

Working paper

Potential of Non- Traditional Exports in Zambia

Growth, Employment
and Distribution of
Wealth and Income

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ACRONYMS

ACI	Agri-Food Consulting International
ACP	Africa, Caribbean Pacific
ADB	African Development Bank
BMGF	Bill and Melinda Gates Foundation
BMZ	German Ministry for Economic Cooperation and Development
BT	Bacillus Thuringiensis
CAADP	Comprehensive African Agriculture Development Programme
CAZ	Cotton Association of Zambia
CBZ	Coffee Board of Zambia
CDT	Cotton Development Trust
CmiA	Cotton made in Africa
COMESA	Common Market for Eastern and Southern Africa
COMPACI	Competitive African Cotton Initiative
CGA	Cotton Growers Association
CSO	Central Statistical Office
DEG	Deutsche Investitions- und Entwicklungsgesellschaft (German Investment and Development Company)
DIFD	Department for International Development
EAFCA	Eastern African Fine Coffees Association
ECZ	Environmental Council of Zambia
ERS	Economic Research Services
EU	European Union
FDI	Foreign Direct Investment
FISP	Farmer Input Support Programme
FRA	Food Reserve Agency
FSRP	Food Security Research Project
GDP	Gross Domestic Product
GRZ	Government of the Republic of Zambia
GTZ:	Deutsche Gesellschaft für Technische Zusammenarbeit
ICA	International Coffee Agreement
ICO	International Coffee Organisation
KASCOL	Kaleya Smallholder Company Limited
KST	Kaleya Smallholder Trust
MACO	Ministry of Agriculture and Cooperatives
MAL	Ministry of Agriculture and Livestock
MCGT	Magobbo Cane Growers Trust
MSCGT	Mazabuka Sugar Cane Growers Trust
Mt	Metric Tonnes
MWUA	Manyonyo Water Users Association
NAP	National Agricultural Policy
NTB	Non-Tariff Barrier
ODI	Overseas Development Institute
PPP	Public Private Partnership
SADC	Southern Africa Development Community
SCRB	Soil and Crops Research Branch

SMEs	Small and Medium Enterprises
SSA	Sub-Saharan Africa
UK	United Kingdom
USA	United States of America
USDA	United States Department of Agriculture
VAT	Value Added Tax
ZACOPA	Zambia cotton Pre-financiers Association
ZCC	Zambia Competition Commission
ZCGA	Zambia Coffee Growers Association
ZDA	Zambia Development Agency
ZESCO	Zambia Electricity Supply Corporation
ZMK	Zambian Kwacha
ZNFU	Zambia National Farmers Union
ZNSS	Zambia National Sugar Strategy
ZSC	Zambia Sugar Company

EXECUTIVE SUMMARY

This study was commissioned to assess the potential for the diversification of Zambia's agricultural economy into non-traditional export markets by determining the prospect for growth, employment creation and, equitable wealth and income distribution in the sugar, cotton and coffee sub-sectors. The study provides an in depth analysis of the key current and prospective natural, economic and policy issues challenging and enabling the long-term growth of the sub-sectors and consequently the attainment of sustainable economic development of Zambia. Both secondary and primary data was used, gathered through desk research and key in-country informant interviews. Secondary data was collected through a review of published and unpublished material including past value chain studies.

The study established that there is considerable potential for growth and employment creation in all the three sub-sectors through the expansion of agricultural production, as the country is well-endowed with natural resources that are well-suited for the competitive production of the three crops. Investigations into the export markets for sugar, coffee and cotton show that there is a growing global demand for these commodities and that the current preferential trade arrangements governing these markets are important for ensuring market access for Zambian products and subsequently increased income potential for producers in these sub-sectors. The study finds that the prospects for equitable wealth and income distribution are most available in the sugar and cotton sub-sectors that already have a significant number of small-scale producers engaged in production. Policy and economic issues confront these subsectors and limit their contribution to effective growth, employment creation, and equitable wealth and income distribution. Lack of financing and high transactions costs have emerged as the cross-cutting constraints for all the sub-sectors. Hence efforts to promote export diversification in these sectors should ideally be focused first primarily on programmes that ensure financial availability and promote investments into infrastructure that will reduce the transactions cost, among other things more specific for each individual sub-sector.

KEY FINDINGS

SUGAR SUB-SECTOR

- The study reveals that the sugar sub-sector is one of Zambia's most important economic sub-sectors and one of the most successful non-traditional export sectors. The sector accounts for 3-4 percent of the national Gross Domestic Product (GDP) and 6 percent of total national exports in Zambia. The sugar industry provides employment for around 11,000 workers, with a total number of dependents exceeding 75,000 (Palerm, Sierevogel & Hichaambwa, 2010). The sugar sector generates over US\$45 million in gross export revenue annually, which has almost doubled from the mid-1990s when export earnings stood around US\$25 Million (World Bank, 2007b). Growth in the sugar sub-sector holds great prospects for Zambia to diversify the economy, which was previously copper dependent, offering great opportunity for agricultural growth, diversification and employment creation.

- The global sugar market is highly distorted due to controls put in place by most countries to protect their domestic markets, and is characterised by high price volatility owing to macro-economic policy, exchange rate dynamics and weather conditions of the major exporting and importing countries in the global market. The price volatility on the world markets makes it difficult to formulate concrete forecasts for sugar prices.
- The EU market, through its preferential trade arrangements; the ACP/ EU Sugar protocol and the Everything–But–Arms (EBA) protocol, make the EU an important export market for Zambian sugarcane producers. However, the recent reforms in the EU sugar markets and changes in the terms of these arrangements such as the removal of the price guarantee point to uncertainty of the sustained profitability of producers and processors in the Zambian market.
- Increased and deeper regional integration under COMESA and SADC through regional trade arrangements such as the SADC Sugar Cooperation Agreement, offers an opportunity for export growth through increased access to regional markets and diversification of market access, which is currently highly dependent on the EU market.
- Zambia is one of the lowest cost producers of sugar internationally and regionally thereby making it a competitive producer globally. A study by the Overseas Development Institute (ODI) revealed that sugar production in Zambia is very efficient with an average cost of production of US\$169 per ton compared to a world average US\$263 making it the sixth lowest cost producer in the world.
- Despite the low cost of producing sugar cane, the growth of the sugar sector is particularly constrained by the high transactions cost incurred higher up the value chain. This includes the high cost of doing business in Zambia as reflected in high taxes, high fuel, electricity, transportation and distribution costs, high wages and inflation rates. These costs are transferred to the domestic markets and as a result they push up the domestic price of the commodity. Additionally, Zambia is a landlocked country with poor transport infrastructure that makes it very expensive to access export markets. High interest rates in the Zambia financial market also pose a significant barrier to entry for potential entrants.
- The growth of industrial use of sugarcane and the policy shift by Brazil, the major world sugar producer, to support sugar production for ethanol production has increased global demand for sugar, thus implying that there is a market available for sugar in the future.
- The sugar value chain in Zambia is highly concentrated with a monopolistic market structure in which the market is dominated by one firm. This uncompetitive market structure has been cited as one of the reasons for the high domestic price of sugar despite Zambia being one of the lowest cost producers of sugar in the world.
- Water and environmental issues are of critical importance in sugar production as the industry is a major user of water resources. Two sugar producing companies (Zambia

Sugar Plc and Kafue Sugar) rely on the Kafue River, which has come under heavy stress due to other uses of the same water including hydroelectricity and domestic consumption. Access to water rights is a major barrier for land development for sugar production including out grower scheme development.

- The growth of the sugar sector can be achieved through promoting programmes that ensure access to water rights that will create incentives for investments in sugar production.
- The enactment of the Zambian National Sugar Strategy is a demonstration of government commitment to growing the sector. The strategy seeks to increase employment and growth through the promotion of out-grower schemes, support for alternative sugar uses such as ethanol production, development of a sugar trade policy and the support for improvement of transport networks.

COFFEE SUB-SECTOR

- There is a growing trend of speciality coffee market segments such as organic and fair trade certified coffees in the major coffee consuming countries that offer premium prices over traditional coffee. The fair trade concept of rewarding efforts of uplifting social, economic and environmental conditions of coffee producers is a significant opportunity particularly the increased gains for smallholder farmers engaged in coffee production.
- Zambia produces Arabica coffee, which is one of the most competitive coffee varieties on the market. Arabica coffee generally commands a premium over Robusta coffee therefore Zambia has access to a higher value market with the Arabica coffee that it produces.
- The production cycle of coffee is lengthy, taking on average four years before the crop matures and the farmers get a return on their investment. This is the most constraining factor for small-scale farmer participation in the subsector, as it involves tying down of the limited resources they have. This is further exacerbated by the high cost of capital in Zambia. Infact between 2003 and 2009 the number of small-scale coffee growers dropped from 500 to 40.
- Zambia has experienced a progressive decline over the years in the production of the coffee bean. According to the Zambian Coffee Growers Association the decline has mainly been attributed to the lack of affordable long term financing for coffee production. For viable coffee production farmers need financing of between 8 and 13 years, of which the banks cannot afford to lend on these terms.
- To capture the potential for the growth of the coffee sector the government needs to work with the private sector to come up with innovative ways of availing financing for

coffee production at rates that are affordable to ensure profitability. In terms of increasing small-scale farmer participation there is a need for programmes that will enable farmers to earn some form of income to cover up the waiting period for the maturity of the coffee trees.

- The potential for promoting growth in this sector is through programmes that create opportunities for access to long-term financing at affordable rates.

COTTON SUB-SECTOR

- The cotton sector is an important to Zambia's economy as it directly and indirectly supports an estimated 21 percent of the Zambian population while also accounting for about 19 percent of national GDP and 32 percent of the value of the main agricultural exports. The crop also generates significant commercial activity throughout the entire economy and value chain, including import and distribution of inputs, the provision of extension services to farmers by companies, cotton seed ginning, exportation of lint and unprocessed cotton seed and processed oil, as well as oilcake and soap production. Demand for Zambian cotton on the international market is high and it fetches premium prices as it is hand-picked which improves quality. Furthermore, there have been efforts by the ginners at improving the ginning process.
- When benchmarked against other cotton producers in the region and elsewhere, productivity of Zambian cotton is low, although within the competitive range. The major constraint in the cotton subsector is low productivity particularly in the small-scale sector, which is exacerbated by poor farming practices such as late planting, weeding, spraying and harvesting. Low productivity poses as the single most important constraint to the growth of the sector.
- Cotton production in the small-scale sector competes with maize for resources such as land and labour, as planting of cotton occurs at the same time with maize production. Given the market support for maize that offers above-market equilibrium prices and the natural inclination of smallholder farmers to preferring maize over other crops, maize production becomes more competitive for farmers to engage in.
- Poor farming practices in the sector have been partly associated with low investments in the sector by the cotton companies who in turn blame the low investment on lack of regulatory frameworks that makes investment in the sector risky. However, of late, there have been some investments by some companies in yield increasing programmes which seem to be bearing dividends as some farmers are reporting increases in yields of up to 1200kg/ha. An example of one such programme is the Yield Programme by Dunavant that provides technical assistance on production management practices, to smallholder farmers.
- Despite challenges, the cotton sector contributes greatly towards employment and wealth creation compared to other cash crops like tobacco and small-scale sugar industry because of the relatively large numbers of farmers involved in cotton production. The suitability of cotton to the circumstances of the poorly resourced small-holder

farmers considering that it can be produced under dryland farming it offer the greatest potential for the involvement of the smallholder sector in accessing export market.

- Programmes that seek to promote the growth of the cotton sector need to be mainly concerned with facilitating the increase in volume of cotton produced through overcoming the constraints to productivity such as input support programmes and removal of maize market distortions that are creating artificial production shifts from cotton to maize.

1. INTRODUCTION AND BACKGROUND TO THE STUDY

1.1. INTRODUCTION

This study was commissioned by the International Growth Centre (ICG) to better inform policymakers on non-traditional agricultural sectors that could contribute significantly to sustainable economic growth in Zambia. Zambia's future development will depend significantly on the diversification of the economy. Most stakeholders believe that the best prospects for diversification are currently found within the agricultural sector given Zambia's natural resource endowment. Historically, Zambia's agriculture sector has been dominated by maize production. However, there is considerable potential for expansion in respect of a number of other agricultural products. Research evidence has shown that varieties of agricultural products are or have the potential to be internationally competitive and have great potential for growth and employment creation. This study looked at the growth and employment creation potential in respect of the coffee, cotton and sugar sub-sectors.

This report presents the findings of the work carried out; conclusions based on discussions held with a variety of stakeholders and target groups; observations made in the field and documents reviewed by the study team. The analyses and conclusions are a qualified interpretation of the range of issues brought out during the course of the study by the consultant.

1.2. STUDY OBJECTIVES

The main objective of the study was to assess the potential for growth and employment creation in the sugar, cotton and coffee sub-sectors in Zambia. The study aimed at providing an in depth analysis of the key issues and challenges faced by the sugar, cotton and coffee sub-sectors with a view of assisting the formulation of favourable sector policies and strategies towards promoting long term growth of the sub-sectors.

Specifically, this assignment was guided by the following key questions to better understand the potential for growth and employment creation in the sugar, cotton and coffee sub-sectors:

- What are recent production trends for each of the products? What are the recent production trends in respect of large and small producers?
- What is the likely future of production trends in respect of each of these products? What are the likely production trends in respect of large and small producers?
- How competitive are these products in the region as well as in the international export markets?
- What are the potential constraints to growth and exports? What are the most critical binding constraints which, if mitigated, would have most immediate and significant effect on growth?
- What government programmes and incentives are there designed to support these products?

- How effective are these government programmes and incentives? Who are the principal beneficiaries?
- What are the employment creation and distribution of wealth and income impacts of growth in these products?

The full scope of work for the study is attached as Appendix 1.

1.3. STUDY METHODOLOGY

Both secondary and primary data was used in the study. The data was gathered through desk research and key informant interviews. Secondary data was collected through a review of published and unpublished material including past value chain studies. The main sources of secondary data included economic surveys from Central Statistical Office (CSO), Ministry of Agriculture, Government of the Republic of Zambia policy and programme documents, consultancy reports and online publications. A complete list of documents that were reviewed is attached as Appendix 2.

Key informant interviews were carried out with leaders of individual commodity sectors with special emphasis given to participants in cotton, coffee and sugar. Additional sources with a detailed knowledge of growth and investment opportunities including the producers' associations, government officials, trade representatives, and farmers were also consulted for relevant information and feedback on the strategies proposed in this report. A complete list of individuals and organizations met is given in Appendix 3.

1.4. REPORT LAYOUT

The report is divided into five chapters. The first chapter gives an introduction and background to the study providing an overview of the Zambian country context as well as factors shaping opportunities for the development of the agriculture sector. Following the introduction, chapters two, three and four discuss the value chains of the three commodities. For each commodity, discussion of recent performance, market opportunities, potential for growth and employment creation, and constraints is followed by a set of recommendations or strategic interventions that could be used to help improve sector performance for growth and employment creation. Finally, chapter five summarizes the main findings and conclusions.

2. COUNTRY CONTEXT

2.1. OVERVIEW OF AGRICULTURAL SECTOR

Agriculture is the mainstay of the rural economy of Zambia and involves crop farming, livestock rearing, fishing and forestry. The agricultural sector, including agro-processing, contributes about 40 percent of the Gross Domestic Product (GDP), 67 percent of the total employment, supplies the bulk of raw materials which account for over 80 percent of the manufacturing sector's value added, and contributes more than 12 percent of foreign exchange earnings (World Bank, 2007a).

Zambian agriculture has three broad categories of farmers: small-scale, medium and large-scale. Small-scale farmers are generally subsistence producers of staple foods with occasional marketable surplus. Medium-scale farmers produce maize and a few other cash crops for the market. Large-scale farmers produce various crops for the local and export markets. Table 1 illustrates the three broad categories of farmers in Zambia – small-scale (or subsistence farmers), medium and large scale farmers. Commercial farmers (medium and large scale) with farm size above 20 hectares, focus on cash crops. Only 740 commercial farmers (less than one percent) have holdings in excess of 60 hectares. While the trend in the number of households in the small-scale category is on the increase, the numbers of the medium and large-scale farmers have remained more or less the same (Government of the Republic of Zambia, 2004a).

Table 1: Characterization of Zambian Agriculture

Characteristics	Small scale	Emergent	Medium scale	Large scale
Number of farmers	459,000	119,200	25,230	740
Area per holding (hectares)	0.5-9.0	10-20	20-60	>60
Crops grown	Food crops	Food/Cash crops	Food/Cash crops	Cash crops
Production focus	Subsistence	Commercial/Subsistence	Commercial/Subsistence	Commercial

Sources: GRZ (2004a).

The main crops that are grown are maize, wheat, sorghum, cassava, rice, millet, groundnuts, soybeans, mixed beans, peanuts, sunflower seed, vegetables, coffee, flowers, tobacco, cotton and sugarcane. However, the Zambian agriculture sector is dualistic with the vast majority of producers being smallholders primarily growing cereals and tubers with an average customary holding of about 1.5 hectares. Smallholders are predominantly subsistence and depending on the performance of maize production, about 50 percent of production is marketable surplus (COMESA, 2007). In contrast, the large commercial estates grow maize and industrial crops on leased land. Fertiliser, labour and seed are the major inputs for households growing crops, with a fundamental impact on food production.

The livestock sub-sector contributes about 42 percent to agriculture GDP (COMESA, 2007). Until recently, the livestock sub-sector has existed in the shadows of the crop sector, especially in the smallholder sub-sector. A study conducted by Daka (2002) shows that livestock products provide about 23 percent of the per capita supply of protein and cattle is the largest source of this supply. Per capita meat consumption in Zambia is about 2.4kg, which is about half that of the average for Africa (COMESA, 2007). Despite their overshadowed existence, integration of livestock activities in farming provides an opportunity

for diversification in farming. This diversification provides a strategy for reducing the risk associated with farming, especially rain fed agriculture and thus stabilizing farm incomes.

Fish is an important food item in the diet of Zambians, accounting for approximately 40 percent of the animal protein consumed. Fisheries development in Zambia has great potential but has performed far below expectation. Local fish demand is estimated at 120,000 tons annually but instead fish catches average only about 70,000 tons (COMESA 2007; Government of the Republic of Zambia, 2004a). Efforts are directed at improving the management in capture fisheries and increase aquaculture. Reasons for the poor performance are attributed to lack of a fisheries development policy as well as lack of research and technology development and extension.

The sector's contribution to real GDP averaged 18 percent over the past decade, making up 39 percent of earnings from non-traditional exports, though this has fluctuated significantly mainly due to the dependence on seasonal (unreliable) rainfall (World Bank, 2007a). The largest exports and highest contribution are in primary agricultural products (maize, sugar, tobacco and cotton) and floricultural and horticultural products. Other important exports include coffee (Arabica), fuzzy cotton seed, paprika, and soybeans. In some years, maize, marigold meal, groundnuts, and seeds have brought important export values, but the performance of these products seems to be erratic (Government of the Republic of Zambia, 2004a).

Zambia has a comparative advantage in the production of a wide range of food and non-food crops, however, it has not capitalised on this comparative advantage to increase production across a wide range of products. This is partly due to unfavourable policy options, lack of capacity and resources to exploit these advantages. In recent years however, production of crops such as maize, flowers, fruits and vegetables has increased but the comparative advantages in terms of livestock, fisheries and forestry have not been systematically harnessed. To a large extent the Zambian agricultural economy remains largely a mono economy dominated by maize production.

Zambia possesses tremendous land and water resources with over 1, 7 million cubic metres of underground water resources. Surface water resources on the other hand range from 136,2 million cubic metres per day in a drought year (10 year return period) to 237.3 million cubic metres per day in an average year. This is about 40% of the surface water resources in the SADC region (Government of the Republic of Zambia, 2006; Government of the Republic of Zambia, 2004b).

Zambia possesses over 423,000 ha of irrigable land of which about 100,000 ha is actually irrigated among large scale, emergent and smallholder farmers. Compared to countries such as Zimbabwe (4.7%), South Africa (7.9%), Zambia with more water resources only had 0.9% of its arable land irrigated between 1995 and 1997 (Government of the Republic of Zambia, 2006). Most of the irrigated land lies along the line of rail, above karstic areas for ground water, adjacent to standing water bodies such as rivers and dams, and in dambos and wetlands for smallholders and emergent farmers (Government of the Republic of Zambia, 2004b).

Zambia is one of the few countries in Africa which is abundantly endowed in terms of land, labour and water resources. Based on this endowment, the country has great potential to expand its agricultural production and provide linkages with other industries. Out of the country's total land area of 75 million hectares (752,000 square kilometres), 58 percent or 42 million hectares falls under the medium to high potential for purposes of agricultural production. The country is divided into three major agro-ecological zones as follows (A map showing location of the agro-ecological zones is attached as Appendix 4):

- **Region I** is characterized by low rainfall of less than 800 mm annually with a growing period of 80-120 days. This area constitutes 12 percent of Zambia's total area and covers the valleys of Gwembe, Lunsemfwa and Luangwa in Southern, Central and Eastern Provinces, as well as the plains of Western and Southern Provinces respectively. The valley parts of the region are hot and humid.
- **Region II** is located through the middle belt plateau and constitutes 42 percent of the country. The region receives 800–1000 mm of rainfall annually and has a growing season of 100-140 days with some of the most fertile agricultural soils located here. It is considered to have the highest agricultural production and permanent settled systems of agriculture are practiced. The Region is divided into two sub-regions.
 - **Region II a** covers Central, Lusaka, Southern and Eastern Provinces and generally contains fertile soils.
 - **Region II b** covers Western Province and consists mainly of sandy soils.
- **Region III** has the highest rainfall in Zambia, and constitutes 46 percent of the country. It receives between 1000-1500 mm per annum and has a growing season of 120 to 150 days. It incorporates large parts of Northern, Luapula, Copperbelt and North-western Provinces and some parts of Central Province. With the exception of the Copperbelt the zone is characterized by highly leached, acidic soils that limit production to tolerant crops unless liming is practiced.

