

UNIVERSITY OF THE WITWATERSRAND

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INVESTIGATING TRADE THEORY IN THE CASE OF THE ZAMBIAN SOYA VALUE CHAIN

BY
RUTH MISELO MWANSA

Student Number: 0614586N

SUPERVISOR: LOTTA TAKALA-GREENISH

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I declare this research report is my unaided work. It is submitted in partial fulfilment of the requirements of the degree of Masters in Development Theory and Policy at the University of the Witwatersrand, Johannesburg. It has never been submitted before for any degree or examination in any other University

.....
Ruth Miselo Mwanza
Student Number 0614586N

..... day of 2015

DEDICATION

For my late Mother, Phares Chafungwa Mwansa and Brother, Robinson Chongo Mwansa Jr who are greatly missed.

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ABSTRACT

This research paper analyses the Zambian soya bean value chain and serves to explore and investigate to what extent trade theory can be used to explain this value chain. Soya bean production in Zambia has grown vastly within the last four years, owing to this growth, Zambia has instantly become a net exporter of soya bean cake. Most of the soya bean cake produced is consumed within the country. The animal feed industry utilises a large percentage of the soya cake in order to produce animal feed for the poultry sector predominantly. The growth in the soya industry has created various linkages for example the poultry industry which is a growing industry owing to amongst other factors, the growth in the Zambian middle class. This research aims to explore the constraints, challenges and drivers of this value chain. Trade theory is used in order to explain the value chain and capture the limitations of theory in relation to the Zambian soya bean value chain. The research paper uses both a qualitative and quantitative methodology. Interviews were used to source information and quantitative data was collected from various platforms.

The research found that there are many challenges that the Zambian soya bean value chain faces. Some of the challenges include but not limited to; high production cost, high transportation costs, limited access to markets, limited storage and trade barriers. Trade theory can be used to explain part of the industry growth that is visible within the soya bean value chain in Zambia but trade and Global Value Chain theory are limited in addressing some of the challenges that the value chain experiences.

The study recommends policies that will reduce the cost of production in order to encourage more soya production from not only commercial farmers but small scale farmers as well. The policy recommendations seek to remedy the hurdles that the Zambian soya bean value chain faces in order to reach this end.

The research was carried out using interviews, various players along the chain were interviewed and data was put together in order to ascertain the commonalities and differences between various respondents.

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ACRONYMS

AfDB	Africa Development Bank
AGOA	African Growth Opportunities Act
CAADP	Comprehensive Africa Agriculture Development Program
COMESA	Common Market for Eastern and Southern Africa
CSO	Central Statistics Office
DRC	Democratic Republic of Congo
EBA	Everything but Arms
FISP	Farmers Input Support Programme
FRA	Food Reserve Agency
GCC	Global Commodities Chain
GDP	Gross Domestic Product
GMO	Genetic Modified Organism
GVC	Global Value Chain
HEPS	High Energy Protein Supplement
IAPRI	Indaba Agricultural Policy Research Institute
IRS	Increasing Returns to Scale
NEPAD	New Partnership for Africa's Development
NAP	National Agriculture Policy
OECD	Organisation for Economic Cooperation and Development
PRP	Poverty Reduction Programme
SADC	Southern Africa Development Community
UNDP	United Nations Development Programme
UN	United Nations
ZDA	Zambia Development Agency
ZEMA	Zambia Environmental Management Agency

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CHAPTER 1: INTRODUCTION

1.0 Introduction

Trade is considered as one of the avenues that will bring about economic growth and industrialisation for late industrialising countries. The Southern African Development Community SADC (1992) region encourages trade because it strives to achieve economic growth, development and alleviate poverty. A broad literature on trade suggests that in order to increase growth within a country, there should be more liberalised trade between countries (Krueger, 1998; Winters, McCulloch and McKay, 2002). Related literature explores the various hindrances to trade in general and trade liberalisation specifically that firm's face (Batwell, 2008; Bigsten and Mkenda, 2002). These include hindrances such as barriers to entry, poor infrastructure and high cost of production to name a few. Value chains represent one strand of the literature on the production and trade connections across nations, possibly enabling industrialisation to take place. Value chains have the potential to create large backward and forward linkages that can therefore enhance trade and lead to sustainable development and economic growth. African countries have historically focused on primary commodities for export. It has been argued that the export of primary commodities alone will not bring about industrialisation to the region (Akyüz and Gore, 2001: 266). This is based on the historical and theoretical insights of manufacturing as the driver of growth. Kenny and Williams (2001) indicate that each country should be taken within its own context and this contribute to the critical views on trade and trade liberalisation being sufficient for industrial growth.

With the debates on the role of trade and industrial growth serving as the background, this research focuses on the agricultural sector given that most Sub-Saharan countries still rely primarily on their agricultural industries. This paper looks at an agricultural sector, soya beans in particular, as a means of exploring the scope for industry development using a global value chain framework to explore the nature of the production and trade connections. Regional value chains in their nature encourage regional trade. They enable each country involved in the chain to explore and potentially identify the area in which it has a competitive advantage in line with the Heckscher – Ohlin model. The soya bean value chain in Zambia will be used as a case study because currently soya bean farming has a seemingly wide value chain. This is believed to be in connection with poultry farming within the region and

specifically in Zambia. This research is important because it fits within a growing debate around the role of regional industrialisation (in the form of production, trade and market development) as one of the mechanisms that can assist both national and industrial growth. The research will contribute to questions on whether value chains in agro-processing are an avenue that can help Africa ‘catch-up’ using the resources that are available within the region, in this case SADC

1.1 Research Question

The research question is: *Does trade theory enable/provide a sufficient platform in understanding the Zambian soya value chain?* This research is situated under the wider umbrella of regional industrialisation. It looks at trade theory and its constraints and drivers and uses this theory to analyse value chains focusing specifically on the Zambian soya value chain within the region. Trade is believed to be a means of industrialisation and it is encouraged within the region. However, trade alone cannot bring about industry growth and development, or resolve/overcome select industry challenges. There are also other mechanisms that play a role in industry development, for example industry protection and in this case value chains. There are also some difficulties that may be experienced as a result of trade, more specifically trade liberalisation, such as the elimination of domestic industries because they cannot compete with imports. It is for this reason that this research will map out the Zambian soya value chain in an effort to expand beyond questions of trade. In this instance the Zambian soya production is interesting because it has increased significantly in the last four years which is believed to be due to a number of factors such as a rise in the tastes of the middle class and the encouragement of crop rotation. It will therefore be interesting and important to analyse the constraints and the drivers of the value chain as well as determine to what extent the factors of trade influence this value chain.

1.2 Hypothesis

The hypothesis; is trade a key factor for the development of the soya value chain in Zambia? As corollary or subsidiary questions, it is important to explore the theoretical framework within which industry and policy decisions and outcomes are conducted and presented. It is also important to understand to what extent these frameworks capture the particular patterns and nature of soya bean trade and production. Another subsidiary set of questions explores

the structure of the value chain from production to processing, the challenges and constraints, the main drivers and the key (national) players. The questions that would aid this inquiry are; questions relating to Zambian trade patterns and policy regarding imports and exports, what are the patterns of soya bean production, who are the national players and who owns the Zambian soya value chain?

1.3 Research Aims and Objectives

The objective of the research is in three parts. 1) determine whether industrialisation can be boosted through the development of the Zambian soya value chain, 2) to find out to what extent trade factors contribute to the Zambian soya value chain and 3) map out the Zambian soya value chain and analyse the drivers, constraints and tensions. This also includes investigations to what extent is the theory consistent with the findings as well as draw out the main challenges for production, trade and market development that hinder developing the value chain. The research is aimed at students, researchers and policy developers as it will look at key aspects that can improve trade and industrial policy. By completing this research the researcher hopes to have contributed to understanding the soya bean value chain within Zambia and its impact on industrial growth within the participating countries.

The aim of the research is to understand the Zambian soya bean value chain by looking at the industry tensions, drivers and constraints in relation to trade theory.

1.4 Structure

- | | |
|-----------|--|
| Chapter 1 | Introduction - will indicate the importance of the research and contextualise or situate the topic being interrogated. |
| Chapter 2 | Theoretical Debates and Literature Review - Will look at the theoretical debates and literature surrounding certain aspects of trade, industrialisation and Global Value Chains. |
| Chapter 3 | Research Design – which includes an overview of the method used to collect data and explore the nature and evolution of the Zambian soya bean value chain. |
| Chapter 4 | Case Study – General Background of Zambian Agriculture. |
| Chapter 5 | Background on Zambian Soya Bean Value Chain and Findings - looks at the inputs, location of production, the type of farmers, price and the |

main actors. The tensions relating to the Zambian Soya Bean Value Chain and the research findings are outlined

Chapter 6 The Implications of the Findings of the Soya Bean Value Chain Research in Relation to Trade – analyses the findings in relation to trade

Chapter 7 Conclusion

1.5 Conclusion

This chapter has highlighted the relevance of this research and indicated the aims and objectives of the research. It has assisted in setting the background to the research and provided a roadmap or structure that the paper will follow in order to carry out the exploration of whether trade theory enables/provides a sufficient platform to understanding the Zambian soya value chain.

In order to gain a thorough understanding of the Zambian soya bean value chain, the scope of this research has been narrowed to include only the above. This research will not cover the following topics or discussions on employment impact, Zambian agricultural practices in detail, links and the nature and influence of poultry production within Zambia or the value chain of other soya bean products such as crude oil. This research will not detail the soya bean value chain of Zambia's trading partners or neighbours.

CHAPTER 2: THEORETICAL DEBATES AND LITERATURE REVIEW

2.0 Introduction

This chapter will explore the theoretical debates surrounding global value chains, trade and industrialisation. The chapter aims to highlight the assumptions, strengths and weaknesses of the theory that is going to be used to analyse the Zambian soya bean value chain. This chapter will begin by outlining the principles of global value chain theory. It will then highlight the discourse on industrialisation and finally explain the discussions within trade theory.

2.1 Literature Review on Global Value Chains

Global Value Chains (hereafter GVC) is a framework that focuses on the order of value added from the point of inception of a product to production and end use (Gereffi and Fernandez – Stark, 2011). The origins of GVC rest in the World Systems theory which focused on commodities (hence Global Commodities Chain (GCC)) and the focus has now shifted to the firm (Gibbon, Bair and Ponte, 2009). There are a number of elements that are considered when analysing a value chain, for example; the weight of the value added to a product in a value chain is interrogated, the decision concerning which firms will be outsourced and which firms remain in house is analysed and cross border dynamics are examined (Gereffi, Humphrey and Sturgeon, 2006). Arndt and Kierzkowski (2001) (in Gereffi et al, 2006) indicate that ‘separability of ownership’ is important in cross border production, furthermore Gereffi et al (2006) emphasise an arms – length market relationship for firms producing standard products. In terms of regional integration, global value chains link firms, workers and consumers in an integrated global economy. This linking of firms is carried out through their contribution to the value of the product which is measured using prices (Gereffi and Fernandez – Stark, 2011; Humphrey and Schimtz, 2010). Gereffi (1995) identifies four dimensions of the GVC: 1) an input-output structure, which describes the process of transferring raw materials into the final product; 2) a geographical consideration; 3) a governance structure, which explains how the value chain is controlled and 4) an institutional context in which the industry value chain is embedded.

Gereffi and Fernandez – Stark (2011) make a distinction between buyer-driven (these are the retailers such as Walmart) and producer-driven (they are vertically integrated) chains. GVC’s

can be analysed using three interpretations which indicate how GVC is structured and governed. The first form of governance is Drivers, a value chain can either be producer driven or buyer driven. The second is coordination which indicates the importance of coordinating firms that will be incorporated into the value chain and the third is normalisation which is to rearrange a given practice so that it reflects a particular standard or norm (Gibbon et al, 2009). There has been a concern regarding the process of coordination of the global production process, Gibbon et al (2009; Humphrey and Schmitz, 2010), indicate that often firms did not take into consideration the different work forms and failed to capture the varying work relationships that exist. The structure of the GVC depends on the complexity of the transactions, the ability to codify transactions and the capabilities in the supply – base (Gereffi et al, 2006).

The governance dimension has been characterised with five structures; markets, modular, relational, captive and hierarchy (Gereffi and Fernandez – Stark, 2011).¹ There is also upgrading within the value chain which is a bottom up view and this focuses on regions and countries (Gereffi and Fernandez – Stark, 2011). Upgrading can be classified into four different types; process upgrading - which is converting inputs into outputs, product upgrading - which is associated with a more complex product, functional upgrading - which is acquiring new functions for better outputs and chain or intersectoral upgrading – where firms move into a new but related industry (Gereffi and Fernandez – Stark, 2011; Humphrey and Schmitz, 2010). According to GVC theory, firms upgrade to improve efficiency and cost, for example Zambeef (in Zambia) is present throughout the soya bean value chain and they indicated that they are able to produce soya products at a favourable price. Upgrading can be assessed based on the output produced. The limitations of this, is that GVC operate best under policies that encourage the chain (Gereffi and Fernandez – Stark, 2011: 29-32). The advantages of GVC according to Gereffi and Fernandez – Stark (2011) are; it stimulates innovation, competitiveness and employment. Gibbon et al (2009) indicate that the problem

¹ The marketing governance includes simple transactions where actors do not have to cooperate formally and price is the governance mechanism. Modular governance occurs when more complex transactions are easy to codify and products are made to a customer's specification. Linkages in modular chains are more substantial and information technology and standards for exchanging information are important to this form of governance. Relational governance comprises of complex information that is not easily transferred. In this form of governance there is knowledge sharing between actors and products are differentiated on the basis of quality, geographical origin or other unique traits. In captive governance small firms are linked to their lead firms and conditions that are set by and specific to the lead firm. The fifth governance chain is hierarchy where products are complex and specifications cannot be codified. This chain contains vertically integrated actors (Gereffi and Fernandez-Stark, 2011: 9-10).

that GVC's face in terms of international political economy rests with international institutions which are more concerned with their power dynamics and effectiveness in relation to their regional and national governance. Second is the relationship between global capital, the international institutions and bodies that represent corporations and government.

Milberg (2008) shows in his study the link between globalisation of production and financialisation. He further shows that GVC sustains financialisation (Milberg, 2008), this view is also illustrated in Newman's (2009) analysis of GVC in the coffee industry in Tanzania and Uganda. He indicates further how these markets have become financialised to the detriment of the poorer market actors. Newman also shows how the Tanzanian coffee industry becomes more concentrated the higher up the value chain one goes.

2.2 Literature Review on Industrialisation

There is a vast amount of literature that covers regional industrialisation. Rostow (1956) sees industrialisation as a movement from an agrarian society to an industrialised society which is sustainable after the period he has coined 'take off'. During the period of industrialisation the Swan – Solow (1957) model emphasises technological change as a measure of growth. There are various models used in order to map out the best way countries can achieve industrialisation within their regions. The protection of infant industry is a practice that has been supported by Rostow (1956) and Shafaeddin (1998) and has been part of the growth of the industrialised North. However, some theorists have indicated that it is not infant industry protection that will bring about growth but an open economy with free trade in the region (Krueger, 1998). This Washington Consensus approach has been criticised for treating developing and developed countries the same. Chang (2002) indicates that enforcing standard policies and institutions on developing countries is putting them at a disadvantage because the policies that are imposed on developing countries (such as liberalisation) are not the policies or practices that the developed countries exercised during their industrial growth, for example industry protection and subsidies were practiced by the developed North. Lin (2012) shows that the debate in structural economics is on-going and it is not simply a case of theory versus policy but the characteristics of each country should be taken into consideration and policies formulated in that regard. Studies have shown that most sub Saharan countries performed poorly under this regime, and in fact experienced a de-industrialisation (Callaghy, 2004). However, Jalilian and Weiss (2000) indicate in their study that sub Saharan Africa

experienced the same type of de-industrialisation as other developing economies. Johnston (1961) indicates that industrialisation can be brought about through an increase in demand for consumer goods, consumption linkages and agricultural production. He further stresses that the production of higher value goods can bring about economic growth.

