Harold Pupkewitz Graduate School of Business

An investigation of the Supply Chain challenges faced by small scale crop farmers at Etunda Irrigation Farm in Namibia

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I, Gustaf Mumbala, declare that this Thesis is my own unaided work. Any assistance that I have received has been duly acknowledged in the thesis.

This thesis is, therefore, submitted in the partial fulfilment of the requirements for the degree of Master of International Business at the Polytechnic of Namibia. It has not been submitted before for any degree or examination at this or any other Institution of Higher Learning.

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KEYWORDS: small scale farmers, smallholder farmers, Etunda irrigation farm, Green Scheme, supply chain challenges, SCOR model, logistics, Fresh Produce Hubs, retail chains in Namibia

Abbreviations:

AMTA:	Agricultural Marketing and Trading Agency
AgriBusDev:	Agricultural Business Development Agency
Agribank:	Agricultural Bank of Namibia
NDP_4:	The Fourth National Development Plan
NDP_2:	The Second National Development Plan
GSP:	Green Scheme Policy
WTO:	World Trade Organisation
SA:	South Africa
SACU:	Southern Africa Customs Union
SADC:	Southern Africa Development Community
SCM:	Supply Chain Management
SCOR:	Supply Chain Operation Reference
NAB:	Agronomic Board of Namibia
NHDI:	National Horticulture Development Initiative

ABSTRACT

The investigation of the supply chain challenges faced by small scale farmers at Etunda irrigation farm is the core of this study. The main rationale for the investigation is the fact that Green Scheme projects, of which Etunda is one of them, is one of the key economic development and diversification focus areas highlighted in Namibia's fourth national development plan (NDP_4).

The farming operations at Etunda are heavily dependent on logistical services for production inputs and post-harvest and marketing activities. The Government of the Republic of Namibia continues to make tremendous investment in the Green Scheme's production, logistics and marketing infrastructure, yet, the small scale farmers are struggling to transform from subsistence to fully commercial farming practices. This study found that the high cost of inputs, lack of inputs, limited flow of inputs, lack of suitable storage facilities and transportation services, lack of market access, lack of management skills, and lack of training are the main supply chain challenges faced by small scale farmers at Etunda irrigation farm.

The findings are of qualitative nature and thus not meant to provide the quantifiable results which can be better attained by a qualitative study or else the combination of both qualitative and quantitative studies. Nevertheless, the study addresses the key research objective which is simply to identify the supply chain challenges as observed and experienced by the stakeholders.

Furthermore, it emerged that, the effects of these challenges transcend down the food chain and therefore should not be addressed in isolation because they are of a supply chain nature.

The case-study research method backed up by semi-structured interviews were used to gather the empirical data in the Etunda supply chain.

CHAPTER 1 INTRODUCTION

1.1 RESEARCH BACKGROUND

The northern part of Namibia is characterized by subsistence crop and livestock farming. As such subsistence farming has been and still remains, the economic backbone of many households, especially in the rural areas in that part of the country.

The importance of the agriculture sector to rural households and national economy at large need no further emphasis. The Fourth National Development Plan (NDP_4), in line with Vision 2030, flags agriculture, logistics, tourism, and manufacturing as the four economic priority areas of focus for Namibia (National Planning Commission, 2012).

Namibia's commercial farming sector consists of approximately 4 200 farmers and enterprises and controls 44% of agriculturally usable land. Whereas, the communal farming sector, occupies 41% of the agricultural land and accommodates approximately 67% of the Namibian population of which an estimated 90% are dependent on subsistence agriculture for a living. The unequal arable land distribution points to the apartheid policies which enhanced ownership of superior grazing land by settlers in the central areas of the country (Emongor, 2008). Thus creating what Uvanga and Dempers (2006) called dualistic agricultural system with on the one hand black subsistence farming, in which women constitute the majority of producers and on the other hand white commercial farming, in which black farm worker provide the bulk of labour.

Thus, the transformation of the agricultural sector and the Green Scheme in particular, does have both political and economic credence among the previously disadvantaged citizens of Namibia. Fiebiger *et al* (2010) stresses that, through the Green Scheme Policy (GSP) which was approved in 2003 and revised in 2009, the Namibian Government aims to develop the potential of irrigation farming. Furthermore, Green scheme (2008) reveals Namibia's regional and international commitments on the agricultural sector such as Comprehensive Africa Agriculture Development Programme of the African Union and the New Partnership for Africa's Development. Namibia commits herself to the creation of national programs to enhance small-scale irrigation management, investing in roads, storage facilities, marketing infrastructure, packaging and handling systems, and input supply networks to raise the competitiveness of local production locally, regionally and internationally. The 2003 African Union Summit held in Maputo adopted a resolution to increase national budgetary allocation to the agricultural sector to at least 10 percent of the annual budget (Green scheme, 2008).

At the estimated cost of N$ 2.5 billion over the duration of the NDP_4, the Green Scheme aims to encourage the development of irrigation based agronomic production in Namibia with the aim of increasing the contribution of agriculture to the country's GDP. The project is in line with NDP-4's agricultural

objectives of addressing food security and increasing the average sector growth to 4% per annum over the NDP-4 period (National Planning Commission, 2012).

It is evident that there is a political will to up-lift irrigation crop farming, also known as Green Scheme, which is mostly made up of small-scale subsistence farming practices. In the Namibian context, an estimated 90% of the population depends on small-scale subsistence farming. Hence, the success of Green Scheme will obviously not only change the subsistence mind-set, but it will bring about massive socio-economic benefits. According to Green scheme (2008) Government recognizes that the most effective way to reduce poverty and improve food security is to raise the productivity of its agricultural resources on which poor people depend for their livelihood.

1.2 WHAT IS THE OBSERVABLE EVIDENCE OF PROGRESS TO-DATE IN THE OF GREEN SCHEME SECTOR?

The Tandjieskoppe Green Scheme Project evaluation report by Mwangi et al. (2004) gives a glimpse of the Green Scheme model as follows: commercial farming enterprises are tied to a settlement of small-scale farming units in a joint enterprise. The idea is for the latter to learn by watching the commercial farmer, thereby building local capacity in terms of production and marketing management. In addition, to training the commercial farmers serve as Service Providers to the small-scale farmers, by providing them with the necessary farm equipment, transport and marketing services at cost (Mwangi et al, 2004).

Irrigation is one of the key sectors identified to contribute towards poverty reduction in the second National Development Plan (NDP2), implemented between 2001 and 2006, through employment creation, diversification of the agricultural economic base, providing livelihood for the growing rural population and reducing rural to urban migration. The strategy of the National Horticulture Development Initiative (NHDI) is to develop the marketing infrastructure with refrigeration storage and ripening facilities at selected collection points for horticultural produce (Mwangi et al., 2004).

The aims of Green Scheme initiatives is to create an enabling, commercially viable environment through effective public-private partnerships, to stimulate private investment in the irrigation sub-sector and settle small-scale commercial irrigation farmers. Agribank is already involved in the Green Scheme sector, through the provision of production loans at Etunda, Orange River Irrigation Project, and Ndongalinene projects. Agribank has therefore developed loan facilities which do not require the small scale Green Scheme farmers' to have collateral security as long as they have a guaranteed buyer of their produce. To date, a total amount of N$9. 5 million was granted for Etunda Irrigation Scheme for both the service provider and the 86 small-scale farmers (Agribank of Namibia, 2013).

In line with the aforementioned commitments the following developments as highlighted by IIta (2012) in the report on food security can be noticed:
Via the National Horticulture Development Initiative **fresh produce hubs** are being developed in Rundu, Ongwediva, and Windhoek. The prime purpose of these hubs is the marketing of fresh produce, sorting, grading, branding, packaging and distribution in domestic and external markets. **Market Share Promotion** is also being used. The market share promotion endeavours to increase the share of locally produced fruits and vegetables in the domestic market. The share has increased from 32 per cent in 2010 to 37.5 per cent by 2011.

Despite all the aforementioned, noticeable progress made so far in terms of investments in farm infrastructure, land, implements, machinery and equipment by the government, there are still reports of non-performance on the part of the Green Schemes which continue to emerge. The NamibianSun (2013) reported that the Namibian government is incurring losses because of the agreement under which it acts as a guarantor for the Green Scheme-affiliated small-scale farmers with Agricultural Bank of Namibia (Agribank) loans. Additionally, the road, electrical, water, and housing infrastructures are in place at most, if not all the Green Scheme projects across the country. Therefore, one may argue that factors contributing to the non-performance of the Green Scheme-affiliated small scale farmers are not those related to infrastructure, but

perhaps on management, coordination, production, and marketing in response to economic forces of supply and demand.

1.3 THE PROBLEM STATEMENT

Small scale farmers at Etunda Crop Irrigation farm are facing supply chain challenges. The National Planning Commission (2012) as well as other media outlets cite high input costs; lack of access to domestic markets; lack of large scale production capacity to meet local demands; and stiff competition from crop products imports as some of the contributing factors to supply chain challenges.

Furthermore, the researcher observed glimpses of difficulties during the site visit to Etunda irrigation farm in December 2011. The informal discussions the researcher had with small scale farmers revealed that Farmers at Etunda unlike others on Green Scheme projects in the country use mixed marketing channels consisting of direct selling to consumers and bulk selling to government and retailers. Several types of vegetables such as tomatoes could be seen rotting on a number of farms despite the fact that December is a festive month and as such the consumption of agro-related products is relatively high all over the country.

This is so despite the governments' significant investments in the Green Scheme logistical infrastructure in the form of silos and fresh produce hubs. Logically, one would expect farmers to take advantage of the government

initiatives in order to attain good economic benefits by leveraging the available logistical infrastructure.

1.4 RESEARCH QUESTIONS

The observed predicament warrants a study of this nature in order to raise awareness of the following aspects: coordination and collectiveness among smallholder farmers could be key to survival and competitiveness in the marketplace, and the establishment of agro-food supply chain and its management, thereof, plus the possible linkages to the agro-food supply chain is essential for agro-industrialisation. This study will, therefore, try to provide answers to the questions listed below.

Main research question

The following research questions will provide the basis for the empirical data collection:

What are the supply chain challenges faced by small scale farmers at Etunda Irrigation Farm?

Sub questions

1. What is the supply chain status quo in the Green Scheme sector?
2. What are the typical supply chain challenges faced by the small scale crop farmers?
3. What are the practical solutions for overcoming the supply chain challenges?

4. What observable evidence is there of progress to-date on the Green Scheme sector?

1.5 RESEARCH OBJECTIVES

The main objective of this study is to identify the supply chain challenges faced by small scale farmers at Etunda.

The following are the sub objectives:

1. To explore the current supply chain environment in which the small scale farmers operate in.
2. To identify the typical supply chain challenges experienced by the small scale crop farmers in their daily operations.
3. To search for practical solutions to overcome the supply chain challenges for the small scale crop farmers.
4. To identify observable evidence of progress to-date in the Green Scheme sector.

1.6 MOTIVATION FOR STUDY

Namibia is a member of WTO, SADC and SACU, and as such, has to abide by the relevant provisions of these organisations as far as trade is concerned. Protection of infant industry for instance as per SACU (2007) article 26 can only be imposed for a maximum period of eight years. The obvious predicament for Namibia just like other developing economies is to find a balance

in terms of meeting her economic development agendas mostly consisting of infant industries within the bounds of international economic and trade policies.

It is quite evident that the infant industry protection measures in place or envisaged will one day cease. This means that this protected economic sector should be ready to face up to the competition then. The contemporary approach to competing in the modern business environment should, therefore, be well understood.

The small scale farmers in Namibia most of whom hail from the rural communities hold the hope for socioeconomic enhancement in the rural and urban areas alike in terms food supply. Therefore, supply chain challenges faced by small scale crop farmers who makes up the bulk of the farming community in numbers as opposed to land occupied is of particular interest.

Logistics, which is the critical component of the supply chain, and the Green Scheme has been highlighted in the National Planning Commission (2012, p. 82) and National Planning Commission (2012, p. 108) respectively, as one of the strategic focus areas for Namibia's economic development and diversification.