Across the length and breadth of the country, rainfall ranges from 800 to 1400 millimetres. This level of precipitation is adequate and suitable for the production of a wide range of crops, livestock and fish. By current estimates, only 14 percent of total agricultural land stock is being utilized (Government of the Republic of Zambia, 2011;

2.2. AGRICULTURAL POLICY FRAMEWORK - HISTORICAL CONTEXT

For many years, the agricultural sector in Zambia, like the rest of the economy, operated under a controlled policy environment. Economic management was mainly through state institutions using various instruments, such as agricultural input and marketing subsidies, foreign exchange controls and controls on interest rates. Revenue, mainly from copper, was used to invest in parastatal firms with high tariffs and prohibitive import licensing ensuring their protection. Inevitably, this stifled private investment in productive sectors and retarded the development of the agricultural sector that became entirely dependent upon an increasingly inefficient public sector.

At the end of the second government's tenure and in the wake of dismal agricultural performance, serious economic reforms were undertaken that continue to have a profound effect on a greater part of the economy. The liberalization of the agricultural sector which began in earnest in early-1992 included the near total retreat of government from its previously primal role in every aspect, from the inputs markets to final retailing. Most of the agricultural sector was unprepared for the consequences of this rapid shift to a market economy. Because of the abrupt retreat of government without the concurrent creation of new support systems, agriculture was left in an institutional vacuum from which it today still recovers.

Notable policy measures undertaken since serious liberalization efforts began in 1992 include the elimination of price controls and subsidies although since the mid 2000's there

has been a policy shift towards introducing limited subsidies in selected key inputs like seed and fertiliser for small-scale farmers; privatization of former parastatal companies; increased private sector involvement in commodity marketing and input supply and also the restructuring of the Ministry of Agriculture to account for its new responsibilities in a market economy compared with the days of central planning. There is however, still an incomplete policy agenda for the sector given existing major constraints and challenges. These include severe bottlenecks in service delivery particularly for small-scale farmers, marketing constraints particularly in outlying areas as a result of poor infrastructure notably feeder roads, a void in agricultural finance and credit, weak regulatory framework and poor enforcement of legal framework, and poor accessibility and administration of land in Zambia. These constraints need to be thoroughly and urgently addressed if agriculture is to develop on a sustainable basis.

3. SUGAR SUB SECTOR

3.1. INTRODUCTION AND BACKGROUND

The sugar sub-sector is one of Zambia's most important economic sub-sectors and is one of the most successful non-traditional export crops. The sector accounts for 3-4 percent of the national Gross Domestic Product (GDP) and 6 percent of total national exports in Zambia. The sugar industry provides employment for around 11,000 workers, with a total of dependents probably exceeding 75,000 (Palerm, Sierevogel & Hichaambwa, 2010). The sugar sector generates over US\$45 million in gross export revenue annually, which has almost doubled from the mid-1990s when export earnings stood around US\$25 Million (World Bank, 2007b).

This section comprehensively discusses growth and employment potential in respect of sugar in Zambia by analyzing the market from a value chain perspective. It is intended among other things, to pinpoint opportunities that may exist for current and future growth and employment creation as well as inform policy makers of options to harness the opportunities for the benefit of the entire economy

3.2. OVERVIEW OF GLOBAL SUGAR MARKET

The global sugar export market is traditionally highly concentrated and dominated by a limited number of countries whilst the import market is more diversified with a larger number of players that include some of the major exporters. Between 2008 and 2010 Brazil, Thailand, Australia, India, Mexico and South Africa were the major exporters of sugar while the EU, USA, Russian Federation, Indonesia, China and India, dominated the import market (OECD/ FAO, 2011). The domestic economic and policy conditions of these major players have to date been the main drivers of supply, trade and price trends in the global sugar markets.

Supply

Global production of sugarcane is expected to increase in response to rising demand for sugar. The growing population and incomes in developing countries are expected to be the main reasons for the increase in demand. However, notwithstanding the sensitivity of sugar production to weather conditions, the supply of sugar on the world market is generally influenced by the various market and trade distorting policy instruments used by governments across the world. A wide range of instruments that include guaranteed minimum payments to producers, production and marketing controls, state-regulated retail prices, tariffs, import quotas and export subsidies are applied to markets for both raw and refined sugar. For instance, the government policies enacted in major sugar cane producing and consuming Asian countries, that intervene with sugar markets and production cycles have been particularly influential on the world sugar supply markets.

Trade

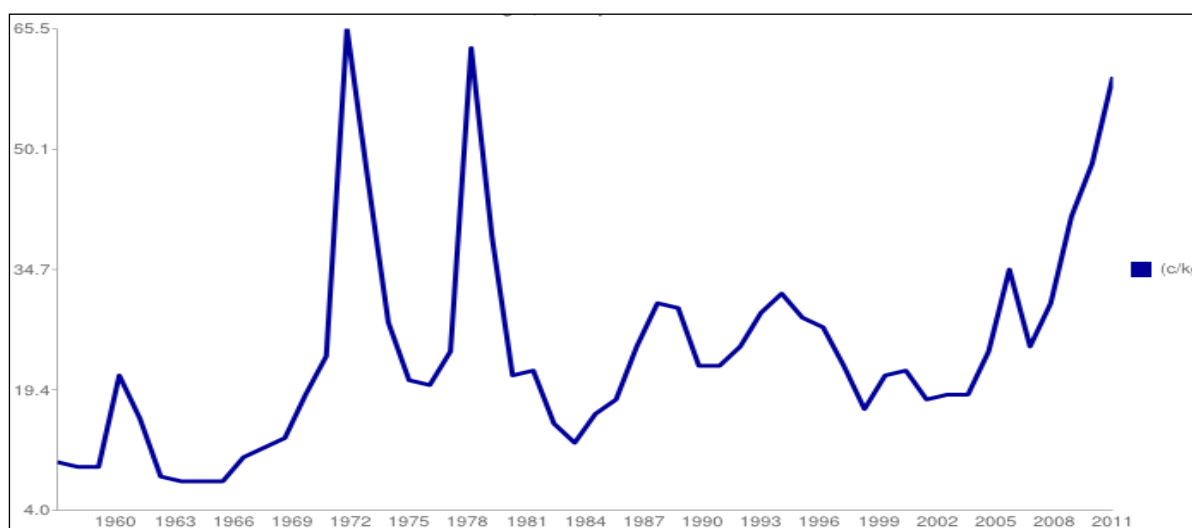
Trade in sugar is for the most part governed by preferential trade agreements. The agreements have largely benefitted sugar producing developing countries by helping them access regional and international sugar markets. The significant trade arrangements include the ACP/EU Sugar Protocol, the Agreement on Special Preferential Sugar (SPS), the Everything-But-Arms (EBA) initiative, the Caribbean Basin Initiative (CBI), African Growth and Opportunity Act (AGOA), North American Free Trade Agreement (NAFTA), the SADC

Sugar Cooperation Agreement and the Southern Africa Customs Union (SACU). The ACP/ EU Sugar Protocol may perhaps be regarded as the most important thus far, as it has enabled the developing countries access to the EU sugar markets at prices substantially higher than the world prices.

Prices

The prices of sugar in the world market are highly variable as shown in Figure 1 below (Figure. 1); sometimes reaching record high levels and sometimes record low levels thus making it difficult to formulate concrete forecasts on the sugar prices. The sugar prices are highly volatile owing to various reasons that include policy factors, oil price changes and exchange rate movements (in relation to the production costs) especially in the major sugar producing countries. The main policy factors that have had a profound effect on the sugar prices have been policies that have influenced the production cycles in the Asian markets that have also translated to supply swings on the market. For example in India the government largely controls the supply and demand of sugar and the price of sugar varies according to the sugar releases by the government.

Figure 1: Global Sugar price Trends (1960 - 2011)



Source: mongabay.com (2012)

The exchange rate fluctuations between the USD and the producer countries' currencies have impacted on the costs of production in the major exporting countries, and consequently affected the world market prices. For instance, when Brazil, Australia and Thailand recently experienced increases in sugar production costs owing to the appreciation in value of their respective currencies against the US dollar the sugar markets experienced price spikes (OECD/ FAO, 2011).

Strong links between the world sugar and oil prices have also emerged. This link is driven by the competition between the industrial use of sugar in the production of ethanol and the consumption use. Policies promoting the industrial use in countries like Brazil have led to shifts in the use of sugar and in the changes in the prices of sugar. The price of sugar has increased due to the increased demand for ethanol.

3.3. DESCRIPTION OF THE SUGAR VALUE CHAIN IN ZAMBIA

3.3.1. Structure & players of the Sugar Industry in Zambia

The Sugar Market is largely private sector driven, highly concentrated and dominated by three sugar milling companies, namely Zambia Sugar Plc, Kafue Sugar and Kalungwishi Sugar. Table 2 shows Zambia Plc to be the single most dominant company contributing over 90% of the total national sugar production while the remaining two companies only contribute less than 10%.

Table 2: Basic Information on Sugar Producing Companies in Zambia

Sugar Company	Location	Hectares under sugar (Estate)	Hectare under sugarcane (Smallholder)	Production in (metric tonnes)	Percentage of total national production (based on 2011 production estimates)
Zambia Sugar Plc	Mazabuka	16,500	7,724	385,000	92.5
Kafue Sugar	Kafue	6,000	N/A	30,000	7.2
Kalungwishi Estates Ltd	Kasama	4,00	N/A	1,400	0.3

Source: Palerm, Sierevogel & Hichaambwa, 2010; Zambia Sugar Plc, 2011; Mulikelela & Munagya, 2010.

Zambia Sugar Plc.

Zambia Sugar Plc is the largest sugar producing company with a capacity to produce 450,000 metric tonnes of sugar following its recent expansion. In 2011, Zambia Sugar Plc produced 385,000 metric tonnes representing about 92.5 percent of total national production. Established in the pre-independence era, Zambia Sugar Plc started operating from the Nakambala Estate in 1966 and has a record of consistent growth and innovation. It is a subsidiary of Illovo Sugar Limited of South Africa, a leading manufacturer of sugar and downstream products, which holds 82 percent of shares while institutional and private shareholders in Zambia control the remainder of the shares (Zambia Sugar Company Plc, 2011). Zambia Sugar Plc has an estate of 16,500 hectares while 7,724 hectares are under smallholder outgrowers. Zambia Sugar Plc produces an estimated 60 percent of its sugarcane requirements while 40 percent is outsourced mainly from out grower smallholders organized under the Kaleya Smallholder Scheme (KASCOL), Magobbo smallholder sugar cane schemes and other independent sugarcane farmers. Sales to export markets are significant (60%), exceeding sales in the domestic market (40%) which average around 150,000 metric tonnes per year. Of the 40 percent sugar sold in the domestic market, 75 percent is sold to the direct sector (i.e. for consumption) while 25% is sold to the industrial sector for the manufacture of foodstuffs and beverages. Zambia Sugar Plc also produces high premium speciality sugar for the preferential EU market, which is a niche export market which increases export earnings for the company.

Kafue Sugar (Consolidated Farming)

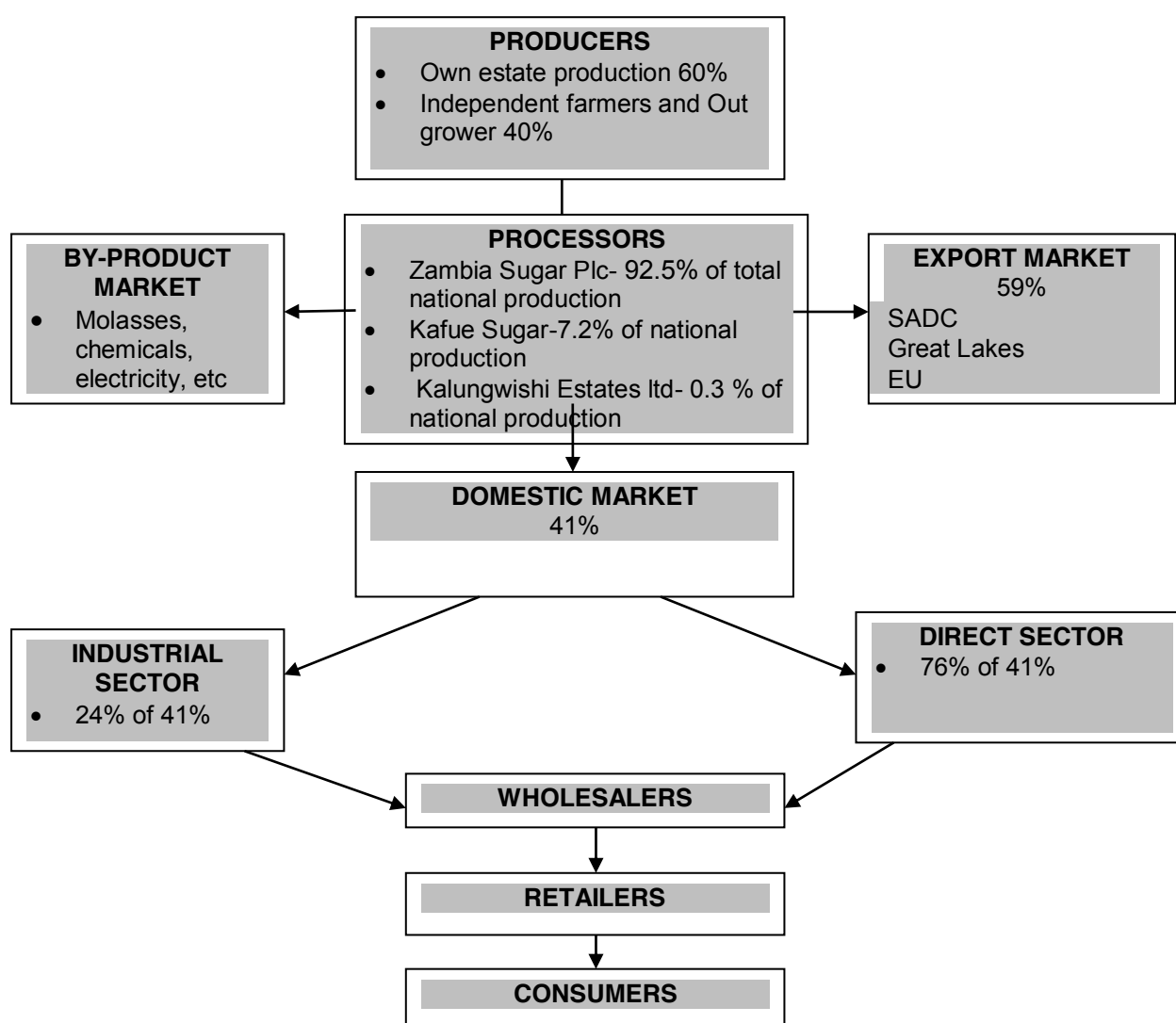
Kafue Sugar, which started its operations in 2005/2006, is located on the Kafue River on the other side of Zambia Sugar Plc's Nakambala Estates. Kafue Sugar has an estate of about 6,000 hectares and produced about 30,000 metric tonnes of sugar in 2011 (about 7.2 percent of total national production).

Kalungwishi Estates Limited

Kalungwishi Estates Ltd is a relatively new sugar company which is located in Kasama in the Northern Province of Zambia. It cultivates about 400 hectares which produced an estimated 1,400 metric tonnes in 2011 (about 0.3 percent of total national production) (Palerm, Sierevogel & Hichaambwa, 2010).

The main business strategy preferred by these companies is that of vertical backward integration whereby the companies own cane producing estates. The schematic presentation of the Zambian sugar value chain in Figure 2 demonstrates this by providing an indication that 60% of the sugar cane supplied to the mills is from own-estates while only 40% comes from individual farmers who either operate independently or are part of outgrower schemes operated by the companies.

Figure 2: The Zambian Sugar Value Chain



Source: Sugar producing companies in Zambia which source is this?

The value chain outline also shows the various sugar value chain actors including producers (cane growers), processors (sugar processing companies also referred to as sugar millers),

domestic, export and by-product markets, wholesalers, retailers and consumers. Wholesalers and retailers are the main channel through which sugar reaches the consumers. For the Zambia Sugar Company (Zambia Sugar Plc), an approximate 80,000 metric tonnes representing about 60% of local or domestic sales were delivered to wholesalers and agents in the 2009/2010 season. Each of the wholesalers or agents delivers an average of 6,000 metric tonnes. The sugar companies also deliver refined sugar directly to retailers including Shoprite, Spar and Pick n Pay. In 2009/2010, this amounted to almost 11,000 metric tonnes, representing about 9 percent of local sales. An average of 250 metric tonnes was delivered to each retailer.

An important player in value chain is the Sugar Producers Association (SPAZ) that represents various interests among sugar stakeholders; the government; donor agencies and funding organizations.

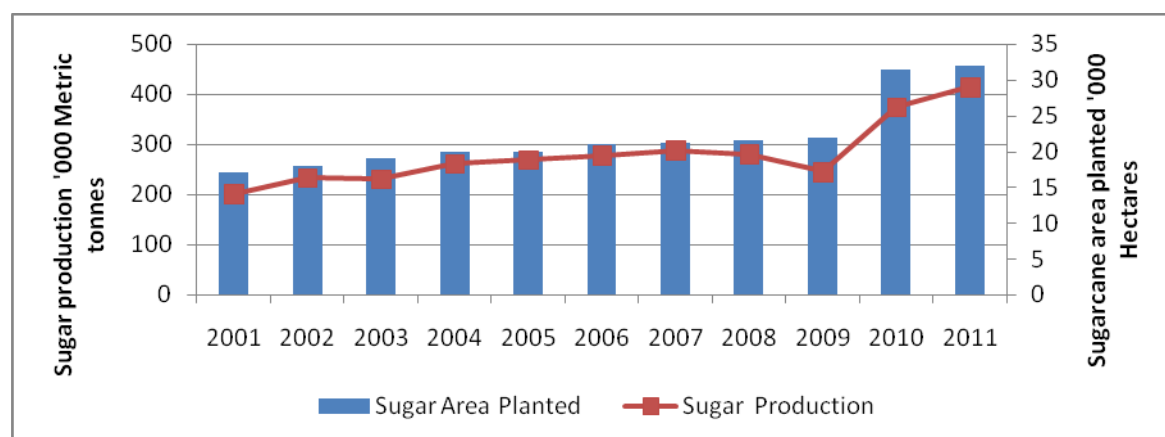
3.3.2. Regulation and Governance

Unlike other export crops, there is no specific regulatory body that determines pricing or quality standards in the sugar industry. At present, there is no particular policy regulating the sugar industry and trade. Policy guidance therefore, is drawn from related policies such as the national agricultural policy and the sixth national development plan. Zambia has yet to formulate a comprehensive national sugar strategy (NSS). An outline document was formulated in mid-2006 as “the elements of the Zambia national sugar strategy”. In 2010, the NSS was updated with some changes to the 2006 NSS. This lack of a policy or finalised strategy poses challenges in that there is no strategic policy guidance regarding the sugar industry at national level (Palerm, Sierevogel & Hichaambwa, 2010)

Non- tariff barriers play a significant role in protecting the Zambian domestic sugar industry. For instance the industry is governed by a policy that makes it mandatory for all sugar sold locally to be fortified with vitamin A. This policy requires that all sugar producers fortify their sugar with vitamin A. The policy was enacted to protect the domestic market from imports of non-fortified sugar.

3.3.3. Production Trends

Sugar production has been on the rise since its privatization in the 1990s. This has been driven by huge amounts of Foreign Direct Investment (FDI) flows and new production technologies introduced. Although increased production can be largely attributed to one sugar producing company (Zambia Sugar Company Plc.), emerging sugar companies mainly Kafue and Kalungwishi Sugar are growing in significance in the market. Figure 3 shows annual sugar production and area planted for the past 11 years in Zambia. Sugarcane area planted and sugar production has been on a steady rise since 2001 with an exception being during the 2008 and 2009 seasons when a slump in production was experienced. Heavy rains that were experienced in 2007 saw a reduction in production yields over the 2008 season. Production fell further in 2009 but more recently, there has been a surge in output owing to major capacity expansion at Zambia Sugar Plc and Kafue Sugar. Total sugar cane production and smallholder production for the past 6 years have been summarized in Appendix 6.