In a quest to industrialise countries aimed to import less and export more, this could also assist their balance of payments. Therefore an import substitution industry (ISI) strategy began to immerge to produce the products that would ordinarily be imported and bring about industrialisation (Krueger, 1998). A connecting theory to ISI is the Prebisch – Singer theory that indicates that primary commodities have a low income elasticity and therefore countries that are dependent on primary commodities will struggle to grow (Dowrick and Golley, 2004: 53). There is also the belief that industrialisation will allow for greater productivity, and a diversification of products and skills (Frankel and Romer, 1999). Leamar, (1995: Krugman, 1994) indicated that the Heckscher – Ohlin – Samuelson model is comprised of 2 countries, 2 commodities and 2 factors (land and labour) and provides the foundation for the way in which trade is considered to influence industry development. This model suggests that a country will trade the products that are most cost effective therefore creating a comparative advantage and increasing returns to scale. Other models such as the Harrod - Domar model form part of old economics and industrialisation theory. The Harrod – Domar model has two parts; the programming mode and the positive (policy) mode (Nowak, 2013).²

In contrast to the trade-driven model where all sectors/industries are given equal weighting, a different view of what drives industrialisation draws on the structuralist approach. According to Kaldor (1968), GDP growth is better connected to manufacturing or industry than the agricultural sector. Kaldor has three renowned growth laws: 1) GDP growth is positively related to the growth of manufacturing output; 2) growth of labour productivity in manufacturing positively relates to manufacturing output growth because of increasing returns to scale (Verdoorn's Law) and 3) there is a negative relationship between labour productivity growth and the rate of growth of employment in the non-manufacturing sector

² Subasat (2003: 4) indicates that the Heckscher-Ohlin model carries a number of unrealistic assumptions such as '(1) commodities are freely mobile internationally, (2) all countries use the same technology in production, (3) factors of production are mobile domestically but immobile internationally, (4) tastes are the same in all countries, (5) there are no economies of scale, (6) there is perfect competition in all markets, (7) there are no transportation costs, (8) all resources are fully employed, and (9) countries have different factor endowments and thus factor prices'.

because of the diminishing returns outside the manufacturing sector (e.g., agriculture) (Thirlwall, 2000).

2.3 Literature Review on Trade

There is numerous literature regarding the benefits of trade (Ancharaz, 2003; Winters, 2004; Frankel and Romer, 1999; NG and Yeats, 1997). When referring to trade in the context of regional integration, free trade is the concept that is widely discussed. Trade affects the import and export of goods across countries. Some have defined it as import liberalisation (Ancharaz, 2003). Krueger (1998), indicates that liberalisation is making a trade regime less restrictive, it is also an indicator or instrument of openness (Winters et al, 2002: 9).

Most of the literature pertaining to trade liberalisation (such as NG and Yeats (1997:899)) assumes that liberalisation will increase the general welfare of countries involved by improving the price of goods through elements such as competition. Within the soya bean industry the price component is very important as the soya bean industry is price sensitive. This will be discussed further in chapter 4 and 5. In terms of constraints to trade, Ancharaz (2003) identifies geography and lack of adequate institutions as two key problems. These constraints are also evident within the Zambian soya bean value chain as transport costs are high, therefore trade over long distances is restricted. Trade liberalisation has been associated with a decrease in government corruption and inflation, and an increase in education and an allowance for educational technologies (Winters, 2004; Krueger, 1998). However, Winters (2004) further indicates that the evidence discovered on the correlation between economic growth and trade is weak but he still leans towards his conclusion. Furthermore, studies have found that liberalisation increases income per capita, through the accumulation of human capital and increase in production (Frankel and Romer, 1999). Ocampo and Taylor (1998) in their analysis found that middle income, upper income and African countries that had a comparative advantage had a worse income distribution rate upon liberalising. Frankel and Romer (1999) also indicated that the study did not provide decisive evidence for their findings.

The most widely held assumption and comprehensively done study is one that indicates that liberalisation brings about direct and substantive economic growth (Dowrick and Golley, 2004; Krueger, 1999; Chang, Kaltani and Loayza, 2009). NG and Yeats (1997: 899) confirm

this by indicating that trade liberalisation improves the standard of living, as nationals are able to purchase cheaper goods, furthermore this will cause producers to compete in foreign markets. Further evidence to substantiate this was given by Akyüz and Gore (2001), who state in their analysis that there were greater benefits for developing countries to converge through openness during the periods between the 1960's and 1970's however, between 1980's and 1990's, developing countries that specialised in primary commodities underwent a decline in economic growth. Other writers such as Fine and Deraniyagala (2001; Rodrik and Rodriguez, 1999) have stated that there is no direct causal link between trade liberalisation and economic growth. Chang et al (2009) qualified in their paper that the effects of openness varies depending on the conditions within countries. A negative correlation was found between trade liberalisation and growth when Greenaway, Morgan and Wright (1997) from a sample set of 32 developing countries found that liberalisation has a negative effect on GDP growth per capita. The debate concerning liberalisation spans further than determining if countries should liberalise or not. It is important to analyse how a country liberalises by studying the nature of the economy and the production or sector in question. It is therefore necessary to explore in this case the details of the Zambian soya bean value chain in order to explain the challenges and drivers of the chain some of which are specific to the soya bean sector and some specific to the Zambian agriculture industry and some are generic and can be compared/seen in other industries as well.

Despite there being a contested causal link between trade liberalisation and growth, there is also limited evidence to suggest that trade liberalisation as an instrument of openness is bad for growth (Rodrik and Rodriguez, 1999). Winters et al (2002) found that on average growth through trade liberalisation brings about change for the poor and alleviates poverty; they also noted that it can worsen poverty. It is believed that trade liberalisation will increase a countries comparative advantage and allow for an increase in terms of scale economics (IRS) and the Heckscher – Ohlin – Samuelson model (Krugman, 1992; Chang et al, 2009). An assumption that follows liberalisation is that it will bring about knowledge transfers in terms of technological spill overs (Krugman, 1992). Scholars such as Rostow (1956) and Shafaeddin (1998) have indicated that before a country undergoes liberalisation, there should be a protection of the countries infant industries until those industries mature. However, this leaves a number of unanswered questions. This provides the space/backdrop for the research on soya production/processing. For example:

- 1) Should the soya bean industry be protected

- 2) For how long should the industry be protected
- 3) How should the industry be protected
- 4) How will successful protection of the industry be assessed
- 5) How can comparative advantage within this industry be fostered

2.4 Conclusion

In conclusion, this chapter aimed to highlight various underpinnings of GVC, trade and industrialisation theory. The chapter illustrated the assumptions, strengths and weaknesses of the three theories in order to set the scene for exploration regarding the extent to which theory can explain the Zambian soya bean value chain.

CHAPTER 3: RESEARCH DESIGN

3.0 Introduction

The methodology of collecting findings is an important aspect of research because it acts as a guide showing how one will go about conducting the research. Literature indicates the different types of research that is available and the various methods that can be used (Creswell, 2014; Hussein, 2009; Yin, 2009). This chapter indicates the manner in which research was constructed, findings gathered and analysed in order to better understand the Zambian soya bean value chain. This chapter will illustrate why the research approach chosen is considered appropriate for this topic. The chapter will also highlight the limitations of the methods employed for the research and show the relevance of open ended questionnaires

3.1.1. Research Methodology and Design

The research will draw from the GVC approach but it will not carry out an elaborate analysis.³ There are various methodologies that one may choose to follow depending on the nature of the research and the outcomes desired. This research calls for a mixed methods analysis. A mixed method incorporates both qualitative and quantitative data capturing. Creswell (2014) indicates that this method is used in order to gain a more complete view rather than looking at data from one spectrum. A mixed method research is used in order to gain a variety of information and to highlight a particular issue from different angles as well as look at the different spheres of a phenomenon (Holloway and Wheeler, 2002: 18). There are different forms of mixed approaches, this research will take the parallel approach which uses a qualitative and a quantitative analysis equally therefore allowing the topic to be analysed from both angles (Holloway and Wheeler, 2002: 18). Although the mixed method is fairly new compared to a quantitative or qualitative inquiry, it is being used more frequently in the world of research. Other researchers, such as Hussein refer to this type of mixed research as triangulation.

This research will use data triangulation or source triangulation which 'depicts the use of multiple data sources in the same study for validation purposes' (Hussein, 2009: 3; Brewer

³ Which would include mapping of all the firms involved, their connections and their value addition at each stage to name a few.

and Hunter, 1989). There are two types of methodology triangulation. This research leans towards a 'Between Method' rather than a 'Within Method'. The difference between the 'Between Method' and the 'Within Method' is that the former uses both quantitative and the qualitative methods in order to analyse a phenomenon, whereas the 'Within Method' looks at multiple complementary methods within a single paradigm i.e. multiple qualitative methods in order to check internal consistencies (Hussein, 2009).

A qualitative approach is used in order to understand the meaning that groups and or individuals place on social and human problems (Creswell, 2014). Case study research (which will be discussed further at a later stage) and interviews are characteristics of this approach and the researcher has used both forms in this research. The researcher used an open ended questionnaire and interviewed individuals that form part of the Zambian soya bean value chain. Bryman (1992; Creswell, 2014) indicates that qualitative inquiries are conducted by unstructured interviewing and follow an inductive style of research. Disadvantages of qualitative inquiry include difficulty in making systematic comparisons because answers may vary widely and results cannot be generalised or quantified broadly.

Bryman (1992: 12) indicates that quantitative research can be conducted in a number of ways; using surveys and experiments, analysis of previously collected data, closed or structured observations and content analysis. Some of the limitations of quantitative research include; the unnatural, artificial controlled environment could influence results as it is not a real world analysis and results are limited as they provide numerical results rather than detailed description and human perception. Creswell (2014) states that quantitative research focuses on testing objective theories by evaluating the relationship between variables. He indicates further that traditionally, quantitative research is characterised by using numbers and closed ended questions and the assumption is that theories are tested deductively and findings can be generalised and replicated. This research aims to explore trade theory using insights from the global value chain theory to map out the different components, tensions and drivers within the Zambian soya value chain.

Researchers such as Creswell (2014) have taken a more in-depth view regarding research methodologies and he therefore has associated each research methodology with a particular

world-view. He links post-positivists, which is a scientific method of inquiry, which includes testing or verifying theories or explanations, with quantitative research (Bryman, 1992). He associates constructivists and transformative world-views to qualitative research. Constructivists posit that individuals want to find meaning in the world in which they live and develop subjective meaning, whereas transformative world-view incorporates politics, political change and social oppression. This research carries quantitative and qualitative world-view aspects as it aims to explore aspects of trade theory using the Zambian soya bean value chain as a case study. The research includes political or government considerations that affect the soya bean value chain. Furthermore the research serves to explore and understand the constraints and drivers of the Zambian soya bean value chain which allows individuals that are part of the chain to formulate subjective meaning in relation to the value chain.

There are varying types of mixed methods that can be used such as; convergent parallel mixed method, explanatory sequential mixed method, exploratory sequential mixed method and transformative mixed method (Creswell, 2014).⁴ This research will adopt a convergent parallel mixed method, where both qualitative and quantitative data is collected together and integrated to produce an overall result. The mixed (triangulated) method was chosen to allow the researcher to have a more holistic view in understanding the soya bean value chain and to draw from the strengths of both the qualitative and quantitative methods and minimise the limitations of both approaches. The researcher chose a mixed approach in order to identify the consistencies or inconsistencies between theory and practice.

3.1.2. Data Collection

There are various ways in which one can collect data in a qualitative and quantitative manner as has been discussed above. This research used qualitative primary and secondary data as well as quantitative data.

⁴ In a convergent parallel mixed methods approach the researcher collects both quantitative and qualitative data at the same time and then collates it. In an explanatory sequential mixed methods approach the researcher conducts and analyses quantitative research first and then uses qualitative research to further explain an inquiry. In an exploratory sequential mixed method approach the researcher begins with the qualitative research first then a quantitative method follows to build an instrument that suits the study. The transformative mixed methods design can be either embedded or multiphase. An embedded mixed approach indicates that either quantitative or qualitative data is embedded in a larger overall design, whereas a multiphase mixed method 'concurrent or sequential strategies are used in tandem over time..' (Creswell, 2014:15-16).

3.1.3. Primary Data

Primary sources included interviews with key personnel from the Common Market for Eastern and Southern Africa (COMESA), Farmers Union members, Zambia Development Agency (ZDA) representatives and some processing companies. Neuman (2011) indicates that interviews assist in gaining rapport and trust with the respondent whilst at the same time extracting knowledge. He emphasises further that the interviewer should remain impartial. The interviews were conducted in a semi – structured manner and the questionnaire used served as a guide to exploring the Zambian soya bean value chain (Lofland and Lofland, 1984). Interviews were relevant for this research so as to gain knowledge pertaining to the soya bean value chain from individuals that are a part of the chain, as Merriam (1998: 23) points out ‘the purpose of an interview is to find out what is in someone else’s mind’.

In terms of ethical considerations, respondents who did not want their names mentioned in the research are represented with a letter of the alphabet and the function of their organisation. The hypothesis was tested using primary data – open ended interviews in Lusaka, Chisamba, Mkushi, Mpongwe and Ndola - in order to extract information regarding the soya bean value chain. These findings were used along with qualitative data (mixed method) to analyse the extent to which trade has played a part in the growth of the soya bean industry.

3.1.4. Secondary Data

Various documents were used to ‘broaden the researcher’s horizons and so enable the researcher to comprehend the subject under investigation and better understand how other people experience the world and compose their thinking of the world’ (Ritchie and Lewis, 2003. 35). The researcher used desktop research such as government and organisation websites, books, journals and newspaper articles.

3.1.5. Quantitative Data

In this research the quantitative analysis will include trade data figures for Zambian soya bean seed or processed soya to countries within the region. Data is sourced from COMESA and the Zambian Central Statistics Office. The data gained in relation to the soya bean value

chain will then be analysed against trade theory in order to evaluate the basis for industry growth in Zambia.

3.2.1. Case Study Research

A case study method is used to contribute to our knowledge of a phenomenon (Yin, 2009). This research uses the Zambian soya bean value chain as a case study because of its dramatic increase in soya production over the last four years, subsequently Zambia has become a net exporter of soya cake. The case study will allow for a detailed focus on the value chain of soya bean within the SADC region. Case study methodology is conducted when a holistic, in depth investigation is being carried out. Case studies bring about multiple view points of the participants and generally use multiple sources of data (Tellis, 1997).