It is against this background that, this study seeks to provoke debate and further academic and industrial interest in the area of supply chain and

the related challenges faced especially by small scale farmers. This is not about overlooking the critical economic contribution the commercial farming communities continue to make in the domestic economy. But the historical evidence has shown that the challenges faced by the commercial sector, mostly made up of minority members of the society are not as enormous as those faced by small scale farmers. Therefore, the departure point of this study is the view that modern competitive business environments call for modern organizational setups appropriate to face up to supply chain oriented competition.

1.7 DELINEATION OF RESEARCH

Establishing the supply chain challenges faced at Etunda is the starting point to supply chain performance improvement. However, the main focus of this research work is to try to discover and list these challenges without going into the depth of discovering by what scale these challenges impact supply chain performance at Etunda.

1.8 THESIS OUTLINE

Chapter 1: Introduction

This chapter gives a brief background on the current supply chain operating environment for the small scale farmer in Namibia, the problem statement, research questions and objectives, motivation for the study, delineation of the research and the thesis outline.

Chapter 2: Literature Review

This chapter gives the literature findings in relation to sub questions, the theoretical and conceptual framework followed by a summary of the literature reviewed.

Chapter 3: Research Methodology

This chapter outlines the philosophical assumptions, the research strategy and methodology, data collection instruments, ethical consideration and the summary of the chapter.

Chapter 4: Results

This chapter gives the sample description, data analysis, and reliability of instruments, validity of measurements, the limitations observed and summary for the chapter.

Chapter 5: Discussion

This chapter discusses the meaning of the main findings presented in chapter 4, revisit the main research question and gives an overview of how answers to the questions were analysed and thereafter summarizes the content of the chapter.

Chapter 6: Conclusions and Recommendations

This chapter sums up the findings in relation to the research objectives and further set the motion for future follow up research work as well as give recommendations for necessary interventions to be undertaken to address the research problem.

CHAPTER 2 LITERATURE REVIEW

2.1 INTRODUCTION

Market liberalisation and foreign direct investment in domestic economies across the world are changing the basis of competitiveness and market share expansion. As such, the contemporary and yet competitive business environment calls for a paradigm shift by both small and big business enterprises across the globe. Businesses that still operate and try to compete for the market share based on the traditional one-man approach faces an uphill survival battle. Ford et al. (2010) argue that the main reason business competition no longer involves organizations competing against each other, but rather competition is now at the supply chain level with entire supply chains competing against each other.

The Green Scheme sector in Namibia, which is mostly made up of emerging commercial small scale, crop farmers, is not immune to the survival pressure which comes with market liberalisation and foreign direct investment. This view is augmented by Emongor (2008) who stated that the agro-food system in Namibia is changing due to increased foreign direct investment by South African supermarkets. South African supermarkets source fresh fruits and vegetables from South Africa or elsewhere via specialised wholesalers, specialised sourcing companies and large scale farmers. Subsequently, Emongor (2008) further argues, small scale farmers are excluded from fresh fruit and vegetables supply chain of supermarkets in Namibia.

The essence of supermarket supply chain within this context as observed lies with the ability to effectively and efficiently distribute agricultural produce and the related services in the market place.

What exactly do we mean by supply chain or supply chain management? Literature has revealed variations in the definition of supply chain and supply chain management. According to Simchi-Levi et al. (2009), supply chain management is a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed in the right quantities, to the right locations, and at the right time, in order to minimize system wide costs while satisfying service level requirements. Whereas Waters (2010, p. 4) states that supply chain management is a fundamentally different philosophy of business organization and is based upon the idea of partnership in the marketing channel and a high degree of linkage between entities in that channel. Under the supply chain management model the goal is to maximize profit through enhanced competitiveness in the final market, a competitiveness that is achieved by lower cost to serve, achieved in the shortest time-frame possible (Waters, 2010, p. 4). Furthermore, Damon and Lilze (2000) argue that supply-chain management is the process introduced to tear down the functional walls of traditional business management and reduce costs.

On the other hand Garcia (2009) argues that, so far, there is no unique definition of supply chain. Because a supply chain may be defined in terms of management processes, operations, functions or a management philosophy. Depending on functions, organizations, and industries, the complexity of a supply

chain leads to different points of analysis and definitions of what supply chain management (SCM) is (Garcia, 2009). The situation which according to Kasi (2005) creates a lack of standard terminology and improvement opportunities in terms of which the key performance indicators within a supply chain system are. One of the many Supply Chain Management definitions is the one provided by La Londe and Masters (2004) who stated that the supply chain is a set of independent firms of retailers, transportation companies, suppliers, and wholesalers passing materials forward by manufacturing a product and placing it in the hands of a customer. In other words, SCM is an integrating function, which links major business functions and business processes within and across an enterprise to achieve a higher performance for all involved parties.

New markets are emerging through market liberalization and thus presenting an opportunity for small scale business entities to tap into in order to further enhance their economic benefits and that of the respective host nations. However the prospects of gaining new foothold in the new market place come with pressure to spontaneously and competitively meeting consumer needs and preferences. These demands of the contemporary marketplace, unfortunately, may come with associated costs, which, if not managed may erode the motives of business expansion.

Ford et al. (2010) argue that in order to compete in this new reality, most organisations are seeking to closely integrate their internal operations and effectively link them with the external operations of supplier and clients of supplier and customers. One essential requirement in this integration is that

supply chain takes advantage of existing and emerging technologies and systems that can be used to link and enable the entire supply chain. These technologies and systems, which allow supply chain members to use information much more effectively in the rapid delivery of goods and services to customers (Ford et al., 2010).

In the Namibian context and the Green Scheme in particular, the Green Scheme Policy (2008, p. 13) states that in order to stimulate the production for both grain and horticultural produce, the government will implement support programs towards the construction and development of grain storage and cold storage facilities and marketing infrastructure. The domestic marketing infrastructure will be composed of collection points and distribution networks within the domestic market so as to increase the share of locally produced crop products. Promotion will also be made for processing and value addition so as to create a diverse range of products in line with the market demand (Green Scheme Policy, 2008, p. 13).

At the domestic level, however, no significant emphasis is being explicitly placed on the essence of supply chain and its management as a tool for sustainable value creation for consumers and subsequently product competitiveness in the marketplace. Notably, the promotion of value addition and the diversification of products is among Namibia's Green Scheme policy focus areas. This is a step in the right direction and is in line with the emerging school of thought on the essence of supply chain management in the contemporary marketplace. The supply chain in the uncertain, turbulent contemporary business

environment, according to Christopher (2011) is no longer about cost reduction, but is evolving to value creation for consumers via forging a genuine relationship with the chain participants both within an enterprise and beyond.

One may argue that value creation and value addition, should underpin the aggro-industrialization agenda in an emerging economy like Namibia's. Agro-industrialization is defined by Boehlje (1996), as the application of modern industrial manufacturing, production, procurement, distribution and coordination concepts to the food and industrial product chain. From the definition of aggro-industrialization, one may deduce that all the aforementioned activities of the industrial product chain ties in closely with the above highlighted supply chain management definition. Hence, the question may be asked as to whether agro-industrialization or alternatively value addition and value creation can be accomplished without sound inter-linkages between relevant centres of production and consumption in an emerging economy like Namibia. The report by the The World Bank (2013b) on Africa Agribusiness argues that the attention focused on production agriculture will not achieve its developmental goals in isolation from agribusinesses, ranging from small and medium enterprises to multinational companies. It is further stressed that the challenge is thus threefold: (1) develop downstream agribusiness activities (such as processing), as well as upstream activities, (such as supplying inputs), (2) develop commercial agriculture, and (3) support and link smallholders and small enterprises to productive value chains.

Namibia like any other developing nations is going through typical economic developmental challenges such as the need to sustainably create jobs via economic development and diversification. The agricultural and Green Scheme sector, in particular, has been pinpointed as an alternative to long term sustainable economic development.

Behind these challenges lies opportunities and thus the rest of this chapter will concentrate on highlighting the typical supply chain challenges encountered by the small scale crop farmers, the practical ways of addressing these challenges, and the benefits that could accrue by addressing these challenges.

2.3. WHAT ARE THE TYPICAL SUPPLY CHAIN CHALLENGES FACED BY SMALLHOLDER FARMERS?

Small scale farmers constitute small operations and they therefore produce at a smaller scale. Therefore, as Doering and Boehlje (2000) argue, smaller operations, not associated with an industrialised system, will have increasing difficulty gaining the economies of size and the access to technology that is required in order to be competitive.

The report by Mwangi et al. (2004) cites that lack of supporting marketing infrastructure and related essential services and marketing strategies have contributed to local producers' inability to identify markets to export their produce to and compete with the South African market. They also face the difficulty in complying with quality and quantity controls, and continuity of supply for the export market due to inadequate training in market planning. The same report further states that the sector is constrained by the high cost of inputs, lack of

access to credit and risks related to drought or frost, inadequate field extension staff and inadequate transport facilities for field staff coupled with the long distances to get to farmers in sparsely populated areas and inadequate research support. Furthermore, stated the same report, the high cost per unit of land has also constrained farmers' access to agricultural land.

Van Renen (1997) argues that unlike commercial farmers', small scale farmers face more challenges when it comes to market access and are still largely precluded from using two of the most profitable channels, such as direct sales to supermarkets, and exports. In the case of the former, this is mainly the result of lack of management skills, as well as the very small quantities produced. Quality also suffers as a result of less than the optimal production infrastructure (e.g. irrigation systems) and a lack of suitable storage facilities. This is also the reason for not being able to enter the export market. Constraints include a lack of transport services, a lack of road infrastructure, communication infrastructure and storage facilities. Farmers also need training and a regular source of market information, concludes (Van Renen, 1997).

Other reasons cited for lack of participation in commercial markets by smallholder farmers in South Africa are as follows:

High transaction costs according to Fenwick and Lyne (1999), shortage of quality labour Nattrass and May (1986), poor liquidity, including low cash income and limited access to credit and saving facilities Christensen (1993), a dearth of information Delgado (1996), tenure insecurity Thomson and Lyne (1993) and weak growth linkages Hopkins et al. (1993). Groenewald (1993) maintains that a

lack of entrepreneurship, expertise, tenure security, access to product and factor market the small farm size and inappropriate technology are the major bottlenecks to agricultural modernization in third world agriculture.

Small-scale farmers in South Africa, just like in other developing countries, have limited access to factors of production, credit and information; and markets are often constrained by inadequate property rights and high transaction costs (King and Ortmann 2007).

As pointed out by Reardon et al. (2009) and confirmed by Louw et al. (2007) in a dualistic agricultural context, as is clearly the case with South Africa, small-scale farmers are largely excluded from large retailer procurement schemes that demand a high level of technology in terms of farming and post-harvest handling practices.

According to Delgado (1999) the absence of participatory local governance favours a dual production system composed of large commercial farms and smallholders left to their own devices.

A common characteristic of the global food system is the adoption of ever more stringent quality criteria to which developing countries are increasingly being forced to adhere to. To the extent that developing country governments do not impose international-level standards, private standards are being implemented by the leading players in retail and food processing (Farina & Reardon, 2000).

Nonetheless, Lundy et al. (2005) argue that market access proponents make a strong and attractive case that for small farmers to thrive in the global economy,

it is necessary to create an entrepreneurial culture in rural communities where farmers produce for markets rather than trying to market what they produce.

As a result of Agro-industrialisation, Boehlje (1996), Berdeque and Reardon (2002), Watling and Nadvi (2004) argue, processors and retailers demand products with specific characteristics coming from reliable suppliers that guarantee quantity, quality, frequency and timing. Therefore, the increase in specificity of produce requirement set by buyers makes spot market an inappropriate source of supply, thereby encouraging in this way contractual relationship between farmers and processors/retailers.

Eighty percent of small-scale farmers in Botswana, Namibia and Zambia were subsistence-oriented. This category of small-scale farming was excluded from the supermarkets' Fresh Fruit and Vegetables supply chains due to erratic production and their inability to meet the chain supermarkets' quality and quantity requirements (Emongor & Kirsten, 2009).