Figure 3: Sugar Production & Area Planted in Zambia over the past 11 years

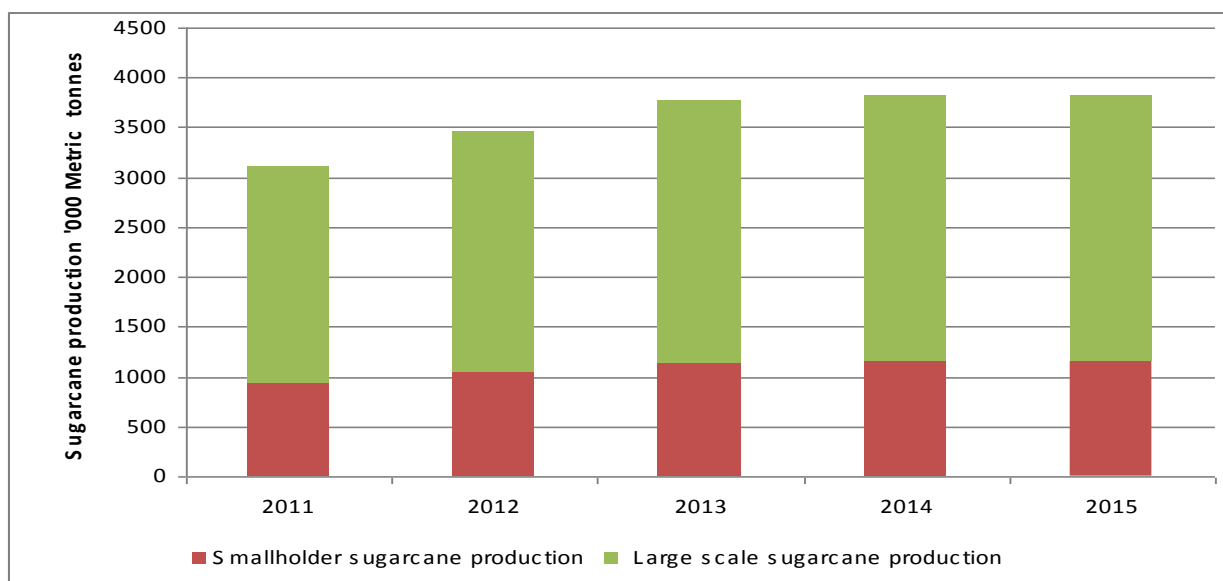
Source: FAOStats

Projected Future Trends in Sugar Production

There are a number of drivers shaping the future trends in sugar production in Zambia. Among these are expansion programmes at existing sugar companies and proposed new investments in the industry. Globally, high world sugar prices are expected to sustain revenue realizations from all export markets, into which increased sugar volumes are to be sold. The existing strong local economic fundamentals are expected to benefit local sales, whilst exchange rate movements and weather conditions will continue to influence profits (Zambia Sugar Company, 2011). Financing costs are forecast to decrease year-on-year with a reduction in borrowings and the refinancing of expansion-related loans. The cost of financing is further expected to decrease following the reduction in lending rates by financial institutions after the Zambian central bank reduced the reserve ratio requirement. In addition, the government is expected to reduce corporate taxes for commercial banks by 5% from 40 percent to 35 percent, and all these efforts will serve to reduce the cost of borrowing.

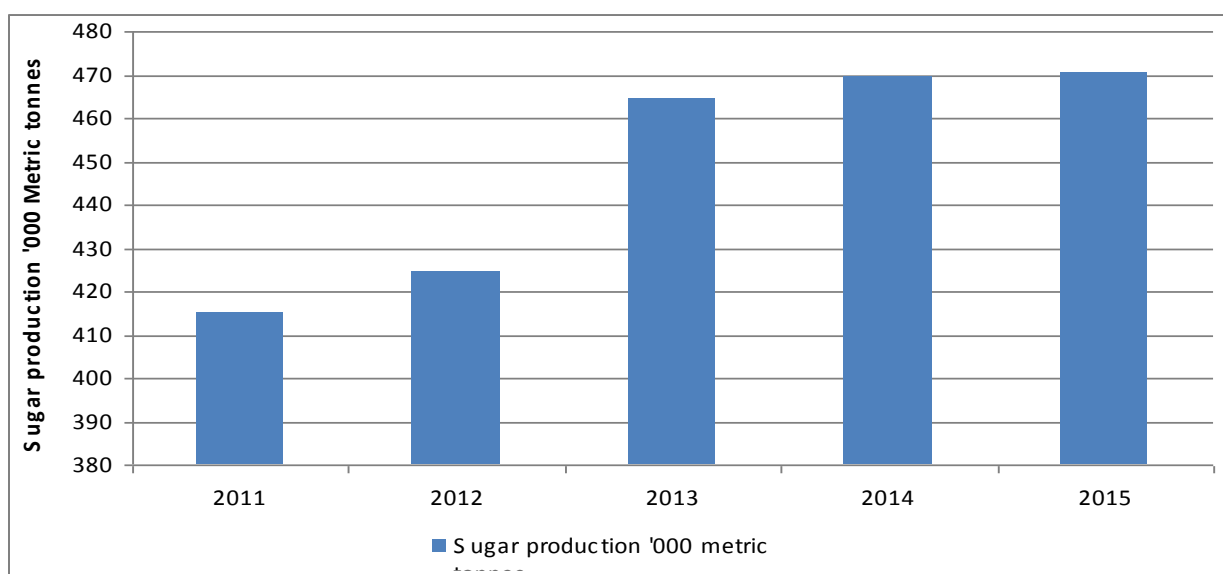
As a result of the positive economic and financial outlook highlighted above, sugar cane and sugar production are expected to increase. Zambia Sugar Plc future trends in sugarcane and sugar production are summarized in figure 4 and 5. The projections are based on a number of exogenous assumptions used to build a partial equilibrium framework for Zambia's sugar market (Chisanga, 2011) (See Appendix 7). Figure 4 shows that total sugar cane production will increase from 3.1 million metric tonnes in 2011 to about 3.4 million metric tonnes in 2012 rising to about 3.7 million metric tonnes by 2015. Figure 5 shows that sugar production will increase from a total from 416,400 metric tonnes in 2011 to about 420,000 metric tonnes reaching 470,000 metric tonnes by 2015.

Figure 4: Future Trends in Zambia's Sugarcane Production



Source: Adapted from Chisanga (2011)

Figure 5: Future Trends in Zambia's Sugar Production



Source: Adapted from Chisanga (2011)

3.3.4. Employment and Income Distribution

Apart from contributing to GDP through exports, the sugar industry contributes to employment of permanent and seasonal workers and supports smallholder farmers involved in out grower sugarcane production. The sugar companies also spend large amounts of money on local suppliers. By supporting local business in the supply chain, sugar companies indirectly attract additional investment to the local economy, thereby increasing local growth

in SMEs through their participation in the value chain. Zambia Sugar Plc is the largest employer in Mazabuka and contributes positively to the development of the town.

According to Zambia Sugar Plc, the company employs around 2,000 permanent employees and just over 4,000 seasonal workers at peak periods. The company spends more than ZMK190 billion (US\$38 million) in salaries, wages and benefits to employees. The largest of these positive impacts is experienced by the company's outgrowers whose total earnings for cane delivered to the Nakambala factory amounted to more than ZMK200 billion (US\$40 million) in the 2010/11 season. Approximately 70 percent of the procurement budget is spent on Zambian suppliers (Zambia Sugar Plc, 2011). Kafue Sugar spends about ZMK12 billion (US\$2.4 million) annually on salaries for over 2,000 workers thus contributing positively to development in the Nampundwe area on the outskirts of Lusaka. The sugar industry contributes considerable tax revenue to government. For instance, it contributed about US\$7.9 million in corporate taxes on profits in 2007 (Mulikelela & Munagnya, 2010).

Sugar production is a high value agricultural industry with significant contribution to the manufacturing sector due to high value addition, diverse range of products and markets. The sugar transformation process results in refined sugar, raw sugar, speciality sugar products, molasses, and electricity generation. Potential exists in production of ethanol-based fuel blend and other downstream products (gel fuels). Value is also added by serving different markets including the domestic, regional, international, preferential E.U and niche markets. Preferential E.U markets present the most lucrative markets with further premiums offered to speciality sugar products.

Currently value added to sugar and its by-products in Zambia in real terms is about US\$ 145 million. The Zambia National Sugar strategy (ZNSS) aims at increasing the value added from the current US\$145 million to US\$157 million by 2013 and to US\$200 million by 2020 (Ministry of Commerce Trade and Industry of Zambia, 2010). The ZNSS aims to achieve this by promoting out grower schemes; supporting diversification into alternative uses of sugar such as ethanol production and the development of a sugar trade policy. This is expected to generate more employment as well as increase incomes from the sugar industry.

The sugar industry also contributes significantly to infrastructural and social development. Much of the infrastructure in Mazabuka town in Zambia has been developed, improved and maintained by sugar sector revenues. Sectors such as engineering, banking and transportation have developed in response to the needs of the industry.

3.4. OPPORTUNITIES FOR GROWTH

3.4.1. Competitiveness of Zambian Sugar

Zambia is one of the lowest cost producers of sugar in the world. It is ranked the world's sixth lowest cost producer after Brazil, Malawi, Zimbabwe, Australia and Swaziland respectively (World Bank, 2006). The Economic Research Services (ERS) of the United States Department of Agriculture, USDA, revealed in a 2007 study that the cost of production for these low cost producers (including Zambia) for raw cane was 8.69 US cents per pound while the world average was 12.39 US cents per pound. Additionally, recent research by the Overseas Development Institute (ODI) revealed that sugar production in Zambia is very efficient, stating that the average cost of production in Zambia is US\$169 per metric tonne compared to the world average of US\$263. The privately managed Zambian sugar sector has shown to compete successfully on world markets, representing a possible source of considerable investment and growth, and faring better than the Kenyan sugar sector, for example, which has a high degree of state involvement.

The ODI study also compared Zambia's costs to three other sugar-producing countries, Kenya, Vietnam and Bangladesh, illustrating that the sugar yield as measured in tons/hectare in Zambia far exceeds that of the other three countries, which is indicative of high efficiency in production (see Table 3).

Table 3: Average Sugar Production in Case Study Countries in 2007

Country	Average sugar production (tons/hectare) in case study countries 2007 (or closest year for which data available)
Bangladesh	1.4
Vietnam	5
Zambia	15.3
Kenya	3.3

Source: Ellis & Singh, 2011

Table 4 shows the sugar retail prices in five selected countries. Despite being a low cost sugar producing country, Zambia's sugar domestic price was found to be the highest among the five study countries as shown in Table 4.

Table 4: Sugar Retail Price in Selected Countries

Country	Sugar retail price 2008 – spot market price at time of country visit (USD)/kg
Bangladesh	0.57
Vietnam	0.66
Zambia	1.2
Ghana	0.99
Kenya	1.05

Source: Ellis & Singh, 2010

It is clear from the figures above that the cost of doing business after the farm-gate is relatively higher in Zambia than in the other sugarcane producing countries. It is therefore prudent for policymakers to critically look at factors such as taxes, cost of financing and transport efficiencies if the retail price of sugar is to compete favourably with other countries. One of the drivers of Zambia's sugar industry competitiveness is the amendment in the EU quota regime. Under the Lomé and Cotonou Agreements, the country enjoyed protected quota-based access to the European Union for a maximum of 28,000 metric tonnes per annum. This regime, however, is set to change under the new "Everything but Arms" agreement between the EU and African, Caribbean, and Pacific (ACP) countries whereby the price for raw sugar has been cut by 32 percent while the quota has been increased. The new trade policy permits Zambia to export a maximum of 250,000 metric tonnes of refined sugar (almost 95 percent of its current production) to the EU from 2009 until at least 2015 from which it stands to benefit through this expanded duty free quota, although the price of the product is no longer guaranteed. In the absence of a guaranteed price, Zambian exporters will have to look at the regional markets seriously because, according to the World Bank (2007b), international price competitiveness is affected by freight costs which are found to constitute an approximate 45% of the export parity price. This suggests that Zambia might be

better placed to serve regional rather than international markets such as the EU because of its high inland transport costs.

3.4.2. Support Programmes for Sugar Production

There are a number of public led initiatives to support sugar production in Zambia as a result of the privatization of the sector. The government attracts investments into the sector through its promotion of FDI and promotion of agricultural growth. Private and donor agency cooperation has also emerged as an important source of initiatives shaping the sugar industry and increasing smallholder participation in the sugar value chain.

One such initiative is the Magobbo sugar scheme sponsored by the European Union (EU) and Mazabuka Sugar Cane Growers Trust (MSCGT). The scheme is implemented through the MSCGT to facilitate sugar cane production in an outgrower scheme involving the local population in the Magobbo area of the district. The European Union agreed to support the MSCGT with a financial grant of up to 60 percent of the project cost. The total cost of the project is US\$6, 5 million with an EU contribution of US\$ 3, 9 million. The project was initiated in October 2009, with the broad objectives of expanding sugar production and sugar product volumes, as well as realising significant increase in permanent employment in the sugar sector in Zambia (WHYDAH, 2011). Some 900 farmers are benefiting from the scheme which has brought an estimated 438 hectares into production with efforts to acquire a block title deed on the land for the farmers being pursued. The project is envisaged to increase income from the current US\$1,168 per year (2011) to US\$4,000-US\$ 5000 in 2012 and to US\$10,000 in 2022 (ibid).

Another initiative is the Manyonyo Water Users Association (MWUA). This is a government initiative supporting irrigation and livelihoods by supporting smallholder cane production co-funded by the African Development Bank (Palerm, Sierevogel & Hichaambwa, 2010). MWUA was initially meant to be a multipurpose scheme for irrigation of various crops. With the expansion project of Zambia Sugar Plc, the Manyonyo farmers saw an opportunity for growing a high value crop with secured markets and have committed themselves to producing sugar cane. Zambia Sugar Plc has committed itself to buy the cane crop as a way of making better use of their increased milling capacity. The scheme is expected to have 555 hectares under sugar cane once it becomes operational (Gerrit and Chuba, 2009).

3.4.3. Expansion and Proposed Investment Programmes

Zambia Sugar Plc completed the acquisition of Nanga farms from Zambeef, which has brought an additional 10,500 hectares into the estate under Zambia Sugar Plc in Mazabuka . Smallholder out-grower development at Magobbo and Manyonyo smallholder schemes has brought an additional 438 hectares into smallholder sugarcane production. In 2011, Zambia Sugar Plc produced a record 1.97 million metric tonnes, which saw sugar production increase to 385,000 tons from 315,000 tons in the previous season representing a 16 percent increase (Zambia Sugar Company, 2011). The company envisages reaching its projected output capacity of 450,000 tonnes per year in 2013. Zambia Sugar Plc has also expanded on electricity generation, making it self-sufficient in its electricity requirements by expanding from 10 megawatts to 30 megawatts. The company also plans to start ethanol production. The expansion project at Zambia Sugar Plc is projected to create some 10,000 jobs, including smallholder out-grower schemes.

Kafue Sugar has grown from an initial 2,000 hectares in 2005/6 to a current 6,000 hectares and is expanding its estate by about 700 hectares thus increasing its capacity to 45,000

metric tonnes per year. This expansion is expected to cost about US\$6 million. The expansion will create a combination of 1,000 permanent and seasonal jobs. Kafue Sugar also has plans for developing an outgrower scheme. These plans are still at a preliminary stage with a planned area of about 500 hectares, which would be put under a centre-pivot irrigation regime. The scheme would benefit some 80 farming families. It is intended to practice green cane harvesting.

Kalungwishi Sugar Company has no immediate plans for expansion or out-grower schemes. Details of expansion programmes in all sugar producing companies are summarised in Appendix 5.

The sugar industry has also attracted a number of proposed new investments. Among these is the Luena farming block in the Luapula Province of Zambia. Luena Farm Block is located 1,060Km from Lusaka and comprises about 100,000 hectares of farmland suitable for growing sugar. The Government of the Republic of Zambia is currently seeking the participation of private sector investors to partner with to develop the farm block into an integrated sugar plantation and processing unit. Development of the Luena Sugar Cane Plantation will include the development of infrastructure such as roads, power, water, residential and commercial properties (Zambia Development Agency, 2011).

Another proposed new investment is the South African based AGZAM Project Developers Ltd which plans to build a US\$251 million sugar and bio-ethanol plant which will be one of the largest non-mining investments in recent years. The company plans to produce 200,000 metric tonnes of sugar and 28 million litres of bio-ethanol per year by 2013 and it is expected that the project will create around 4,000 jobs. The company will cultivate about 15,000 hectares of cane sugar in [Kazungula](#) and support about 3,000 hectares of plantations by out-growers (The Zambian Economist, 2011).

3.4.4. Sugar Outgrower Schemes

Outgrower schemes or contract farming is gaining prominence in Zambia's sugar industry as a model that secures cane deliveries from smallholders while guaranteeing their market and thus supporting farmers' livelihoods. The most successful outgrower scheme is the Kaleya Smallholder Trust (KST), which has been operational since the 1980s. It currently operates with 160 smallholder farmers with about 1,040 hectares under sugarcane. The outgrower scheme was initiated by four shareholders (Zambia Sugar Plc, Development Bank of Zambia, Commonwealth Development Cooperation and Barclays Bank). This was an initiative for poverty alleviation and also as an expansion strategy by Zambia Sugar Plc to provide more cane for milling operations (Gerrit and Chuba, 2009). There are three major institutions operating the Kaleya Smallholder Scheme, namely, the sugar milling company (Zambia Sugar Plc); a management Company (KASCOL); and farmers organization (Kaleya Smallholder Trust-KST) (Palerm, Sierevogel & Hichaambwa, 2010).

Two other outgrower schemes are currently under development. These include the Magobbo Cane Growers Trust (MCGT) and Manyonyo Water Users Association (MWUA). The MCGT scheme is part of Zambia Sugar Plc expansion project, which includes irrigation development. Manyonyo Water Users Association (MWUA) situated East of Nega-Nega in Southern Province, is under the Ministry of Agriculture and Livestock (MAL) Small-Scale Irrigation Project with irrigation works currently being constructed. It is co-funded by MAL and the African Development Bank (Palerm, Sierevogel & Hichaambwa, 2010).

3.5. CONSTRAINTS TO GROWTH

3.5.1. High Transactions Costs

A number of major constraints exist in the Zambian sugar market including the high cost of doing business in Zambia as reflected in high taxes, high fuel, electricity, and transportation and distribution costs, and the high wages that push the domestic price of the commodity upwards. The sugar industry is capital intensive and requires heavy capital investments such as setting up irrigation facilities and factory plants. In Zambia, the cost of borrowing is very high and this limits growth of the sugar industry particularly for small industry players and potential new entrants.

Zambia also faces a major challenge with transportation which affects its competitiveness in the international market. Zambia is a landlocked country and coupled with poor transport infrastructure, this makes it very expensive to access export markets. As noted already, freight constitutes a significant proportion (about 45 percent) of the export price posing a major challenge for the sugar industry.

The competition framework governing Zambia's industries including sugar is weak as is evidenced by the monopolistic structure of the industry. This has been reflected in the domestic pricing of sugar where the price is significantly higher than the cost of production. The Zambia Competition Commission, which is the main competition regulation body in the economy, is limited in scope in resolving competition problems arising in the economy especially where there is vested interest.

3.5.2. Land Tenure and Security

Land tenure and security is a major issue affecting the growth of the sugar industry in Zambia. Sugar investments involve huge tracts of land and water extraction. The acquisition of land often involves possession of land from customary tenure or other uses resulting in displacements and conflicts. Tenure security for smallholder farmers involved in outgrower schemes is another constraint since most of the land is held under customary tenure.

3.5.3. Water and Environmental Issues

Water and environmental issues are of critical importance in sugar production as the industry is a major user of water resources. Two sugar producing companies (Zambia Sugar Plc and Kafue Sugar) rely on the Kafue River which has come under heavy stress due to other uses of the same water including hydroelectricity and domestic consumption and as well as the regulation of flows at the Itezhi-Tezhi dam. Furthermore, water crises caused by the increasing population demanding more and more water, as well as the changing climatic conditions coupled with poor management of the basin, have brought about an imbalance between supply and demand. There are legal implications regarding access to commercial irrigation water. Water rights are granted by the Water Board of the Department of Water Affairs. Access to water rights is a major barrier for land development for sugar production including outgrower scheme development. At present water rights have been granted to Zambia Sugar Plc (1,246,428 cubic meters) and 575,540 cubic meters for outgrower scheme while Kafue Sugar has been granted 515,000 cubic meters. There are indications that the water rights already allocated to sugar estates and Zambia Electricity Supply Corporation (ZESCO) Limited may be exceeding future water availability (Palerm, Sierevogel & Hichaambwa, 2010).

3.6. CONCLUSIONS AND RECOMMENDATORY REMARKS

The analysis of the sugar industry in Zambia concludes that the industry is positively contributing to economic growth, value addition, employment and wealth creation. The sugar industry in Zambia has experienced significant growth in recent years owing to the increasing investment in the subsector. This has generated positive economic benefits for the local economy through employment creation and other multiplier effects in the areas of operation. Outgrower schemes are a growing model in the sugar industry and present a great opportunity for enhancing smallholder incomes. The preferential trade agreements (particularly the EU/ ACP Sugar Protocol) have been instrumental in ensuring access of Zambian sugar to the European markets.

Zambia has been found to be a low cost sugar producing country; however, the high domestic price raises questions of domestic competitiveness of the sugar market. The industry faces challenges of transport infrastructure constraining exports and international competitiveness. Water rights and land tenure security have emerged as major issues requiring attention to enhance investments and increased participation by smallholders. The lack of a sugar sector policy negatively affects the industry, as there is no strategic policy guidance for the sector. Potential for increased value addition in the industry exist through widening the domestic and market base through investment such as in biofuels and other downstream sugar products. Government and donor agency led initiatives are gaining prominence in the sugar industry with a major aim of promoting smallholder sugar production for enhanced livelihoods.