3.2.2. Types of Case Studies

According to Yin (1994; Yin, 2009) there are various types of case studies namely; *Exploratory* (a prelude to social research), *Explanatory* (may be used for conducting a casual analysis) and *Descriptive* (requires that descriptive theory be established) , Stake (1995) added three more varieties of case studies; *Intrinsic* (this is when the researcher has an interest in the case), *Instrumental* (when the case is used to discover more than what is obvious to the observer) and *Collective* (when a group of cases are analysed). Odell (2001) indicates a few more the *Preliminary Illustration* of a theory which adds flesh to the skeleton of an abstract idea for clarity purposes. This case study does not examine alternative interpretations nor does it judge which cases are more valuable or appropriate. The *Disciplined Interpretive Case Study* which interprets an event by applying known theory to the new event. It is usually used for explaining new phenomena such as wars. The *Least Likely (Theory - Confirming)* case study, uses an extreme case that is likely to disprove a theory to provide a strong support for the theory should it be proved. *Most likely* case study is the opposite of the least likely case study. If a theory is invalid, the case used to confirm its invalidity is a case that has the sufficient conditions required for the theory to be valid yet makes the case invalid. And the *Deviant* case study highlights new findings if there is substantial detail on a theory.

This research used a single case study for a multi-perspective analysis as the researcher interviewed players within the soya bean value chain; input company representatives, small and commercial farmers, animal feed companies, government bodies and processors. Case studies tend to use triangulated research as multiple sources of data are used in order to validate research findings (Yin, 1984). The research will take a descriptive inquiry as it aims to illustrate facts for the benefit of further research or for policy makers and or scholars and other citizens. The findings of descriptive case studies may be used as evidence in evaluating theory according to Odell (2001).

3.3. Limitations

Some of the limitations the researcher faced includes the inconsistency of data collection. To remedy this, the researcher also used the World Bank data base. Another limitation is that interview candidates were not available. In that case the researcher interviewed a secondary candidate who had the information required or conduct interviews via telephone or e-mail. One of the aims of this research is to develop a picture of the different views, rather than to create a statistically significant database of responses. This will result in a certain amount of biasness regarding the individuals or organisations that will be interviewed.

3.4. Conclusion

This chapter has looked at various literature surrounding research methodology. It has looked at the three different types of methodology that a research can follow and it has identified the structure that this research has taken. It has highlighted the use of two types of qualitative research; interviews and case study research. It has shown how that data was collected, gathered and interpreted. This research is exploratory and seeks to investigate whether a case-based understanding of the nature of the soya bean value chain challenges or reinforces the notion and centrality of trade to industry development. The findings are tentative and raise further questions for research which will be detailed in chapter six.

CHAPTER 4 GENERAL BACKGROUND OF ZAMBIAN AGRICULTURE

4.0 Introduction

This chapter serves to contextualise the Zambian soya bean value chain by giving a background of the agricultural sector in Zambia. The chapter will cover various agricultural aspects including trade patterns within the agriculture sector in general, the policy environment and the general constraints and developments within the agricultural industry. This will allow the reader to be able to better place the soya bean crop within the Zambian agricultural sector and better understand the context of some of the challenges within the Zambian soya bean value chain.

4.1 Overview

Zambia is located in the southern central part of Africa. It is a landlocked country and it is surrounded by eight neighbouring countries (Angola, Botswana, the Democratic Republic of Congo (DRC), Malawi, Mozambique, Namibia, Tanzania and Zimbabwe). The country has 10 provinces (Central, Copperbelt province, Eastern province, Luapula province, Lusaka province, Muchinga province, Northern Province, North-West province, Southern province and Western province). Zambia has a population of about 14.6 million people and there are over 30 spoken languages within the country, of which English is the only official language. It is a net exporter of copper and the countries stable food is maize (The World Bank Fact Book, 2014). There are a number of other crops that are becoming attractive to investors, amongst these are; groundnuts, cassava, wheat and soya beans (ZDA, 2011).

In terms of land, Zambia has state owned land and customary land. The procedure to acquire state owned land is fairly straight forward as the Zambia Development Agency (ZDA) is able to identify land that is ready for agricultural activity. Customary land is acquired through the village chief or headman, the land has to be converted to state land which has been reported to be a tedious process (ZDA, 2011; Oxfam, 2013). One of the disadvantages of agriculture in Zambia for the small scale farmers is that there is a heavy reliance on rainfall. The outbreak of various crop-threatening diseases greatly affects agriculture, for example in 2013, the country experienced irregular rainfall and an outbreak of army worms which affected the output of maize and cotton for that year (Rasmussen, Munkoni and Lwanda, 2014). Owing to

the fact that there has been consistent growth in the agricultural industry over the past few years, soya beans has been identified as the leading sector for economic transformation. The agriculture sector has had a direct positive impact on livestock production and has created linkages to dairy, beef and leather industries (Rasmussen et al, 2014).

Zambia GDP Sector Contribution (2013)⁵

Table 2. GDP by sector (percentage)

	2008	2013
Agriculture, hunting, forestry, fishing	21.2	17.7
of which fishing	1.0	0.5
Mining	3.9	2.2
of which oil		
Manufacturing	10.1	8.2
Electricity, gas and water	3.0	3.0
Construction	17.2	29.1
Wholesale and retail trade, hotels and restaurants	19.8	15.1
of which hotels and restaurants	3.1	1.9
Transport, storage and communication	4.4	3.9
Finance, real estate and business services	9.8	9.2
Public administration, education, health and social work, community, social and personal services	2.8	2.9
Other services	7.9	8.8
Gross domestic product at basic prices / factor cost	100.0	100.0

Source: Data from domestic authorities.

Figure 1.

As indicated in the above table, the agriculture, hunting, fishing and manufacturing sectors contributed 25.9% to the Zambia's GDP in 2013, whereas in 2014 the agro-processing and manufacturing industry contributed about 11% to the Zambian GDP (ZDA, 2014). There is potential for agro-processing to grow in various industries including, but not limited to; peanut butter, cotton spinning and textiles, animal or stock feed and edible oil production. There are a number of constraints that the agro-processing industry faces namely; limited supply of raw materials, limited technology and failure of locally produced products to compete against imports (ZDA, 2014). Other constraints include high transportation costs, access to market and financing to name a few (Engineering and Consulting Firms Association, Japan, no date; National Agriculture Policy, 2004-2015; Lubungu, Burke and Sitko, 2013).

⁵ Sourced from Rasmussen et al (2014: 5).

4.2 Agriculture in Zambia

Zambia's agriculture sector is endowed with land and water resources which serves to the countries advantage. Zambia has about 42 million hectares of arable land of which only 1.5 million hectares is cultivated yearly, it also possesses 40% of the water in southern central Africa.⁶ The Agriculture sector does not only contribute to the growth of the economy but primary agriculture contributes about 35% to Zambia's total non-traditional exports (this includes all exports other than copper and cobalt) (ZDA, 2011). The agricultural sector plays a major role within the economy because it is a major employer, employing about 60% of the country's informally employed population (Rasmussen et al, 2014). The agricultural crops in Zambia that are prioritised are wheat, sugar, cotton, tobacco, coffee and tea because these crops have the most investment and are exported. Maize is a priority crop because it is consumed nationally and addresses Zambia's poverty reduction strategies. However, there are crops such as soya beans, groundnuts, cow peas and sunflower that are fast becoming the choice for investment. (ZDA, 2011; UNDP, CAADP, NEPAD, 2013).

In 2012, Zambia had one of the highest gross domestic product (GDP) increases (of 7%) in Southern Africa. The Zambian agricultural sector is believed to be one of the main sectors that contributed to this increase (Mutumweno, 2013). According to a report conducted by the Indaba Agricultural Policy Research Institute (IAPRI) in 2012, Zambian agriculture contributed 13.3% to the Zambian GDP and the growth rate of agriculture was projected at 7.7% annually.

Maize is Zambia's staple crop, it is grown mostly by small scale farmers in all the Zambian provinces however, the province that grows the most maize is the Eastern province. Maize is generally a more attractive crop because it can be consumed by farmers and it has the support of the government (ZDA, 2011). The government has an initiative called the Farmers Input Support Programme (FISP) which was initiated in 2009/2010 as a way to increase maize production and bring about food security. This programme provides maize seeds and fertilizer to farmers as part of a government initiative called Poverty Reduction Programmes (PRP). The government also provides a market for maize farmers by purchasing the crop through the Food Reserve Agency (FRA). Kuteya (2013) indicated that about 80% of the

⁶ Recently there have been claims that the notion that Zambia possess 40% of the water in Southern Africa is false (Demian, 2015). However, trusted authorities remain silent on the matter.

agricultural budget goes to FISP and FRA. He indicated further that by the government prioritising FISP and FRA there are less resources for Research and Development, Infrastructure and livestock development within the agricultural space. Crops such as soya bean on the other hand do not have this kind of attention from government. The soya bean industry operates under the general agricultural policies such as GMO ban.

Zambian agriculture is comprised mainly of small scale farmers in rural areas that account for about 70% of the total number of farmers and the remaining 30% of farmers are commercial farmers (Oxfam, 2013). Maize farming is dominated by small scale farmers who grow 95% of the maize produced in Zambia (Oxfam, 2013). According to the Crop Forecast Survey (2012), most small scale farmers in Zambia produce maize, groundnuts, rice, cotton and sunflower whereas crops such as tobacco, wheat and soya beans are grown largely by commercial farmers (Oxfam, 2013)

In order to expand the agricultural sector the government has identified various farming areas referred to as farming blocks for commercial development (ZDA, 2011). The Zambian small scale farmers produce 99.4% of the cotton in the country, 98.5% of the sunflower and 99.5% and 100% of the groundnuts and rice respectively. Large scale farmers or commercial farmers on the other hand grow 74% of the tobacco in the country and 100% and 93% of the total wheat and soya beans produced respectively (Oxfam, 2013). The crops that are most attractive to commercial farmers are; tobacco, wheat and cotton, these crops account for a large percentage of the country's exports to SADC and COMESA countries (ZDA, 2011). In relation to soya beans, the poultry sector is one of the fastest growing sectors in Zambia. This therefore has a direct effect on the soya beans industry. The poultry sector was negatively affected by the low yield in soya beans in 2009 (ZDA, 2011). The poultry industry continues to grow because poultry products are the most affordable and sustainable form of animal protein and therefore have a continued demand (ZDA, 2011).

4.3 Food Security

Owing to the fact that most of the small scale Zambian farmers are located in the rural areas, an improvement in production amongst the small scale farmers will have a direct effect on the levels of poverty (Oxfam, 2013). Poverty in Zambia is an issue that the government sets out to tackle. Poverty reduction strategies are implemented in the agriculture sector through

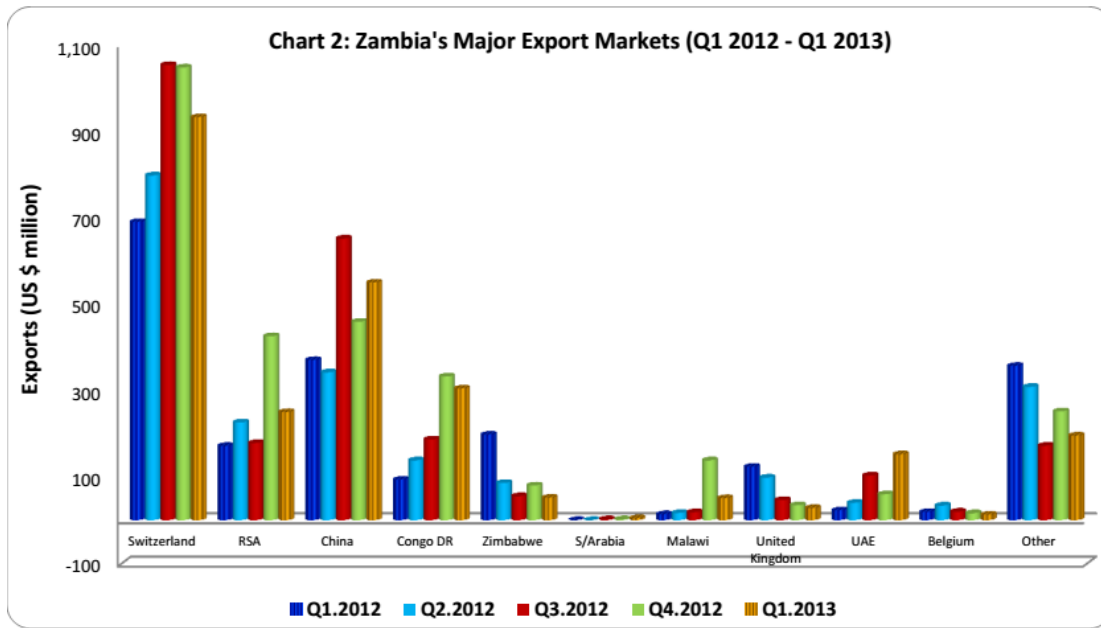
FISP and the FRA, these initiative aim to provide food security to the Zambian population. The government invests in agriculture though infrastructure such as roads that connect the rural producers to urban markets. The countries national agricultural plan includes; attaining food security for the majority of Zambians through increased yields, developing commercial agriculture that encourages domestic and export production and diversify agriculture and encouraging competitiveness (NAP, 2004)

4.4 Trade

Zambia is a member of various trading blocs such as COMESA, SADC, the Everything but Arms (EBA) initiative, which allows the country access to the European Union, and the African Growth Opportunities Act (AGOA), which permits access to the US market. Zambia also has agreements with countries such as Japan and China (ZDA, 2014). Zambia takes advantage of the trading blocks that it is a part of; the country exports agricultural products to COMESA countries between the value of US\$125 million and US\$140 million per annum. The value of agricultural exports to the SADC region ranges from US\$140 million to US\$170 million per annum (ZDA, 2014).

Below are illustrations that show Zambia's major trading partners in terms of general exports and imports.

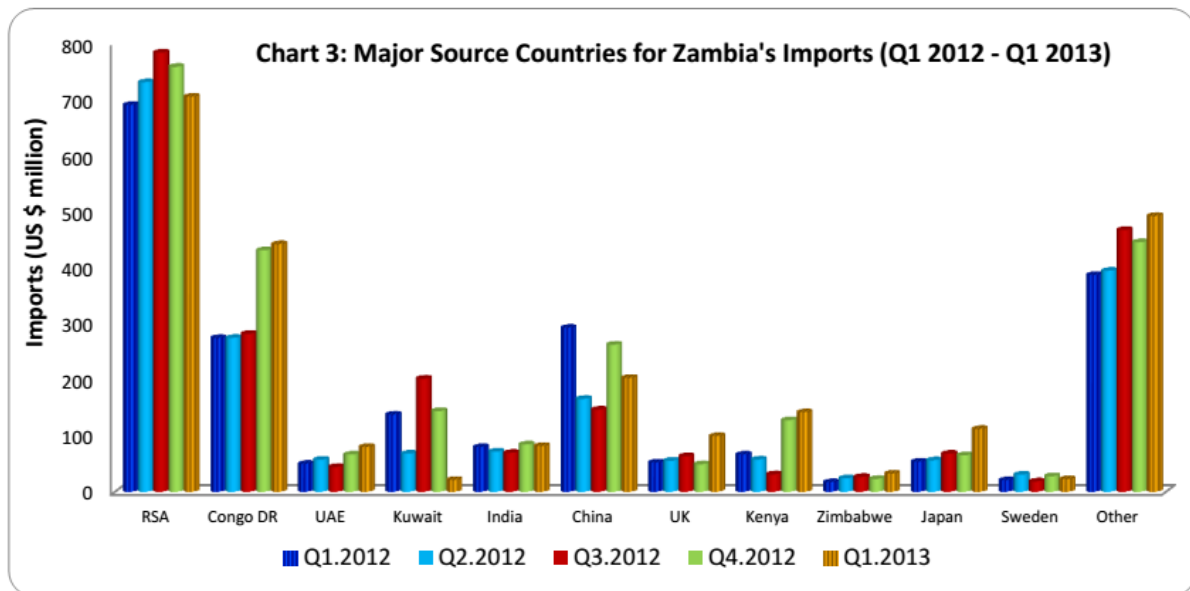
Zambia's Major Export Countries (2013)⁷



Source: Central Statistical Office

Figure 2.