Blandon (2006) reasoned that high transactions costs inhibit transaction between buyers and sellers. In that situation, collective action becomes a key factor to reduce the transaction costs. He further argued that the volume and frequency required makes it impractical for the small scale farmer to establish a direct relationship with a supermarket chain.

2.4. WHAT ARE THE PRACTICAL SOLUTIONS FOR OVERCOMING THE SUPPLY CHAIN CHALLENGES?

Several strategies for overcoming market access challenges by smallholder firms which have been suggested are as follows:

Glover (1984), Key and Runsten (1999), Poulton et al. (2010) argue that contract farming is generally considered as an attractive mechanism for integrating poorer farmers into the open-market economy and, subsequently, for increasing production and farm income.

Delgado (1999) and Holloway et al. (2000) contend that institutional arrangements, according to products such as vertical coordination (e.g., through contract farming) and horizontal coordination (through producer groups such as cooperatives), may help to reduce the relatively high transaction costs smallholders face and may help them to overcome access barriers to production resources, information, services and markets for high value.

Mkhabela (2002) argues that policies such as helping small-scale farmers to organise into co-operatives and associations would help reduce the high unit costs of negotiating deals, transportation, treating and storing of manure.

Louw et al. (2007) advocated for lowering the transaction costs for both the smallholders and supermarkets, as these strengthen forms of collective action among smallholders to promote equity and competitiveness. More specifically, Louw et al. (2007) maintained, this should facilitate co-ordinated efforts to: train farmers in product quality and marketing; enable farmers to comply with delivery schedules; overcome transport problems; and access cheaper inputs.

The South African (SA) government is promoting the use of cooperatives as organizations that could help enhance the development of small-scale farmers and other communities in South Africa. In August 2005 a new Cooperatives Act (No.14 of 2005), based on international cooperative principles, was signed into law by the SA government. The International Cooperative Alliance (2005) defines a cooperative as "an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise" (Ortmann and King, 2007).

In Thailand, according to Pingali (2004) international retailers such as 7-eleven, Royal Ahold, Tesco, Makro, and Sainsbury have been establishing supermarkets to serve the growing domestic market for fruit and vegetables. Small farmers according to Van Roekel et al. (2002) were integrated into the fresh food supply chains via networks of contract farmers and buyers who are preferred suppliers, and via informal farmers' associations. Sabharwal (2003) and Deshingkar et al. (2003) argue that similar cases of agricultural diversification and the emergence of contracts between farmers and large food outlets can also be observed in India. In India, companies such as McCain (major supplier to McDonalds') negotiate with small farmers directly for the provision of potatoes. In these types of

agreements, the large food outlet undertakes the required investment necessary to produce the specific product (Sabharwal, 2003).

Improving market access includes the following components: (1) reforming the regulatory and taxation system; (2) improving market infrastructure (e.g., building more roads, post-harvest facilities, market centres); (3) establishing agricultural marketing information systems, and (4) strengthening farmer groups and creating market linkages. Given the right set of assets and attributes, the formation of groups can be an effective mechanism for improving livelihoods of smallholder farmers. By forming a collective, smallholders have a greater ability to maximize existing resources, as well as access new resources that increase their chances of achieving positive livelihood outcomes (BARHAM, 2007).

In order to enhance supply chain participation by small-scale farmers Blandon (2006) suggested development of the policies addressing the following areas:

- Technological barriers such as those associated with entry cost, output, quality, and frequent production.
- Tackling marketing barriers associated with particular characteristics of procurement systems used in the supply chain such as grading, selling place and payment system.

2.5. WHAT BENEFITS COULD ACCRUE TO THE SUPPLY CHAIN PARTICIPANTS BY OVERCOMING THESE CHALLENGES?

Awad and Nassar (2010a) argue that the integration of technology, people, business and processes is crucial for the survival and the competitive edge in the current digital age and this is not important only within a firm but also across extended enterprises. It is further stated that the most significant form of supply chain integration is information sharing.

Several benefits of collaboration among smallholder farmers, according to Delgado (1999) are as follows:

The farmer typically gains the benefit of assuring supplies of the right inputs at the right time, frequently credit against crop deliveries, and an assured market for the output at a price not always known in advance, but applied equally to all farmers in a given location and time period. Extension is usually part of the service provided, typically at higher rates (and quality) than state extension services.

Kay (1981) argues that ffixed costs such as management, supervision, information and machinery can be spread over more units of output resulting in reductions in cost per unit of output (increasing returns to scale or size). Hallam (1991) defines returns to scale as the proportionate change in output when all inputs are increased in the same.

Warr (1994) argues that in the future supply chains will compete amongst one another, and if only certain elements in the supply chain perform efficiently the full potential for value adding will not be realized.

The NCFC (2005) cited in Ortmann and King (2007) echoes these sentiments by providing the following reasons why cooperatives were, or are being formed: to strengthen bargaining power; maintain access to competitive markets; capitalize on new market opportunities; obtain the needed products and services on a competitive basis; improve income opportunities; reduce costs; and manage risk.

Small-scale farming, according to Delgado (1999) is more politically acceptable and sustainable option than an economy relying mostly on large commercial farmers.

Organisations that do not compete in isolation and their wider supply chains create high-value products and services for end-consumers. Some authors have even argued that it is the extent that organisations are integrated with their supply chain "partners" that determines their competitiveness (Christopher, 2011).

Collective action allows farmers to pool produce in order to guarantee frequency and variety. Thus in the same way, collection, manufacture, transportation, and distribution costs can be lowered. Hence, this enables the small scale farmers' integration to the supply chain (Blandon, 2006).

2.6 THEORETICAL FRAMEWORK: SCOR MODEL BACKGROUND

The Supply Chain Operations Reference-model (SCOR) is a process reference model that has been developed and endorsed by Supply Chain Council as the cross-industry standard diagnostic tool for supply chain management. SCOR enables users to address, improve and communicate

supply chain management practices within and between all interested parties. SCOR is a management tool. It is a process reference model for supply chain management, spanning from the supplier's supplier to the customer's customer. The SCOR-model has been developed to describe the business activities associated with all phases of satisfying a customer's demand. By describing supply chain using process building blocks, the model can be used to describe supply chains that are very simple or very complex using a common set of definitions. As a result, disparate industries can be linked to describe the depth and breadth of virtually any supply chain. The model has been able to successfully describe and provide a basis for supply chain improvement for global projects as well as site-specific projects. SCOR is a consensus model. It was developed and continues to evolve with the direct inputs of industry leaders who manage global supply chains and use it daily to analyse and improve the performance of their organizations. SCOR, as the Supply Chain Council (2013) further stresses, features an intentionally broad scope and definitions that can be adapted to the specific supply chain requirements of any industry or application.

2.6.1 SCOR Management Processes

According to Supply Chain Council (2013) the following five major supply chain management processes, which are also depicted in Figure 1, can be described as follows:

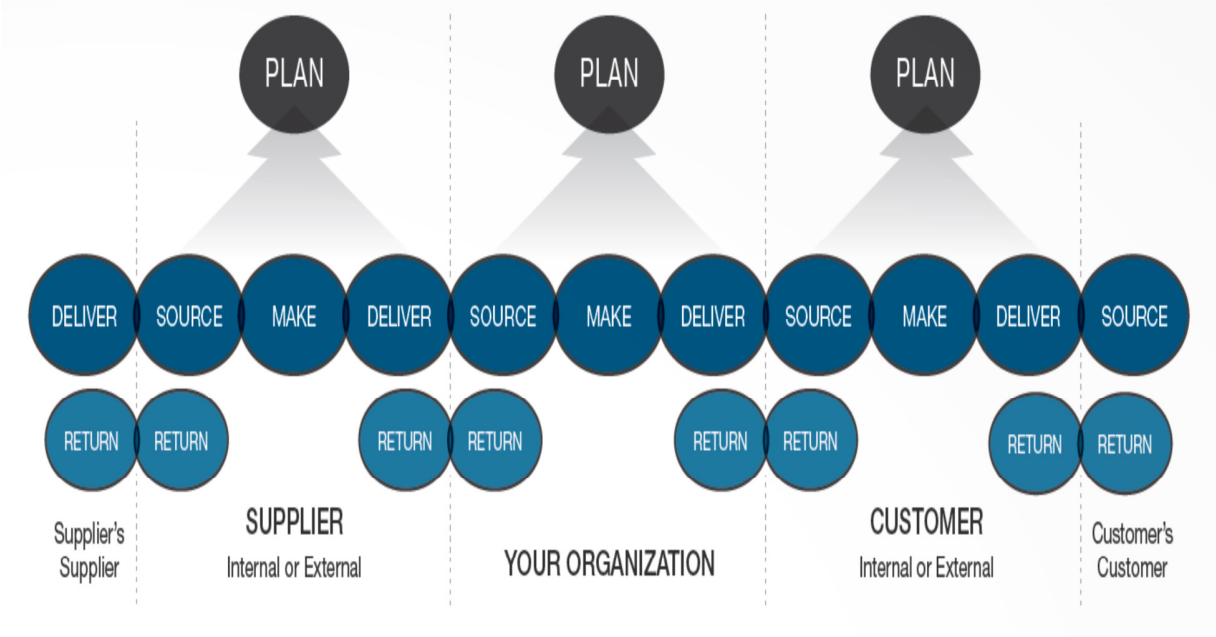

Figure 1: The five major management process of the SCOR-Model (Supply Chain Council, 2013)

1. Plan (P)

The Plan processes describe the planning activities associated with operating a supply chain. This includes gathering customer requirements, collecting information on available resources, and balancing requirements and resources to determine planned capabilities and resource gaps. This is followed by identifying the actions required to correct any gaps.

2. Source (S)

The Source processes describe the ordering (or scheduling) and receipt of goods and services. The Source process includes issuing purchase orders, scheduling deliveries, receiving, shipment validation and storage, and accepting supplier invoices.

3. Make (M)

The Make processes describe the activities associated with the conversion of materials or the creation of the content for services. It focuses on conversion of materials rather than production or manufacturing because Make represents all types of material conversions: assembly, chemical processing, maintenance, repair, overhaul, recycling, refurbishment, remanufacturing, and other material conversion processes. As a general guideline these processes are recognized by the fact that one or more item numbers go in, and one or more different item number come out of this process.

4. Deliver (D)

The Deliver processes describe the activities associated with the creation, maintenance, and fulfilment of customer orders. It includes the receipt, validation, and creation of customer orders; scheduling order delivery; pick, pack, and shipment; and invoicing the customer.

5. Return (R)

The Return processes describe the activities associated with the reverse flow of goods back from the customer. The Return process includes the identification of the need for a return, the disposition decision making, the scheduling of the return, and the shipment and receipt of the returned goods Repair, recycling, refurbishment, and remanufacturing processes are not described using Return process elements. See Make for clarification.

2.6.2 General remarks on SCOR framework

It is worth noting that the aforementioned process definition (i.e. Figure 1) represent the high level also called level 1 of the supply chain management by the Supply Chain Council. According to Supply Chain Council (2013) other levels of process definitions such as level 2,3 4 also forms part of the SCOR model as well. However, for the purpose of this study the usage of SCOR up to level 1 will suffice; the reason being that attention will not be paid to the specifics of the particular supply chain process improvements.

Furthermore, the focus of this study is the supply chain challenges in the context of small scale crop farming at Etunda irrigation farm starting with the entry and uptake of crop production inputs and ending with crop products' arrival in the marketplace. Therefore, for the sake of completing this research project the reverse logistics processes also referred to as Return (R) in the SCOR model has been omitted. Furthermore, the researcher felt that the Etunda farm produce with the exception of cereal is mostly fresh produce, which is highly perishable. This means that reverse logistic (Return (R)) will not be applicable in this case.

2.7 CONCEPTUAL FRAMEWORK: ADAPTATION AND APPLICABILITY OF THE SCOR MODEL TO THE STUDY

Literature review has revealed the existence of diverse definitions of supply chain and subsequently, the lack of a uniform description of the related processes. This study attempts to bring to the fore the supply chain challenges faced by Etunda small scale farmers. This objective cannot be accomplished without a broad overview of the constraints faced at each process of the chain.