Considering findings of the study on the opportunities available and constraints faced in the industry the growth of the sector can be achieved through the programmes that;

1. Ensure water right and land tenure security, which would in turn create incentives for private sector investment in sugar industry especially given the already growing local and foreign investment in the sector.
2. Redirect the focus of the sector to regional markets and reduce dependence on the EU markets, more so that the EU has revised its trade arrangements by removing the price guarantee and has enacted reforms on its sugar industry. Furthermore in comparison to international markets, regional markets tend to offer more stability particularly in terms of prices.

4. COFFEE SUB SECTOR

4.1. INTRODUCTION AND BACKGROUND

Coffee production is most suited to areas with high rainfall and high altitude and thus 40 percent of the coffee is grown in the Northern districts of the Muchinga Mountains encompassing the Nakonde, Kasama and Isoka regions. Approximately 5% of the coffee is grown in some parts of Central province and a further 8% in the North-Western province near the Copperbelt. The balance is grown in the vicinity of the capital city of Lusaka and Southern province around Mazabuka area (Tea & Coffee, 2006). Zambia is well-suited for irrigated coffee production, with favourable climatic conditions and abundant land resources. Coffee was introduced in the late seventies for commercial purposes through the World Bank Coffee I (1974) and Coffee II (1994) projects as a non-traditional agricultural crop to

spearhead governments policy of seeking alternatives in the countries diversification programme from solely depending on copper for foreign exchange earnings (Taguma, 2011). While coffee ranks as one of Zambia's top ten non-traditional exports, it generates less than US\$10 million a year. Hence, coffee constitutes a very small share of Zambia's agricultural exports.

Zambia produces Arabica coffee, the most highly regarded species from plant seedlings that are raised in on-farm nurseries. The coffee consists of two categories, conventional varieties and semi-dwarf varieties, and is harvested between May and September. The freshly picked coffee cherries (red-hulled beans) are mechanically hulled, washed and sun-dried on wire mesh trays. The total national production of coffee in Zambia for the 2009/2010 crop year was approximately 1,620 metric tonnes. The Zambia Coffee Growers Association (ZCGA) has estimated the 2010/2011 production figure at 766 metric tonnes. This represents a significant decline from the previous years, due in part to several farm closures, such as that of the Kasama Coffee Company which at one point delivered over 30 percent of the industry's total produce. The dramatic fall in coffee production is also as a result of a combination other factors such as depressed prices and investment in coffee production that has declined considerably in the last decade due to volatile prices of coffee on the world market. The appreciation of the Kwacha against other foreign major currencies in 2006 has also been cited as another contributing factor. Equally, droughts that have been experienced in some of the years in the past decade have had a negative effect on the production of coffee in Zambia. These and other phenomena have contributed to the low production figures that have been recorded resulting in an inability by numerous farmers to recover their operating costs and in turn, uprooting their coffee crops.

The recovery of the Northern Coffee Corporation plantation is likely to revive the Zambian coffee industry. The company intends to plant over 500 hectares of coffee, with the first 200 hectares planted in the first half of 2012. Production of coffee beans will commence in 2014. There is a window of opportunity for the growth for coffee growers in Zambia to which these farmers are responding by increasing their hectarages. Zambia has the potential of producing an annual production of more than 50,000 metric tonnes of good quality handpicked green beans with an average value of US\$175 million and more than 400,000 metric tonnes using mechanical pickers with an average value of US\$1.040 billion. The local coffee industry is relatively well organized, with functioning structures and institutions to support its growth. However, the industry faces several constraints ranging from financial resources to limited promotional information. The coffee sector in Zambia has no established outgrower schemes that encourage the participation of small-scale producers as the case is in the sugar and cotton sectors. Research and development in the coffee sector in Zambia is equally non-existent. Thus, Zambia still remains a very small coffee producing country contributing only 0.02 percent of the worlds' coffee.

As a result, under favourable conditions, high short-term and medium-term price expectations can lead to higher production from existing trees and vice-versa, while new trees are planted – provided land is not a binding constraint. Conversely, periods of very low prices can induce cash-strapped small producers to forego even basic maintenance investments, and in so doing jeopardize future production potentials. The same outcome can be the product of non-price factors, such as the disarray or non-existence of markets or other institutional arrangements for the availability of inputs and the disposal of output; lack of financing; transportation, etc. These effects may be magnified by the existence of a set of productive techniques – albeit limited – the most advanced of which require a certain non-labour investment and some additional skills on the part of the producer, as well as a suitable market, infrastructure, and technological and informational environment, and hence are not available altogether in the least developed areas and countries (Branch *et al.*, 1999).

4.2. OVERVIEW OF GLOBAL COFFEE MARKET

Coffee is the most valuable tropical agricultural product. World coffee consumption has been growing steadily at a rate of around 2.5% per annum and was estimated at approximately 128 million 60-kg bags in 2008. Consumption is concentrated in the mature markets of Western Europe and North America, but is now growing faster in emerging markets, such as those in Eastern Europe and Asia (ICO, 2009). Market fundamentals continue to favour firm prices with current prices at their highest levels since 1977. Vibrant world consumption means that the supply/demand balance will continue to be tight and prices will remain firm. A brief analysis of world consumption over the last forty years confirms its buoyancy, particularly during the last ten years. Nevertheless, credit restrictions and the lack of liquidity caused by the world financial and economic crisis, combined with higher production costs, and could lead to a reduction in supplies. This in turn could also lead to a slackening in the current growth rate of consumption (ICO, 2011).

A closer look the main consumption markets of the EU and the USA reveals that the consumption of traditional coffee has declined over the recent years to be overtaken by the growth in differentiated speciality coffees. The development of the segment of speciality coffee consumers is growing mostly in the EU where it is stimulated mainly by the increasing supply of differentiated coffees such as organic and fair trade certified coffees in the large retail stores and the rising coffee shops in the EU (Pay, 2009). The new speciality coffees tend to fetch premium prices over traditional coffee rewarding efforts of uplifting social, economic and environmental conditions of coffee producers. This segment is particularly important for the developing country producers that are faced with social, economic and development challenges and therefore acts as a incentive for producers to work towards meeting these challenges.

3.3. DESCRIPTION OF THE COFFEE VALUE CHAIN IN ZAMBIA

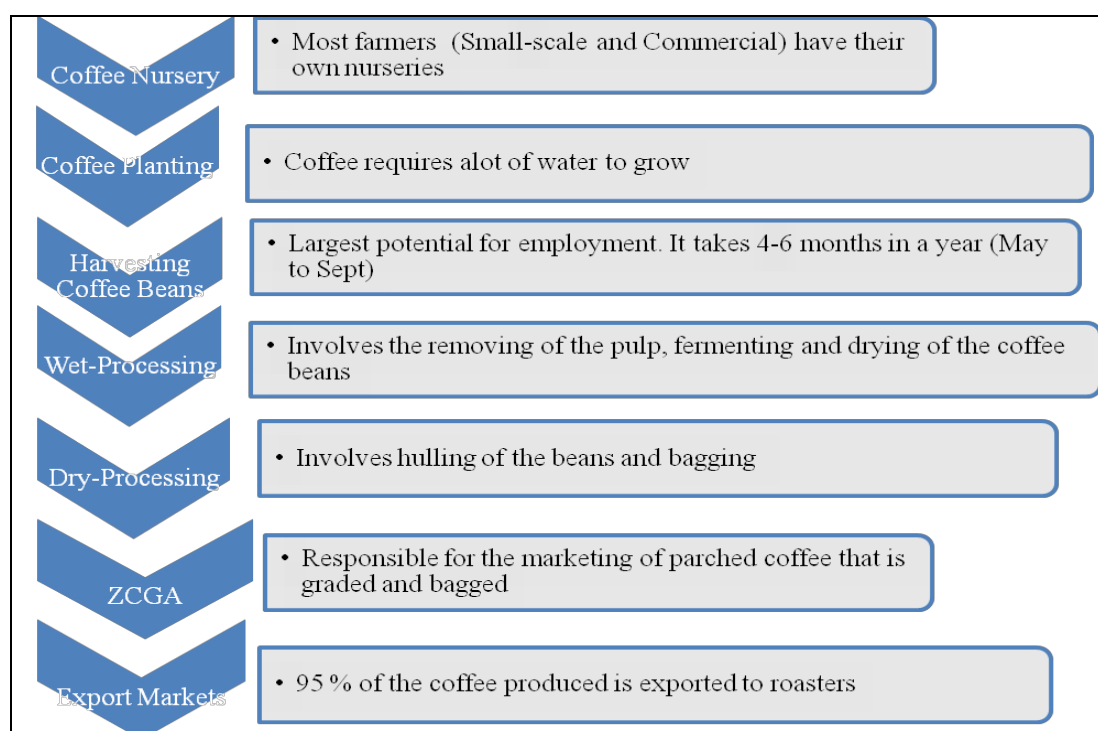
3.3.1. Structure & Players of the Coffee Industry

The coffee industry is relatively well-organized in Zambia, with functioning structures and institutions to support its growth. The Coffee Board of Zambia, a statutory government agency, is the primary regulatory body. The Board oversees the growth of the coffee sector, ensures the equitable distribution of Government resources to small and large-scale commercial farmers alike, and markets Zambia's coffee brand/image overseas.

The Zambia Coffee Growers' Association (ZCGA) is the operating wing of the Coffee Board, which provides coffee extension services and ensures quality control. It also provides administrative, milling, warehousing, and shipping services to its members and bears the sole responsibility for export sales. ZCGA members who meet certain criteria may conduct their own independent marketing. The association also handles the logistics for all exported coffee products. ZCGA is wholly owned and funded by its members (coffee growers) who presently number 9 large-scale (over 11 hectares each) and 6 small-scale producers (below 11 hectares each). It is also a company limited by guarantee with 7 Board members, mainly drawn from the regional coffee growing areas of the country and 4 members of staff who administer its activities. The ZCGA has successfully co-ordinated Zambia's coffee industry for 24 years (Taguma, 2011).

Zambia’s coffee value chain is relatively uncomplicated as shown in Figure 5 below. The value chain is composed of commercial coffee growers, small-scale farmers and the Zambia Coffee Growers Association (ZCGA). The coffee industry also has five roasters that produce for the local market. The process of coffee production starts with the establishment of nurseries by coffee growers both small-scale and commercial. Thereafter, the seedlings are transplanted and moved to the main field. Farmers harvest red (ripe) coffee cherries (Mofya-Mukuka, 2011) over a period of 4-6 months (May to September). Coffee is regarded as a commercial crop in Zambia; hence all farmers that are engaged in coffee production are regarded as commercial producers. Ninety-nine percent of the coffee growers in Zambia produce their coffee on large estates whilst the remainder of the growers cultivate their coffee on small holdings (Mofya-Mukuka, 2011). Once the coffee beans have been harvested, they are wet-processed on the farm. The process involves removing of the pulp and fermenting the beans before they are dried and subsequently dry-processed. The process of dry processing involves the hulling of the parchment and then bagging the beans. After the beans have been dry-processed, they are transported to the ZCGA where they are sorted, graded and repackaged. The grading and export presentation is in grades AAA, AA, AB and numerous additional smaller grades totalling up to twelve coffee grades. The ZCGA is also responsible for marketing of the coffee beans through a silent auction system (Mofya-Mukuka, 2011). Ninety-five percent of the coffee that is produced in Zambia assumes the value chain as depicted in Figure 6 below. The physical exports are shipped through the neighbouring countries in East Africa and South Africa. The remaining 5 percent assumes the value chain as depicted in a figure in Appendix 8.

Figure 6: Zambia Coffee Value Chain

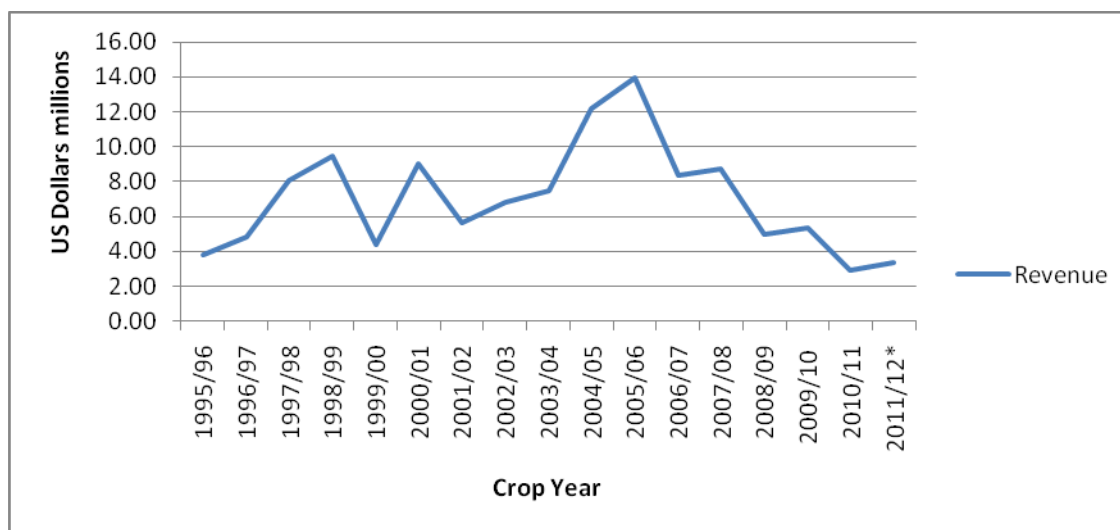


Source: Taguma (2011)

Revenue realized from the coffee industry reached its peak in the 2005/06 crop year. As shown in Figure 7 below, ever since the peak revenue was recorded, there has been a slump in the revenues derived from coffee exports in Zambia. The reduction in

revenue is as a result of the reduced production of coffee due to the reasons cited in some sections below.

Figure 7: Revenue from Coffee Exports in Zambia



Source: Adapted from Taguma (2011)

4.3.2. Regulation and Governance

4.3.3. Production Trends

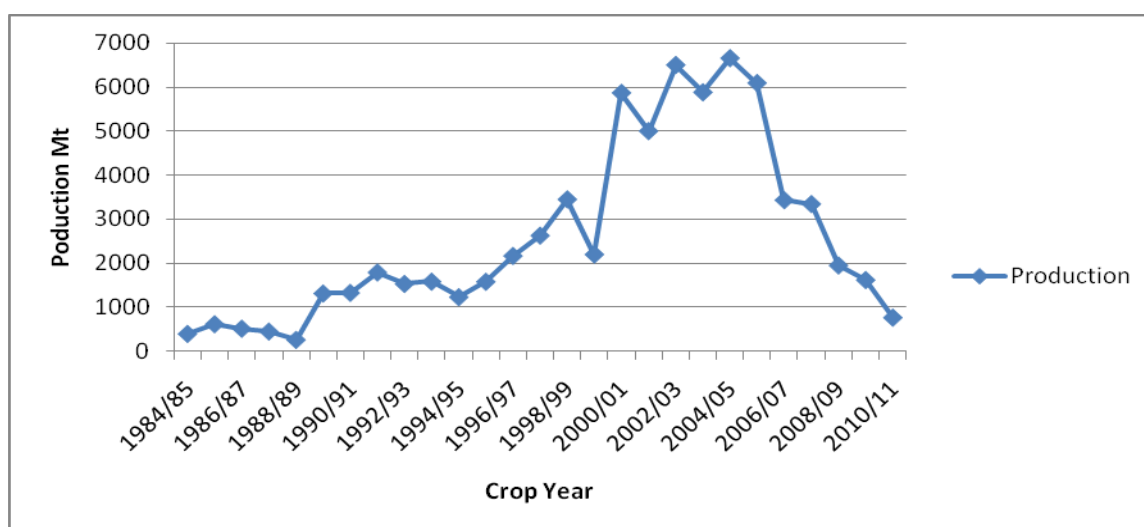
Zambia produces Arabica coffee from plant seedlings that are raised in on-farm nurseries. The coffee consists of two categories, conventional varieties and semi-dwarf varieties, and is harvested between March and July. The freshly picked coffee cherries (red-hulled beans) are mechanically hulled, washed and sun-dried on wire mesh trays. Many of the farmers undertake to apply progressive agronomic techniques, including prudent water usage, crop protection and nutrition, "fertigation" (fertilizer in irrigation water), composting of coffee pulp, biological pest control, and the promotion of biodiversity. Coffee in Zambia is predominantly produced by commercial farmers who constitute up to 99 percent of the growers, whereas in the rest of Africa the coffee industry is dominated by small-scale farmers. However, these small-scale farmers only cultivate less than 5 percent of the crop (Mofya-Mukuka, 2011; Ponte, 2002). Bellachew (2008) also notes that in almost all coffee growing countries of the world, over 85% of coffee production comes from smallholder coffee producers.

Zambia's unique case of dominance by commercial farmers in the production of the coffee bean is partly attributed to the fact that Zambia was a late entrant into the coffee industry compared to the other countries in East Africa where small-scale farmers dominate the industry. In Zambia, the commercial growers immediately adopted some latest technologies for cultivation practices including composite manure from the coffee pulp and pest management through chemical and biological methods. In addition, they use sophisticated methods for irrigation, fertilization, and chemical application (Mofya-Mukuka, 2011). On the other hand, most small-scale farmers in Zambia are resource poor and have concentrated on production of maize which has been heavily promoted through government policies and subsidies. This has been at the expense of diversification into other crops like coffee. The few smallholder farmers who have

started producing coffee generally lack irrigation capabilities and other necessary equipment like pulping facilities. Hence, the technology used in the coffee sector acts as a barrier for small-scale farmers to venture into the production of coffee in Zambia. Further, the current government agricultural policy does not strongly promote the production of coffee by small-scale growers. Furthermore, there is no sufficient investment in primary movers of agriculture such as irrigation facilities and extension services to support coffee production by small-scale producers (Taguma, 2011). Most often small-scale farmers do not have access to titled land hence discouraging them from investing in long-term investments like tree crops such as coffee.

The total national production of coffee in Zambia for the 2009/2010 crop year was approximately 1,620 metric tonnes. The Zambia Coffee Growers Association (ZCGA) has estimated the 2010/2011 production figure at approximately 766 metric tonnes (See Figure 8 below; Appendix 9 and 10). This represents a significant decline from the previous years, due in part to some farm closures such as that of the Kasama Coffee Company. At its peak in 2004, the Kasama coffee plantation produced one-third of Zambia's approximately 6,654 metric tonnes of output. Depressed world coffee prices have also contributed to the low production figures that have been recorded. Bafess (quoted in Mofya-Mukuka, 2011) also notes that investment in coffee production in Zambia has declined considerably in the last decade due to volatile prices of coffee on the world market. Some farmers have also experienced difficulties recovering their operating costs and consequently uprooted their coffee crops. The drop in production in the season 2005/06 was due to the drought experienced in 2004/05. The effect of this drought had its full impact with yields for the 2006/07 season, which was additionally affected by a number of coffee growers uprooting their coffee trees to replace them with easier cash crops like wheat. This was largely prompted by lack of long-term finance and farmers could not, particularly in the face of a depressed market environment dating back to the 1999/2000 season, reinvest from their own resources. The unstable exchange rate prevailing at that time also affected the coffee producers. According to Mofya-Mukuka (2011), coffee trees take up to four years before the first harvest, hence the current low production could largely be a consequence of farmers' low investment in planting and crop management during the price decline and drought periods.

Figure 8: Coffee Production Trends in Zambia (1984-2011)



Source: Adapted from Taguma (2011)

Zambia still remains a very small coffee producing country contributing only 0.02 percent of the world coffee market (Mofya-Mukuka, 2011). Several options have been

considered in an attempt to increase coffee production through smallholder coffee schemes. For example, in 2001, Agriflora had announced plans to invest US\$1 million in a scheme to promote small-scale coffee on an outgrower basis. It was envisaged that the coffee would be processed at cooperative-based pulparies managed by Agriflora staff. Under the same scheme farmers were to be encouraged to intercrop the coffee plants with export-quality vegetables to ensure a cash flow while awaiting the first harvest from the coffee plants. However, this initiative did not get implemented because Agriflora experienced operational problems and was eventually liquidated in 2001 (DFID, 2002).

Projected Future Trends in Coffee Production

The revival of the Northern Coffee Corporation plantation is likely to revive the coffee industry in Zambia. The company intends to plant over 500 hectares of coffee, with the first 200 hectares planted in the first half of 2012. Production of the coffee bean will commence in 2014. This year's 766 metric tonnes is the lowest level of coffee output the industry will ever produce and that from here onwards it is envisaged that there will be increased production. The Northern Coffee Corporation investment is thought highly likely to boost the morale of Zambian coffee farmers (Lublinkhof, 2011).

Industry experts have noted that the coffee sector in Zambia has enormous potential for growth. Observations are made that the major producer of coffee, Brazil, is moving away from extensive production of coffee to intensify its industrialization efforts. Thus, there is a window of opportunity for growth for coffee growers in Zambia to which local coffee growers are responding by increasing their hectarages. According to (Taguma, 2011), Zambia has the potential of producing an annual production of more than 50,000 metric tons of good quality handpicked green beans with an average value of US\$175 million and more than 400,000 metric tonnes using mechanical pickers with an average value of US\$1.040 billion.

Currently, there are no coffee outgrower schemes in the industry. In the past, the Coffee Board of Zambia in partnership with Agriflora Limited Company had made an attempt to promote a scheme which has since then gone defunct. This development or setback limits the potential for further growth in the coffee industry (Taguma, personal communication).