Zambia's Major Country Source of Imports (2013)⁸



Source: Central Statistical Office

Figure 3.

⁷ Sourced from Bank of Zambia Trade Report (2014: 5)

⁸ Sourced from Bank of Zambia Trade Report (2014: 6)

4.5 Policies

There are a number of policy objectives that the Zambian government aims to achieve within the agricultural industry, among these are; national and household food security and sustainable industrial development by ensuring that agro-based raw materials are produced (NAP, 2004). In order to improve agriculture in Zambia, the Zambian government promotes and encourages farming communities to carry out good agronomical practices such as crop rotation, erosion control, the use of livestock manure and the improvement in farming information dissemination such as farmer field schools in rural areas (UN, unknown).

The FRA is a statutory institution whose mandate is to purchase maize from farmers at market price. One of the aims of the FRA is to ensure that even the small scale maize producers that are situated in the rural areas have a market to sell their crop. With regards to policy, there is government regulation on imported and exported maize. In general there is a maize export ban (Oxfam, 2013). The national requirements have to be fulfilled first before maize can be exported out of Zambia. The projected annual requirement for maize is estimated at 1 600 000 tonnes. The exporting of maize is a regulated process and only licensed companies are permitted to export the crop (ZDA, 2011).

The biggest market for maize is the government through the FRA. The Zambian government determines the price of maize and purchases maize from farmers at their set price. The FRA has been criticised for payment delays as this negatively affects farmers. On various occasions the government has been known to set prices high and as a result traders are unable to compete (Oxfam, 2013). Other crops such as soya beans are governed by the general agriculture policies and do not have policies that are specifically for the crop.

With the aim to diversify and decrease poverty, the government is encouraging small scale farmers to expand into higher value crops such as tobacco, coffee, herbs and spices, floriculture and horticulture (UN, unknown). The government has also embarked on an initiative to improve road infrastructure called 'Link Zambia 8000', which is a mandate by the government to build 8000 roads that provide access to markets for actors in the agriculture space as well as other industries.

4.6 Conclusion

This chapter has given an overview of the Zambian agriculture industry. It has highlighted some of the challenges that the agricultural industry faces which are also true for the soya bean industry, for example access to markets, high production costs and transportation costs to name a few. This chapter has shown the relevance of this research by indicating that the soya bean industry is expanding because of national demand regarding the poultry industry as well as international investment in terms of NEPAD and UNDP.

CHAPTER 5: BACKGROUND ON ZAMBIAN SOYA BEAN VALUE CHAIN AND FINDINGS

5.0. Introduction

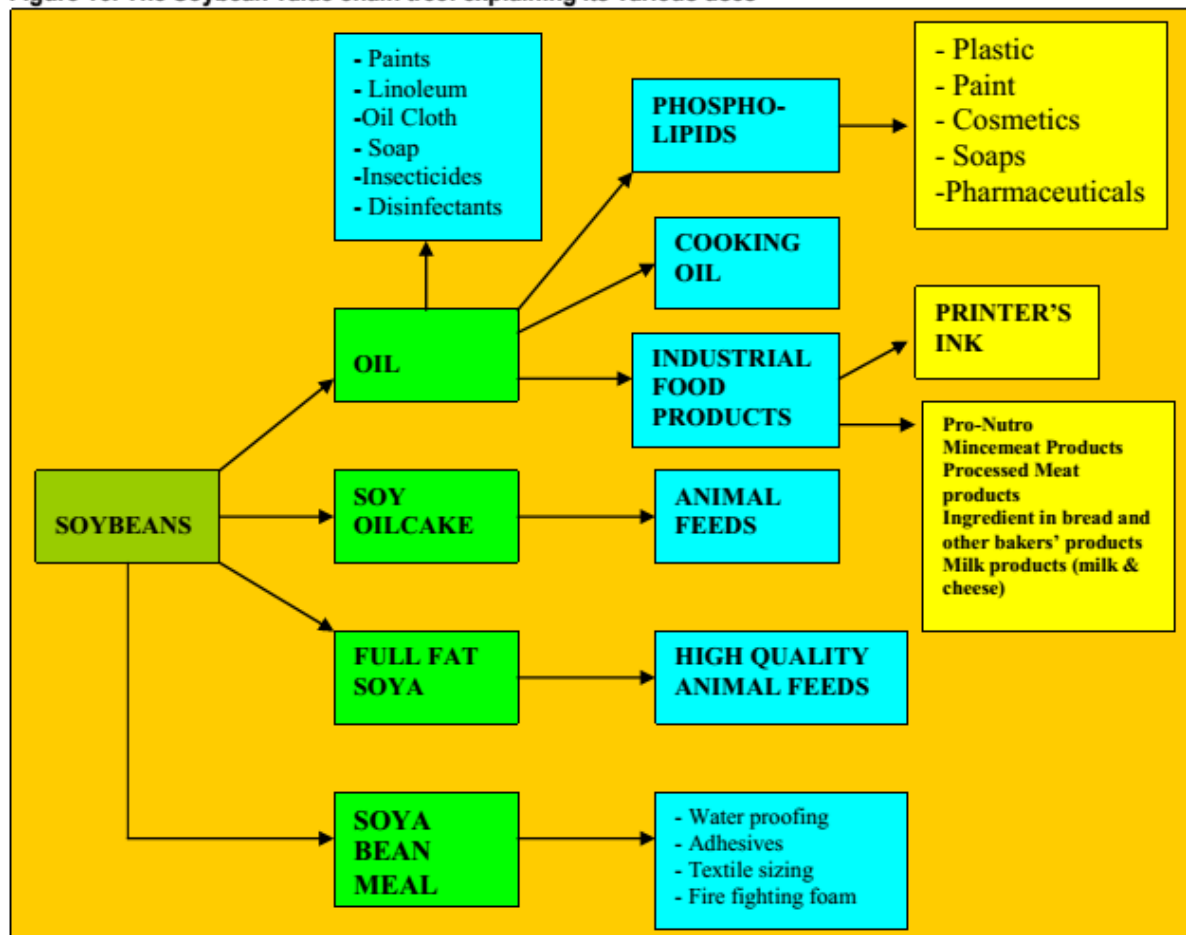
The Zambian soya production has increased dramatically in the last four years. The market for soya products in Zambia is self-sufficient and allows for exports. Most of the farmers that are involved in soya production are commercial farmers, owing to the high cost implication that comes with the crop such as transportation costs and high input costs. For this reason, soya production is less attractive to smallholder farmers. Soya beans are well known for their health benefits in terms of the protein content, as well as their ability to support nitrogen content in soils depleted by monocropping of maize and other crops. The soya value chain shows potential to grow into the region and therefore it is important to look at the various players within the value chain. This chapter aims to investigate the evolution and nature of soya beans in order to understand how industry development takes place. The chapter will look at the actors in varying sections of the value chain, it will then look at the documented drivers and constraints of the value chain in order to understand the evolution and nature of the soya industry.

5.1.1. Background on Zambian Soya Bean Value Chain

Below is a diagram that shows the soya bean value chain from production to processing. This chapter and research paper in general follows the value chain to the third column.

The Soya Bean Value Chain⁹

Figure 16: The Soybean value chain tree: explaining its various uses



Source: Adapted from Grain SA

Figure 4

Zambia is generally crushing less soya beans than the installed milling capacity and the actual milling capacity available. Soya production has increased from about 60 – 70,000mt in 2010 to over 200,000mt in 2013. In 2011, the Agricultural Conservative Forum Secretariat reported that Zambia is not reaching its full crushing capacity of 300,000mt. Research findings showed that Zambia is still not reaching its crushing capacity as Trader Company X indicated that in 2014 Zambia crushed about 400,000 tons while it has a crushing capacity of 600,000 tons.

⁹ Sourced from Department of Agriculture Forestry and Fisheries (2012:17).

Desktop research showed that the main driver of the Zambian soya bean value chain was the stock feed industry and in particular the poultry industry. Research by Technoserve (2011) indicated that 81% of soya cake goes to the Zambian poultry industry, which still is the case today according to Mr Roodt from Novatek¹⁰ who indicated that about 80% of the soya cake is utilised by the poultry industry. He indicated further that the pig industry is growing. This was confirmed by the research conducted and it was discovered that another driver of the industry is the Zimbabwean market as Zambia exports soya cake and stock feed to Zimbabwe according to Novatek; one of the major players in the stock feed industry and a sister company to Zambeef (Zamanita).¹¹ Therefore the main challenges of the Zambian soya bean value industry are; high cost of production; high transportation cost; lack of adequate infrastructure for example storage facilities; crushing beans below the country's crushing capacity and poor agronomical practices specifically for small scale farmers.

5.1.2. Farming

Six farmers were interviewed in total. Most of the soya bean farming is carried out by commercial farmers even though small scale farmers dominate the farming sector. Small scale farmers face a number of challenges when growing soya beans, one of the challenges is access to markets. A small to medium scale farmers in Kabwe who was interviewed indicate that accessing markets depends on the size, preference and location of the farmer. He said that Kabwe is a farming town therefore it is not difficult to find buyers. He also stated that small and emerging farmers put their crops together and sell it in bulk to traders or millers. However, there are small scale farmers in rural areas that find it difficult to get their crop to market and have to sell their crop to traders at a lower price (Lubungu et al, 2013). Soya beans is believed to be one of the hardest crops to grow because of the shattering nature of the beans and the issue of rust and weeds. This means that the crop requires that farmers use the prescribed herbicides, insecticides and fungicides – chemicals that are imported into the country and therefore making them expensive. This is one of the reasons why most soya beans are planted by commercial farmers, as small scale farmers find it too costly and or they

¹⁰ Novatek is part of the Zambeef group and it produces feed for broiler, Pullet, Layer, hourse, pig, diary, and cattle concentrates (Zambeef website, 2015).

¹¹ Zamanita is part of the wider Zambeef group that is vertically integrated and involved in agri-business from production (the group has their own crop farms) to processing, distribution and retailing. The Organisation has various branches namely; Zambeef Retailing Ltd, Zamleather Ltd, Masterpork Ltd, Zampalm Ltd, Zamanita Ltd, Zamchick Ltd, Zamhatch Ltd and Master Meats in Nigeria and Ghana. The Zambeef group distributes chicken, pork, milk, dairy products, eggs, edible oil, stock feed and flour. Novatek, a stock feed producer, is part of the Zambeef group (Zambeef website, 2015)

do not have good agronomic practices to produce the desired yield. A small to medium scale farmer in Kabwe has been growing soya beans for the past five years and he has been decreasing his hectares annually because he has found harvesting soya beans difficult owing to the bean's shattering nature. During the last soya bean season he purchased a combine harvester and managed to harvest two tons/ha. He indicated that one of the challenges that small and medium scale farmers face is information asymmetry. He indicated further that farmers are not made aware of how to grow crops including what inputs (chemicals, fertilizer and inoculants) one should use. According to the CSO in 2013 smallholder farmers produced 36,756mt of soya beans and large scale or commercial farmers produced 224,307mt.

Below is a diagram that illustrates the provinces of Zambia. Soya production takes place in the Copperbelt, Central, Lusaka and Southern province.¹²

Map Showing the Provinces of Zambia

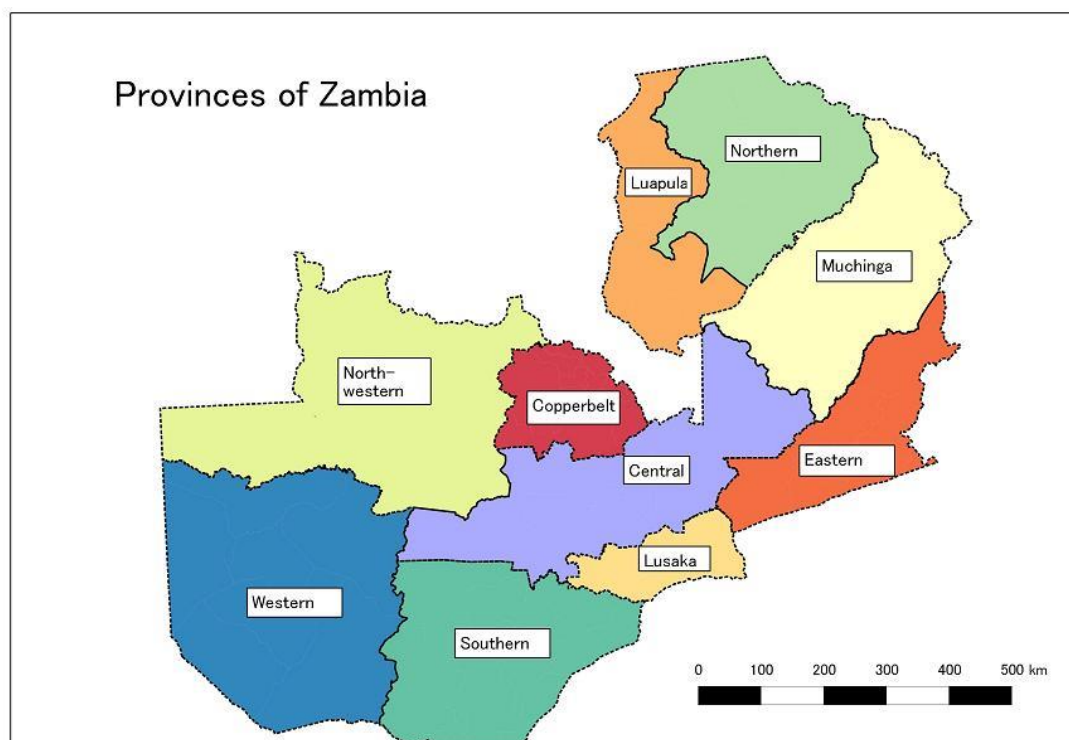


Figure 5.

¹² Sourced from TechnoServe, 2011: 13.