Furthermore, the Green Scheme concept is relatively new and probably unique within the domestic context, and therefore, ambiguity in terms of process definition could possibly complicate the comprehension of the findings by the general audience. Additionally, there is need to establish a framework and context based on the relevant research data collection, analysis, interpretation and recommendations. The SCOR model as per Supply Chain Council (2013) presents the following crucial benefits:

1. SCOR provides a common language for supply chain classification and analysis. Using a common language and framework makes it easier for teams to communicate, speeds benchmarking efforts and enhances the evaluation of best practices.
2. The SCOR model provides a framework for measuring and understanding current supply chain conditions and performance and creates a foundation for improvement. It can help supply chain managers evaluate the cost-performance trade-offs, develop strategies for meeting new customer expectations, and respond to domestic and global market growth.

Subsequently, the Supply Chain Council SCOR model (i.e. Figure 1) was adopted in Figure 2 in order to depict the conceptual framework for Etunda supply chain. For the purposes of this study the process Source (S) has been renamed to Source Inputs, Source Crop Products respectively; Make (M) has been renamed to Store Inputs, Cultivate Crops, and Market/Sell Crop Products respectively; whereas Deliver (D) has been renamed to Deliver Input, Deliver Crop/Products respectively.

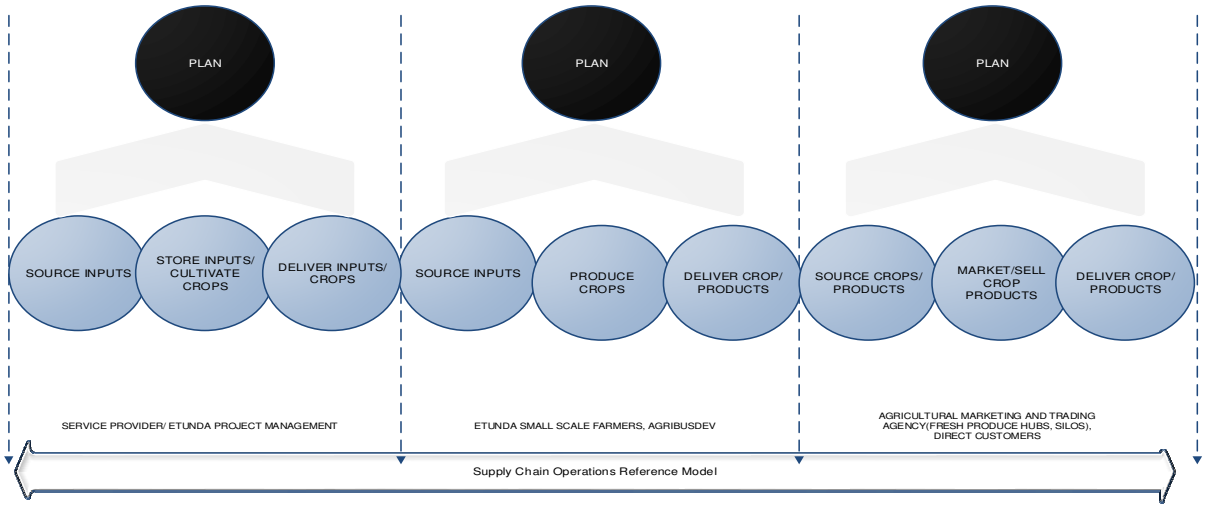

Figure 2: Adapted SCOR Model

Although this study does not go into the specifics and details of a particular supply chain process improvement, the adopted SCOR model remains very much relevant in terms of providing a structured approach to establishing a focus area for data gathering, detecting emerging themes and attaching contextual meaning to the research findings.

2.8. SUMMARY

Factors such as agro-industrialization, globalization and multi-nationalization, change in technology, trade liberalization and policies, and new consumers demands, as Blandon (2006) mentions, are the driving force behind the market transactions shift from the spot market to vertically-coordinated markets. Coordination between buyers and sellers can occur in different ways, along a 'vertical coordination continuum', including contracts, alliances, and joint ventures. The arrival of retail majors may bring marketing opportunities to the

local and international markets (Blandon, 2006). However, the grades and standards associated with the procurement system could be hindrance to small-scale participation in agro-food system.

Large-scale producers are paramount to the export business at national level. However, the small holders are vital to communities and regional stability (Chisholm, 2011).

CHAPTER 3 RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

This chapter gives an insight on the main research question, the appropriate research approach, the methods and instruments of data collection adopted to address the question. Measures to address the expected academic standards on ethical considerations have been highlighted as well.

3.2. RESEARCH QUESTION

The following research question has been the core of empirical data collection:

What are the supply chain challenges faced by small scale farmers at Etunda Irrigation Farm?

3.3 OVERALL RESEARCH APPROACH

Limited literature has been found on challenges faced by the small scale farmers in Namibia and crop farmers in particular. However, with regards to Etunda supply chain challenges, no relevant literature could be found. There is a need to unearth the real supply chain challenges as experienced by the farmers at Etunda. Notwithstanding the fact that challenges documented thus far at the national level might as well have existed within the Etunda supply chain, although perhaps at a different scale and magnitude, the researcher is of the opinion that an assumption could be made that the supply chain challenges faced by small scale farmers at Etunda irrigation farm are yet to unravelled. This assumption is in line with the main research question posed in this study as highlighted in 3.2. By asking “What are the supply chain challenges faced by small scale farmers at

Etunda Irrigation Farm?" Furthermore, Creswell (2003) suggest that the ideal research design framework constitutes three elements namely philosophical assumptions; general procedure of the research called strategies of inquiry, and detailed procedures of data collection, analysis and writing called methods. Additionally, J.W.Creswell et al. (2007) assert that a research design is a plan or strategy which moves from the underlying philosophical assumptions to specifying the selection of respondents, the data gathering techniques to be used and data analysis to be done.

Having made the assumptions, the next point of consideration is then what should be the appropriate inquiry strategy, data collection, analysis and interpretation in order to address the main research question.

This study is about challenges faced by small scale farmers at Etunda within the supply chain context. Based on the assumption made earlier on, it is justifiable to adopt a qualitative research strategy. According to Morse (1991) the qualitative inquiry strategy is applicable when the topic is new, the topic has never been addressed with a certain sample or group of people, or existing theories do not apply with the particular sample or group of people under study. In this case and as indicated earlier, there are no direct research reports on supply chain challenges faced by small scale farmers at Etunda, hence the choice of a qualitative research strategy. Qualitative research is further defined by Claire et al. (2013) as a situation where words and sentences recorded from interviews or focus groups, written responses to open-ended questions are the only means of gathering sensitive information about experiences of humans.

The Etunda Green Scheme project is one of the established projects in Namibia under government funding. The supply chain challenges faced by small scale farmers at Etunda are not necessarily applicable to other Green Scheme projects in Namibia due to other factors such as the farmers' cultural backgrounds, operational contexts as well as the geographical location of the farm in relation to the market place. Etunda's small scale farmers constitute the unit of analysis within the supply chain context, and, therefore, this scenario whereby a particular organization is been studied befits the case study definition (Creswell et al., 2007). As a research method, Bromley (1991,p. 302) argues that the case study is a systematic inquiry into an event or set of related events which aims to describe and explain the phenomenon of interest. The combination of the small scale farmers at Etunda and the related supply chain challenges as the basis of this study, therefore, justify the choice of a case study both in terms of the unit of analysis and research method. The key strength of the case study method according to J.W.Creswell et al. (2007) is the use of multiple sources and techniques in the data gathering process.

Based on the above-mentioned definition of the case study, it is therefore, evident that the set of respondents is made up of players in the Etunda supply chain including small scale farmers.

There is a need to select the appropriate data collection tools. According to Yin (1994) interviews, surveys, documentation review, observations and even the collection of physical artefacts are among the suitable data collection tools.

The interviewees were chosen to gather cross sectional, primary data representing a respondents' point of view and experience.

After making the philosophical assumptions, the research method, the appropriate data collection tool and the sampling approach were chosen. According to Creswell et al. (2007) purposive sampling means participants are selected because of some defining characteristics that makes them holders of data needed for the study. In this case, the objective is to uncover supply chain challenges faced by small scale farmers at Etunda. Therefore, participants were purposely chosen based on the role they play in the supply chain.

3.4. RESEARCH METHODOLOGY

The choice of a case study as a research method has been made on the premise that in depth primary data about the challenges faced by small scale farmers at Etunda can only be uncovered by interviewing the farmers, as well as the associated players in the supply chain. Since the supply chain topic is relatively new to the participants there was a need to guide the direction of the interview sessions. This was accomplished by the use of open-ended questions.

3.5 DATA COLLECTION INSTRUMENTS

According to Creswell et al. (2007) semi-structure interview seldom spans a long time period, and usually requires the participants to answer a set of predetermined questions while at the same time allowing the probing and clarification of unclear responses. Hence the technique used by the researcher was to use a set of predetermined questions and then probe further in cases where the responses were unclear.

The researcher developed fifteen (15) interview questions. The literature findings from chapter 2 plus the SCOR model informed the phrasing of interview questions. For instance, where literature review found market access to be one of the typical supply chain challenges a deliberate effort was made to incorporate that aspect in the interview questions. The SCOR model was used to identify the appropriate respondents, the critical supply chain processes as well as to guide the incorporation of the key aspects of supply chain principles in the interview questions. This implies that the flow of interview sessions as guided by the predetermined open-ended interview questions went along the SCOR principles of the plan to “Source, Make, Deliver” illustrated in Figure 1 in chapter 2.

All the interview sessions were recorded by means of audio recording equipment (i.e. Samsung Galaxy Tab).

3.4. ETHICAL CONSIDERATIONS

The questionnaire is made up of the introductory part and the list of open-ended questions. The introductory part gives a background on the researcher, the problem statement, the justification of the study, as well as statements relating to the research ethical requirements. The content of the questionnaire in most cases was read out by the researcher to each participant at the beginning of each interview session. But there were also cases where the questionnaire had to be dispatched to the respondent a day before the interview as per the respondents’ requests. In addition, to sensitizing the participant on their rights to

partake, in the survey, permission was also sought from the participants to record the interviews.

Furthermore, the participants' identities were completely removed during the data analysis process. Additionally, assurance was given to participants that the research report will be made available to them upon completion of the project.

3.5 SUMMARY

The outlined research approach represents a blueprint for the research project. The main research question; the respective philosophical assumption; the inquiry strategy; and the detailed data collection strategies were outlined. Data analysis is covered in the next chapter (chapter 4).

CHAPTER 4 FINDINGS

4.1 INTRODUCTION

This chapter outlines the composition of the sample, data analysis methods and tools used, presentation of the findings as well as a description of the encountered constraints during the data collection and data analysis exercises.

4.2 DESCRIPTION OF SAMPLE

In total eight interviews were conducted by the researcher with the following sets of participants: three interviews with small scale farmers, one interview with the on-site service provider who is also a large scale farmer, two with the Agricultural Marketing and Trade Agency (AMTA) officials, two with the Agricultural Business Development (AgriBusDev) officials. The following diagram which is an adapted SCOR model depicts the Etunda supply chain with its processes, and all the players and stakeholders in the chain.