4.3.4. Employment and Income Distribution

Coffee production is labour intensive and therefore can be a major employer in the Zambian economy. Even with the current small crop, the industry employs as many as 3,000 coffee pickers who are in employment practically 5 months of the year. This figure could easily grow tenfold as it did when the coffee industry produced 6,500 metric tonnes of green beans and employed approximately 25,000 workers. Several large coffee estates in Zambia have closed down, leaving a large rural population out of seasonal or permanent employment (Mofya-Mukuka, 2011). Increased production would therefore contribute immensely to reducing Zambia's high unemployment rate.

Table 5 below illustrates projected employment creation and its associated production and income among some of the ZCGA members. The number of seasonal employment is likely to increase by 500 in two farming seasons representing approximately 14 percent increment in seasonal employment. The number of permanent employees is likely to increase by 7 workers representing an increment of approximately 2 percent. This is despite recording a marginal increment in the hectarage.

Table 5: Projected Employment Creation by some ZCGA members

Grower	Production Year			Hec-Tares	Employ	2012/2013	Projected Income
	Hec-Tares	Employ	2011/2012				
			Mts.				
Terranova	250	150 ^a 1,600 ^b	510	250	150 1,800	580	2,320,000.00
Mubuyu Farms	240	139 1,400	200	240	139 1,600	350	1,400,000.00
Munama Farm (CBZ)	70	35 180	55	70	40 250	176	704,000.00
Balmoral Farm	20	28 250	20	25	30 270	40	160,000.00
Kansato	15	20 120	15	15	20 130	22	88,000.00
Totals	595	372 3,550	800	600	379 4,050	1,168	4,672,000.00

Source: Taguma (2011)

Notes: ^a Top figures in each cell of the employment column represent permanent employees. ^bBottom figures in each cell of the employment column represent seasonal employees

The projected increase of 46 percent in coffee production will result in increased revenue to be received by the growers. The increase in revenue will further in turn be used for reinvestment in the industry thus expanding the hectareage of coffee production by the growers. Further, it has also been noted that the rebranded Kasama Coffee Company will be managed by an independent team and is expected to contribute to the economy of the northern region of the country by employing more than 100 workers. It has also been noted that Munali Coffee Estate employs approximately 1,700 labourers year-round, though the workforce rises to well over 2,000 during the peak planting season. Coffee pickers, the majority of whom are women, earn about 120 ZMK (2 to 3 U.S cents) per kilogram, with the average worker able to pick 80 to 90 kg of coffee beans per day. Efficient workers can gather up to 200 kg of coffee beans, with some workers exceeding 300 kg per day (Lublinkhof cited in, Luxner 2006).

4.4. OPPORTUNITIES FOR GROWTH

4.4.1. Competitiveness of Zambian Coffee

The marketing of coffee in Zambia is highly liberalised with producers selling their coffee beans on a competitive basis. Interviews held with key stakeholders (Taguma & Mofya-Mukuka) revealed that the price (competitiveness) of Zambia's coffee is determined by several factors among which include:

- **Variety:** Zambia grows and produces washed Arabica coffees which are among some of the most competitive coffee species. Arabica coffee carries greater value on the market compared to Robusta coffee thus making Zambia's coffee competitive.
- **Production:** Zambia produces shade grown coffee and is considered to have good qualities which makes the coffee competitive. Zambian coffee is largely produced by commercial farmers that employ good field management practices. Unlike most other countries where the majority of the coffee is produced by small scale farmers who do not observe some of the good management practices.

- **Processing:** After harvesting, the processes that follow are what determine the quality that is retained. The manner in which coffee is processed to a large extent determines the price of coffee. Arabica coffees produced in Zambia are processed using the ‘wet-processing’ method which ensures that the inherent qualities of coffee are retained, hence making it competitive on the international market.
- **Specialty:** Zambia produces specialty coffee although this is not on a very large scale. This is a premium type of coffee that fetches a relatively higher value compared to the ordinary type of coffee. Zambia also produces triple A grade coffee which is competitive on the world’s niche markets.
- **Certification:** This improves the competitiveness of Zambia’s coffee both in regional and world market. Strides have been made to certify coffees produced by some commercial growers in Zambia.

One good example of competitiveness of Zambia’s coffee is the Munali Estate in Mazabuka which became the second African coffee producer to receive Utz Certified certification, an organization whose name comes from the Guatemalan Mayan words for “decently produced coffee.” This strict certification consists of “good agricultural practices” that run the gamut from plant protection and sanitation procedures to social and economic welfare. Complying with the Utz Certified code means that Munali Estate meets criteria for responsible coffee production, such as protection of labour rights, responsible use of agro-chemicals, standards for efficient farm management and access to education and health-care for employees. Munali coffee has the advantage of being a high-grade product. The market for such coffees has been growing worldwide at a rate faster than that of the coffee market as a whole.

Zambian specialty coffee has entered into the global niche market. Table 6 below shows how the industry has fared over the years. The industry ‘swiftly’ moved into positioning itself in the high quality and value specialty markets of Europe, USA and Japan and this is attributed to its main success as is evidenced by the only specialty association of coffee organization in Africa known as the Eastern African Fine Coffees Association (EAFCA), of which Zambia is now a member. The Association also, nominated Zambia to host the second conference in Africa in 2004 in spite of Zambia’s coffee industry being one of the smallest in Africa and the world over (Taguma, 2011).

Table 6: Sales performance in Specialty Markets vs. Traditional Markets

	Year								
	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Mt. Sold	102.60	211.80	529.56	100.80	124.68	74.28	51.00	387	470.28
% of total sales	1.70	3.64	8.04	1.70	3.65	2.23	2.68	24.00	64.00
Aver. Price	1,897	1,959	2,014	2,941	3,330	3,3393	3,660	3,919	4,500
\$/Mt	1,135	1,289	1,846	2,313	2,443	2,632	2,636	3,353	4,000
% aver. price spec/trad.	+67	+52	+9	+27	+36	+29	+39	+17	+13
Aver. Diff.	+49 +0.4	+27 -4.5	+16 -5.0	+25 -2.7	+30 +1.3	+23 -7.6	+45 +5.6	+52 +26	+43 +20

Source: Adapted from Taguma (2011)

Notes: Spec/trad denotes “specialty” and “traditional”.

- The figures at the bottom of rows under, “Average price \$/Mt.”, and “Average differential”, are averages for all the grades sold in the season with the top ones being averages achieved for specialty products

The majority of the Zambian coffee exports head to European markets, primarily Germany, the UK, Switzerland, and the Netherlands. The remaining export markets

include South Africa, Australia, Japan, and the U.S. Local sales of roasted coffee account for less than 10 percent of total Zambian coffee production.

4.4.1. Support Programmes for Coffee Production

An enabling policy framework is integral to the transformation of Zambian agriculture into the main stay of the Zambian economy (Mwanaumo, 1999). The main thrusts of the National Agricultural Policy (NAP) are liberalization, commercialization, promotion of public and private partnerships, and provision of effective agricultural services that will ensure sustainable agricultural growth (Government of the Republic of Zambia, 2004a). The coffee industry in Zambia is guided by the Coffee Act No.24 (CAP 228) which was enacted in 1989 through an Act of parliament and was later amended in 1994. The Act provides the legal framework and guidance for the coffee industry in Zambia.

The Zambian government is encouraging farmers to diversify into production of high value cash crops such as cotton, tobacco, coffee, herbs and spices, floriculture and horticulture products. The agricultural sector is projected to be the major source of export diversification required to boost the country's job creation capacity and balance of payments. The government is promoting outgrower programmes earmarked to assist smallholder farmers improve their productivity and farm income. Crops supported under the programme include Tobacco, Cotton, and Coffee among others. In general, the main principle of outgrower schemes is the provision of extension services, inputs, credit and marketing by the private sector, all linked to timely payment. They have become a popular method of providing extension services for high value export crops. However, currently there are no outgrower schemes in the coffee sector that are being promoted either by the government or the private sector. The case is however different in the sugar, cotton and tobacco sectors where outgrower schemes are prevalent and has attracted the participation of small-scale farmers in places where the schemes are being promoted.

At present, there is no coffee research programme in Zambia. Research is an important tool to provide technical backstopping, reduce risks of technical failure, standardize all aspects of coffee management and processing practices to the local environment, and lay a base for any predictable problems related to variety, disease, and insect pest, management, that may evolve along with the expansion of coffee production in different agro-ecologies (Bellachew, 2008).

In 2009 the Zambian government signed an International Coffee Agreement (ICA) with the United Kingdom (UK) based Company aimed at encouraging sustainable development of the coffee sector worldwide. The main purpose of the agreement is to enhance and promote sustainable development of the coffee sector by promoting international cooperation on coffee matters and provide a forum for consultation among governments and the private sector. The agreement is also meant to encourage signatories to develop a sustainable coffee sector in economic, social and environmental terms that seek a balance between supply and demand and fair pricing for both consumers and producers (Chinyamu, 2009).

It is expected that this will benefit producers and develop strategies that will improve the capacity of small scale farmers for them to benefit from coffee production which can contribute to poverty alleviation among others. The agreement stipulates that members should limit tariff-related and regulatory barriers to coffee consumption such as preferential tariffs, quotas, government monopolies and subsidies. One of the objectives of sustainable development in the agreement is that each exporting member country

will be required to implement the system of certificates of origin as established by the ICO which is to improve the living standards of people engaged in the coffee industry (Chinyamu, 2009).

With the increasing tonnage of coffee produced, the European Union provided assistance to establish a dry processing mill at ZCGA's office in Lusaka's industrial area. This mill enables the industry to enhance the quality of its export coffee products as similar types can be blended and standardised at a central location. The operation is closely monitored and evaluated by a team of specialised on-site staff. Growers and in particular small-scale members who do not have on-farm mills are able to send their coffee for processing at the mill saving on the financial outlay for such a facility.

Large scale producers benefit from GRZ agricultural incentives, such as Value Added Tax (VAT) rebates, capital equipment purchase discounts, and electrical rate reductions. Small-scale farmers or outgrowers who do not register as agricultural enterprises are not eligible to benefit from the agricultural incentives. Commercial borrowing is not easily or widely available. Some banks have begun to introduce agricultural loans, although the rates are not yet competitive.

4.5. CONSTRAINTS TO GROWTH

4.5.1. Lack of Financing

As earlier noted, one of the major constraints of the industry growing towards becoming a real contributor to the national GDP, is lack of long-term finance. Coffee being a tree crop requires long-term developmental finance of between 8 to 13 years considering that the first crop only yields in the third year from planting. Zambia has the climate and resources such as water and land to be able to produce 100,000 metric tonnes within 15 years. The country is presently (2011/2012) estimated to produce approximately 800 metric tonnes.

There is also a lack of pre-shipment finance in Zambia's coffee sector. Pre-shipment is not readily available because commercial banks in Zambia are not willing to lend to coffee farmers on a long-term basis. Financing of between 8 to 13 years (cropping only begins in the third year after planting). The industry needs pre-shipment finance to ease the management of the crop. Harvesting starts in May through to the month of September. For one to produce a good quality product the crop needs to be conditioned for a period of at least 6 weeks so that the moisture evens out and the crop matures. This means a crop that was picked between May and September can only be sold after taking into account processes of pulping, fermentation, drying, conditioning, milling and grading in preparation for the market. Once sold, it takes at least 8 weeks from time of sale to receiving payment. The earliest therefore that one would receive funds for the coffee picked in May would be November which is at least 6 months from the time of picking. On the other hand, the crop for the following year is grown during the period August to December with fertiliser applications, etc. It therefore, becomes difficult for the farmer to find resources to finance the crop that is ripe and being picked in readiness for sale and at the same time find finance to grow the following year's crop. The two activities take place before cash inflow for the crop yields starts flowing in. It is for this reason that pre-shipment finance against the crop that is being picked is of absolute necessity to ensure the financing of crop picking and processing as well as timely procurement of inputs for growing the crop for the subsequent season (Taguma, 2011).

4.5.2. Limited Access to market promotional information

Opportunities for exploiting speciality (niche) markets for Zambia's coffee products have been limited by a lack of access to information and ability to carry out more robust market promotion campaigns. The ZCGA is unable to meet the costs of investing in more effective market intelligence gathering and actual promotional activities. It is also not easy to simply request additional contributions from the members in order to undertake thorough market research and promotional campaigns, particularly in the light of the reduced number of growers. Despite this being an important activity, Zambia is not sufficiently established in the international markets as a coffee producer. Furthermore, even if the industry was well established, regular promotional campaigns are important if potential and existing consumers are to be won and maintained respectively. An export promotion fund would thus enable the ZCGA to address the needs for strengthening international marketing efforts on behalf of its members.

4.5.3. Lack of irrigation facilities

Coffee production is also constrained by the lack of irrigation facilities. Zambia only has one rainy season thus making rain dependent coffee production challenging considering that coffee production requires a lot of water.

4.5.4. High fuel and labour costs

High fuel costs have negatively affected the production of coffee in Zambia. Fuel pump prices in Zambia are high relative to other neighbouring SADC and COMESA countries. Equally high labour costs have also been cited as a hindrance to coffee production in the coffee sector and are partly responsible for discouraging small-scale farmers from entering into the coffee sector and large-scale producers from expanding their hectareage.

4.5.5. Coffee production Cycle

Coffee trees start bearing fruits several years after planting, normally five, with a productive life spanning up to and beyond 20 years. The main annual production cost is that of harvesting, which is highly labour-intensive and often implies the hiring of labour outside the farmer's household, even for relatively small plots. Other annual production costs include pruning, fertilization and other activities, some of which normally need cash disbursements on the part of the producer (for fertilizer, pesticides and the like). The amount of these labour and non-labour investments has, of course, an impact on the productivity of the trees, both in the short and longer term (Branchi *et al.*, 1999).

Zambia has a climate that is well suited for the production of coffee. Coffee ranks as one of Zambia's top ten non-traditional exports and it generates slightly less than US\$10 million per year. The main cost in coffee production is harvesting, which is highly labour-intensive and often necessitates hiring of labour outside the farmer's household, even for relatively small plots. Under favourable circumstances, high short-term and medium-term price expectations can lead to higher production from existing trees and vice-versa, whilst planting new trees – provided land is not a binding constraint. Zambia's coffee value chain is composed of commercial coffee growers, small-scale farmers and the Zambia Coffee Growers Association (ZCGA). The coffee industry also has five roasters that produce for the local market.

4.6. CONCLUSIONS

Zambia produces Arabica coffee, which is one of the most competitive coffee varieties on the market. The coffee sector in Zambia has the potential to contribute to foreign exchange earning and employment creation for both seasonal and permanent employees. However, the coffee sector has been experiencing a downward trend in the production of the coffee beans. The sector continues to face challenges at both the policy (macro) level and production (micro) level. The coffee sector in Zambia is well regulated with the Zambia Coffee Growers Association (ZCGA) promoting the development of Coffee in Zambia. However, the Zambian government has not put in place deliberate programmes that support the uptake of coffee as a viable option for small-scale farmers to diversify into. Introducing programmes of this nature would attract small-scale producers in the programme and will help to improve livelihoods of small-scale producers in regions where the crop has a comparative advantage. Thus, large-scale farmers appear to be well placed and have taken the lead in the production of coffee in Zambia.

Long-term financing is the main challenge for both small-scale and large-scale producers and has been the major contributory factor for the observed progressive downward trend in coffee production in Zambia in the past decade. Closure of one of the major coffee farms in Northern Province (Kasama Coffee Company) in 2004 greatly reduced Zambia coffee exports. Zambia's coffee sector has not seen investment in outgrower schemes that promote coffee production as the case is in the sugar, cotton and tobacco sectors. Combined with the lack of long-term financing, the production process is the main limiting factor for smallholder participation in the coffee sector. The coffee sector does not have a research programmes that promote research and development to enhance the competitiveness of Zambia's coffee on the world market. That withstanding, Zambia's coffee has managed to penetrate into the niche markets of Europe, Japan, and the USA. However, there is a lot more that still needs to be done to in order revive the coffee sector in Zambia and sustain its productivity on a commercial basis. Zambia has continued to sale coffee bean to international roasters because value addition in Zambia's coffee industry remains low downstream.

On the basis of the identified opportunities and constraints the growth of the coffee sector can be achieved through programmes that;

1. Ensure the availability of long-term affordable funding for coffee producers
2. Support for small-scale farmers engaged in coffee production especially during the time when the crop is still developing and has not matured enough to sell.
3. Create incentives for the engagement and participation of small-scale farmers, in particular linking the programmes with the fair trade initiatives that offer premium prices based on the altruistic reasons such as supporting poor farmers from developed countries

5. COTTON SUB SECTOR

5.1. INTRODUCTION AND BACKGROUND

Zambia is the second largest cotton producer in the Southern African region after Zimbabwe. Zambian cotton is almost entirely produced by smallholder farmers and at its peak (2005), there were 280,000 households selling seed cotton, which is about 35 percent of the national smallholder farmer population (ACI and Agridev Consult, 2008). Eastern Province (Lundazi, Chipata, Chadiza, Katete and Petauke) is the most important region in terms of cotton production and accounts for about 70 percent of Zambia's total output, with parts of Central, Lusaka, and Southern provinces accounting for the balance (Keyser, 2007). In terms of value, it accounted for 32 percent of the value of the main agricultural exports while in terms of GDP, cotton accounted for around 19 percent of total agricultural GDP. For the 2010/2011 season, cotton production was 63,000 metric tonnes of lint (about 150,000 metric tonnes of seed cotton) as a result of the improved producer prices. For the same period, there were about 272,000 contracted farmers. Cotton provides direct and indirect employment to an estimated 21 percent of the population and directly supports the livelihood of over 1.4 million people. Long-term prospects for growth are promising as Zambia cotton receives some of the highest premiums in Africa (Kabwe, 2010).

Cotton generates significant commercial activity throughout the economy and value chain, including import and distribution of inputs, the provision of extension services to farmers by companies, cotton seed ginning, exportation of lint and unprocessed cotton seed and processed oil, as well as oilcake and soap production. This section comprehensively discusses growth and employment potential in respect of cotton in Zambia by analyzing the market from a value chain perspective.

5.2. OVERVIEW OF THE GLOBAL COTTON MARKET

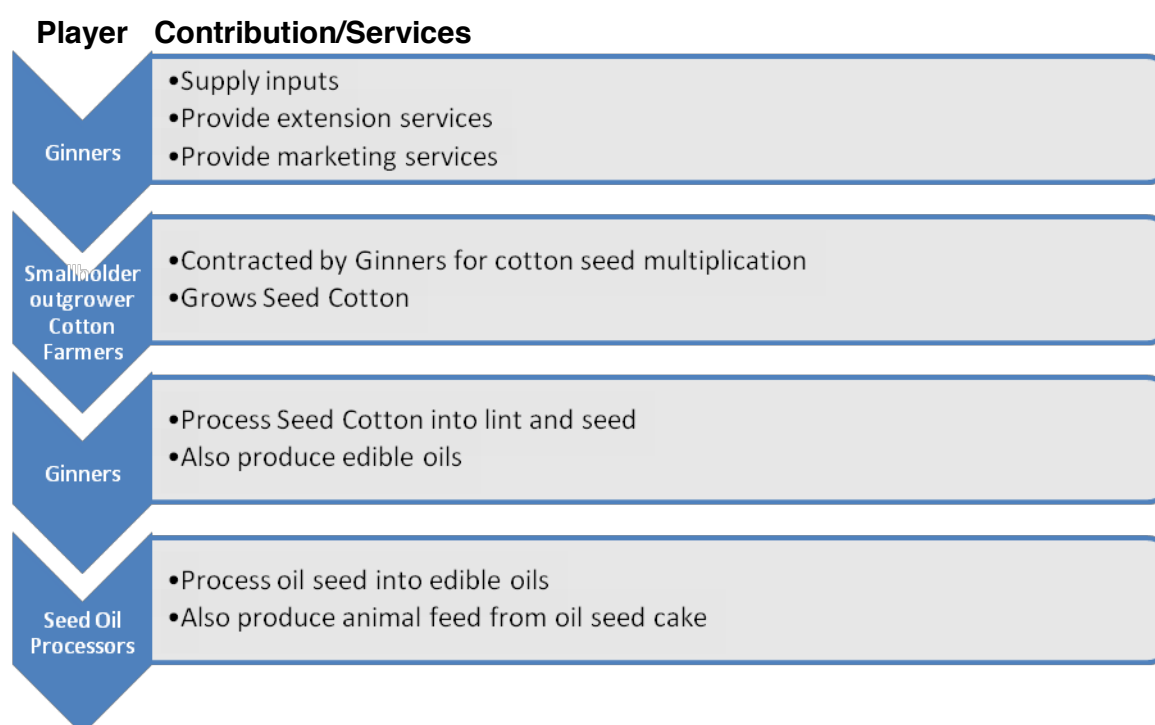
Despite its low share in global trade, cotton trade is very important to many poor countries, especially in sub-Saharan Africa where an estimated 2 million rural poor households depend on the commodity. Since the 1960s cotton production grew at 1.8 percent annually to reach 24 million tons in 2005 from 10.2 million tons in 1960 (International Encyclopaedia for Social Sciences, 2008). Most of this growth came from China and India the leading textile producers in the world. The United States, Central Asia, and Francophone Africa dominate the export market accounting for more than two-thirds of global trade. Cotton has been subject to various marketing and trade interventions; typically taxation in low income countries, especially sub-Saharan Africa and Central Asia, and subsidization by rich countries, especially the United States and the European Union (EU). The subsidization has had a very profound effect on the world cotton prices as these countries have been able to produce large volumes of cotton that they have dumped on the world market leading to depressed prices. Technological advancements in the lead exporting countries by way of adoption of GM cotton have led to even greater increases in the production of cotton by these countries.