The diagram below indicates the yield rate in Metric tons per hectare for small scale farmers and large scale or commercial farmers. The diagram shows an increase in the yield of commercial farmers but the yield of the small scale farmers stays relatively the same.¹³

Graph Showing Yields of Soya Beans in MT (2009 – 2014)¹⁴

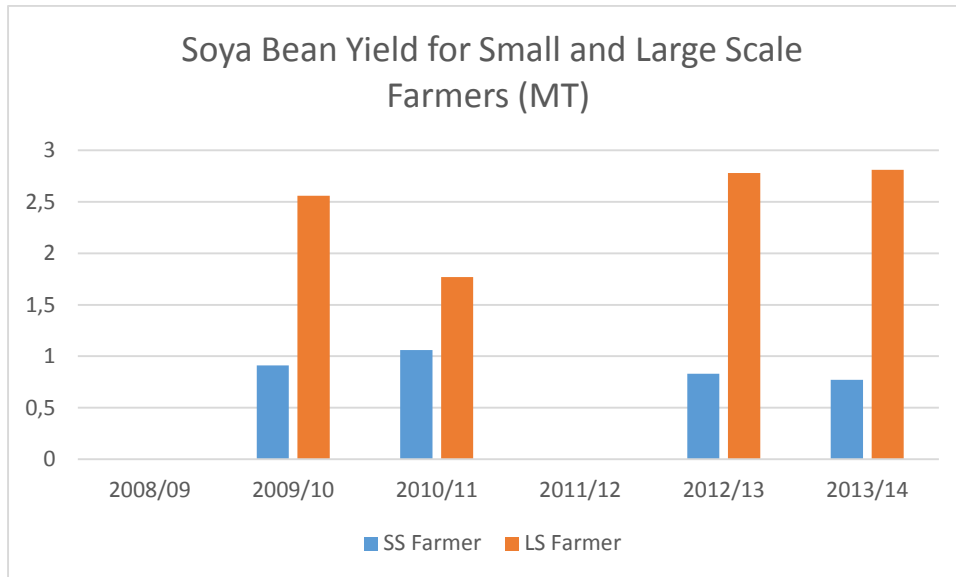


Figure 6

According to commercial farmer Mr Mukuka, commercial farmers grow more soya beans than maize because it fetches a higher price compared to maize and the government is less involved in terms of price setting unlike in maize farming. The challenges that were brought forward were; unpredictable weather patterns, the cost of labour (the minimum wage in Zambia increased almost two fold in one year from K12.80/hour to K22.00/hour); fuel fluctuation make it difficult for farmers to plan; cheap palm oil imports affect the whole value chain because consumers purchase less of the locally produced oil; and the cost of electricity has increased by 30% (in 2014), this therefore increases the cost of production. Commercial farmers were varied in their use of inputs as some of the farmers imported their inputs except from their seed, whilst others purchased all their inputs locally. Commercial farmers have contracts with millers or processors who buy their beans once it is harvested, one commercial farmer indicated that he is more concerned with oil extraction and he refines the oil and exports the cake to Tanzania, Zimbabwe and Namibia.

¹³ Please note that the Central Statistics Office did not have data for the 2008/2009 farming season, as well as the 2011/2012 season

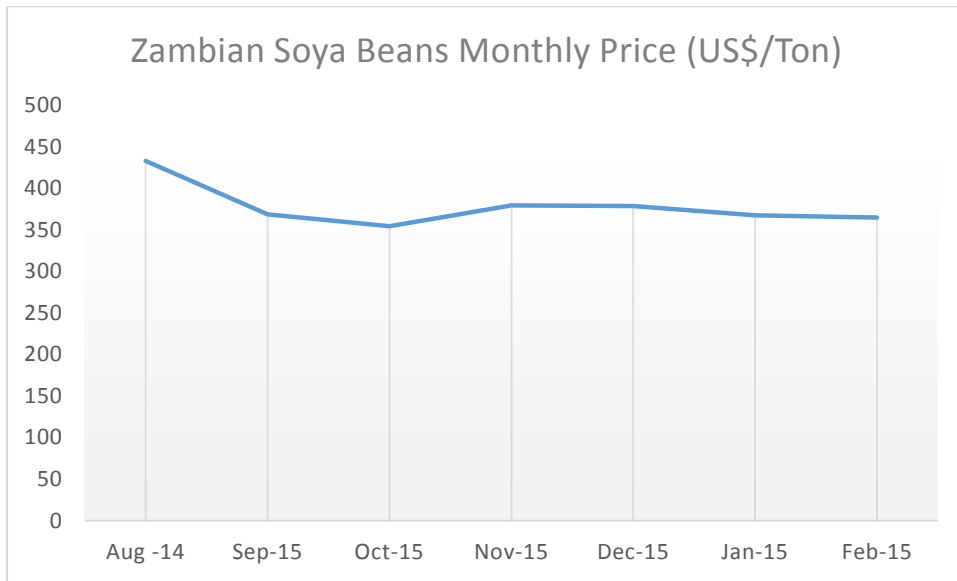
¹⁴ Sourced from Zambia Central Statistics Office (CSO)

In 2011 the cost of production for commercial farmers in Zambia was between US\$451 and US\$398 per ton for farming on dry land and using irrigation respectively. Zambeef's cost of production is about US\$250/ton and it costs about US\$50 to get to market (therefore US\$300). Mr Lunt, the head of commodities at Zambeef, advised that if Zambia can grow soya beans at US\$300/ton (including transportation) then they (Zambia) can supply the whole region. This implies that in general farmers produce soya beans at a higher cost. A representative from Olympic Milling indicated that on average the cost of farming is between US\$277/ton – US\$300/ton and this excludes transportation to market.¹⁵ Zambeef may be able to produce at a lower cost for various reasons. The organisation is vertically integrated. They own vast farms where they grow most of the crops that they require including large fields of soya beans. The organisation imports its inputs except from its seed which is purchased locally. In general farmers have been complaining that the costs of inputs are increasing while the purchasing price of soya beans remains stagnant. A Farmer's Union Report (2014) indicated that farmers are concerned as soya bean production is becoming less profitable because of the falling local prices. Whereas, import - export parity prices for soya beans are higher in comparison to the local prices in Zambia. For example, import parity prices for South African beans were about US\$680 while export parity prices were around US\$486/ton at the end of November 2014 (Farmers Union Report, 2014). Members of the farmers union stressed that the desired price would be a price between import and export parity and above the price offered the previous soya bean season, therefore landing the price at about US\$500/ton (Farmers Union Report, 2014).

The illustration below shows the price of soya beans in Zambia between August 2014 and February 2015 in US dollars per ton.

¹⁵ The cost of production for small scale farmers would be higher because they may not have access to the financial facilities and machinery that emerging and commercial farmers may have.

The Zambian Soya Beans Monthly Price (Aug 14 – Feb 15)¹⁶



Source: Index Mundi

Figure 7

¹⁶ Sourced from Index Mundi. <http://www.indexmundi.com/commodities/?commodity=soybeans>

Comparison of Production Costs and Yields¹⁷

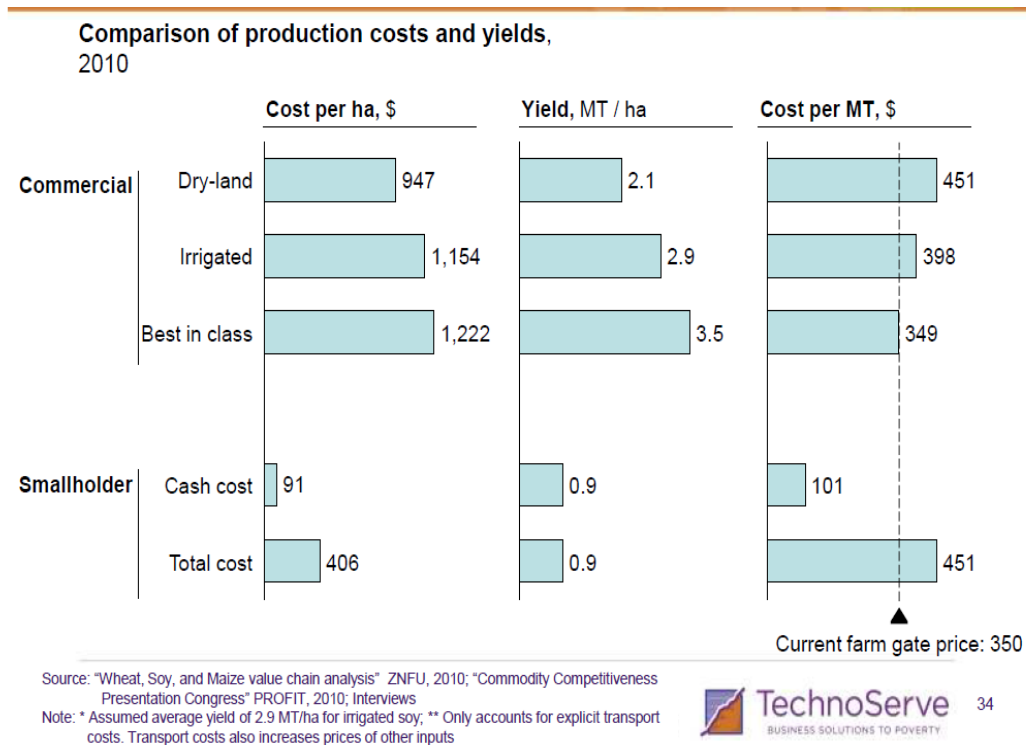


Figure 8

5.1.3. Inputs

With regards to inputs, six companies were interviewed; Seed Co, Foreign Seed Company C, Zamseed, ATS Agrochemicals, Omnia and Fertilizer Company D. Both Seed Co and Zamseed indicated that they sell most of their seeds to commercial farmers because they purchase seeds in larger quantities. The seed companies set their prices by looking at the production costs plus a mark-up. Zamseed offers commercial farmer’s payment plans for seeds purchased but both companies do not offer smallholder farmers the same facility as smallholder farmers are prone to defaulting because they have poor agronomic practices and do not harvest a high yield.

All chemicals used by farmers in Zambia are imported as Zambia does not have the capacity or the market to produce chemicals in large quantities. All of the chemical companies that were interviewed offer soil testing to their customers who are mostly commercial farmers. Mr Mwaye from ATS Agrochemicals said that each crop uses a different variation and

¹⁷ Sourced from TechnoServe, 2011: 34.

combination of chemicals. He added that soya beans on average requires about 10 – 12 different chemicals, he indicated further that the price of chemicals varies depending on where it is sourced. Mr Mwaye stated that chemicals do not form the largest portion of the total cost of production. He stated that chemicals would constitute about 20% of the total cost of production therefore confirming desktop research. He said that weeds are the biggest problem when it comes to soya beans, if weeds are not properly controlled they can destroy up to 50% of the soya bean crop. Furthermore, as secondary sources indicated, fertilizer accounts for about 40 – 45% of the total cost of production of soya beans which is less than the cost of fertilizer when growing maize (which accounts for about 50% of the total cost).

Within each industry there are various challenges that firms face in relation to soya beans. Some of the challenges that were put forward by Seed Co; were owing to the fact that soya beans is a cyclical product, farmers recycle the seed and it is therefore difficult to estimate how much seed will have to be produced for each planting season; exchange rate fluctuations for imported chemicals; cheap oil imports were also highlighted as a problem owing to the fact the soya bean value chain is integrated, a problem in one part of the chain affects the whole chain. For example, local producers cannot compete with the cheap oil imports and as a result local consumers opt for the cheaper product. This causes a ripple effect in the soya bean value chain because a crushed bean produces oil and cake and if the oil tanks of the processors are full then they will not be able to crush as much soya beans. If processors crush less soya beans than the previous year, this affects the farmers who will not be able to sell as much as they had hoped to sell or as much as they have produced, this affects the stock feed producers who will not get as much cake (for stock feed) as they expected because less soya beans will be crushed. This will in turn affect the consumer who purchases poultry or pork as the law of supply and demand will cause chicken prices to increase or feed imports to rise. This view was shared by the respondent from Olympic Milling, National Milling and Commercial Farmer, Mr Mukuka.

5.2. Processing

Zambia is a net importer of edible oil. According to research conducted by Technoserve (2011), Zambia imports about 75% of cooking oil. Most of the cooking oil is imported from Kenya via the COMESA agreement. During interviews this issue was highlighted by not only the processors and millers but the input companies and farmers as well. Three processing

firms were interviewed along with one trading company. Zambia has three large solvent extractors; Mount Meru in Chisamba,¹⁸ Zamanita in Lusaka and Emman Farming Enterprise in the Copperbelt.¹⁹ The processing companies purchase soya beans mostly from commercial farmers but also from small holder farmers and traders depending on the price. They process the soya beans into cake and soya oil. Zamanita transfers the cake to Novatek who then produce stock feed and they keep the oil for further processing. Mount Meru sells their cake to various companies that then process it into stock feed, and they process the crude oil further into their branded cooking oil; Soyola. Astral Manufacturing Limited (Zambia) processes the soya bean into high full fat meal, low fat soya and crude soya oil, they then sell the cake to stock feed companies and the crude oil is sold to refineries.

There are seven stock feed companies that were interviewed. Tiger Feed Nutritionist, Rowena Blanco mentioned that feed production in Zambia has increased in the last couple of years and will most likely continue to increase, she indicated further that Tiger Feeds production (and most of the feed company's production) is driven by the poultry industry. Tiger Feeds produces about 3800 tons of poultry feed a month. The feed companies purchase their soya beans mainly from commercial farmers but also from small scale farmers.

Some of the challenges that processors face include; electricity problems in terms of power outages; the high moisture that comes with the beans; getting trucks across borders efficiently means that there should be adequate information of what is needed at the borders; some of the smaller stock feed companies do not have a consistent supply of soya beans because they do not have pre-signed contracts with farmers; there is information asymmetry regarding how much soya is being produced, used and exported and the transport costs in Zambia are high. A challenge that was mentioned by Mr Chacko from National Milling was that there needs to be a balance in soya beans in terms of price, if the price is too high then it affects the processors and if it is too low then it affects the producers, when there was a shortage of soya beans in 2008 prices reached US\$850/ton, it now ranges between US\$400 - US\$500/ton.

¹⁸ This is a Tanzanian company with presence in Uganda, Rwanda, Kenya, Malawi and Zambia. It has a petroleum branch and a milling branch. The organisation is licensed to import, retail and distribute petroleum products in Zambia. Mount Meru also crushes soya beans, sunflower, cotton seed and palm to oil. In an interview it was mentioned that the organisation sells the cake to various stock feed companies who were not disclosed

¹⁹ Emman farming Enterprise is run by a Zambian – Greek family. The organisation runs a feed plant and produces soya bean oil and solvent extracted soya meal. The house edible oil brand is called Royal and they produce poultry and bovine feed

5.3. Trade

Some of the challenges related to trade include, high transportation costs which play a major role when importing into and exporting out of Zambia. Unstable fuel prices affect a company's distribution costs and border delays due to new government instruments such as Zambia Environmental Management Agency (ZEMA) who often delay the release of transportation permits therefore affecting product delivery. Irregular access to export permits and border closures are issues that processors face. Zambia's largest market is Zimbabwe and during this research, Zimbabwe unexpectedly closed its borders to all semi-finished and finished products. An interview with animal feed company, Novatek indicated that the unexpected closure placed a challenge on farmers because processor would therefore purchase less beans, he indicated further that the Zambian market now produces for export and their biggest market is the Zimbabwean market and a closure of the Zimbabwean border poses a problem for companies that export soya cake to Zimbabwe. Fertilizer Company D indicated that transporting one truck across the Zimbabwean border costs US\$63/ton. Zamanita indicated that in general farmers transporting there beans from Mkushi area to market (Lusaka) is about US\$30 - US\$40 per ton (distance from Mkushi to Lusaka is about 151Km). Mr Lunt also indicated that transporting soya beans from Zambia to Randfontein costs US\$100/ton.²⁰

²⁰ This includes the fuel and border costs.

