities and incomes portfolios and illegal activities would require broad and systematic research methodologies to trace events over time.

In particular, illegal engagements must be examined further to capture not only what illicit activities people did, but to understand the interactions of those engagements as it related to the income derived. This will contribute to the understanding being sought about the dynamics of income and activities portfolios which is critical to policy development. However, considerable patience must be exercised during the data collection phase, since people did not readily disclose their unlawful leanings. A discussion on illicit practices during

data collection can be easily derailed if extreme caution is not taken on the sequence of questions asked. Experience from the fieldwork suggested that it will be of use in research designs to utilise in-depth semi-structured interviews strengthened by observations. Observation is a key method but will not capture certain kinds of engagements and can lead to participants becoming suspicious. There was doubt that structured interviews and questionnaires could assist in illuminating the effect of the different activities and how they impacted on income portfolios. Certainly, questionnaires, in particular, would raise the level of mistrust among participants and could disrupt the information flow and make participants become conservative. In-depth semi-structured open ended interviews and observations can be effective for gathering the relevant information provided the exercise started with legal activities and proceeded thereafter.

Finally, it is the ambition of this researcher that this vital subject which has many critical and worrying aspects, will contribute to the on-going dialogue among those who participate in poverty reduction effort in Jamaica and the developing world.

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Appendix A

A.1 Cane Sugar Production from 1770-1800 (tonnes)

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Sources: Spence 2004a

A.2 The Caribbean Population and Size

[copyright clearance to reproduce table not obtained]

Source: Duval 2004 and CIA 2006

A.3 Parishes of Jamaica in their Respective Counties

[copyright clearance to reproduce table not obtained]

Source: The Jamaica Gleaner n.d.

A.4 Preferential Sugar Trade Arrangements

1) The EU Preferential Trade Arrangement

The EU negotiates most of the agreements and offers some of the largest quotas in the global sugar trade. Most of the sugars supplied to the EU are made under preferential arrangements. The agreements are centred on duty free access and price structuring.

a) The Africa, Caribbean and Pacific (ACP) Sugar Protocol

As a follow-up of the British Commonwealth Sugar Agreement, which was implemented in 1958, the United Kingdom (UK), when joining the European Economic Community in 1973, made the commitment to import 1.3 million tonnes of raw cane sugar annually from the traditional ACP states and India, along with an additional 400,000 tonnes from Australia. By 1975, the ACP/EU Sugar Protocol was made effective under the Lome' Convention, which was replaced by the Cotonou Agreement in 2000.

b) Most Favoured Nation Arrangement

In addition to the 1.3 million tonnes from the ACP states and India, another 80,000 tonnes was included under the EU preferential trade, referred to as the Most Favoured Nations (MFN). Under the programme, Brazil will supply 26, 667 tonnes and Cuba 53,333 tonnes. Unlike the ACP protocol no fixed price was established.

c) Special Preferential Sugar – Maximum Support Needs

In 1995, a further agreement was made under the EU sugar import regime referred to as the Special Preferential Sugar (SPS) or Maximum Support Needs; to support refining capacity in France, Portugal, UK and Finland. The arranged quota is fixed at 1.765 million tonnes and is filled by ACP countries. No duty is charged on SPS.

d). Everything but Arms Initiatives (EBA)

An adjustment was made to the EU trade arrangement in 2001, where the 58 Least Developed Countries (LDC) were given duty free access to the EU market. The special arrangement is called the Everything But Arms Initiatives (EBA), which allows for imports to the EU everything except for arms and three sensitive products (banana, rice and sugar). For the sensitive products, free access and duty reductions will be effective by 2002 for bananas, 2006 for rice and 2009 for sugar.

e). Economic Partner Agreements (EPA)

The European Commission has developed a proposal containing a special package where free markets for all products should be granted to all ACP member states. The programme was scheduled to take effect in 2008.

2) The US Sugar Trading Arrangements

The US is among the top eight sugar producing nations and is both a beet and a cane sugar producer. The country imports raw sugar to fulfill its annual domestic needs on a country by country basis. Sugars delivered into the US are monitored under a tariff quota system.

a) The US Tariff Rate Quota System

The US sugar industry is protected under the US tariff rate quota (USTRQ) system. The USTRQ allows for the entry of 1.117 million tonnes of raw sugar from 40 countries. In 1994, the US established the free trade agreement with Mexico and Canada known as the North American Free Trade Agreements (NAFTA). A section of the agreement provides for Mexico to supply the US domestic sugar market with 137,000 tonnes of refined and/or raw sugar annually.