5.3. DESCRIPTION OF THE COTTON VALUE CHAIN IN ZAMBIA

5.3.1. Structure of the Cotton Industry

The cotton value chain in Zambia mainly consists of the ginners, smallholder farmers and seed oil processors as direct players. Inputs are mainly supplied by the ginners through farmer distributors which primarily include chemicals and cotton seed (which they multiply using selected smallholder farmers using foundation seed developed by the CDT). These ginners currently numbering 5 also supply specialized cotton extension as well as marketing services. The second level of the chain includes the seed cotton farmers who are usually organized in out grower schemes contracted to particular ginners. These usually vary in numbers depending on cotton prices offered in the previous season as well as incentives being offered for producing competing crops such as tobacco and maize. However, in high production years, they have numbered up to 300,000. The seed cotton produced is then supplied to the ginners who had provided financing through inputs and extension. They then clean and separate cotton lint from seed and export. A less prominent part of the chain are the seed oil processors who in certain instances happen to be the same Ginners who process cotton seed into edible oils and animal feeds. Figure 9 illustrates a simplified value chain.

Figure 9: Zambia Cotton Value Chain



5.3.2. Regulation and Governance

Although currently the Zambia does not have specific policies regulating the operations of the players in the cotton industry, the industry is still considered to be well organized. It comprises of regulatory institutions as well as the players who are mainly the ginners and the producers. The regulatory institutions include the Cotton Board which has been provided for in the proposed Cotton Act. This board has nine voting members appointed

by the Minister of Agriculture and Livestock upon nomination by their own institutions. The proposed members come from industry relevant institutions such as the Permanent Secretary of the Ministry of Agriculture and Livestock (MAL), two persons each from the Cotton Development Trust (CDT), the Cotton Ginners' Association (CGA) and Cotton Growers' Association, the Controller of Seeds (one person) and one person from the Environmental Council of Zambia (ECZ). The specific stated functions of the Board include to:

- Regulate the production, processing, and marketing of cotton;
- Advise government on regulations and policies related to the sector;
- Monitor and report on implementation of policies and matters related to the sector and
- Carry out such activities as are necessary to the better performance of its functions

Other than the Board, there are other institutions such as the Cotton Association of Zambia (CAZ), Zambia Cotton Ginner's Association (ZCGA), Zambia Cotton Outgrower Pre-financiers Association (ZACOPA) and the CDT. These institutions have particularly played important roles in providing opportunities through production support schemes detailed under the section on opportunities for growth for the sector.

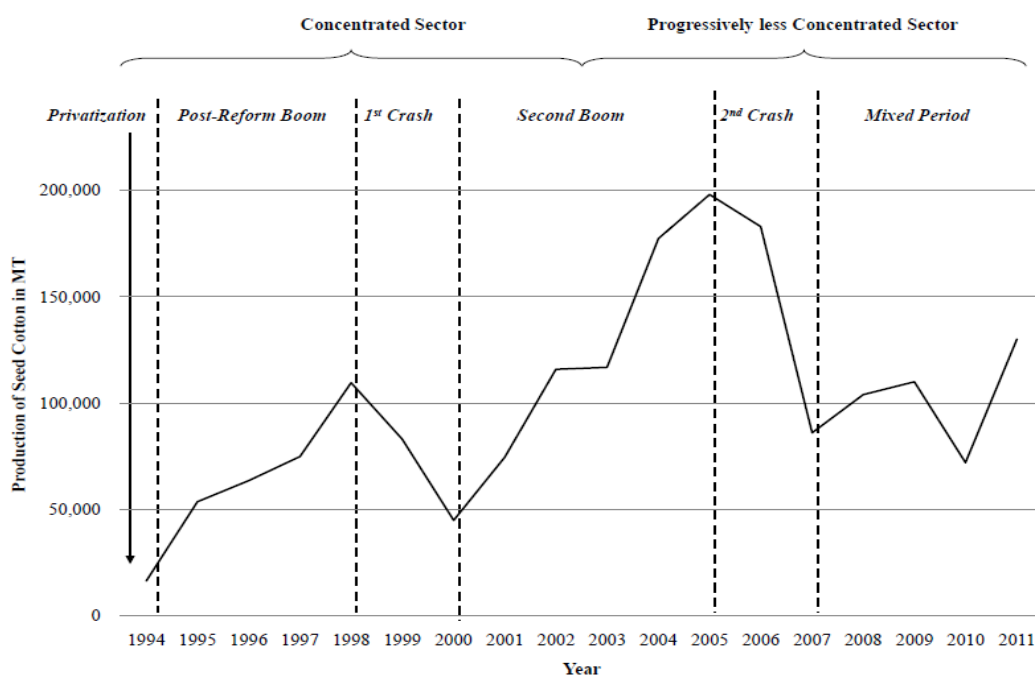
According to Tschirley and Kabwe (2007), Cotton sectors in Sub-Saharan Africa can be organized in a wide variety of fashions. These range from publicly-owned national monopolies; local monopolies in which private firms hold monopoly rights in defined geographical zones; concentrated market-based sectors in which 2-3 private firms dominate the cotton market; competitive sectors in which many private firms compete vigorously for seed cotton; and hybrid sectors which combine elements of different types. Tschirley and Kabwe (2010) furthermore show that the prices and services received by the cotton producers are related to the prevailing market system. Competitive market systems are expected to deliver attractive seed cotton prices to producers, but are rarely able to deliver input credit or achieve high lint quality while concentrated market systems are expected to deliver some input credit and also achieve higher lint quality but over time are expected to deliver lower seed cotton prices to producers compared to competitive systems. The prices delivered under the concentrated system are also known to depend very much on the behaviour of the dominant companies (Tschirley and Kabwe, 2007).

Although currently there are five (5) registered cotton ginning companies with a ginning capacity of about 120 metric tonnes of lint (Mwale, 2011), two companies remain the dominant players in the Zambia cotton sector and accounted for about 80 percent market share as at 2009 making it to be classified as a concentrated system (Tschirley and Kabwe, 2010). Furthermore, these ginneries have always operated below their full capacity (about 40 percent). During interviews with one of the stakeholders, a particular reason given for low utilization of the ginning capacity was the low supply of cotton seed which results from low production. Whereas privatization of the sector resulted in an increase in the number of cotton ginning companies, there has not been corresponding efforts (especially from government) in the development of the smallholder cotton farmers who are the main suppliers of seed cotton. Discussions held with stakeholders indicated that as at 2011, Dunavant was the key player, while the others included Continental, Chipata-China Cotton, Alliance Cotton and Africotton ginneries.

5.3.3. Production Trends

Although there are very few commercial farmers who are involved in seed multiplication, seed cotton in Zambia is almost wholly produced by the smallholder farmers. The majority cultivate an average of less than one hectare under a rain fed production system (Kabwe, 2011). Cotton production trends in Zambia have exhibited variations depending on the price fluctuations which is the key determinant of production. Year on year variations in production respond to lagged prices and are usually as a result of farmers increasing the area under production in response to the previous years' prices as well as new farmers producing the crop. Figure 10 shows the trends in cotton production (in metric tons) since liberalization of the sector in 1994.

Figure 10: Cotton Production Trends in Zambia from 1994 to 2011



Source: Kabwe, 2011

Liberalization of the cotton sector in 1994 resulted in an increase in seed cotton production from 20,000 metric tonnes to 110,000 metric tonnes around 1998. However, due to lack of regulation in the sector which led to rampant credit default, production went down to 42,000 metric tonnes a mere two years later. Between 2000 and 2005, the sector recovered with production reaching a record high of almost 200,000 metric tonnes of cotton seed produced by about 300,000 smallholder farmers. According to Tschirley and Kabwe (2007), there were multiple drivers for this unprecedented production increase. Firstly, the Distributor System first launched by Dunavant in 1999, was greatly refined which subsequently dramatically improved credit repayment rates among farmers prompting Dunavant to aggressively expand its production network. Clark Cotton, the other large cotton company operating in Zambia at the time, also improved from its traditional system and was able to increase production while maintaining its repayment rates. Consequently, national production more than quadrupled between 2000 and 2005, driven by yield growth in addition to area expansion. Furthermore, by resolving the issue of propylene contamination, which had threatened the country's export market, Zambian cotton received a premium on world

markets which trickled down to farmers, hence high producer prices, despite the country operating in a concentrated sector.

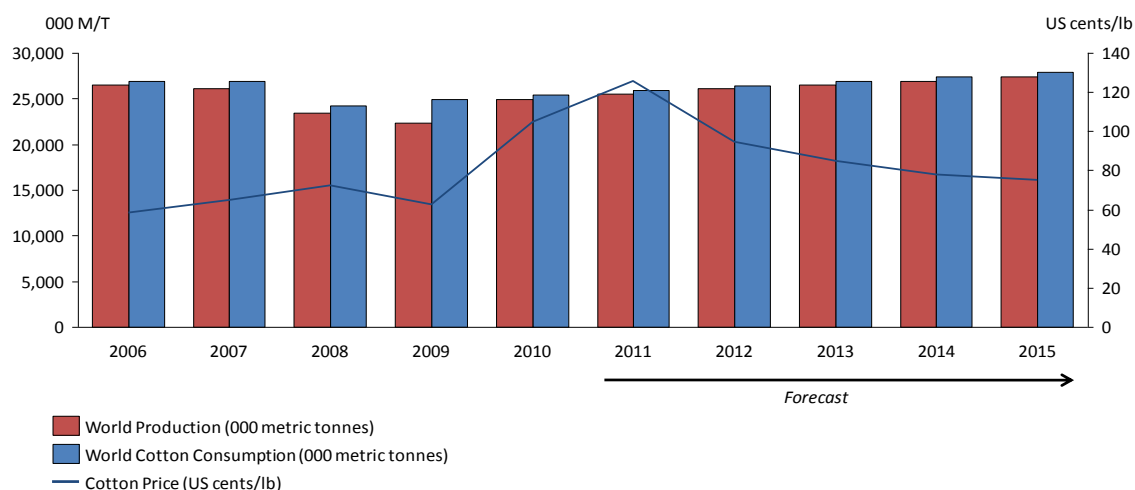
Production went down again to approximately 83,000 metric tonnes in the 2006/2007 season as a result of macro-economic instability, low international prices and credit default. Since 2002, the *Zambian Kwacha* steadily appreciated against the dollar placing the export sector under increasing pressure. By 2005 the *Kwacha* appreciation proceeded more rapidly causing a serious crisis in all export sectors. For instance, the cotton outgrower companies who had purchased inputs around June/July 2005 when the exchange rate was at ZMK4, 700/US\$1 based their input prices at that exchange rate. The *Kwacha* then began to appreciate and by May 2006 the exchange rate was down to ZMK3, 200/US\$1. In this environment, Dunavant indicated that it mobilized the local currency at the low exchange rates and announced that it would pay only ZMK860/kg down from ZMK11, 200/kg from the previous year (Tschirley and Kabwe, 2007). As a result, cotton planting for the 2006/2007 growing season fell by 40 percent. This also eroded farmer confidence to such an extent that even when the pre-production prices were increased, farmers could not respond. Whereas there appeared to be some progression again in 2008/2009 season, production was only approximately 73,000 metric tonnes (Kabwe, 2011). However, the 2010/2011 season saw improvement in production to 150,000 metric tonnes of seed cotton which has been attributed to improved producer prices (Mwale, 2011). The stakeholders interviewed believe that as a result of good producer prices, the 2010/2011 production could have been higher had it not been for the droughts experienced in some cotton growing areas during the planting period.

According to the Global Development Solutions (2007), the *Zambian* climate and its general altitude of 750-1200 meters above sea level creates an environment quite favourable for growing cotton. Furthermore, potential for growth is high as cotton buyers appreciate the quality of *Zambian* cotton because it is hand-picked making it cleaner and less prone to damages on the fibres compared to machine picked cotton (Tschirley and Kabwe, 2010; Global Development Solutions, 2007). However, the principal reason given for the relatively continued good performance of the cotton sector is that the two major cotton ginning companies do an excellent job in providing inputs and crop collection through their out grower programs where they provide finance, production inputs and extension services (Tschirley and Kabwe, 2010; Global Development solutions, 2007; ACI and Agridev Consult, 2008). Even though in the recent past, production has not responded that much to increases in prices due to competition with maize which has been receiving increasing amounts of subsidized inputs from the government under the Farmer Input Support Programme (FISP) as well as guaranteed market under the Food Reserve Agency (FRA), the observed delays/failure to pay farmers for maize supplied by the FRA implies that cotton may again be the only crop for which farmers receive advance credit for inputs while at the same time having a definite market and an expected price. This makes producers view it as a well-financed, low risk opportunity and consequently even if they could make more money growing other crops, they would still prefer to grow cotton.

Cotton production is also highly responsive its own prices as well as prices of other competing crops such as tobacco. Based on prices paid in the previous year, existing farmers expand areas under production while new farmers also grow the crop. Therefore, based on the high prices of US\$0.66/kg paid for the year 2010/2011 season, the 2011/2012 production is expected to rise. In terms of future outlook for the cotton market, Dalberg (2011) shows that cotton prices are expected to fall by the end of 2011 and to continue to ease, although at a much slower rate, towards 2015, owing to higher

cotton production in both 2011/12 and 2012/13 and the more long-term switch to man-made fibres (see Figure 11).

Figure 11: Five-Year Forecast on World Cotton Production, Consumption and Prices (2011-2015)



Source: EIU GFS; FAPRI; Dalberg analysis

Considering that the growth in cotton production in Zambia has been highly responsive to international prices, it can be projected that national production is also going to decline in response to world prices. However, this projection is based on the assumption that there is an insignificant increase in efforts by cotton companies and government to raise farmer productivity which could raise production despite falling world prices.

Drivers of Projected Growth in Cotton Production

Between 2000 and 2005, there was significant increase in land area used to plant cotton as a result of contract farming arrangements, whereby smallholder farmers received inputs on credit and extension assistance from private sector processing and marketing companies, along with guaranteed output markets. The expansion of cotton production was almost entirely the result of ever increasing numbers of farmers becoming involved in outgrower schemes, up to approximately 280,000 in the 2004/2005 season, with Dunavant accounting for some 180,000 smallholder farmers. There was hardly an increase in the average yields, which remained stagnant (reportedly due to poor farming practices) at slightly below 600 kg/ha (ACI and Agridev Consult, 2008).

Since 2006, there has been a change in approach to increasing cotton production pioneered by Dunavant which has entailed coming up with programmes that stimulate productivity. Since then a number of programmes aimed at improving productivity have been recorded while productivity rises are also being cited in certain areas (i.e. among those farmers who are under the YIELD programme, ACI and Agridev Consults (2008) report yield increases of up to 1200kg/ha being recorded. Since 2006, Dunavant has been running programmes aimed at increasing cotton yields for the farmers and make the crop more profitable. For instance, they are running a yield programme which aims to raise not only cotton productivity but also profitability by teaching farmers business skills. They are also operating a mechanization scheme, under which farmers are given tractors to enable them increase the land under cotton production as well as improve

the timelines of land preparation and hence increase yields. Dunavant is promoting the use of herbicides to ease the constraint of weeding (which takes up a substantial amount of time for cotton farmers) thus raising hectarage, yields as well as improving the quality of cotton produced. They are also supporting research in high yielding cotton varieties under the Cotton Development Trust (CDT). According to some stakeholders, on average, cotton yields have risen from about 500kg/ha to 750kg/ha and are likely to rise even more as a result of these efforts, with the target standing at 1,200kg/ha. As such, this increased productivity and the projected increase in the number of farmers growing the crop in the coming years is going to raise the national cotton production.

5.3.4. Employment and Income Distribution

The cotton industry has a lot of potential for creating employment at the different stages in the value chain. Cotton production is labour intensive as it requires a lot of weeding. Furthermore, Zambian cotton is hand-picked creating employment within the rural areas during harvest. For example, although current figures were not available, the 2004 cotton production of 172,000 metric tonnes generated approximately US\$50 million in export earnings of cotton products. Furthermore, in addition to the 227,000 farmers involved in cotton seed production, 1,200 permanent employees and 1,700 temporary employees worked in the cotton industry (Global Development Solutions, 2007). Discussion with the stakeholders revealed that Dunavant alone paid ZMK220billion (US\$44 million) to farmers while the whole industry paid an estimated ZMK600 billion (US\$120 million) in 2011. Indirectly jobs are also created through agro-dealers and transporters who are involved in transportation of the inputs and crop during the harvest season. Cooking oil is produced as a by-product and sold locally thus creating more jobs in the manufacturing and marketing sectors. However, most stakeholders believe that the sector could do much better with some more value addition. They believe the current trend of exporting raw cotton has limited the sector's contribution to employment as spinning, which is the most value adding stage, is not done in-country.

ACI and Agridev Consult (2008) have done a detailed comparison of the distribution of net income across each level of the cotton value chain to enable a comparison of benefits accruing to actors at various levels of the chain. This provides a picture of the distribution of benefits at each level of the value chain as it reflects the often vastly different volumes handled by players at each level of the chain. They calculate the value accruing to each of the levels along the value chain, and apportion costs accruing to hired labor and to actor profit margins. The results are reproduced in the Table 7.

Table 7: Employment and Income Distribution for the Cotton Value Chain

Wage Costs	\$/kg	kg/actor	No. Actors	Total
Farmer				
Wage Costs	0.04	655	280,000	\$7,336,000
Profit	0.08675	655	280,000	\$15,909,950
Processor				
Wage Costs	0.0522	30,566,667	6	\$9,573,480
Profit	0.0054	30,566,667	6	\$990,360
Total Profit				\$16,900,310
Total Wages				\$16,909,480

Note: Average yields are derived from total ginnery throughput for 2005/06 season divided by the number of outgrowers. This results in slightly higher than the purported average yields of 600kg/ha since most farmers have slightly more than 1ha. Farmer wage cost assumed to be cost of hired labor for harvesting. Farmer profit assumed to include returns to own labor. Processor wages include wage costs as well as administration staff. Processor is assumed to follow the Distributor value chain model.

Source: ACI and Agridev Consult, 2008

Comparison of the returns to wage employment and owner profit at each level of the chain (Table 5) shows that the cotton industry provides a greater share of own-farm profit (US\$15,909,950) than wage labor (US\$7,336,000) at the farm-level of the chain, but significantly more returns to wage labor (US\$9,573,480) than profit (US\$990,360) at the processor level of the chain; indicating that the cotton industry is not only a significant provider of income to farmers, but also wage employees (ACI and Agridev Consult, 2008). For comparison purposes, Table 8 (reproduced from the data by ACI and Agridev Consult, 2008) presents a comparison of wage costs and profit margins accruing to the cotton, tobacco and smallholder sugar value chain players. This shows that the cotton industry made a bigger contribution to the Zambian economy than did the Burley tobacco and the smallholder sugarcane value chains in this particular year. This is the case because the cotton industry provided employment to over 280,000 smallholders compared with only 9,000 Burley producers and 161 sugarcane farmers.

Table 8: Income Distribution along the Cotton, Tobacco and Sugarcane Value Chains

		Cotton (US\$)	Tobacco (US\$)	Smallholder Sugar (US\$)
Producer Level	Profit	15,909,950	2,002,745	2,027,154
	Hired Wage	7,336,000	112,753	149,632
Processor Level	Profit	990,360	376,000	589,599
	Hired Wage	9,573,480	1,868,249	1,422,711
Industry Level	Profit	16,900,310	2,378,945	2,616,752
	Hired Wage	16,909,480	1,981,001	1,572,343

Source: ACI and Agridev Consult, 2008

5.4. OPPORTUNITIES FOR GROWTH

5.4.1. Competitiveness of Zambian Cotton in the Export Markets

Zambian farmers generally grow a medium-staple variety that is suitable for making good cotton fabrics and for blending with longer staples in fine fibres. For this reason, demand for Zambian cotton is quite high on the international markets (Tschirley and Kabwe, 2010; ACI and Agridev Consults, 2008). This is because over the past three years, a lot of effort has been concentrated at training the farmers in good management practices like pest control, proper weeding and timely harvesting. This, coupled with the fact that the cotton is handpicked, makes it attract premiums on the world markets. Other factors leading to high competitiveness include investment in state of the art cotton cleaning machinery which results in good cotton staple and thus price premiums.

According to Global Development Solutions (2007), taking into account the higher yield rates and prorating the average yield to 750kg/ha, as shown in Table 9 which benchmarks seed cotton production yield for selected countries, Zambia ranks relatively low, particularly, among smallholder farmers. However, as far as production cost is concerned (\$/kg), Zambian smallholder farmers are well within competitive range of other seed cotton producers in the region and elsewhere.