Below are two graphs that show Zambia's main export and import soya products.

Zambia Soya Bean Product Exports in USD (\$) ²¹

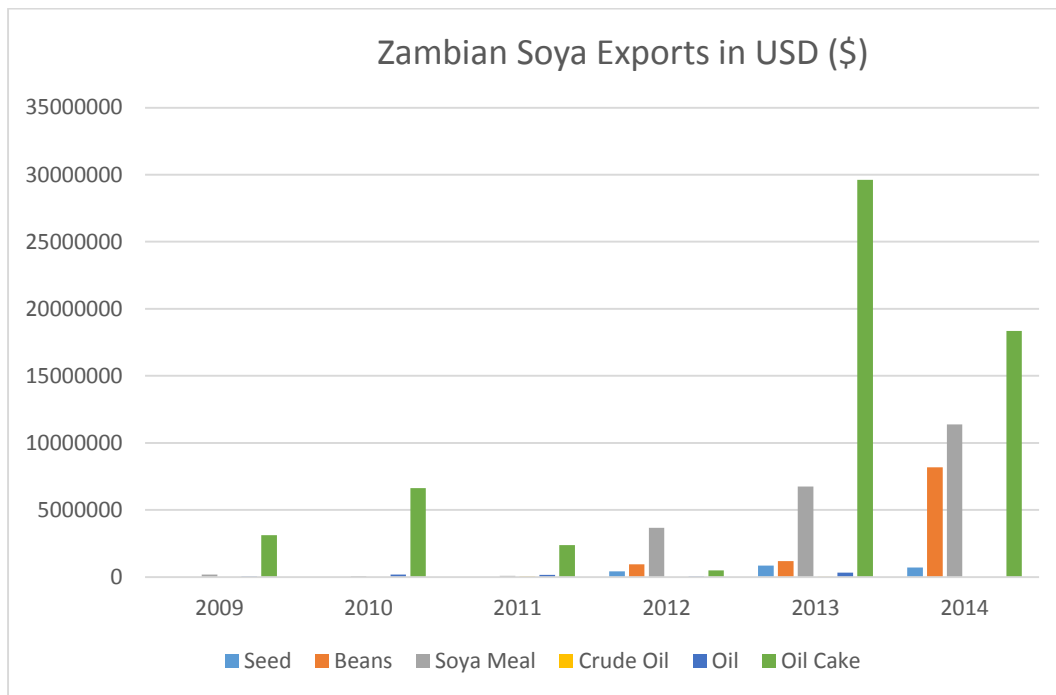


Figure 9

Zambia Soya Bean Product Imports in USD (\$) ²²

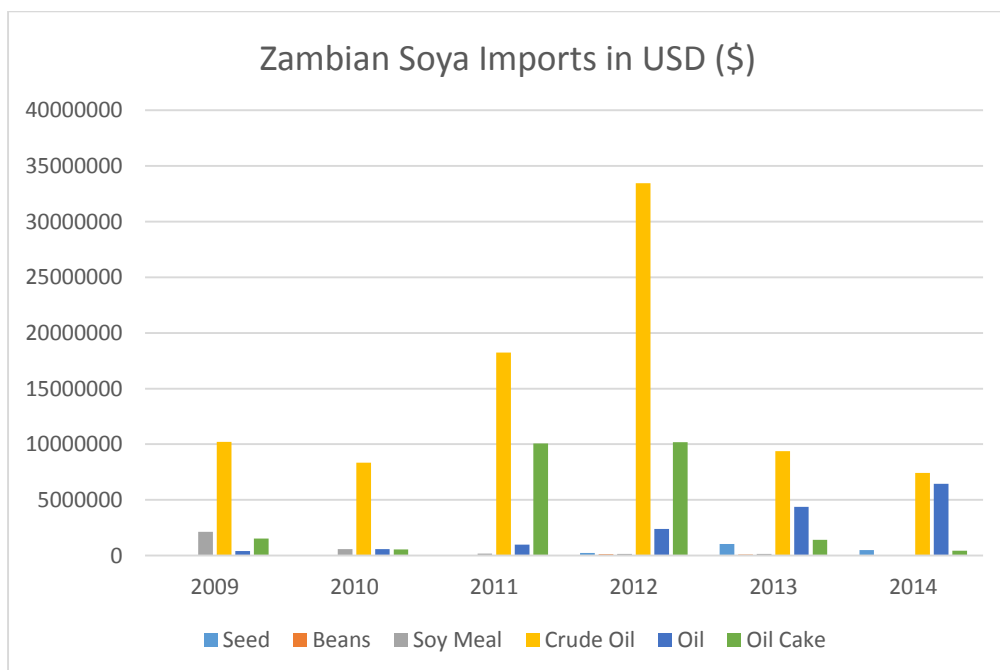


Figure 10

²¹ Sourced from the Zambia Central Statistics Office (CSO)

²² Sourced from the Zambia Central Statistics Office (CSO)

In an interview with a COMESA representative regarding the palm oil imports, Mr Musonda indicated that a lot of African countries import crude oil from countries like Indonesia because of availability and price. The COMESA agreement indicates that if there is 35% value addition in a country that is part of COMESA then that product can be exported to COMESA countries duty free. He stated further that Kenya is able to land palm oil into Zambia at a price that is lower than the cost of oil produced in Zambia, this shows that oil production costs in Zambia are high and the manufacturing process is inefficient. Under COMESA Zambia imported US\$102,022 worth of beans and exported US\$1,191,396 worth of beans in 2013.

According to the CSO, in 2013 Zambia exported US\$6,759,260 worth of soya bean meal, US\$356,358 worth of crude and edible soya oil and US\$29,613,665 worth of soya bean cake. The country imported US\$140,304 worth of soya bean meal, US\$13,760,119 worth of crude and edible soya oil and US\$1,407,757 worth of soya bean cake. In terms of price, According to the Novatek representative Zambia's soya bean cake prices are in line with the world market, he indicated further that during the beginning of September the soya prices dropped by US\$40 because the American harvest was large. This therefore meant that the export price of soya beans from the United States (US) would be lower. Mr Roodt from Novatek indicated that Novatek had to drop their cake price from US\$500 to US\$450 in order to be competitive. This shows one of the characteristics of the soya bean industry; that it is price sensitive and buyers of soya beans will purchase the beans with the lowest price. In general the price of soya beans is between US\$400/ton - US\$600/ton and this year it was US\$450/ton according to National Milling. A commercial farmer in the Mkushi area indicated that the price of crude soya oil is about US\$1200/ton.

5.4. Conclusion

In conclusion it is evident that the Zambian soya bean industry is dynamic. The industry experiences a number of constraints such as; cheaper oil imports, high input and transportation costs, high production costs in general (including labour and electricity) and lack of access to markets. This chapter has highlighted that commercial farmers and small scale farmers have slightly different challenges in that small scale farmers struggle with financing and poor agronomical skills, elements that commercial farmers do not experience.

This chapter has set the context for the Zambian soya bean value chain and illustrated what the issues are and why these are problems within the soya bean industry. It has identified the various stages of the chain and the challenges involved within each sphere, this helps one analyse how these issues can be resolved.

CHAPTER 6: THE IMPLICATIONS OF THE FINDINGS OF THE SOYA BEAN VALUE CHAIN RESEARCH IN RELATION TO TRADE.

6.0 Introduction

Theory offers a guideline on what ought to be. Very often theory is not congruent to practice and in these instances theory does not accommodate the physical norm. This section will use theory to analyse and explain the Zambian soya bean value chain. It will look at the various instances where trade and GVC theory can be supported by practice as well as instances where theory does not support or does not cater to or give answers to the challenges within the Zambian soya bean value chain. The researcher will draw from the theoretical discussions regarding GVC and trade theories discussed in Chapter two of this paper. The chapter will highlight the strengths and weaknesses of GVC and trade theory in relation to the Zambian soya bean value chain. This paper does not seek to discredit trade liberalisation or GVC theory, it seeks to show that there are elements of growth within an industry that trade liberalisation or GVC theory cannot account for. This chapter will look at the production and processing phase of the chain, and trade and GVC theory. It will also briefly analyse the linkages that have been created as a result of the growth in the Zambian soya bean industry and touch on the implications of the lack of policies surrounding this value chain. This chapter outlines a national value chain with instances of international trade pertaining to the Zambian soya bean value chain. This chapter is structured in this format to allow for the various stages of the soya bean value chain to be addressed in the same manner in which the value chain occurs.

6.1 Production and Processing

The theory of GVC focuses on industry development which indicates that value should be added from the point of inception of the product to production and end use. It looks at the various forms of value addition or inputs moving into a different stage of production. This theory focuses on firms and cross border networks. In terms of processing regarding the Zambian soya bean value chain, there are a number of aspects that can be attributed to GVC

theory. There are five dimensions of a value chains identified by GVC theory, these are; 1) an input-output structure; 2) a geographical consideration; 3) a governance structure, 4) an institutional context and 5) upgrading. The Zambian soya bean chain has an input output structure which is visible at the production stage where the inputs are the various ingredients used to produce the soya bean such as the chemicals, fertilizers, machinery and seed; the output is the soya bean itself (Gereffi and Fernandez – Stark, 2011). This input-output structure is most visible at the processing stage where the most value addition takes place. During the crushing phase, soya bean cake and crude oil are produced. These products then move further along the chain and the soya bean cake is processed into stock feed and various human soya products such as soya chunks (produced by Processing Company 1 Foods, a soya food producer) as well as soap (produced by Mount Meru a milling company and oil producer). The crude oil is further refined into edible oil (by Zamanita and Mount Meru).

The geographical consideration in this instance would be the fact that the soil quality and resources (in terms of land and water) in Zambia are an added advantage for the growth of crops and soya beans in particular. During the interview process, it was indicated that the soya beans that are grown in Zambia are the preferred beans within the region. It is also a geographical consideration that most of the trade in soya cake is between Zambia and its neighbours. According to Novatek, Zambia exports most of its soya cake to Zimbabwe. In general, exports are mostly within the SADC region owing to the fact that transportation costs are high and the road infrastructure is not well developed.

This research paper will use the GVC framework loosely and not give a detailed analysis of the governance within the chain. The GVC framework has been used in order to structure the analysis however, the paper will not analyse the GVC framework to the extent documented by Gereffi. The governance structure that exists within the soya bean value chain in Zambia is one that does not include formal government regulation. The value chain structure is one that puts firms or actors that are part of the chain under pressure as there is a level of interdependency between the firms. In this instance, oil refineries would put pressure on crushers who would put pressure on producers or farmers. The respondent from Olympic Milling indicated that owing to the fact that when the soya bean is crushed there is more cake than there is crude oil, Zambia may be approaching a stage whereby it will produce excess soya cake and there will be demand for the soya oil. There is formal government policy that governs the maize industry where the state sets maize prices and provides a market for

farmers to sell their maize through the FRA. In terms of the fourth requirement according to the Gereffi dimensions, the soya bean value chain in Zambia has only recently started receiving attention as it is still a growing industry therefore it does not yet fully exist within an institutional context like maize. This value chain has however been identified as one of the crops for investment in the agricultural sector in Zambia by the World Bank.

GVC theory also looks at value chain upgrading that takes place within the chain, in this instance the form of upgrading will occur in the processing stage which is where the most value addition takes place. There are companies within the chain that do not only focus on stock feed but they also focus on human products. Quality Commodities exports a product called High Energy Protein Supplement (HEPS), which is a high protein meal. Olympic Milling suggested that Zambia should look into producing HEPS for export as the country approaches the phase where it is crushing more beans than the economy needs. This form of diversification into other forms of soya products can be considered as a product upgrade along the chain.

Another aspect of GVC theory identifies if the chain is buyer – driven or producer – driven.²³ The Zambian soya bean value chain is producer driven as the drivers of the chain are the stock feed companies because they are influenced to a large extent by the poultry industry (manufacturing - industrial capital), the consumers as well as to some extent external markets. In terms of coordination of firms, although the GVC literature focuses on global firms, the Zambian soya bean value chains is nationally orientated in that all the stages of the value chain take place in Zambia. The value chain extends outside of the country's borders when soya oil and cake are exported to or imported from external markets. However, according to an interview with Novatek, the soya meal export quantities are minimal compared to the amount of soya meal that is produced and consumed for domestic animal feed. This indicates that the development of a value chain is not reliant on global access. The limited interaction with the global community reduces market access and access to tools and knowledge acquired from global sources. This analysis has shown that the two main drivers

²³ Producer – driven commodity chains happen to be in more capital – intensive sectors where the lead firms are main barriers to entry including technology and large manufacturers are the lead firms however, the assumption that follows this law of governance is that producer driven is dominated by manufactures. Buyer - driven commodity chains are found in more labour intensive sectors where market information and product design costs are the barriers to entry. The assumption of buyer driven is that they are primarily driven by commercial capital for example retailers (Gibbon et al, 2009).

of GVC theory are not a prerequisite of value chain development or upgrading which is a contrast to the theory.

Firms play a role in the soya beans industry particularly in the processing phase where firms such as Astral Manufacturing process soya beans and then sell the crude oil to refineries and the soya cake is sold to stock feed companies (the firm opted to keep their partners anonymous). This process requires a coordination between the players within the chain as well as an inevitable linking of firms as firms within the sector create relationships where they are guaranteed business from each other, for example, some farmers are contracted to sell their produce to a particular firm that will then crush the bean or millers such as National Milling indicated that they source their solvent extracted soya cake from Mount Meru.

The soya bean value chain also follows the pyramid structure that is indicated in GVC theory where the industry becomes concentrated the further up the chain one goes. Other than a product upgrade, there was also an upgrade in crushing plants in Zambia between 2011 and 2014, there was only one solvent extractor plant in Zambia which was Zamanita, but after 2011, two more were built; Mount Meru in Katuba (about 26km North of Lusaka) and Emman Farming Enterprise (an animal feed company that also refines soya oil into their house brand 'Royal' in Luanshya, Copperbelt). This shows an upgrade that addresses the increase in production. There are firms in the industry that are vertically integrated such as Zambeef which produces soya beans on its farms as well as having contracts with commercial farmers who then sell their beans to the firm. Zambeef then crushes the bean and the soya cake goes to its sister company, Novatek which produces animal feed and the crude oil goes to the Zamanita plant for further processing into its edible oil house brand, Amanita. Firms such as Mount Meru (who also opted not to disclose who their clients are) indicated that they sell their soya cake and further refine their crude oil into their house brand Soyola.

Normalisation in this context is to adjust a given practice so that it reflects and or echoes a standard or norm. In the case of the Zambian soya bean value chain the value chain is still developing and policies have not yet developed to support the soya bean environment, a state

of normalisation would be once soya bean production becomes a state supported crop and an environment is created to improve the value chain.²⁴

Traditional industrialisation theory focuses on a movement from agrarian to industrial society and technological growth. As has been indicated in previous chapters, Zambia had one of the highest GDP growth rates in Southern Africa in 2013 and the agriculture industry in general contributed largely to this growth. It has been seen that soya bean farming is fast becoming an area of interest for Zambia because of its potential to stimulate trade within Southern Africa. In this instance the Zambian soya bean value chain is a form of industry development and possibly plays a part in the countries industrialisation process where there is more export in semi-finished and finished products. It is arguable that the soya bean sector is an infant industry that may require state assistance until it is mature enough to compete with imported soya products or until soya bean products can be produced at a lower cost therefore allowing players within the chain to export soya products and reduce the overall cost of landing soya products in foreign countries.