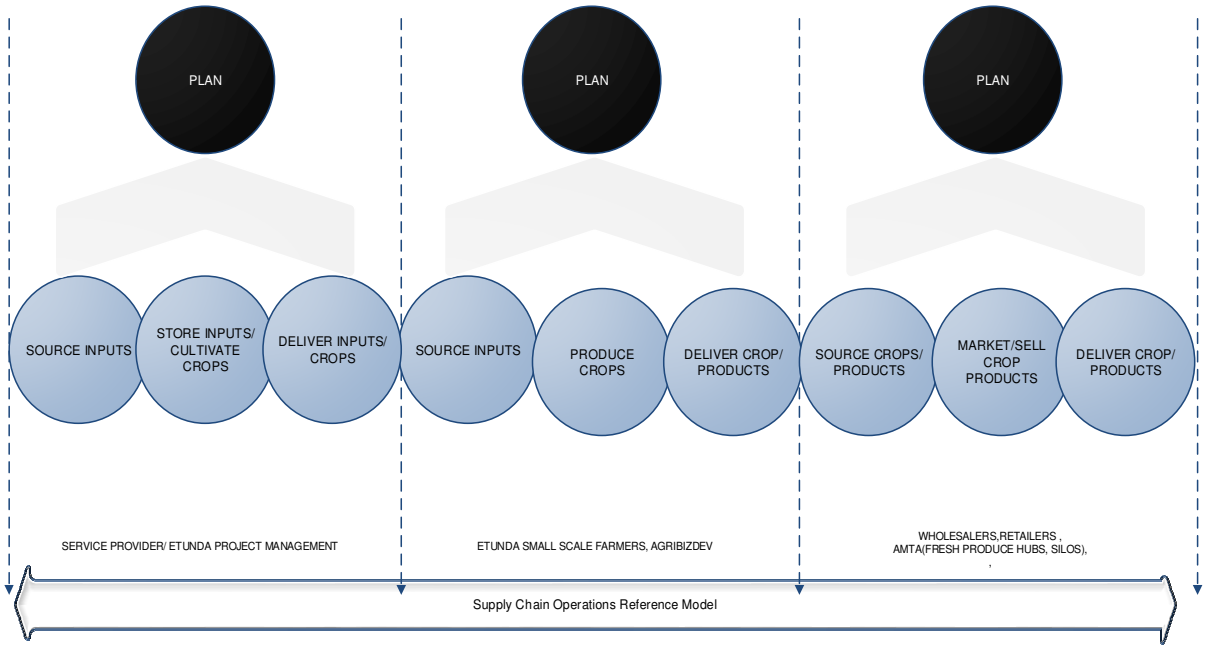

Figure 3: Adapted SCOR Model

The SCOR model prescribes the Plan, Source, Make, Deliver and Return as the key supply chain processes per supply chain participating organization. The interconnectivity among processes (depicted by circles) in figure 2 illustrates cross-organizational linkages and interdependencies across the chain which is in line with the supply chain definition. Meaning, for instance the input sourcing and planning by the Etunda Project management rely on the input sourcing plan by the small scale farmers and vice-versa.

Based on figure 2, the target population is thus made up of on-site crop farming input supplier also known as Etunda Project Management, small scale crop farmers, Agricultural Marketing Agency (AMTA), Retailers and Wholesalers, and Agricultural Business Development Agency (AgriBusDev). Briefly, as revealed during the interviews with the participants, some of the roles played by the respective participants are as follows:

- Etunda Project Management- acquires, stores and distribute the crop production inputs and the related services needed for crop production by the Etunda small scale farmers. Moreover, the Etunda Project Management actually also conducts large scale farming on-site while providing mentorship to small scale farmers at the same time.
- Small scale farmers –source the crop production input from the on-site Etunda Project Management section.
- AMTA- via marketing agencies acquire the domestic fresh produce and cereals from farmers, including small scale farmers at Etunda and sells to consumers or else export to foreign markets. Furthermore, the agency is responsible for the coordination of logistics activities via which crop products go through from the Green Scheme farms to the domestic Fresh Produce Hubs or grain silos.
- AgriBusDev- coordinates the operational and strategic aspects of the Green Scheme activities at domestic level. Furthermore, the unit influences domestic policy development.

The sample is made up of the farmers, Etunda Project Management, officials from the Agricultural Marketing Agency (AMTA) and AgriBusDev. The farmers interviewed have between fifteen (15) and one (1) year(s) of farming experience at Etunda Crop Irrigation farm. The interviewees from the Etunda project management team has nineteen (19) years of experience in the agricultural sector. The interviewees from AMTA have less than a year in the agricultural

sector. Whereas, interviewees from AgriBusiDev have more than five years of experience in the agricultural sector.

The Etunda irrigation farm currently has about 950 ha under irrigation. The farm in its current state has a carrying capacity of 96 small scale farmers, but currently only 64 small scale farmers are actively involved in farming. There are 10 medium scale farmers. The medium scale farmers differ from small scale farmers in the sense that they do not benefit from government guaranteed credit facilities. Furthermore, unlike small scale farmers who have 3 to 6 ha, they have 12ha allotted to them for farming purposes, and their land tenure is five years. Other than that medium scale operating environment at Etunda is very much the same as that of small scale farmers and thus the early assumption of regarding medium scale farmers as small scale farmers remain valid for the purpose of this study. Furthermore, the service provider is now made up of the project management team composed of project manager deputised by the deputy project manager who are both appointed on five year contracts. The project management team is directly involved in commercial farming at Etunda, but in addition, they are also expected to provide mentorship and services to small scale farmers.

Agricultural Marketing and Trading Agency (AMTA) is a newly established non-profit making company. AMTA's mandate is to implement Government policy towards agricultural marketing, operations and management of Fresh Produce Hubs and Silos. To date AMTA has two active operations at Fresh Produce Hubs at Ongwediva and Rundu under its management.

Agricultural Business Development Agency (AgriBusDev) is a state owned company constituted under company act section 21 (i.e., non-profit making). AgriBusDev's mandate is to implement Green Scheme policy, acts as a holding company for Green Scheme projects, does the regulatory duties and set guidelines

Worth noting is that by the time of data collection for this study both agencies mentioned above were more less than 5 months old.

4.3 DATA ANALYSIS (BY QUESTION)

The research design, methodology and the respective data collection instrument led to the chosen data analysis approach which is content analysis. Neuendorf (2002) argues that content analysis is a systematic approach to qualitative data analysis that identifies and summarises message content. Furthermore, Creswell et al. (2007,p. 101) stresses that content analysis is used when working with qualitative responses to open-ended questions on surveys, interviews or focus groups. Content analysis, is a process of looking at data from different angles with a view to identifying clues in the data that help understand and interpret the raw data. These clues are identified or developed via a process called coding. Coding is the process of reading carefully through your transcribed data, line by line, and dividing it into meaningful analytical units. The combination of inductive codes and a priori codes were used during the data analysis exercise. Inductive codes are those codes developed by the researcher by directly examining the data, whereas the a priori (pre-set) codes are those identified during the literature review. Once the data have been coded the next

step of data analysis is where codes are organised or combined into themes or category (Creswell et al., 2007).

The following table which culminated from the just outlined data analysis procedure presents extracts from interview sessions per question, the codes or meaning derived from the extracts and lastly the cumulative meaning or themes represented by the codes.

Table 1: Data Analysis

1. What supply chain challenges hinder the effective inflow of crop farming inputs and the outflow of crop products at Etunda?			
	Responses	**Codes**	**Theme**
Interviewee 1	*Vegetables are very perishable and they required at different storage temperatures, but at the moment there is only one storage compartment, thus making difficult to store for instance onions and tomatoes at the same time. Grain storage is not much of a problem because there are silos.* *The lack of access to the market via the major retail chains is the main factor that hampers the flow of produce from Etunda to the market place.*	-Insufficient cold storage -Non-suitable cold storage -Lack of access to retail chain -Lack of market access	Lack of suitable storage facilities Lack of market access Lack of market access
Interviewee 2	*Fertilizers are the main cause of high cost and farmers at Etunda are not allowed to source them from elsewhere. The truck, whenever available does pick up the produce from each farm. But there are cases where the truck fails to come simply because it is engaged in other sales related activities The harvest gets spoiled in such cases,*	-High fertilizer cost -Lack of fertilizer sourcing option -Non-reliable transportation -Lack of transportation -Lack funds to buy inputs -High cost of input	High cost of input High cost of input Lack of

	Affordability of inputs is only possible with credit facility.		suitable transportation services Lack of production input
Interviewee 3	*Cost of fertilizers is very high, usage of private transport to ferry inputs from the commercial area to the farm is prohibited or else if own transport is used the freight price already include an average even lighter price*.	-High cost of fertilizers -Unaffordable on-site transport	High cost of input Lack of suitable transportation services
Interviewee 5	*Access to the market (lucrative market), quality, and quantity are the critical challenges. Lucrative market access is mainly made up of the domestic market through which the masses gain access to the horticultural produce. For instance, via the likes of Pick & Pay and Checkers. Farmers at Etunda are struggling to meet quality, quantity and consistency expectations of the retail chains.* *Transportation is another constraint.*	- Retail chains inaccessible -Market inaccessible -Inability to meet quality, quantity and consistence expectations of retail chains -Non-availability of transportation	Lack of market access Lack of market access Lack of market access Lack of suitable transportation

			services
Interviewee 6	*Cost of inputs including seeds, fertilizer, water and electricity, especially for crops like maize is extremely high. Other crops like ground nuts, watermelons do not attract high costs on input compared to the main crop which is maize.* *Farmers are at liberty to buy inputs such as seeds elsewhere, but when it comes to other inputs such as fertilizers which require a lot of storage space, then sourcing from the service provider becomes the only economical option due to the large storage space requirement which farmers don't have. For instance 200 50 kg bags of fertilizers are needed for maize.* *Agribank provides production financing at 100% collateral to farmers, which makes it difficult for starters or farmers without collateral.*		
Interviewee 7	*The cost of electricity is high, the cost mechanization which is mostly a reflection of the cost of diesel is high as well. Fertilizers are cheap from the source but the transportation costs push up the price the farmers eventually pay*	-High electricity cost -High mechanization cost due to diesel cost -High fertilizer cost due to transportation costs	High cost of input High cost of input High cost of input
Interviewee 8	*Electricity cost, fertilizer cost, and limited technical capacity, especially on the engineering side. Agricultural*	-High cost of	High cost of

	engineering, mechanical and electrical engineering. *There existed market limitations which hampered the sales of the produce in the past, but a new window of opportunity is available*	fertilizer and electricity -Limited agricultural, mechanical and electrical engineering -Low sales due to market limitations -Limited market access	input High cost of input Lack of market access Lack of market access
2. Which supply chain challenges affect the small scale farmers in Etunda?			
Interviewee 1	*The retail chain mostly sources the produce from the South African commercial farmers and many times when it comes to domestic sourcing the offers made are usually too low to even enable the farmer to break-even.* *For instance, by the time of the interview there are over 100 tons of onions stockpiled at Etunda.* *Water, and electricity are costly. Water is supplied by Namwater to the Etunda farm via an open canal. The water consumption meter is not located at Etunda thus, the Etunda water consumption includes household and farming consumption as well the volumes lost due to evaporation. Fertilizers are bought from SA at very*	-Lack of access to retail chains -Unfair trade practices by retail chains. -Lack of market access -High cost of water	Lack of market access Lack of market access Lack of market access High cost of

	high prices, which subsequently increases the cost of domestic production. The electricity rate charged for Etunda is based on the commercial rate, which further increases the cost of production.	& electricity, fertilizers	input
Interviewee 2	*Fertilizers, water, transport, seeds are unaffordable by small scale farmers.* *Selling to established food retail chain is not the practice because these chains buy their produce mainly from SA.* *Price competitiveness is another observed obstacle.* *The water in the canal is siphoned off by the farmers and members of the community, but the bill is only borne by the Etunda.*	-High cost of fertilizers, water, transport, seeds -Lack access to retail chains -Lack of price competitiveness -Contributing factors to the cost of water	High cost of input Lack of market access Lack of market access High cost of input
Interviewee 3	*Farmers are price takers as the prices for input and produce are already set by the Green Scheme service provision unit.* *The consumption of fertilizers is already set by means of an application program.*	-Lack transparency in pricing -Monopolistic practices	High cost of input
Interviewee 6	*Land below 12ha may not meet the consistency required to meet the supply of produce to the formal market. Storage facilities on site are available via the service provider, meaning the farmer has to sell his produce to the service provider and only then the produce makes it to the on-site cold storage. The fresh produce hub*		