Table 9: Benchmarking Smallholders Seed Cotton Production in Selected Countries

Country	Yield Rate	Production cost	
	Kg/ha	\$/ha	\$/kg
Zambia	750	210.81	0.21
Pakistan	1,680	387.34	0.23
Kyrgyzstan	2,450	393.66	0.17
Cambodia	1,200	415.93	0.35
Kenya	575	145.88	0.26
Mozambique	297	41.15	0.14
South Africa	473	718.77	1.52
Ethiopia	556	293.39	0.24

Source: Global Development Solutions (2007)

ACI and Agridev Consult (2008) did a comprehensive analysis of the competitiveness of Zambian Cotton using value chain analysis under various smallholder management models namely:

- Low yielding family farms: this model does not use fertilizer, uses a standard chemical pack and unimproved crop management. The average yield for this model is 600kg/ha
- High yielding family farms: this model uses 2 bags of fertilizer, standard chemical pack and unimproved crop management practices. The average yield for this model is 900kg/ha
- Dunavant Yield programme: this model does not use fertilizer, uses a standard chemical pack and improved crop management practices¹. The average yield for this model is 1200kg/ha

Their analysis shows that the low yielding model obtains net profits of US\$94 per metric tonne, while the high yield model obtained a net profit of US\$42 and the Dunavant yield model obtains a net profit of US\$136.38 per metric tonne. The high yield model had lower net profits due to the inclusion of the cost of fertilizer. This confirms the assertion by cotton companies who refuse to provide fertilizer to smallholder farmers. This is because whereas farmers would have to double yields (from 600kg/ha to 1200kg/ha) before fertilizer costs starts to pay off, they could still achieve this yield through improvement of management practices. Fertilizer is not a limitation to achieving yields as high as 1200kg/ha.

5.4.2. Support Programmes for Cotton Production

Although the cotton industry supports an estimated 21 percent of the population, it has not received much support from the government. For instance, the 2012 agricultural budget shows that whereas the total agricultural budget was ZMK1,698 billion, about 47.1 percent will be used to support one commodity, maize, through the Farmer Input Support Programme (FISP) for maize inputs; and the Food Reserve Agency (FRA) for

¹Improved crop management practices include very simple improvements such as timely planting, good thinning and weed control, and timely spraying of agrochemicals based on good pest scouting, etc.

maize marketing support. The rest of the budget is supposed to cater for the remaining functions such as remuneration, administration, research, infrastructure development and others (GRZ, 2011). Commodities like cotton receive very little budgetary support from the Government. Majority of the support for the cotton industry comes from the ginning companies and cooperating partners. The following list shows the interventions that are being undertaken in the sector by the private sector, cooperating partners and the government to support cotton production.

Out grower Schemes

Under this programme, smallholder farmers producing cotton are linked to the cotton value chain under outgrower arrangements. The basic principle of the outgrower schemes is that the private sector companies provide inputs and support to the smallholder farmers in exchange for their output, i.e. the seed cotton produced. Various models are used to reach out to as many farmers as possible over a wider geographical coverage area. One of them is the distributor model, pioneered by Dunavant which is based on the appointment of village based agents working on commission who are responsible for mobilizing; recruiting and contracting the farmers; distribution of inputs; crop monitoring; recovery of credit and ensuring that all the cotton produced by the farmers under their responsibility is delivered to the company

YIELD Programme

Dunavant has also embarked on a yield programme. The programme was prompted by diminishing returns for the cotton growers as a result of lower prices for cotton on the international markets, exacerbated by the appreciation of the Zambian Kwacha in the 2005/2006 season, threatening the very survival of the cotton industry in Zambia as there was a risk that more and more smallholder farmers were opting out of cotton production in favor of other crops like maize (Dunavant, 2005). The programme aims at increasing average yields per hectare, which had stagnated at approximately 600kg/ha under the distributor programme when the Distributors were also responsible for providing technical support to the contracted farmers, by focusing on basic key crop husbandry practices in an effort to improve average yields. Company staff provides training to incentivized Lead Farmers who each pass on the gained knowledge to groups consisting of 15 collaborating farmers.

In the absence of a policy regulating the operations of players in the cotton industry, there have been efforts by the players themselves to put up programmes and activities that regulates the operations of the industry and ensure continuity as well as increased production. These efforts are basically motivated by earlier negative experiences such as the overcapacity in the ginning industry and the entrance of new competitors leads to companies competing for a limited amount of cotton resulting in large scale side-buying and side-selling, a phenomenon that could potentially destroy the industry². As Tschirley and Kabwe (2007) point out, competition can be good for farmers, resulting in more choice and better prices. But the sustainable expansion of cotton production in Zambia depends on the reliable provision of inputs on credit and good extension advice to hundreds of thousands of smallholder farmers. Realizing this, certain bodies that regulate the behavior of players have been formed. Among these include:

The Cotton Association of Zambia (CAZ)

²Side-selling or side-buying is where a farmer is supplied inputs and equipment on credit by one company but is approached or approaches another company, who does not run a credit and extension system, to procure the cotton produced. Thus no deductions for the credit recovery are made, leaving the original supplier with a heavy debt and no cotton to process

This is a semi-autonomous association formed in 2005 and affiliated with the Zambia National Farmers Union (ZNFU) to represent farmer interests in the sector and providing the Zambia Cotton Ginners' Association with an organized body with whom to dialogue on key issues affecting smallholder farmers (ACI and Agridev Consult, 2007).

Zambia Cotton Ginners Association (ZCGA)

All ginners in Zambia are members of the (ZCGA) which includes members from ZNFU, Ministry of Agriculture and Livestock (MAL), and Cotton Development Trust (CDT). Its main functions are to liaise between outgrower scheme arrangements to ensure side-selling is minimized; to develop strategies to expand cotton production and yields; and to assess market price trends and liaise on prices.

The Zambia Cotton Outgrower Pre-financiers Association (ZACOPA)

This association was formed to safeguard the interests of the established ginners who pre-finance inputs in their outgrower schemes and attempt to prevent side-selling and side-buying of their crop.

The Cotton Development Trust (CDT)

The CDT is a semi-autonomous grant dependent organization formed in 1999 by the then Ministry of Agriculture and Cooperatives (MACO) and mainly funded by the Ministry through the Soil Crop Research Branch (SCRB). The aim of the Trust is to develop agriculture in Zambia through strengthening the cotton sub-sector, with its main role being in research and development, while ensuring that pure cotton seed is available for and provided to the farmers by a cotton maintenance breeding program, which produces breeders' and pre-basic seed for multiplication by the gineries or contracted farmers (ACI and Agridev Consult, 2007).

Donor Funded Programmes

During the interviews, it was mentioned that donors have channelled funds through the government such as the support to CDT by the World Bank through funding the construction of a dam. Furthermore, donors are reportedly funding more projects through the Cotton Growers Association as well as running independent programmes aimed at improving cotton production such as the Competitive African Cotton Initiative (COMPACI) funded by the Bill and Melinda Gates Foundation (BMGF) and the German Ministry for Economic Cooperation and Development (BMZ) in partnership with the private sector (as represented by local private cotton companies). The COMPACI programme is a follow-up of Cotton made in Africa Initiative (CmiA) which came to an end in 2008 and was aimed at promoting improvements in cotton production in Sub-Saharan Africa (SSA) in compliance with ecological, economic and social sustainability criteria. This was achieved by working through local cotton companies who work with cotton producing families to introduce sustainable cotton farming methods such as selective use of pesticides and better application techniques as well as sustaining soil fertility through use of organic fertilizers. Furthermore, participating farmers were supported with training and small loans to finance production. Then the cotton produced under these conditions was sold under the label Cotton made in Africa (CmiA).

Following the success of the CmiA pilot from 2005-2008, the BMG and BMZ came up with COMPACI which is currently being implemented by the DEG and GTZ. Similarly the private sector represented by local cotton companies acts as partners and provided more than a third of the US\$48.9 million required over the four years the programme will be implemented. The goal of COMPACI is the sustainable improvement of the living conditions of 265,000 cotton growers in six African countries (Zambia inclusive) by 2012. The project provides support to increase farmer's income from agriculture by one-third within the four years, to produce more staple foods and to improve their operating

equipment. The increased income of the small farmers and their families will be achieved through increased productivity which in turn is achieved through educating them in farming methods, pre-financing of production and loans for draught animals, strengthening of cooperative structures, verification of small farmers and engaging local companies to market their cotton. COMPACI also advises African governments in developing strategies for the cotton sector within the framework of the Comprehensive African Agriculture Development Programme (CAADP). COMPACI also does the following:

1. Financing of the extensive start-up of verification of approximately 150,000 farmers according to the CmiA criteria and strengthening of the regional verification institutions;
2. Independent project monitoring and evaluation performed by the American Research Institute on the basis of on-going focus group interviews;
3. Has a specific gender component to support women in cotton producing families.

None of the stakeholders interviewed were aware of any legislation and tariffs directly impacting on their sector. Apparently ginners are able to export any amount of lint produced without hindrance. However, it was highlighted that the issuance of investment licenses and tax incentives for those investing in rural areas is likely to benefit the cotton sector as investors are likely to setup ginning companies in the rural areas.

5.5. CONSTRAINTS TO GROWTH

5.5.1. Low Productivity

The biggest constraint identified by all the stakeholders interviewed was the low volumes produced as well as the low productivity of cotton. The Global Development Solutions (2007) study shows that increasing farmer yields would help lower the cost/kg for the ginneries (whose cost of ginning is also among the highest) since the ginneries would receive a greater return on the administrative, loan interest and input costs that they spend on their respective outgrower programs. Keyser (2007) shows that despite good progress with development of outgrower schemes and smallholder supply networks, cotton yields in Zambia remain extremely low compared to world and even African standards. While there has been some improvements in yields since the introduction of outgrower schemes (from around 500-600kg/ha in the mid-1990s to the current 700-800kg/ha for smallholder farms), these yields are very low compared with Cameroon, Mali and other West African countries where smallholders often achieve yields of 1,200kg/ha or more. Among the reasons for the low yields include late planting by farmers who prefer to plant maize first; poor weed control and chemical use. The lack of proper regulation in the industry also contributes to this low productivity. This is because so many ginning companies were established which promoted pirate buying of cotton. As a result, most companies stopped investing in the farmers in terms of providing extension and quality inputs leading to low productivity. Although prices tend to be high, farmers are not able to benefit as yield and returns to labour tend to be low.

5.5.2. Low Technology Adoption

Technology is perceived as a constraint to growth by Cotton Association of Zambia (CAZ). The failure by the nation to adopt genetically modified cotton is seen as a constraint as Zambia is being left out when the rest of the world is growing *Bacillus thuringiensis* cotton (BT cotton) which is perceived to have potential for improving

production. Burkina Faso (the continent's largest producer of cotton) has been growing BT cotton while other countries like neighbouring Tanzania have been undertaking trials (Dalberg, 2011). BT cotton is engineered for pest resistance. It leads to a reduction in crop damage with associated efficiencies in input costs, and can increase the quality of cotton by avoiding spotting and discoloration associated with pests. Furthermore, in countries with low yields due to low application of pesticides by credit-constrained farmers, adoption of BT cotton can lead to increases in yields. However, in Zambia, while the policy-makers realize the importance of the advantages associated with BT cotton, they also claim to be aware of the risk that such modified genes would enter the food value chain via cotton cake, a common feed for beef cattle in commercial feedlots. Research has not yet been conducted on how such modified genes could affect the meat in beef cattle and the people consuming the meat. Moreover, others claim that the introduction and cost savings of genetically modified cotton seed may be less than the benefit of developing an "organic" brand for Zambian cotton seed, lint cotton, yarn and woven fabric (Global Development Solutions, 2007). Furthermore, some stakeholders interviewed pointed out that recent studies show that BT cotton does not perform very well under small-scale management and that the costs and risks involved with it do not warrant the increase in the yields that are obtained. However, all agreed that there is need to still explore whether BT cotton should be introduced slowly among the progressive farmers.

5.5.3. High Input and Transactions Costs

Input costs were not seen as a major constraint as most cotton production is pre-financed. However, the range of inputs provided was perceived as having the potential to limit productivity. The input range offered by outgrower companies does not include fertilizer and consequently smallholder farmers do not use fertilizers. However, Keyser (2007) shows that even though cotton yields could improve substantially with only 2-3 bags of Compound C per hectare, cotton produced using fertilizer costs 60 percent more per metric tonne making smallholder farmers that produce cotton without fertilizer being the lowest cost producers despite getting low yields. Another study (Global Development Solutions, 2007) which attributes much of the low cotton yields in Zambia to extensive soil depletion claims that the soils are so depleted that fertilizer application would only provide minimal benefit. Consequently farmers find it profitable to divert fertilizers, when it is provided, to crops like maize which are highly responsive to fertilizer application.

Logistic costs including transport and access to information were identified as another constraint. Due to limitations in information flow between the market players, the vice of side-selling has persisted occurring more often when production is reduced or when demand increases greatly. Side-selling always reduces recovery rates for those who pre-finance cotton and reduces the incentive for them to expand into certain areas. Poor road infrastructure received mention from some stakeholders who highlighted that in certain outlying areas, the soils are very good for cotton production with the constraint of inaccessibility.

5.5.4. Lack of Regulatory Control and Coordination

Whereas market access was not perceived as a constraint by most stakeholders, policy was generally cited as a constraint by all stakeholders who were interviewed. According to Tschirley and Kabwe (2010), as much as the Zambian cotton sector is still dominated by two companies, the new entrants as a group appear to be large enough and well established to change the competitive dynamics in the sector. And therefore, realizing

that while competition could be good for the farmers³ sustainable expansion of cotton production depends on continual improvement in service provision for productivity growth and in cotton quality. Experiences from past years and also neighbouring countries show that uncontrolled competition among companies can lead to widespread credit default which undermines input credit provision, extension and cotton quality (Tschirley, Poulton and Labaste 2009). This is the reason why key stakeholders have been calling for the need to develop a regulatory structure that preserves the positive performance associated with concentrated sectors while providing enough room for competition from new firms to ensure continued innovation and remunerative prices for farmers which is still absent.

According to Tschirley and Kabwe (2010), Zambia does not have any formal set of publically known rules with some level of public sector participation. Consequently private companies run their businesses and coordinate with each other in largely informal ways, with little if any influence from government and no formal rules governing what influence could bring to bear. This is despite efforts, over the past seven years, of various stakeholders in the cotton sector who have worked to formalize a regulatory structure in the form of a Cotton Act (though the Cotton Board proposed within the Act has been formalized and is operational since 2009). The failure to enact the Cotton act has largely been attributed to changes in the Ministers of Agriculture during critical periods in the process (as each new Minister has requested to be familiarized with the Act before they can proceed with it). However, the Act has a lot of provisions that are likely to regulate the operations of the players in the cotton industry. For instance, the industry currently relies on self regulation and there are instances when issues like side-selling undermine the players' ability to invest in the industry as they are not guaranteed returns on their investments. Ultimately, the industry has not received as much investment in extension and input provision as it potentially could, leading to continued low productivity. Such issues could be addressed by the Act as it empowers the Cotton Board to register all operators in the sector and issue licenses and certificates without which they cannot operate. The Board also has the mandate to withdraw these licenses when an operator is engaged in vices such as side buying.

As regards phyto-sanitary regulations, the lack of regulation of cotton seed for planting has been the major constraint. Professional seed companies are at present not involved in seed cotton production, like they do for other crops such as maize, soya beans etc. The different outgrowers are responsible for producing their own seed. However, some of them have in at times supplied seed which is of questionable quality to their farmers leading to low productivity. This seed challenge is being exacerbated by the set-backs facing the Cotton Development Trust (CDT) which is responsible for developing foundation seed which is then given to the ginners to multiply over time. The Global Development solutions (2007) reported that the CDT which is supposed to conduct research and test cultivars does not receive much support from the cotton industry, while the support from the government has not been sufficient. Consequently, they are constrained in the manner in which they serve both the cotton producers and the Zambian cotton industry. It was reported that the last introduction of new cotton cultivars into the Zambia cotton production sector occurred in 1995. Similarly, although the growing of ratoon cotton is discouraged because it causes disease build-up, some outgrower companies have tolerated this activity which has the potential to bring about disease and negatively affect production if left unchecked.

³It results in more choices in terms of whom to work with, and better prices

5.6. CONCLUSION

The cotton sector is an important industry in Zambia. Other than providing direct and indirect employment to about 21 percent of the population, it accounts for about 19 percent of the total agricultural GDP. Although the nation does not currently have policies regulating the industry, it seems to be relatively organized with the players regulating themselves to some extent. Although there are currently five cotton companies, the industry is concentrated with two key players currently accounting for about 80 percent of the total market share. The industry value chain is simple and only comprises of the producers and ginners while the weaving and apparels section are absent. Over the past years, cotton production has fluctuated in response to changes in world prices and other changes within the industry such as privatization. Currently production is estimated at around 150,000 metric tonnes, almost all of which is accounted for by smallholder farmers. Future production is projected to increase due to the good prices being experienced, increases in yields due to some interventions by some cotton companies and donors as well as expected increase in the number of producers as farmers are expected to switch from maize to cotton due to challenges being experienced with maize marketing.

When benchmarked against other cotton producers in the region and elsewhere, productivity of Zambian cotton is still quite low although within the competitive range. The major constraints to growth and exports has been low productivity which is exacerbated by poor farming practices such as late planting, weeding, spraying and harvesting. These poor farming practices have been partly associated to low investments in the sector by the cotton companies who in turn blame the low investment on lack of regulatory frameworks that makes investment in the sector risky. However, of late, there have been some investments by some companies in yield increasing programmes which seem to be bearing dividends as some farmers are reporting increases in yields of up to 1200kg/ha. Finally, despite these challenges, the sector contributes greatly towards employment and wealth creation compared to other cash crops like tobacco and small-scale sugar industry because of the relatively large numbers of farmers involved in cotton production as well as the fact that the proportions of wages to profits at the production level favours the farmers while at the processing level, they favour the employees other than the cotton companies.

Considering that low productivity which leads to low production has been identified as the major constraint in the growth of the industry, (i.e. farmers make losses whenever cotton prices fluctuate in response to world prices, while ginners operate below full capacity due to low supply of seed cotton which raises unit ginning costs,) efforts need to be targeted at interventions that raises productivity. In this regard, efforts for increased growth may include any of the following aspects;

1. Training, capacity building and extension support to farmers on good management practices
2. Provision of comprehensive all-inclusive input packages that will enhance the productivity in outgrower schemes
3. Facilitating the adoption of improved technology such as Bt cotton in order to gain the same competitive edge as the major suppliers on the international markets

6. CONCLUSIONS

The primary objective of this study was to assess the potential for growth and employment creation in the sugar, cotton and coffee sub-sectors in Zambia. The study aimed at providing an in depth analysis of the key issues and challenges faced by the sugar, cotton and coffee sub-sectors with a view to assist in the formulation of favourable sector policies and strategies to promote long-term growth of the sub-sectors. Both secondary and primary data were used, gathered through desk research and through key informant interviews. Secondary data were collected through a review of published and unpublished material including past value chain studies.

Zambia has considerable potential for economic growth and employment creation through expanded agriculture production. The country is endowed with vast natural resources, land remains largely unexploited, and there is abundant water that could be used for irrigation. Because of these natural conditions, Zambia has been able to develop a successful sugar industry based on extremely low field costs. The country has also done relatively well in other high-value crop sectors like cotton and coffee for which natural growing conditions are well suited.

In considering how best to grow these sectors, thereby increasing employment and income distribution in Zambia, the following observations can be made:

Zambia's sugar sub-sector holds great potential for growth and exports. The export sector is a major driver in the industry with opportunities available in both the regional market and the EU. Sugar production is highly competitive in the global and regional market but the high cost of doing business and a highly concentrated market structure makes it uncompetitive domestically, limiting consumer welfare and potentially harming producer (smallholders') welfare. The potential of sugar to contribute to wealth and employment creation not only rests in its contribution to GDP and merchandise exports but in local employment creation, inclusion of smallholders in the value chain through outgrower schemes, huge spending of sugar companies in local towns and communities, hiring of local contractors and suppliers among others. Smallholders are constrained in their participation in the value chain due to their limited capacity, poor management skills and access to land. Outgrower schemes that are constantly evolving offer a great prospect for enhanced and equitable distribution of the benefits of growth in the sugar industry in Zambia. Water rights and land tenure security are major issues requiring attention to enhance investments and increased participation by smallholders. The lack of a sugar sector policy negatively affects the industry, as there is no strategic policy guidance for the sector. Potential for increased value addition in the industry exist through widening the domestic and market base through investment such as in biofuels and other downstream sugar products. Government and donor agency led initiatives are gaining prominence in the sugar industry with a major aim of promoting smallholder sugar production for enhanced livelihoods.

Despite Zambia's coffee industry being in the top ten non-traditional exports, the industry still remains plagued with multiple challenges. Zambia is endowed with a favourable climate to produce much more than the current production levels. The coffee industry harbours the potential to create wealth for the country and also acts as a reservoir for both temporary and permanent employment creation in rural areas. However, the industry lacks sufficient financial and institutional support from both the Zambian government and the donor community to actualize the potential. Both the commercial and small-scale coffee growers are bound by similar constraints. Zambia's value chain is relatively uncomplicated compared to other coffee producing countries.

Lack or limited access to long-term financing still remains a great challenge for both small-scale and large-scale coffee producers. Volatility in world coffee prices in the past decade have equally contributed to the observed downward trend of coffee production in Zambia. Zambia's coffee sector has not seen investment in outgrower schemes that promote coffee production as the case is in the sugar, cotton and tobacco sectors. The coffee sector also does not have a research programmes that promote research and development to enhance the competitiveness of Zambia's coffee on the world market. That withstanding, Zambia's coffee has managed to penetrate into the niche markets of Europe, Japan, and the USA, and with appropriate support, could further entrench its position as a niche player in the global coffee industry..