In addition to NAFTA, the Central American Free Trade Agreement was established in 2003. The US established a deal with Guatemala, El Salvador, Honduras and Nicaragua to increase their sugar quotas from 110,000 tonnes to 236,000 tonnes by 2018. The increase will take effect with 85,000 in the first year, with an annual increase of two per cent.

A.5 Information and Data Collected for Carrying Out Competitiveness of the JSI

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Source: Porter 1990

A.6 The Total Cost of Implementation of JSI Rationalisation Strategic Plan, 2006

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Source: PIOJ 2006

A.7 Summary of the JSI Competitive Advantage

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Source: Porter 1990

A.8 Pioneers of the SLA

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Source: Solesbury 2003

A.9 DFID SLA Checklist of Questions for Family Interview

Vulnerability Context

- Crop(s) produced beside sugarcane?
- Importance of each crop to the livelihoods of the family?
- Particular use of revenue from crop(s) eg. for children school fees?
- Proportion of produce marketed?
- Prices of crop(s) throughout the year?
- Predictability of seasonal price?
- Nature of price cycles?
- Proportion of family food needs (own consumption vs portion purchased)?
- Time of the year cash income most important vs time at which cash is most available?
- Access to financial service institutions that encourage future savings?
- Length of the most difficult period?
- Impact of the most difficult period and natural events (eg. rainy season) on health and ability to work?
- Nature of the most difficult period (increasing or decreasing)?
- Nature of earning opportunities (agricultural or non-farm)?
- Nature of remittance income?

Livelihood Assets

Human Capital

- Nature of the local environment (the importance of knowledge)?
- Access to and sources of valuable information?
- Nature of knowledge distribution in the community?
- Use of technology (from internal or external sources)?
- Information awareness?
- Awareness of rights, policies, legislation and regulation impacting on livelihoods (if aware, what level of understanding)?

Social Capital

- Connectedness with community members and the wider society
- Membership of groups and association
- Relationships of trust

Natural Capital

- Access to types of natural resources
- Nature of access rights (eg. private ownership, rental or contested ownership)
- Evidence of conflict over resources
- Productivity of resource (eg. issues of soil fertility/structure)
- Existing knowledge that can assist an increase in the productivity of resources
- Versatility of resources (multiple purpose or single purpose)

Physical Capital

- Access to infrastructure (does it support a service?)
- Appropriateness of infrastructure (does it meet the needs of users?)

Financial Capital

- Existing type(s) of financial service organisation (formal or informal)
- Provision and conditions of service (eg. interest rates, collateral requirements)
- Accessibility criteria
- Reliability of remittances
- Options of savings

Transforming Structures and Processes

The information required relating to this component can be extremely time consuming and difficult to acquire, however the following general idea will be useful when thinking about structures and processes that affect livelihoods.

- The role of authority (who or which organisation actually does what?)
 - Responsibilities of organisations/or individuals?
 - Share of responsibilities at the lower level?
 - Reflection of responsibilities (in policy and legislation)
 - Awareness of organisations of their human and political rights?
 - State of relationship between policies (bodies that make them) and legislation (bodies that implement)?
- Awareness of political, human, social and economic rights

Livelihood Strategies

- The livelihood portfolio of each family member
- Percentage of income from different sources
- Time and resources devoted to each activity

- Why changes occur in livelihood activities over time? (eg. responding to environmental change; domestic cycle; or as a response to opportunities or threats)
- Investment possibilities (if so, what are the priorities?)
- Preferences in term of livelihood activities

Livelihood Outcome

- Access to means of ensuring that rights are met
- Security against physical damage, violence, natural and economic shocks
- Quality and sources of information openly available
- Involvement within the political process
- Access to education, sanitation and health

A.10 Question Guide for Group Discussion

What are the goings and comings in the area?

What are the things people are talking about in the area?

Who is the most helpful person who comes to the area?

How is agriculture going these days?

What are the bright spots?

A.11 Seasonal Calendar

Two seasonal calendars, one from each region, were explained and drafted during the fieldwork exercise. The calendars were centred on how farmers organised their farm and economic activities in relation to the time of the year. Planting, cultivation practices, harvesting and marketing dates were presented in a scheduled format. Although the calendar did not deliberately include dates regarding non- agricultural activities; it captured a wide range of management strategies employed by family members. The majority of the farming activities and practices focused on the pattern of rainfall.

In Jamaica, May through to November are normally the wetter months. This climatic pattern of the calendar year is usually marked by the hurricane season, which begins in June and ends in November. Most Jamaican rainy periods are observed within this time-frame. The rainy period in Jamaica is important not only to the livelihood of farmers but also for commercial activities and industrial processes. Farmers in both regions are of the view that rainfall is the main driver of the Jamaican agriculture economy.