	provides storage, but it's far from Etunda and thus necessitating the need for transportation. There is a need for incentives such as free transportation for the farmers to make use of the fresh produce hub in Ongwediva		
Interviewee 7	*Small scale farmers are still hanging onto subsistence, a government dependency tendency which in a way also does not enhance their progress towards commercialization.*	Lack of entrepreneurship	Lack of management skills
Interviewee 8	*AgriBusDev is of the opinion that the planning of input acquisition should be done in such a way that the benefits of economies of scale can be attained. Etunda for instance, has 950ha under production, and thus, if the input can be procured at once major savings could be attained. Provision for GRN trucks at affordable rates to transport input from source to destination.* *In the free market economy, one does not really have much room to discriminate by policy so that the input destined for Etunda/Green Scheme be treated differently from the rest because at the end of the day all producers contribute to food security in the domestic market.* *Other than that the subsidy mechanism is being contemplated whereby only registered projects would qualify for the subsidy.*	-Unexplored economy of scale opportunities -Limitations of free market economy -Lack of subsidy	Lack of management skills High cost of input High cost of input
3. How can those challenges be overcome?			
Interviewee 1	*With the cultivation land (300 ha) expansion plans underway there comes a need for more storage on site and*	-Expansion of cultivation land -Expansion of on-	

	therefore more silos need to be built to cater for additional storage requirements. *34 ton open and 15 ton cold truck is being acquired with the assistance of the government.* *The green scheme farming model has been a 50/50 PPP profit sharing whereby the prospective commercial farmer or investors bids in response to the advertised tenders in order to become a service provider. However, these arrangements never worked in favour of the government, and therefore, as a result AgriBusiDev and AMTA were established.* *AgriBusDev oversee the production side of the Green Scheme. Whereas AMTA is responsible for the marketing, crop import control, and legislative enforcement. Agents registered with AMTA will source produce from Green Scheme farmers at the farm selling price. The agencies then seek the most lucrative market for the produce. The higher the price they get from the produce the better the commission the agent gets. The farmers focus on production is enhanced. Farmers are, however, not limited to selling their produce through this established channel. The only requirement being that records are kept. However, supplying the international market when the domestic market is not adequately supplied is highly discouraged.* *Negotiations with Nored have begun in order to bring about reasonable power supply rates for.*	site storage capacity -Acquisition of more suitable transportation equipment -Amendment of profit sharing/farming model -Strengthening of the institutional support capacity to enhance production and marketing -Establishment of profit maximization mechanisms via AMTA registered sales agencies -Introduce measures to curb domestic shortages due to exports -Negotiate for discounts on power supply rates with Nored	
Interviewee 3	*Having two suppliers of fertilizers at Etunda might bring about needed*	-Diversification of fertilizer sourcing	

	options for fertilizers sourcing. Currently the provision of fertilizers is monopolistic and therefore expensive.		
Interviewee 6	*Food security is a national priority, provision of infrastructure is a prerequisite to many other activities in the chain, but the lack of incentives for farmers to produce consistently and at large scale should be among the practical solutions needed in the chain. Incentives on critical input such as water, fertilizers, energy, transportation, cost of storage. The focus of incentives should be among others on encouraging products supply to AMTA and subsequently to the market place.*		
4. What are the available supply chain facilities for the crop farmers in terms of farming input, storage and transportation, selling and marketing of the produce?			
Interviewee 1	*There is one open carriage tractor used for ferrying produce from the field. No cold storage truck is available to ferry the produce. However, a cold truck will soon be made available via government funding.*	-Lack of suitable transportation	Lack of suitable transportation services
Interviewee 2	*Mixed marketing channels are possible and allowed. The availability of buyers is not really a concern and there are cases whereby we are forced to make use of public transport to ferry our produce to the consumers. But the usage of public transport is very costly as one may have to pay the freight of persons accompanying the produce and the produce.*	-Lack of suitable transportation -Lack of cost-effective transportation	Lack of suitable transportation services
Interviewee 3	*Transportation to the marketplace like Oshakati is not available. Like these watermelons are rotting on the site due to a lack of transport to the market place.* *The cold storage facilities are not yet ready for on-site storage.*	-Lack of transportation -Lack access to on-site storage -Lack of knowledge about cold storage availability	Lack of suitable transportation services Lack of suitable storage facilities Limited flow of

			information
Interviewee 5	*An oversight has been noticed with Etunda cold storage design and therefore considerations are being made to make use of storage at Orushandja in addition to storage options available at the Ongwediva hub in order to meet the storage needs for specific crops.*	-Lack of suitable storage -Lack of knowledge of cold storage design	Lack of suitable storage facilities Lack of suitable storage facilities
Interviewee 6	*There is pressure on the farmers to deliver products to the retailers and hence if transportation is subsidized most of the issues related to distribution will be addressed by leveraging the existing investments in the logistics infrastructure. The lack of inbound logistics hampers produce movement to the market place.*		
5. What is your view on the availability and sufficiency of critical farming resources such as labour, finance, machinery, seeds and fertilizers, and land?			
Interviewee 1	*There are registered retailers for seeds who are allowed to deliver seeds. "* *Delivery of seeds may be delayed due to other factors such as high demand for the specific seeds. The demand, for maize seeds are very high.* *There are 80 permanent employees on the farm, whereas 20 are employed on a casual basis. Casuals already trained are being recalled whenever the need arises and there is no significant deficit of labour force supply.* *There is sufficient machinery.*	-Diversified sourcing of seeds Non-reliable delivery of seeds	Lack of production input
Interviewee 2	*Inputs are available at most times, but there are cases where we are forced to go and seek somewhere else when availability becomes an issue.* *Fertilizers cost less at agricultural centres such the one at Oshakati,*	-Non-availability of inputs -High cost of on-site fertilizers	Lack of production input High cost of input

	Ongwediva in comparison to prices on offer on the site which can be two times higher. *Casual labour is readily available. Finances are available by means of a voucher which is used to buy the input. The voucher systems works on a revolving basis.* *House and land ownership belong to the government. Access to credit facilities is guaranteed by government.*	-Lack of collateral -Collateral by means of government guarantee	
Interviewee 3	*Despite having submitted the cropping plan, there are cases where the needed fertilizers run out, a situation which severely affects the cropping activities in terms of fertilizer application.* *There is a market for fresh maize, but the Green Scheme commercial unit only offers guaranteed market for dry maize at a fixed price. The fixed price, however, is not necessarily the best there is for producers.* *Customers self-collection of fresh maize, sometimes is necessary, but due to a lack of appropriate transportation and cold storage constraints we unable to service their orders.* *Most of the fertilizers are not available via the local retail outlets. Machinery sometimes go out of order and the use of casual labour does attract costs as well.*	-Non-availability of fertilizers -Inaccessibility of market for fresh maize -Lack of suitable storage -Lack of transportation -Non-availability of fertilizers -Non-availability of mechanisation equipment	Lack of production input Lack of market access Lack of suitable storage facilities Lack of suitable transportation services Lack of production input
Interviewee 7	*The small scale farmers' share 50% of serviced cultivation land with the service provider who is expected to competently farm while at the same time provide mentorship to the small scale farmers. This setup severely hampers the performance of the project as this puts a lot of strain on the*	-Limited production capacity -Non availability of the inputs	Lack of production input Lack of production input

	availability of the inputs.		
Interviewee 6	*Appropriate and modern machinery are available, but not sufficient to meet the farmers' needs. Equipment is available on site at Etunda but sufficiency depends on the timing.* *Provision of seeds depends on the cropping program, but if deviation from the same occur then delays become inevitable.* *Land is available under leasehold and thus it is not the farmers' asset and hence cannot be used as means access to financing.*		
6. What is your view on availability and sufficiency of critical marketing facilities such as cold storage, transportation, market information dissemination, and distribution centres?			
Interviewee 1	*The market for wheat and cereal is already guaranteed and the prices are already known. When it comes to vegetables, there is however a challenge. However, there is an organization for potato and onion growers which regulates and coordinates the flow of onions and potatoes into the market place in order to enhance the economic benefits of the growers. This is done via a database which gets fed with the respective cropping schedule for all the growers. The gathered information can then be used to organize and schedule crops and hence harvesting time by the growers such that there is no products flooding into the market place.* *When it comes to other vegetables we simply gamble. Most of the crops with the exception of potatoes and onions are seasonal and thus it's not simple to control their flow into the marketplace. Potatoes and onions can be grown through out as long as the right cultivars are picked for cropping. There is no similar body for other crops."*	-Opportunity to leverage on guaranteed market -Opportunity to leverage best practices -Lack of market-oriented production/-Limited flow of demand/supply information	Limited flow of information Limited flow of information
Interviewee 2	*There is a market beyond the established Green Scheme marketing*	-Non-availability of transport	Lack of suitable

	channel for fresh maize, but transportation, cold storage is a major issue. The cold storage facilities on site just got completed and we got notified of the developments. *We do not have cold storage facilities per farm and this leads to crop losses.* *Market information is not readily available and thus each cropping season is done on an ad hoc basis. Furthermore, the relaying of such information was irrelevant in the past due to the fact that the relevant storage facilities were not available.* *The extension officers visit each farmstead to communicate the necessary information from time to time.*	-Non-availability of cold storage Lack of market-oriented production -Ad hoc flow of relevant information	transportation services Lack of suitable storage facilities Limited flow of information Limited flow of information
Interviewee 3	*The Green Scheme commercial area serve as a point of contact for customer self-collection and therefore one has walkover to communicate stocks availability because there is no real time centralized stock management mechanism for the farmers.* *Communication of general information is mostly done through site to site visits by the project administration staff or extension officers.* *Sales and marketing training and the related information are not provided. Communication of the stock level information to the commercial unit is made on the ad hoc basis.*	-Lack of information, communication means -Ad hoc flow of stockpile information	Limited flow of information
Interviewee 7	*There will be a flow of information in the future, between AMTA, AgriBusiDev and Agronomic Board of Namibia. There is a fair representation of all the stakeholders at the Agronomic Board of Namibia.*	-Ad hoc flow of sector information	Limited flow of information
Interviewee 8	*AgriBusiDev is represented on the Agronomic board whereby periodic*	-Periodic flow of information	Limited flow of information

	meetings are held on a quarterly basis. AMTA is a permanent guest at the Agronomic board as well.		
7. What are the up Skilling needs among the farmers and are they availed to the farmers in Etunda?			
Interviewee1	*Financial literacy and discipline training in order to alleviate the hand-to-mouth mind-set in cases where farmers use up revenues before settling their debts.*	-Unaddressed capacity development gaps	Lack of training
Interviewee 2	*Training is needed, but there does not seem to be trainers domestically as the ones who used to come to give training used to come from Kenya.* *Only Induction training covering mostly the production side is provided at the onset.*	-Non-availability of trainers -Unaddressed capacity development gap	Lack of training
Interviewee 7	*AgriBusiDev is lining up specially focused training for the small scale farmers on matters such as financial management and entrepreneurship.*	-Unaddressed capacity development gaps	Lack of training
8. Where do you sell your products (producers only)?			
Interviewee 3	*The Etunda Green Scheme and direct selling to customers are the main marketing channels mostly used to sell our produce.* *Attempt to sell through retail chain often does not materialize as promises for pickup do not bear fruit.*	-Multi-marketing channels -Lack of access to retail chains	Lack of market access
9. How do you approach input sourcing, production planning, harvesting, storage, distribution and marketing (producers only)?			
Interviewee1	*Each farmer put up a cropping programme based on which inputs are sourced.*	-Cropping plan dependent input sourcing	
Interviewee 2	*Induction training is, however, offered to every farmer from the onset. Every farmer prepares a cropping programme and that depends on the groups. The purpose groups being to coordinate the produce readiness for the market entry. This practice is mainly applicable to maize production. Other crops are not included in the arrangement."* *"Cropping program and the actual*	-Lack of cropping plan for crops other than maize	Lack of management skills