The Zambian cotton sector also has tremendous potential for growth. Despite facing constraints such as insufficient regulation - which has impacted negatively on investment in the sector and consequently yields - the sector is still contributing greatly to wealth creation in the rural areas and economic growth. The sector has huge potential for growth and there is high demand for Zambian cotton on the world market where it fetches premium prices. The sector also creates a lot of employment along the value chain. However, low productivity is still a challenge as productivity among the smallholders is still low. The major constraints to growth and exports of cotton have been low productivity, which is exacerbated by poor farming practices such as late planting, weeding, spraying and harvesting. These poor farming practices have been partly associated with low investments in the sector by the cotton companies who in turn blame the low investment on lack of regulatory frameworks that makes investment in the sector risky.

Although all these sectors have specific challenges the lack of affordable financing and high transactions costs are the main cross-cutting constraints to export diversification. Therefore addressing these challenges not only leads to the growth of these sectors alone but also extends to other sectors that were not part of this study. This finding particularly emphasizes the need for competitive low-cost financing, and infrastructure and transport development as a first step in promoting diversification through comprehensive economic growth. Meanwhile the growing international demand for these products and Zambia's natural conditions that competitive production these and other crops emerge as the country's main opportunities for overall export diversification. Zambia needs to find ways of harnessing its natural advantage to benefit from the growing international markets.

7. APPENDICES

Appendix 1: Scope of Work

Background and study context

The International Growth Center (ICG) in Zambia has commissioned this study to better inform policymakers on alternative agricultural sectors that could contribute significantly to sustainable economic growth in Zambia.

Zambia's future development will depend, in important part, on diversification of the economy – developing new areas of production and export. The best prospects for diversification are within the agricultural sector. Historically, Zambia's agriculture sector has been dominated by maize growing. However, there is considerable potential for expansion in respect of a number of other agricultural products. Research evidence has shown that varieties of agricultural products are or have the potential to be internationally competitive and have great potential for growth and employment creation. This study will look at the growth and employment creation potential in respect of the coffee, cotton and sugar sub-sectors.

Specifically, this assignment will ask the following questions to better understand the potential for growth and employment creation in the identified sub-sectors:

1. What are recent production trends for each of the products? What are the recent production trends in respect of large and small producers?
 - A 5-10 year trend for each product, also broken down for different producer groups (large and small scale farmers)
2. What is the likely future of production trends respect of each of these products? What are the likely production trends in respect of large and small producers?
 - Use past trends to extrapolate possible future growth path
 - A qualitative assessment approach: talk to different commodity associations and players about future plans e.g. expansion of hectares, improved technology (seed), involvement of out-growers, all of which could expand production in the sub sector
3. How competitive are these products in the region as well as in the international export markets?
 - Approach competitiveness in terms of pricing structure, quality, branding. This should be benchmarked against similar indicators from other countries in the region. We will analyze statistics for regional and global trade
4. What are the potential constraints to growth and exports? What are the most critical binding constraints which, if mitigated, would have most immediate and significant effect on growth?
 - Explore from different players in the value chain about the major drawbacks to growth and export
 - Land, capital, labour Technology (seed, mechanization) input costs

- Logistic costs (transport, access to information)
 - Policy and market access
 - Prices
 - Sanitary and Phyto-sanitary issues
 - Ask different players to rank constraints on an arbitrary scale?
5. What government programmes and incentives are there designed to support these products?
- Fiscal or tax incentives, subsidies
 - Government programmes that encourage the production of the crop
 - Donors channelling money through the government
 - Analysis of current trade legislation, tariff structure
6. How effective are these programmes and incentives? Who are the principal beneficiaries?
- Identify beneficiaries; provide numbers of beneficiaries, volumes of export
7. What are the employment creation and distribution of wealth and income impacts of growth in these products?
- Predicting employment creation, explore different functions along the value chain offer employment opportunities e.g. hand picked cotton instead of mechanization
 - Link increased production to increased employment opportunities
 - Look at wealth creation for each sub sector, its distribution among actors in the value chain

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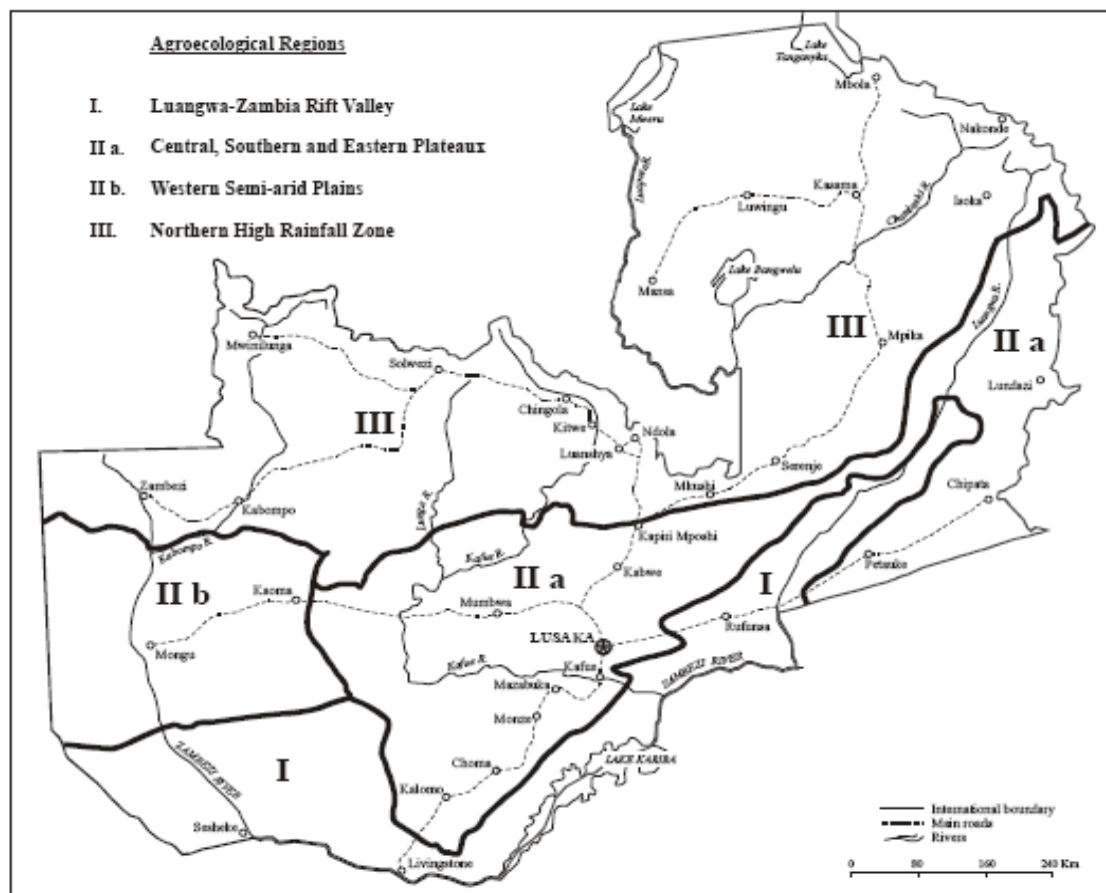
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Appendix 3: List of People Interviewed

- 1) Stephanie Rousseau
Programme Officer
European Union
Regional Cooperation/Sugar Accompanying Measures
- 2) Quentino Chanda
Regional Sales Manager
Zambia Sugar Company
Lusaka
- 3) Ackson Tembo,
IT and Statistics officer
Zambia Sugar Company
Lusaka
- 4) Joseph Taguma
General Manager
Zambia Coffee Growers Association
- 5) Rhoda Mofya-Mukuka
Post Doc Researcher
Food Security Research Project
- 6) Enock Mbewe
Accountant
Coffee Board of Zambia
- 7) Nicholas Mwale
Board Secretary
Cotton Board
- 8) Stephen Kabwe
Outreach Coordinator
Food Security Research Project
- 9) Ruud van Gent
COMPACI Principal Advisor, Zambia
COMPACI
- 10) Gracious Hamatala
YIELD Program Manager
Dunavant
- 11) John Moon
Agricultural Manager
Consolidated Farming Limited

Appendix 4: Map showing Agro-ecological Zones in Zambia



Source: FAO (2005).

Appendix 5: Future Expansion Projects at Major Sugar Companies

Sugar Producing company	Expansion type	Projected area and output capacity	Year of project completion	Capital injection	Expected number of jobs created
Zambia Sugar Plc.	- Area and factory expansion	- 10,500 Ha estate expansion and 438 Ha small holder out-grower development - 250,000 tons sugar output capacity representing 100% expansion	- Area expansion completed and commissioned but output capacity of 450,000 has not yet been achieved	- 1 trillion Kwacha	- 10,000 jobs, including small holder out-grower scheme
	Electricity generation	- 160-tonne per hour boiler and power plant that turning steam into electricity - Increased power generation from 10 to 30 megawatts	Completed in 2009		
	Ethanol production				
Kafue Sugar	- Area and factory expansion	- 700 ha estate expansion - 45,000 tons sugar output capacity	- 2013	- \$6million	- 1000 jobs
Kalungwishi Sugar	No data	No data	No data	No data	No data

Source: Own compilation

Appendix 6: Current and Future Production of Sugar & Sugar Cane

SUGAR

	Current production	2006	2007	2008	2009	2010
		Total Sugar Production 1000 tonnes	277.9	287.7	280.5	244.8
	Future production	2012	2013	2014	2015	
		Total Sugar Production 1000 tonnes	424.3	464.4	469.7	470.8

SUGARCANE

	Current production	2006	2007	2008	2009	2010
		Total Sugar Production 1000 tonnes	2105	2108	2160.4	1926
Small holder production	631.5	632.4	648.1	577.8	930.3	
Large scale production	1473.5	1475.6	1512.3	1348.2	2170.7	
	Future production	2012	2013	2014	2015	
		Total Sugar cane production 1000 tons	3464.7	3785.0	3823.3	3829.3
Smallholder sugarcane production	1039.41	1135.5	1146.99	1148.79		
Large scale sugarcane production	2425.29	2649.5	2676.31	2680.51		
		2012	2013	2014	2015	
		Sugar production 1000 tonnes	424	464	470	471

Source: FAOStats and Sugar producing companies

Appendix 7: Assumptions for Zambian Sugar Baseline

Variable	Units	2010	2011	2012	2013	2014	2015
GDP per Capita	USD	1123.0	1280.0	1452.0	1661.0	1888.0	2090.0
Consumer Price Index	Index	2013.9	2207.2	2439.0	2658.5	2857.9	3052.2
Inflation rate	%	9	9.6	9.2	9	7.5	6.8
Interest Rate	%	17.0	16.0	15.0	13.0	12.0	11.0
Nominal Zambia Exchange Rates	ZMK/USD	4800.0	4700.0	4625.0	4500.0	4375.0	4300.0
Total population of Zambia	Millions	13.3	13.6	13.9	14.3	14.6	15.0
World Sugar Prices	Cents/Kg	61.2	71.7	53.0	54.0	54.4	55.0
Input Prices		623.0	638.3	620.0	610.0	600.0	590.0
Rainfall	Mm	800.0	771.0	773.0	815.4	794.6	890.0
Temperature	°C	28.9	29.5	27.5	30.9	30.4	28.5

Source: Economic Web Institute; Trading Economies; USDA; World Bank, 2010; Zambia

Based on the above assumptions a number of behavioural equations were developed. These included the following:

Sugar Supply equations

1. Sugarcane Area Planted = f (lagged sugar domestic price(+), input price(-), interest rates(-), Privatization dummy(1995), Policy dummy (Legislation on fortification(2000(+)))
2. Sugarcane yield = f (rainfall(-), temperature(+), technology trend(+))
3. Sugarcane production = yield*area planted
4. Sugar production = sugarcane production*extraction percentage
5. Sugar imports = f (sugar domestic use/sugar production(+), sugar domestic price/import parity price(+), policy dummy(Legislation on fortification(2000)(-))

Sugar Demand Equations

The following are the demand side variables for the Zambian sugar model:

6. Sugar per capita consumption= f (Real Domestic Sugar Prices Zambia(-), Real per capita GDP(+), Consumption trend(-))
7. Sugar domestic use = Sugar per capita consumption*population
8. Sugar exports⁴ = sugar production + Imports - consumption+ change in stock

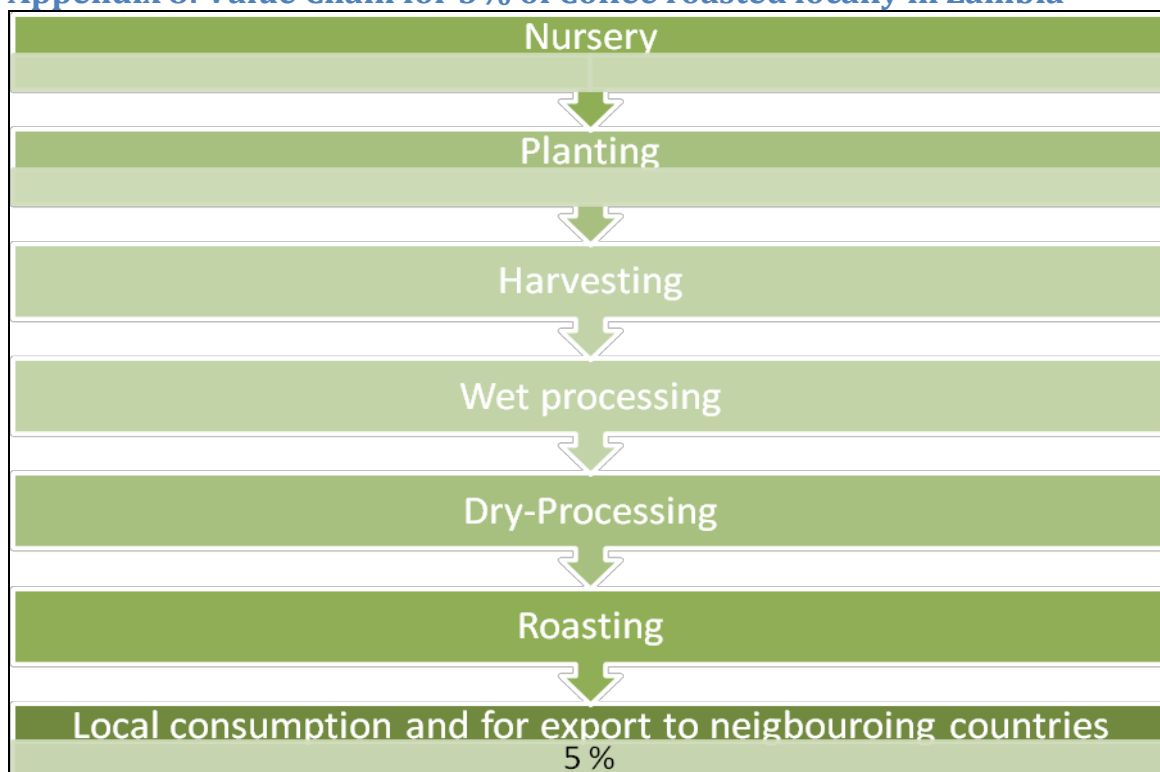
Sugar price equation

9. Sugar real domestic price= f(Real export parity price(+), Domestic use/production(+), policy dummy(liberalization (1993(-)),policy dummy(Legislation on fortification(2000)(+))

Future projections for each of the equations were made from 2012 to 2015 (see Appendix 6).

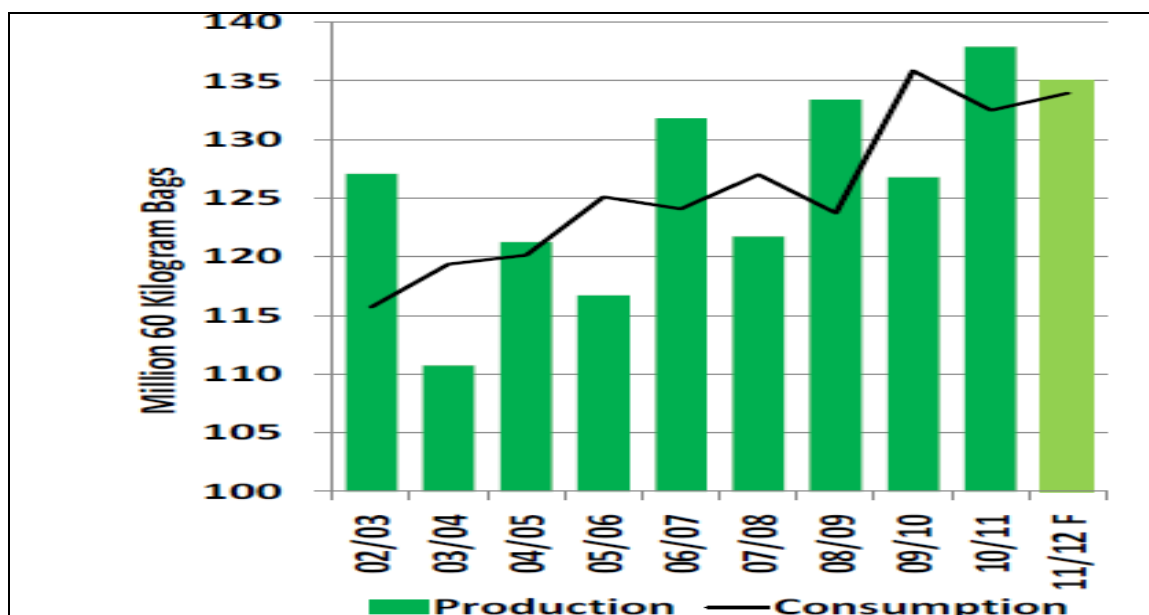
⁴ Exports were not modelled but were used to close the model through the identity as given in (8)

Appendix 8: Value Chain for 5% of Coffee roasted locally in Zambia



Source: Own compilation

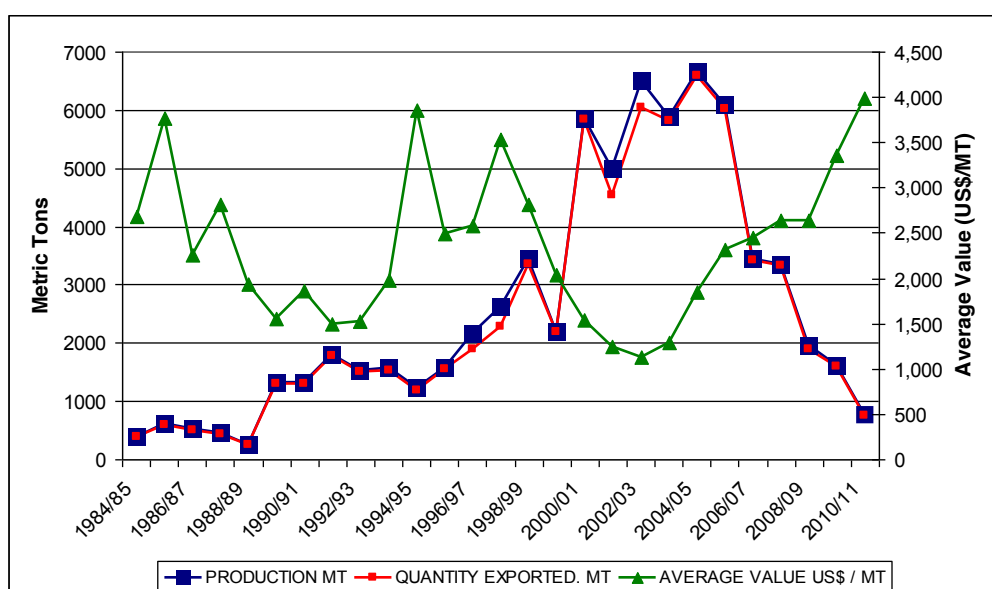
Appendix 9: World Coffee Production and Consumption



Source: USDA (2011)

Appendix 10: Coffee Production and Export revenue in Zambia

Crop Year April/ March	Production Mt	Qty. Exported Mt	Average Value US\$/Mt
1984/85	397.00	377.34	2,678.00
1985/86	618.00	598.26	3,761.04
1986/87	515.33	499.38	2,257.21
1987/88	450.48	432.48	2,813.00
1988/89	260.80	244.68	1,938.93
1989/90	1,313.30	1,293.60	1,550.00
1990/91	1,329.00	1,309.00	1,856.66
1991/92	1,791.56	1,771.56	1,495.47
1992/93	1,530.50	1,513.50	1,526.80
1993/94	1,582.45	1,536.36	1,972.98
1994/95	1,231.74	1,195.86	3,856.28
1995/96	1,580.45	1,543.80	2,485.50
1996/97	2,167.08	1,884.42	2,574.15
1997/98	2,627.82	2,285.06	3,529.15
1998/99	3,450.22	3,358.24	2,810.83
1999/00	2,200.00	2,179.51	2,041.80
2000/01	5,868.16	5,832.16	1,542.19
2001/02	5,000.00	4,531.44	1,250.03
2002/03	6,500.00	6,036.42	1,134.99
2003/04	5,881.00	5,811.42	1,288.60
2004/05	6,654.64	6,584.64	1,846.32
2005/06	6,091.72	6,016.72	2,312.75
2006/07	3,431.84	3,411.84	2,442.89
2007/08	3,344	3,324.00	2,632.13
2008/09	1,950.62	1,900.62	2,635.93



Source: ZCGA (2011) and Taguma (2011)

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