GVC and trade theory do not answer the challenge that the Zambian soya bean value chain faces. GVC focuses on upgrading vertically or along the chain, whereas trade focuses on the continuous exchange of goods across borders. One of the major issues that the Zambian soya bean value chain faces, is that the country is crushing less soya beans than its available crushing capacity. According to Trader Company X, and a representative from Omnia, Zambia is only using a third of its crushing capacity. This in turn calls for more production of the crop. In order to increase production Zambia is encouraging small scale farmers to produce soya beans and increase their yield. In order to achieve this, the Zambian government assists small scale farmers to improve their agronomical practices by encouraging field days and Agriculture shows. Various firms such as Zamseed and Omnia also conduct field days where they educate farmers, small scale farmers in particular, on how to grow various crops. In this regard the GVC and trade theoretical frameworks do not address the issue that Zambia faces.

²⁴ 'The term used here does not mean 'making things normal' in the vernacular sense of unexceptional...' (Gibbon, Bair and Ponte dates).

6.2 Trade

The soya bean production in Zambia more than doubled between 2011 and 2013, there was also a substantial increase in the crushing capacity that was available in Zambia during this time. In 2011 Zamanita was the only solvent extractor plant in Zambia, and by the end of 2014, Mount Meru and Emman Enterprise had come on board. These crushing plants are privately own and show how concentrated the soya bean value chain becomes the further up the chain one goes. The increases in crushing plants contributed heavily to the industry growth of the soya bean sector in Zambia. Trade or GVC theory do not give an explanation for the sudden boost in production and crushing capacity that occurred in Zambia. Trade theory posits that the importing and exporting of goods will bring about economic growth and in this case industry growth. However, research indicates that the increase in demand from the poultry industry is responsible for the increase in soya production. Within the Zambian soya bean value chain, there is interaction with global firms in the production phase through the inputs that are imported into Zambia. Although the imported materials are an important aspect of the chain, they are not the cause of the increase of soya bean production, but a by-product of the increase in demand from the poultry industry. A large percentage of soya cake produced in Zambia is used within the Zambian market itself for stock feed and in particular poultry feed. This can be attributed to the increase in the size of the middle class and the affordability of poultry as a source of protein.

The rapid increase in the soya bean industry can be regarded as a case of satisfying market demand rather than a case of trade. Trade and exports of soya products are important but trade has not been identified as the driving force of the soya bean value chain in Zambia. It may be argued that the soya bean industry is a response to various factors such as crop rotation for farmers who grow wheat in the winter or a response to the politics surrounding maize farming however, these arguments are outside the scope of this research and will therefore not be investigated further. There is however an opportunity to increase the trade of soya meal to the rest of Southern Africa, this can be achieved by increasing production within Zambia to allow the country to reach its full crushing capacity which is in excess of what the country needs.

Below is a graph illustrating the Zambian soya bean production of soya meal, oilseed and soya oil between 2009 and 2014.

The Zambian Soya Beans Production (2009-2014)²⁵

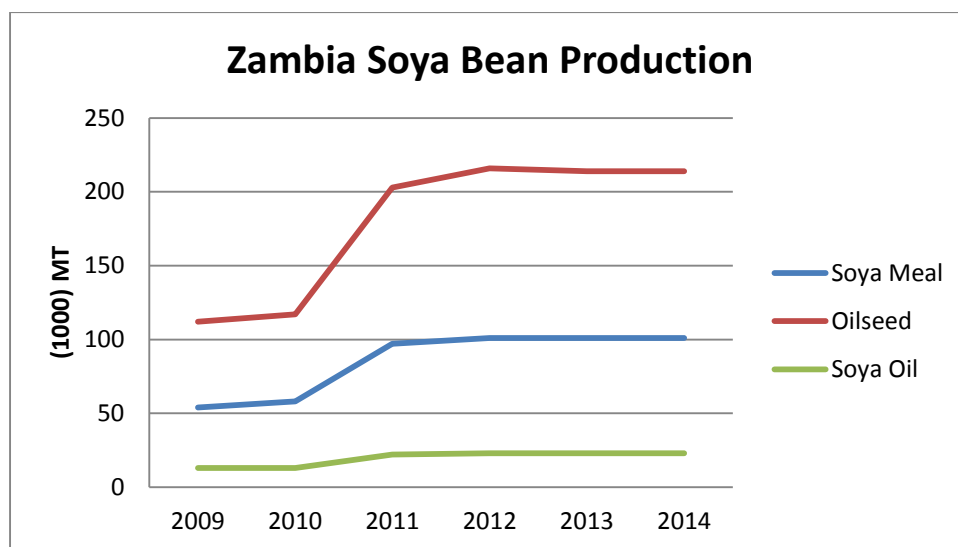


Figure 11

There is evidence of trade between countries regarding the Zambian soya bean value chain. During the production phase most of the inputs for soya beans except the seed itself are imported from countries such as South Africa. This has created an environment in support of regional integration, where one country relies on the imports from another country within the region

The soya bean industry in Zambia is growing faster than the government can create policies to support it. There are currently limited policies that support soya bean production or address the general challenges that the soya bean value chain in Zambia faces. There are policies regarding maize for example; maize exports are heavily regulated however, policies that support the import and export of soya beans and soya bean products are limited. Owing to the fact that Zambia's general policy is against GMO products, in instances where the country has imported soya beans, the beans were imported from GMO free certified countries such as India.²⁶

The issue concerning the high price of the imported inputs is one of the challenges that soya bean farmers face. The high cost of inputs was highlighted as a challenge throughout the research at all stages of the chain. Most the inputs that are used for soya production are

²⁵ Sourced from Index Mundi. <http://www.indexmundi.com/agriculture/?country=zm&commodity=soybean-oil&graph=production>

²⁶ According to an interview with a representative from Novatek, in 2008 when there was a shortage of soya beans, Zambia imported beans from India (GMO free certified) as GMO soya beans could not be imported.

imported and therefore subject to exchange rate fluctuations. Mr Mwaye, from ATS Chemicals, indicated that chemicals for soya production cost about 20% of the total production, he indicated further that fertilizer will cost about 50% of the total production cost. These percentages were confirmed by a representative from Omnia, a fertiliser company. According to trade theory imported goods improve the living standards of citizens because imported products are supposed to be cheaper than local products in order to stimulate competition. However, in this case throughout the soya bean value chain there is the concern of the high cost of production owing to of the imported inputs. It is believed that because the inputs used in farming are imported therefore the cost of farming in Zambia is higher compared to countries like South Africa, where due to the size of the market, inputs can be manufactured within the country. In this instance, it is evident that the effect of the imports on soya bean production is not consistent with trade theory literature that assumes that trade (export and import) causes an increase in the living standard of the consumers because of the imported cheaper goods which also allow for competition within the industry.

This in turn hinders small scale farmers from entering soya bean production because they find that the cost of production is too high and they begin to have bad agronomical practices, for example most small scale farmers do not use the correct fertilizer for their soya bean crop (instead they use their already purchased maize fertilizer) or they do not utilise all the recommended chemicals. Trade theory does not provide answers for challenges such as these nor does it not give an alternative. GVC theory is also silent on input challenges that small scale farmers face in this instance.

The high cost of inputs poses difficulties for the Zambian soya bean industry and agriculture in general. In terms of the concept of comparative advantage in trade theory, it is arguable that Zambia can be seen to have a comparative advantage when it comes to soya bean production because of its resource advantage (land and water) within the region. However, the high cost of inputs place Zambia in a position where soya bean production is not the country's most cost effective crop and Zambia therefore currently cannot be seen to have a comparative advantage in the soya bean industry. The high cost of inputs generally make it difficult for trade outside the Zambian borders as a result, trade is limited despite this, the Zambian soya bean value chain has expanded.

The research highlighted that the soya bean industry is price sensitive as the farmers/traders wish to sell their crop at the maximum price and the processors or millers wish to buy soya beans from the farmers/traders with the lowest price. If the cost of soya beans production in Zambia was to decrease, more small scale farmers would enter soya bean production and Zambia would reach its crushing capacity, then Zambia would be seen to have a comparative advantage in soya production. This view was confirmed by Mr Lunt from Zamanita (Zambeef) who indicated that if Zambia could produce soya beans at a cost of US\$300 per ton (this includes transport to external market), then it would be able to export to the southern region.

The argument that free trade will bring about growth in an economy is an old one (Dowrick and Golley, 2004; Krueger, 1999; Chang et al 2009) and in the case of the Zambian soya bean value chain, it is evident that free trade is not bringing about industry growth in the context of soya beans. One of the challenges that were indicated was the issue of the cheap oil imports from Kenya through the COMESA agreement. This problem was mentioned throughout the value chain from the input companies to the processors because it is a challenge that affects the whole chain. The cheap oil imports have a negative effect on the soya bean value chain and put local edible oil refineries at a disadvantage. Many of the respondents indicated as a policy suggestion that there should be more regulation to decrease or stop the cheap oil imports from East Africa because consumers purchase the palm oil imports as opposed to the more expensively produced local oil products. This is an area where the state can intervene in terms of industry protection, in order to protect local production until such a time when the firms are more efficient and can compete with imports. GVC theory and trade do not include solutions to such challenges.

Zambia has not overtly stated that they have adopted an import substitution industrialisation (ISI) policy, however, similarities of this concept can be seen. Zambia does not import soya bean cake in order to produce animal feed, its primary product is produced within the country and then undergoes its first processing phase where the bean is crushed and soya bean cake and soya oil is produced. The amount of soya beans and soya cake that is imported is negligible as Zambia is a net exporter of soya bean cake and the soya oil is refined further into edible oil. Zambia generally has liberal markets especially between its trading blocks; COMESA and SADC. Trade theory assumes that trade liberalisation increases the general welfare of the countries involved and improves the living standards of citizens because

nationals can purchase goods at a cheaper price. The palm oil imported under the COMESA agreement may improve the welfare of the consumers as they purchase a cheaper product but the imports negatively affect local processors and products and stifle local innovation as processors may struggle to compete with the imported goods and exit the market. This in turn affects Zambia's quest for poverty alleviation as it affects local business. This is not consistent with the trade assumption that indicates that trade brings about change for the poor and alleviates poverty.

As discussed in chapter two, there are various assumptions that are embedded in liberal trade theory such as when countries engage in liberal trade there is an exchange of knowledge or technological spill overs, in this regard there is limited evidence of skills being transferred as trade theory suggest. This is evident in that the number of oil refineries in Zambia is few and with the palm oil imports, there has been no visible transfer of knowledge or skills which ought to result in the reduction of oil refining costs therefore allowing local refineries to compete and the number of oil refineries to perhaps increase.

Further assumptions of trade theory include; the notion that there is easy and frictionless entry into and exit from markets between countries. In this instance the research identified that one of the challenges that processors or millers face is the unexpected border closures such as when Zimbabwe unexpectedly closed its borders. This shows that trade is not always as frictionless and as easy as the theory states. Furthermore trade theory does not offer a response in this regard. Another assumption that trade theory makes is that trade brings about increasing returns to scale as producers produce for an international market however, in this instance the cost of production of soya bean products added to the high transportation cost of transporting out of Zambia do not bring about increasing scale returns. For example Mr Lunt from Zamanita indicated that transport alone from Zambia to Randfontein will cost about US\$100/ton.²⁷ Increasing returns to scale is one of the key tenant of industrialisation and this cumulative growth across multiple linked sectors is what brings about industrialisation. Increasing returns can occur through trade however, trade is not the only avenue to accumulation of surplus in skills, capital, technology and knowledge, in manufacturing. The research indicates that through the soya bean value chain farmers are able to transfer their farming skills to other crop production, this chain creates linkages in the pharmaceutical

²⁷ This includes fuel and border costs.

industry in that companies such as Mount Meru also use soya beans to produce soap; in the animal feed industry, owing to the high protein content, the beans are mostly used in poultry and pig feed; and human products such as edible oil, cereal, soya milk and soya meal.

Zambia is a net exporter of soya cake and its primary market is Zimbabwe, in order for free trade to benefit the countries involved, there has to be an agreement between the parties. One of the challenges that were mentioned during the research was the unexpected border closures that make trading between countries difficult. During the research, Zimbabwe unexpectedly closed its border to semi-finished and finished products perhaps to allow for growth in their own soya bean industry therefore showing that imports into Zimbabwe may have been affecting the country's own local production. This also may have been a form of infant industry protection. Trade liberalisation theory does not offer solutions for countries that close their borders to imported goods and it does not give an alternative.

In the case of the soya bean value chain in Zambia, production of the crop is dominated by commercial farmers who may have entered soya bean production because they knew that they would be able to fetch a higher price in soya beans per ton than they did in maize. Some commercial farmers opted for soya bean production because they may have felt that the industry was less regulated. Another factor that cannot be explained by theory is the phenomenon of how Zambia more than doubled its annual production in four years and this has essentially led to the growth of various industries in Zambia such as the stock feed industry. Both GVC and trade theory do not shed light on these issues.

Market access is one of the most important aspects for both small scale and commercial farmers in general. Price is an important factor in the soya bean value chain. Soya bean farmers wish to sell their crop where they can find a market at the best price. This creates a space for government to create an environment where both processors and farmers can benefit from soya bean farming therefore allowing soya bean prices not to drop too low as this will negatively affect the farmers and at the same time the prices should not become too high as this will adversely affect the processors or millers. GVC and trade theory do not give guidance as to how such production dynamics can be addressed. The role of the state in this regard would be to create an environment through various policy intervention to assist the role players within the soya bean value chain.

Trade theory assumes that there is perfect information within the market however, research indicated that small scale farmers lack adequate agronomical skills. In an interview with Mr Mwanguku, he stated that small scale farmers are unaware of how to farm soya beans. A representative from ZDA said that they have farmer's day events available for small scale farmers implying that there is imperfect information within the farming industry.

6.3 Inter-Industry linkages

Some of the advantages of GVC are the backward and forward linkages that are created as a result of industrial growth. The linkages that are created along the Zambian soya bean value chain are not restricted to one part of the chain but they are evident throughout the chain and are present in varying industries such as agriculture, pharmaceutical and stock feed to name a few. The soya bean industry in Zambia has created forward linkages such as the stock feed industry in animal feed, in particular poultry feed as well as bovine and fish. There is a developing industry for a high protein porridge for humans consumption called HEPS which is produced by Quality Commodities. Within the Zambian food industry the demand for soya meal and soya milk has increased, these products are produced by Processing Company 1 foods as well as cooking oil which is produced by Mount Meru and Zamanita. Organisations such as Mount Meru indicated that they use the entire soya bean product, for various products such as soap.

The backward linkages that have been formed include fertilizer companies such as Nyiombo which is a local fertilizer company that competes in the Zambian market against well-established fertilizer companies like Greenbelt (also a Zambian owned company), Amiran and Omnia. Seed companies in Zambia for example Zamseed and Seed Co sell a variety of soya bean seeds to farmers, each seed has certain environment specifications designed for high yields in varying environments. Soya bean seeds are constantly being modified to be able to produce a better yield under a variety of soil conditions in Zambia. Owing to the fact that soya beans is high in nitrogen content for soils that are depleted by monocropping of maize, growing soya beans therefore aids in the production of other crops as it returns nutrients to the soil.