	harvest inform the import bans, by the authority.		
10. What do you think of quality and quantity of goods produced from Etunda (retailers, wholesalers only)?			
Interviewee 1	*The quality of the produce, in our perspective, is a factor of taste and shelf life. For instance, with watermelon as long as the skin is thick enough to prevent perspiration and thus enhance its shelf life and the taste is good then the quality is good.*	-Farmer's perspective on quality	
Interviewee 2	*Collaboration among farmers for the purpose of meeting a specific demand is possible. Quality is not really the basis of the cropping planning due to affordability constraints.*	-Exciting opportunity for crop aggregation -Quality as a factor of affordability	
11. What are the regulatory or the relevant support offered to facilitate market access by Etunda produce?			
Interviewee1	*Agents registered with AMTA will source produce from Green Scheme, farmers at the farm selling price. The agents then seek the market to sell the product at the highest possible price. The higher the price they get from the produce the better the commission the agents get. In such way the farmers focus will then be on production. Farmers are, however, not limited to selling their produce through this established channel. Despite the Green Scheme subsidies by the government there are no regulatory means for enforcing the aforementioned expectations.*	Established institutional support to facilitate market access Lack of control mechanism to leverage existing logistical investments by government	
12. How does information flow between input suppliers and producers, producers and retailers?			
Interviewee 1	*There is an access point which covers the Etunda administration area, but not the whole farm. The infrastructure behind the access point is proprietary to the scheme and thus decision is yet to be made as to whether to allow service providers such as MTC to take over the*	-Limited information, communication means	Limited flow of information

	facility or not. Communication for voice is reliable across the Etunda farm.		
Interviewee 8	*AMTA has come on board and this will lead to market led production via agents. This has alleviated the lack of institutional setup of the past where farmers did not have proper guidance which led to major losses. The new setup is meant to give farmers the necessary incentives to produce.*	-Limited flow of market related information.	Limited flow of information
13. Is there a membership for the small scale farmers to a lobby group or association?			
Interviewee 1	*The lobby group via AgriBusiDev has been established to close the gap between the ministry of agriculture and Green Scheme. AgriBusiDev does put up the organizational structure of the Green Scheme projects.*	-Lack of holistic lobby group.	
Interviewee 2	*There is a committee made up of farmers through which issues of concern are communicated. The cooperative has also been established to which the farmers contribute funds, but not all farmers are members at the moment.*		
14. What are the practical ways of improving the profitability of the small scale farming?			
Interviewee 1	*Advanced storage facilities offer good opportunities for storing and timing the product entry into the market place. Prices of onions for instance start picking up around the first week of December each year thus if taken advantage of good revenues can be obtained by timing the onions entry into the market place around this time.* *Diversification of crops is mainly hampered by the cost of production.* *Diesel, fertilizers and chemicals are among the most important inputs which, if subsidized local produce could become price competitive.*	-Opportunity for maximizing revenue -Essence of market information -Inability to diversify crop production -Essence of subsidies to lower production costs -Essence of production cost to price competitiveness	High cost of input
Interviewee	*There is a perception that the set price for some commodities does not carry good margins. But that can be*	-Lack of	Lack of

8	*attributed mostly to the fact that farmers, perhaps do not look at profitability in terms of volumes sold, but rather in terms of price per unit sold say via the informal markets. NAB set the minimum price for maize in order to prevent price distortion, but that does not mean that it cannot be sold for more*	understanding of profitability	management skills

4.4 RELIABILITY OF INSTRUMENTS

The researcher conducted open-ended guided interviews in person. Therefore, according to Creswell et al. (2007) in qualitative research the researcher is the data gathering instrument, credibility and trustworthy is a given and the two imply validity and reliability. Furthermore, Lincoln & Guba (1985) claim “Since there can be no validity without reliability, a demonstration of the former [validity] is sufficient to establish the latter [reliability]”. Since in this case the data were gathered through interviews by the researcher in person, one may argue that validity is non-questionable and thus reliability is implied. Furthermore, the data gathered via the interviews is of primary nature (please see 4.3 above) and was used in its raw form for data analysis purposes.

The data collection exercise was guided by open-ended questions which were developed within the SCOR framework. This proved handy as it enabled the consistent approach to conducting interviews, although not all the interview questions turned out to be relevant to all the participants. The audio recordings done by the use of Smart Voice Recorder a free app downloaded from Samsung Play Store produced clear enough audio files which were used for transcription.
Seventy five percent (75%) of the interviews was conducted in English by the researcher himself. The other twenty five percent (25%) of the interviews were conducted in Oshiwambo (the native language spoken by small scale farmers at Etunda and the researcher himself). The transcription of interviews, and recordings was done by the researcher himself. The audio recordings have been replayed twice per recording in order to make sure that crucial information is not

omitted during the transcription exercise. The recordings done using a Samsung Galaxy Tab 10.0 tablet came out clear for transcription purposes.

4.5 VALIDITY OF MEASUREMENTS

According to Creswell et al. (2007,p. 81) rather than examining or measuring the observable features of the phenomenon, qualitative research sets out to penetrate the human understanding. It is, therefore, further argued that what we are dealing with is therefore, not so much an exact, measurable findings, but an emerging reality that we are describing and analysing. One of the traditional method of measuring validity is triangulation which Richardson (2000) argues is based on the assumption of a fixed point or object that can be triangulated. She, therefore, dismissed this fixed position as the outcome of a qualitative study and proposes that we should not triangulate but crystallise. The concept of crystallisation as proposed by Richardson (2000,p. 934) enable us to shift from seeing something as fixed, rigid, two-dimensional object towards the idea of a crystal which allows for an infinite variety of shapes, substance, transmutations, dimensions and angles of approach. Therefore , it was further argued by Creswell et al. (2007,p. 81) that we describe our findings as those which crystallise from the data. As such this crystallised reality is credible in so far as those reading analysis will be able to see the same emerging pattern, and this enhances the credibility of the research.

4.6 LIMITATIONS OBSERVED

Due to time constraints, only eight (8) interviews could be completed within the deadline. As a result, findings and recommendations in this report are

based on eight participants' experiences and viewpoints. Therefore, given the size of the sample, one might argue against the generalizability of the findings to the entire Etunda supply chain environment. Worth noting however, is the fact that, the Etunda business model subjects all the farmers to more or less the same operating environment. Furthermore, the focus of the study is on supply chain which is made up of input suppliers, producers (i.e. Etunda crop farmers), Green Scheme production coordinator agency (i.e. AgriBusDev) and the marketing agency (i.e. AMTA). The picked sample represents all the aforementioned supply chain participants. Therefore, one might not necessarily expect the proportionate variation in the findings of this study due to increase in the sample size.

However, the exclusion of the Agronomic Board of Namibia as well as several government ministries such as the line ministry itself and the ministry of finance could be a major drawback from the economic policy perspective. Notwithstanding, the efforts made to thoroughly peruse the government's policy on Green Schemes as well as the Auditor General's report on Green Scheme.

4.7 SUMMARY

This chapter presented the sample description; the chosen data analysis approach and the respective data analysis table; a brief for reliability of the instruments, validity of measurements and lastly the limitations observed.

CHAPTER 5: DISCUSSION OF FINDINGS

5.1 INTRODUCTION

This chapter focuses on the denotation of the main themes discovered in chapter 4, the discussion of the practical and theoretical implications of the themes within the SCOR framework and the literature findings, the extent to which the main research question has been addressed. Efforts are made to explain the preference of SCOR model over using the graphical presentation of themes in chapter 4 (Table 3) as a basis of data interpretation.

5.2 MAIN THEMES

The discussion of each theme commences with the description of the theme, the supporting evidence from the interview extracts, the implications of the finding within the theoretical framework (SCOR model), followed by the concluding critical discussion. The choice of SCOR model as the reference model for discussing the findings is mainly because the findings are of supply chain nature and thus related and, therefore, cannot be interpreted in isolation.

The themes were constructed out of the interview extracts and as such their description is simply a summarised version of interview extracts. The interview extracts are made up of many variables which are described by the respective themes.

5.2.1. High cost of input

Description of the theme

High cost of input encompasses cost related factors which in this research seem to have a potential to hamper the consumption of inputs for production

purposes, thus reducing the output or else increasing the cost of production. It came out that the inputs cost incurred by the farmers at Etunda are many and they include: fertilizers, chemicals, mechanization equipment, water, energy, including fuel and electricity, seeds, funds as well as those associated with other factors of production such as labour and land.

The following is the list of the related extracts from interviews pertaining to the high cost of input:

Interviewee 1: “Diesel, fertilizers, chemicals, water, electricity are among the most critical inputs, which if subsidized could make local produce price competitive. Water is supplied by Namwater to the Etunda farm via an open canal. The water consumption meter is not located at the Etunda and thus the Etunda water consumption and subsequently the water bill includes consumption for both household and farming purposes. Due to the hot weather and climate for Namibia some of the water is lost through evaporation. Fertilizer is bought from SA at very high prices, which increases the cost of domestic production. The electricity rate charged for Etunda is based on the commercial rate, which further increases the costs of production.”

Interviewee 2: “Fertilizers, water, transport, seeds are unaffordable. Fertilizers costs less at agricultural centres such as the one at Oshakati, Ongwediva in comparisons to prices offered at Etunda.”

Interviewee 3:” We are price takers as prices for production input and produce are already set by the Green Scheme management unit”

Interviewee 6: “Cost of inputs including seeds, fertilizer, water and electricity, especially for crops like maize is extremely high. Other crops like groundnuts, watermelon do not attract high input costs compared to the main crop, maize.”

Interviewee 7: “The cost of electricity is high; the cost mechanization which is mostly a reflection of the cost diesel is high as well. Fertilizers are cheap from the source, however, due to transportation costs the price the farmers end up paying increases.”

Implications of the finding:

Based on the SCOR framework, high cost of input sourced by the small scale farmer could be passed over to the retailer, consumer or the wholesaler. As a result, the researcher assumes that these high costs of inputs may lead to the following two repercussions on the Etunda supply chain:

- May lead to under or poor production by the farmers due to non-affordability and low consumption. In other words, the small scale farmer instead of acquiring the crop production inputs at an optimum level may choose to compromise on quantities in order to stay within budget. The less optimal uptake of inputs by the farmer may lead to poor quality produce or fewer quantities produced due to poor yield.
- The domestic producer may lose quality and price competitiveness in the market place. Higher quantities of poor quality or good quality produce at high cost could lead to loss of competitiveness in the market place.

Those repercussions were somehow stated in The World Bank Report (2013a) on Africa Agribusiness, which echoed that the growth of competitive agribusiness in Africa is severely constrained by the low use of modern inputs and limited access to improved technologies. It was further reported that wider uptake and more intensive use of improved seed, fertilizer, and other inputs would go a long way to closing the African “agricultural performance deficit.”

Discussion

The policy statement on agricultural marketing and trade by the Ministry of Agriculture, Water and Forestry (2011, p. 20) advocates for the promotion of competitive sourcing of production inputs, for agricultural and agro-industrial products, and ensure availability of an assortment of high quality and affordable food products in the domestic market. Despite the advocacy, there is still a huge outcry about the high input cost among the farming community at Etunda. Given the scale of investment by the government in the Green Scheme, why is this good practice not implemented?

Worth noting is that some of the inputs such as water and electricity are domestically generated and distributed by state owned enterprises. Therefore, one may expect an incentive program developed specifically to allow the Green Scheme sector to come out of current infancy.

5.2.2. Limited flow of information

Limited flow of information denotes unreliable flow of the product in the market. Furthermore, it also encompasses non-timely circulation of strategic directions and operational developments in the agronomic sector and Green Scheme in particular, lack of institutional setup and the related infrastructure for real-time information circulation on market developments.

The following is the list of the related extracts from interviews pertaining to a limited flow of information:

Interviewee 1: “There is an organisation for potatoes and onion growers which coordinate the production and flow of onions and potatoes into the market place in order to enhance the economic benefits of the growers. When it comes to other vegetables we simply gamble.”

“There is an internet access point which covers the Etunda project management block, but not the whole Etunda irrigation farm. The infrastructure behind the access point is privately owned by Etunda, and thus the decision is yet to be made as to whether to allow service providers such as MTC to take over the facility or not. Voice communication is reliable across the whole Etunda farm. ”

Interviewee 2: “Market information is not readily available and planning for each cropping season is done on an ad hoc basis. Furthermore, the relaying of such information was irrelevant in the past due to the fact that the relevant storage facilities were not available.”