The calendar is based on activities in the cane growing areas of Vere, Mid Clarendon, Upper Clarendon (in the parish of Clarendon) and Long Pond and Hamden (in the parish of Trelawny). The Vere and the Mid Clarendon areas are situated in the irrigated belt, while the Upper Clarendon area, Long Pond and Hamden is rain-fed. For sugarcane, the most common crop in these areas, harvesting is normally carried out between January and June in all areas. Families keep alert during this period, as it is the busiest time of the year in these areas.

Cutting, loading, haulage and supporting activities mount in communities in close proximity to factories. Also, it is during these six months that most of the cultivation practices are carried out. Fertilising, weeding and herbicide applications, stumping, drainage maintenance, supplying, moulding and inter-row cultivation are the main activities.

The Technical Advisory Services of SIRI recommends that fertilising and pre-emergent herbicide application should be carried out 2-3 weeks after harvesting. These recommendations were often not adhered to, even in the irrigated belt areas, though they have extended time to carry out these practices. Most of the fertilising on small holdings are carried out at the start of the rainy seasons in April with cheaper post-emergent herbicide applications following the emergence of weeds. Sugarcane is planted all year round in the irrigated belt while the concentration of planting in the rainfed areas is during the rainy period. Particularly in rain-fed areas, small farmers who are replanting generally carry out land preparation before the rain, make cane seed arrangements and, as soon as the rains begin, the process of planting commences. Sometimes this practice has proven risky as weed infestation may set in due to lengthy delays.

The harvesting period throughout any of the areas increases economic activities and this allows for the contingent workforce (self, irregular and part-time workers) to capitalise on their income. Artisans, small retail groceries, cook shop operations, taxi operators, small manufacturing businesses, sugarcane field seasonal workers, charcoal burners, sugar factory seasonal workers and other service providers plan their livelihood activities and strategies around this six month of operation. At the end of the sugarcane harvest, it is usual for some residents to migrate (temporarily or permanently) elsewhere in search of employment.

In regard to other crops activities, these are characterised by inter-cropping cultivation, and the type of crops vary with the different areas. Although there is a mix of vegetables, root crops, legumes, orchards or permanent cropping system across the five areas, there is an inclination for farmers operating in the irrigated Vere and Mid-Clarendon to establish commercial vegetables crops such as callaloo, pak choi, okras, hot peppers, tomatoes and pumpkins that depend on irrigation for most of their growth cycle. In the Upper Clarendon rain-fed area there is the tendency for farmers to commercialise orchard or permanent crops such as oranges, coffee, coconuts and cocoa (they are also involved in vegetable crops) while the Long Pond farmers concentrate most on commercial species of root crops such as yams sweet potatoes and, cassava and, to a lesser, extent legumes. Farmers in the Hamden area have commercialised an even mix of the species.

There is no specific time for establishing vegetables in the irrigated areas; this is based on market demand which is always fluctuating. Nevertheless, there is a trend from March to May where vegetables tend to be scarce due to drought conditions. To prepare for this period, irrigated farmers established their vegetable crops in mid December through to late February. With the exception of the irrigated areas, vegetables are established in the rainy months (May to November) and are marketed from August to February. In general, commercial yam establishments in the Long Pond area have two planting seasons, an early April to May season and a late July to August. Other root crops are planted across the areas based on the intermittent rainfall pattern throughout the year. There are some cultural myths and tales that are attached to the planting of legumes and root crops in these areas. On average, cultivation and marketing of the different root and legumes are year round practices.

The fruit trees that are common in nearly all homes form a significant part of the household income particularly in the Long Pond and the Hamden areas. There is no cultivation practice connected to these crop species. However, much effort and planning is centred on harvesting. Ackee, mangoes, breadfruits, avocados, guinea, tamarind and citrus are popular. Their harvest periods are seasonal; some produce one crop a year, while others two and three. Managing and operating activities around harvesting have become an important part of the livelihood system of the rural economy.

A.12 Question Guide for Key Informant (Ministry of Agriculture: Head of the Sugar Transformation Unit).

The EU have announced a reduction in the price of raw sugar, what plans and/or strategies will the government undertake for small cane farmers to offset the losses?

What is the primary objective of the Sugar Transformation Unit?

What steps will be taken to ensure that the vulnerabilities of the fall-out are reduced?

What are the likely barriers for implementing the plan?

What is the budgeted cost for realising the objective?