Owing to the fact that commercial farmers are growing more soya beans and small scale farmers are slowly beginning to enter this value chain, there is an implication for lenders. In general according to Commercial Bank one, banks are willing to lend to commercial farmers quicker than they are willing to lend to small scale farmers. Commercial Bank one also indicated that although there are bank structures in place that support small scale farmers the processes are tedious and banks find that small scale farmers are prone to defaulting on payment for a number of reasons, One reason being that they have lower yields and they struggle to pay back loans and another being that they struggle to provide collateral in order to receive financing. The increase in the soya bean industry has created a linkage in the banking sector in that banks in Zambia are beginning to finance soya beans more than they did before, according to Commercial Bank One, this is because banks are becoming more familiar with the crop. An increase in the soya bean industry has also had an effect on industries that supply farming products like farming equipment and machinery because of the growth in soya bean production companies that sell farming equipment would sell more of their product.

In general the growth of the soya bean industry creates opportunities for employment in diversified areas that are linked to the chain

6.5 Conclusion

It is evident that the Zambian soya bean value chain has more intricacies than can be explained by the GVC and trade theory. This chapter has outlined the Zambian soya bean value chain in association to GVC, trade theory and trade assumptions. The chapter has shown where the soya bean value chain is consistent with theory and it has highlighted various instances where both/either GVC and/or trade theory are silent. The chapter has looked at GVC and trade theory in the context of production and processing, trade, linkages and policies relating to the Zambian soya bean value chain. GVC is useful in that it helps explain the governance of the value chain while trade theory is useful in that it emphasizes that a country should export more than it imports which is the case with the Zambian soya bean value chain. These theories are not useful in that this value chain has limited access to global firms and markets in terms of GVC theory. In terms of trade theory there is little evidence of

knowledge being transferred to processors and trade evidently bringing about increased welfare for the consumers (in the form of lower prices) but not the processors.

CHAPTER 7: CONCLUSION

7.0 Introduction

This research paper sought to explore the Zambian soya bean value and analyse the constraints and drivers of the chain. The research paper looked at two theoretical frameworks; GVC and trade theory and used the Zambian soya bean value chain to identify the instances where theory can explain the Zambian soya bean value chain and highlighted instance where theory has its limitations.

7.1 Summary of Chapters

This paper commenced with an introductory chapter that laid the foundation and gave context as to the importance of this research. The introduction chapter also provided a roadmap for the readers and indicated the outline of this research paper. Chapter two gave a theoretical framework and explored the GVC, trade and industrialisation literature so as to illustrate the assumptions that each theory has and to outline the underpinnings of each theoretical framework. Chapter three discussed the methodology that the researcher used and showed why the chosen mixed methods methodology was best suited for this case study. Owing to the fact that this research is founded in the agriculture sector of Zambia, chapter four outlined the context of agriculture in Zambia and set the scene for the Zambian soya bean value chain to be used as a case study in this research. Chapter five illustrated the research findings of the Zambian soya bean value chain and showed the constraints and challenges that players along the chain face. Chapter six, used the theory discussed in chapter two to explore the findings indicated in chapter five and shows where theory can explain the soya bean value chain in Zambia and where theory is limited in this regard.

7.2 Implication of Findings

It is evident from the previous chapters that the Zambian soya bean value chain faces similar challenges and constraints to many agricultural crops. Literature is consistent with the research regarding the challenges that soya bean farmers face. The main challenges that were highlighted along the value chain are; the fact that Zambia is not utilising its full crushing capacity and there is room to increase soya bean production and high transportation costs to

name a few. Linked with this is the government's quest to engage more small scale farmers in soya bean production. In line with the literature, small scale farmers are in the agricultural majority however, small scale soya bean farmers face challenges of low yields, high production costs, difficulty in accessing markets, lack of finance and poor agronomical skills. Other challenges that were mentioned along the value chain include competition from palm oil imports, transportation costs, poor infrastructure and barriers to trade, this includes export and import barriers such as the closure of the Zimbabwean border under short notice.

GVC is not fully able to explain the Zambian soya bean value chain because the focus of GVC theory is on firms and access to international markets. There are no bottlenecks in the national soya value chain but there are various challenges at different stages of the chain. Trade theory emphasises upgrading through obtaining a comparative advantage. However, according to research, the pull or governance of the soya bean value chain in Zambia is created by the growth in the domestic poultry industry rather than the processing companies. The processing companies increased as the demand for soya beans in the national poultry industry increased. Once production increased and the Zambian market was satisfied, processors began to export semi-finished soya products such as soya cake.

It is evident through the research that Zambia is one of the key players in the soya bean industry in Southern Africa as it has become a net exporter of soya meal. The country's biggest international market is Zimbabwe, this may be due to elements of proximity as high production and transport costs hinder the Zambian soya bean value chain. Owing to the size of the Zambian market and its capacity to crush more soya beans than the country needs, this creates scope for developing a regional market in terms of production and regional demand. During the research it was indicated that the Zambian soya bean was the most desired within the region. This may be due to the good soil quality in Zambia which brings about a soya bean with a higher oil content. However, within the soya bean industry, price is the determining factor. Countries such as South Africa have better technology and more financing for their farmers whereas the majority of the farmers (small scale) struggle to receive financing and do not use technology such as combine harvesters to harvest their crop. As much as there is scope for a regional market, each country wishes to develop its own national value chain and upgrade along their national chains. Research in Zambia regarding the possibility of regional collaboration showed that countries would rather rely on

themselves than on another country. Respondents such as Mr Roodt (Novatek) indicated that he would rather have other countries within the region as markets rather than partners.

7.3 Research Objectives Set Out

From the research it is evident that the Zambian soya bean value chain has brought about numerous linkages. Industrialisation can take place in many forms, one of the avenues is through the increase in the demand of the consumption of goods. This value chain has shown backward linkages in areas such as manufacturing, the more the industry grows the more soya bean farmers will consume farming machinery as well as the farming inputs. This industry has also allowed for local industries to start up such as Nyombo, a local fertilizer company. Forward linkages includes soya product for non – human and human consumption (including the pharmaceutical industry). Zambia is able to export soya beans in its raw (bean), semi – finished (cake) and finished form (higher value product i.e. soya meal).

In terms of the second objective, there are aspects of trade literature and theory that are consistent with the research. However, the literature and theory do not give a robust explanation for the rapid increase in soya bean production. The literature is consistent with the research findings concerning the challenges of soya bean farmers, for example high cost of transportation, high cost of production and palm oil imports.

The third objective which set out to analyse the tensions, constraints and drivers of the soya bean value chain was achieved through the inter views conducted with various actors within the soya bean value chain.

7.4 Theories and Assumptions

With regards to the assumptions on trade theory, this research found that there are various elements that are not consistent with trade theory. The assumption that trade brings about competition within the market, the transferring of skills and knowledge and the increase to the welfare of the economy were disputed in that the palm oil imports pose a threat to the local edible oil industry making it difficult to local refineries to compete within the market. This in turn shows the lack of knowledge or skills transfers to the local refineries as they are

unable to compete and new refineries are unable to enter the market. In terms of the consumers, their standard of living is increased in that they can purchase edible oil at a lower price but it is difficult for other players to enter the market therefore decreasing the potential of local start up and job creation.

The assumption that trade allows for increasing returns to scale as the country develops a comparative advantage can be realised by the Zambian soya bean industry however, the Zambian soya bean industry has not reached that status. The country is crushing less soya beans that it has capacity. It is able to satisfy its own market and can export to its neighbour, Zimbabwe. At this point some of the main challenges regarding the soya bean industry is the high cost of production and transportation.²⁸ These factors affect the industry's ability to produce maximum quantities for export.

The research found that there is imperfect information within the soya bean industry in Zambia and entry and exit into the market is not easy and frictionless as theory suggests.

7.5 Policy Recommendations

The soya bean industry is limited in terms of policies specific to the soya bean industry, or that enable the growth of the soya bean value chain in Zambia. The agricultural policy that is most relevant to soya bean production is the GMO free policy that Zambia has undertaken. Some of the policy recommendations that would promote the environment for soya bean production are;

- i. Imported palm oil under COMESA negatively affects the whole soya bean chain. Perhaps the government could institute an import quota to allow local refineries to participate within the market. This form of industry protection will allow local oil industries to grow until they are more efficient and can compete with imported products.
- ii. Owing to the fact that one of the challenges that Zambia faces is that it is not reaching its processing capacity, there is therefore a need to increase soya bean production. In this regard government can support soya bean production (especially for the small scale farmers) by endeavouring to reduce production

²⁸ Geography plays a part in that Zambia can transport soya bean to countries that are closest geographically.

costs i.e. cost of inputs and providing financing to small scale farmers who currently find this difficult. Decreasing tax on agriculture input items for example machinery could also lend to reducing costs.

- iii. Zambian border controls and permits processes can be improved in order to allow products to flow into and out of the country with little difficulty.
- iv. The government can address the issue of storage for farmers by building storage facilities that are government owned and farmers can use them at a discounted rate.
- v. Access to soil testing for small scale farmers will aid production in the long run and save on time as farmers will know the type of soil they have off hand and be able to purchase the necessary chemicals and fertilizer. The government can create a standard mandatory test that is affordable.

7.6 Suggestions for Further Research

This research paper explored the Zambian soya bean value chain by investigating the constraints and challenges of the soya bean value chain in Zambia and analysing trade and GVC theory in relation to the chain. There are dimensions along the chain that can be used as future research such as the value chain of soya oil and the edible oil industry in Southern Africa. In relation to edible oil further research could explore why the cost of processing edible oil is expensive in Zambia and why refineries are not able to compete with COMESA imports. Owing to the fact that the poultry industry plays a significant role in the Zambian soya bean value chain, further study could look at the poultry trend within Southern Africa.

Another avenue that can be researched further is the effect the Zambian soya bean value chain has had on employment in linking sectors such as the poultry sector, agriculture sector and the oil industry. For example since the drastic increase in production of soya beans based on various factors such as the rise of the middle class, 1) has the number of employee in these linking sectors increased? 2) has the remuneration of employees in these linking sectors increased?

An area for further research would be to look at the possibility of regional integration using soya bean production as a case study in Southern Africa. This entails research at a

government policy level and an investigation into; at what point are governments willing to integrate an industry

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Appendix 1

	Processors	Address	Contact Details	Name	Company
1	National Milling	Cairo Road, Lusaka	+260211229548	YES	YES
2	Zamanita	Mumbwa Rd, Lusaka	211286448/1286450/ 1286460	YES	YES
3	██████████	6454 Buyantanshi Rd, Heavy Industrial Area, Lusaka	242380/0977740832 seba@sebafoods.co.zm http://sebafoods.co.zm/co ntact-us/	NO	NO
4	Olympic CBT	Bessemer Rd, Heavy Industrial Area, Ndola	+260 21 2651183/2650465 olympiccbt@olympicmilling .com		
5	Tiger Animal Feed	Mwembeshi Road, Light Industrial Area, Lusaka	+260286262/288052/ 212386	YES	YES
6	██████████	397A Kafue Rd, Lusaka	(0211) 273331/272075/274315 (website direct e-mail)	YES	NO
7	Novatek	Plot9070, Katanga Rd, Off Mumbwa Rd, Lusaka	286543/+26078779134		
8	Mount Meru Millers		255241/256833/ 0978180040 infozm@mtmerugroup.com	NO	YES
9	██████████	Acacia Park, 2 nd Floor, Arcades, Lusaka	211 845785	NO	NO
10	██████████ Flour Mills	Lusaka, Industrial Area		NO	NO
11	Astral Manufacturing Ltd	Lusaka and Kitwe	Berry.mwango@astralzamb ia.com		
	Input				
12	Seed Co	683B, Mumbwa Rd, Lusaka	211 846367-70/288048-9 seedco@seedco.co.zm	YES	YES
13	██████████		021 3220650/3220602 (website direct e-mail)	NO	NO
14	Zamseed	Buyantanshi Rd, Lusaka	211 243762/241283/248025/ 248026 zamseed@zamnet.zm/ zamseed@zamseed.co.zm	YES	YES

15	Omnia		+26 01 243 441 fertilizer@omnia.co.za or specialities@omnia.co.za	YES	YES
16			Mr. Miti	YES	NO
17	ATS Chemicals	Lusaka	Mr Mwaya	YES	YES
	Production				
18	Commercial Farmer	Chisamba, Zambeef	Mr Njamba	YES	YES
19	Farmer	Chisamba, Fringila	Mr Kalidas	YES	YES
20	Commercial Farmer	Chisamba	Mr Gordon		
21	Small/emerging Farmer	Kabwe	Mr Mwanguku		
22	Commercial Farmer	Mpongwe	Mr Mukuka	YES	NO
23	Commercial Farmer	Mkushi	Mr du Toit		
	Institutions				
24	COMESA	Lusaka		YES	YES
25		Lusaka, Showgrounds		NO	NO
26	Zambia Development Agency (ZDA)	Lusaka, Privatisation House			
27		Lusaka, Acacia Park	Mr Siyafunko	NO	NO
28	ZARI	Chilanga, Lusaka	+260211 278023 e-mail: zaridirector@zari.gov.zm		
29	Central Statistics Office				YES
	Declined				
1	Zambia National Farmers Union (Assoc)	Tiyende Pamodzi Road, Show Grounds, Lusaka	+260211 252649/255769/ 257958/254431/ 0977 722686(<i>website direct e-mail</i>)		
2	MRI	Lusaka			
3	IAPRI				
	No Response				
1	Agri Options	Mkushi	Mr Snyman		
2	Commercial Farmer	Mkushi	Mr. de Kock		
3	Commercial Farmer	Mkushi	Mr. Hunt		
4	Nutri Feeds	Lusaka			
5	TechnoServe	Lusaka			

Total Interviewed: 29 Respondents
Declined: 3
No Response: 5
Total Respondents Contacted: 37

Appendix 2

Possible Interview Questions

Input

1. What are the current prices of inputs (fertilizer etc.) in the country or in the different provinces?
2. How accessible are inputs to small holder and commercial farmers?

Seed Companies

1. Where in the Southern Africa region do you have offices?
2. Where does the seed come from, is it imported?
3. Is there a specific kind of seed that is used in Zambia?
4. How much seed do you sell?
5. Do you sell seed mostly to smallholder farmers or commercial farmers?
6. Who are your biggest customers?
7. How is the price of seeds determined?
8. Do you export seeds, if so how much?
9. Do you believe that the GMO ban in Zambia is a great constraint for the soybean industry?
10. What are the constraints within this (seed) industry?
11. In terms of the soybean value chain do you think there is scope for integration between the three countries?

Production

1. Currently what are the costs for growing soya beans among small and commercial farmers?
2. Which input is the greatest barrier to increased production/yield?
3. Who sets the price of soybeans and how is this done?
4. Is storage a problem? Are storage facilities equally accessible for smallholder and commercial farmers? At what price?
5. What other factors influence production cost?

Processing

1. Which companies process soybeans and why?
2. How does sunflower compete with soybean?

Trade

1. To what extent is there trade within the SADC region, or outside the region? And why?
2. Which policies have been put in place to support soy?

Infrastructure

1. What are some of the infrastructure constraints? – roads, silos.

Finance

1. Does the government or any other creditor give loans and are they easily repayable?