Interviewee 3: “The Green Scheme commercial area serves as the point of contact for the customer self-collection and, therefore, one has to walk over to

each farmer in order to find out the availability of stocks because there is no real time centralised stock management mechanism for the farmers."

Interviewee 6: "Market information flow is poor, no emails or SMSes. For instance, when the Ongwediva hub got opened farmers got a 12 hours' notice to make the produce available for display at the Hub. There is no liaison officer for instance to coordinate information flow to the farmers and vice versa."

Interviewee 7: "There will be a flow of information in the future between AMTA, AgriBusDev and Agronomic Board of Namibia (NAB). There is a fair representation of all the stakeholders at the moment at NAB's board level."

Interviewee 8: "AMTA has come on board and thus this will lead to market led production via agents. This has alleviated the lack of institutional setup of the past where farmers did not have proper guidance which led to major losses. The new setup is meant to give farmers the necessary incentives to produce."

Implications of the finding:

Within the SCOR context the flow of information is core to all planning aspects which include plans to source, make, deliver and return across the supply chain. Regulators and agencies such as the AMTA, AgriBusDev, Agronomic Board of Namibia, responsible for institutional support to the Green Scheme sector, the line ministry and the small scale farmers need reliable and timeous flow of the relevant information for planning, intervention and execution of their responsibilities in the chain. Based on the SCOR model, the researcher

assumes the limited flow of information may have the following repercussions on the Etunda supply chain:

- Etunda project management, small scale farmers and marketers alike need reliable market related information in order to optimally source inputs, produce and manage marketing resources. For instance, the small scale farmer would need information on the supply and demand for specific commodity such as tomatoes. The availability of such information will help the farmer to develop an informed cropping program. The information contained in the cropping program is crucial to the service provider who may source and stock the required inputs in order to guarantee the timely delivery of the same to the small scale farmers who need it for tomatoes cultivation. The marketer of the tomatoes on the other hand needs to know the expected tomato quantities the small scale farmers hope to harvest such that they tie the pre-sales deals, and make the necessary logistical arrangements for the delivery of tomatoes to the customers.

  As such, without the reliable and timely flow of the relevant information to the participants in the chain, the coordination outline above will be impossible and may lead to undesired consequences such as shortages, oversupply of tomatoes, tomatoes stock piles on the farm and post-harvest losses.
- The list of possible eventualities due to limited, unreliable flow of information could be endless. Regulators and other stakeholders in the

Green Scheme sector, for instance, need to be fully informed in order to develop and implement the appropriate interventions.

The report by the The World Bank (2013b) on Africa Agribusiness further explain the repercussions by stating that modern information and communication technologies offer exciting new ways to improve market integration, reduce transaction costs and risks.

Discussions

The agricultural marketing and trade policy documents of the Ministry of Agriculture, Water and Forestry (2011) allude to market orientation approach to the marketing of local produce as opposed production orientation approach. For the market orientation approach to be fruitful the centres of production need to have access to the market related information. It is a well-known fact that in the modern era, the use of information communication technology provides the most effective and efficient means of information exchange. It came out during the interviews that internet access, for instance, is mainly limited to the commercial area as the internet coverage does not cover the whole farm and, therefore, not accessible to all the farming units.

Furthermore, the Ministry of Agriculture, Water and Forestry (2011, p. 26) advocates for the development and promotion of the utilization of a fully integrated and efficient national agricultural and agro-industrial marketing infrastructure for storage and processing, information technology centres, internet, and telecommunication coverage, feeder roads, water supply, and electricity connection at all designated agricultural hubs. What is not clear is

whether the centres of production like Etunda will be linked to the above-mentioned in order to enable efficient flow of information.

5.2.3 Lack of suitable transportation services

This category denotes non-availability or lack access to cold, closed, open transportation, automobiles needed to ferry fresh and dry produce from source to destination at the right time and without compromising the expected delivery and quality requirements of the produce.

The following is the list of the related extracts from interviews pertaining to lack of suitable transportation services:

Interviewee 1:" There is one open carriage tractor used for ferrying produce from the field. No cold storage truck is available to ferry the produce. However, a cold storage truck will soon be made available via government funding."

Interviewee 2: "The open tractor whenever available does pick up the produce from each farm. However, there are cases where if the truck is involved in any other sales related activities, then the harvest gets spoiled on the farms."

Interviewee 3: "Customers self-collection of fresh maize, sometimes is necessary, but due to a lack of appropriate transportation and cold storage constraints we are unable to service their orders."

Implications of the finding:

Based on the SCOR model, the researcher assumes the lack of suitable transportation services has the following repercussions on the Etunda supply chain:

- The effective and efficient movement of the produce within the prescribed quality standards can be hampered.
- Stock build-up and stock shortages can easily occur in the chain.
- Crop losses and subsequently financial losses by the farmers become inevitable.
- Some of the output gets spoiled in transits

Discussion

The extracts from the interviews reveal the usage of an open carriage tractor for both dry and fresh produce. This definitely has a potential to compromise quality standards inherently expected of food products. Furthermore, the researcher is of the opinion that lack of emphasis on safety and quality standards in the performance audit recommendations in relation to transportation facilities could give an impression that such matters are less important. The interview give a completely different picture of, for instance, the use of an open tractor to carry both dry and fresh produce.

5.2.4. Lack of market access

Lack of market access denotes inability of the produce to reach the consumers or enter the shelves of the formal, lucrative, established retails chains or shops.

The following is the list of the related extracts from interviews pertaining to lack of market access:

Interviewee 1: “The lack of access to the market mostly dominated by the major retail chain is the main factor that hampers the flow of produce from Etunda to the market place. The retail chain mostly source the produce from the South African commercial farmers and many times when it comes to domestic sourcing the offers made are usually too low to even enable the farmer to break-even. For instance, at this point in time there is over 100 tons of onions stockpile at Etunda.”

Interviewee 2:“Selling to established food retail chain is not the practice because these chains buy their produce mainly from SA.”

Interviewee 3: “Attempts to sell through the retail chain often does not materialize as promises for produce does not materialise at times.”

Interviewee 5: “Access to the lucrative market, quality, and quantity are the critical challenges faced by farmers. Lucrative market is mainly made of the domestic market through which the masses gain access to the horticultural produce for instance, via the likes of Pick & Pay and Checkers. Farmers at Etunda are struggling to meet quality, quantity and consistency as per the expectations of the retail chains stores.”

Interviewee 8: “There used to be market limitations which hampered the sale of the local produce in the past but this is now a thing of the past.”

Implications of the finding:

Within the SCOR context, it is expected that the lack of market access will have an effect on the upstream activities of the supply chain. In addition, the

researcher, therefore, assumes that lack of market access has the following repercussions on the Etunda supply chain:

- Discourage production by the farmers and lead to job losses, and food insecurity.
- May lead to lost opportunity of return on investment made by the government on the Green Scheme sector.

Discussions

The interviews mostly point to the market access via the retails chains, most of which are of the South African origin, as the critical success factor. This sentiment is further augmented by Murpphy (2006) as cited in van der Heijden & Vink (2013), who argues that supermarkets are able to impose their supply chain requirements onto suppliers because they are increasingly the most important gatekeepers of consumer retail markets. It is further stated that the reality in countries with high levels of supermarket concentration is that if a food producer does not sell into a supermarket value chain he has limited alternative options.

What literature fails to reveal is the structure and the status of the domestic market in terms of supermarket concentration. What has been revealed by Chikazunga et al. (2007) is, however, the fact that the South African supermarkets are making use of increasingly centralized and vertically integrated procurement systems, focused around their own distribution centres and a relatively small number of suppliers.

The observed development in the Green Scheme sector is the establishment of fresh produce hubs as well as AMTA to manage the hubs. What is not clear is how AMTA will facilitate the uptake of the local produce by the supermarkets operating in Namibia.

The report by The Auditor General (2013) suggests that the lack of distribution infrastructure for the Green Scheme projects result in stiff competition in the market and the projects not getting the fair value for their produce. And thus, further recommending that the Ministry should complete the construction of the fresh produce hubs and make them accessible to the projects. It looks as if the distribution infrastructure referred to here is the fresh produce hubs. What has not come to the fore is the strategy by which products from the fresh produce hubs will enter the supermarket shelves.

The agricultural marketing strategy and trade policy report by the Ministry of Agriculture, Water and Forestry (2011, p. 28) points to the usage public procurement and market share promotion programme for the benefit of domestic horticultural production and to support the marketing of the cereal produce of communal farmers. If fully implemented this policy could provide the much needed marketing channels for the small scale farmers.

5.2.5 Lack of suitable storage facilities

Lack of suitable storage facilities denotes non-availability, lack of access to the cold storage or silo facilities needed to store fresh and dry produce respectively. The following is the list of the related extracts from interviews pertaining to lack of suitable storage facilities:

Interviewee 1:"Vegetables are very perishable and they require different storage temperatures, but at the moment there is only one storage compartment, thus making difficult to store for instance onions and tomatoes at the same time. Grain storage is not much of a problem because there are silos."

Interviewee 3: "There is a market for fresh maize, but the Green Scheme commercial unit only offers guarantee market for dry maize at a fix price. The fixed price is not necessarily the best there is for producers. Customers' self-collection of fresh maize, sometimes is necessary, but due to transportation and cold storage constraints we are unable to service their orders."

Interviewee5:"An oversight has been noticed with Etunda cold storage design and, therefore, considerations are being made to make use of another storage at Orushandja in addition to storage options available at the Ongwediva hub in order to meet the storage needs for specific crops."

Interviewee 6:"Storage facilities on site are available via the service provider, meaning the farmer has to sell his produce to the service provider and only then the produce makes it to the on-site cold storage."

Implications of the finding:

Within the SCOR context, it is expected that the lack of suitable storage facilities will have an effect on the downstream activities of the supply chain. The researcher therefore assumes that the lack of suitable storage facilities has the following repercussions on the Etunda supply chain:

Appropriate storage for crop products either fresh or dry is essential to preserve the quality standards as well as enhance their longevity on the shelf.

Moreover, some crops are seasonal, but their consumption in the market place does not necessarily coincide with their harvesting time and hence have to be stored until the marketplace is ready for their consumption. Therefore, the lack of suitable storage facilities may lead to the following:

- Farmers may be forced to hastily sell the produce at unfavourable prices in order to avoid post-harvest crop losses due to spoilage. Or otherwise avoid cultivating highly perishable but yet highly profitable crops all together the situation which deprives them of diversification of produce which might be essential for farming risk mitigation.
- Farmers might be unable to serve the market with diverse delivery needs such as bulk deliveries in the case of wholesalers as opposed to continuous small batch deliveries which might be the preferred delivery mode by crop processing plants. The scenario which might lead to them losing the competitive edge in the marketplace and subsequently leading to the lack of market access by the produce.
- Meeting the quality standards in the market place is another aspect which is highly dependent on the suitability of storage in terms of, for instance, complying with the prescribed storage temperature for specific crops.

These repercussions were somehow flagged in the report by The World Bank (2013a) which suggest that the lack of storage facilities can impair quality, forces quick sale at harvest when prices are lowest. The same report further stressed that sale removes the ability to use the crop as collateral.

Discussions

The interview extracts reveal that an oversight in the design of the cold storage facility at Etunda has been noticed. As a result, the current facility lacks in terms of meeting all the temperature requirements for different crops at the same time.

It appears as if the design of the cold storage facility was not informed by an agriculture specialist inputs. The report by The Auditor General (2013) concluded that the lack of grain storage, cold storage facilities at some projects led to the improper use of the facilities which poses a health risk and loss of produce.

By the time of this study, the storage facilities have since then been developed, but despite that, there seems to be pressing storage suitability issues, such as those related to temperature requirements, which have not been addressed in the process of design and development.

5.2.6. Lack of production input

Lack of production input denotes non-availability of input such as seeds, fertilizers, chemicals, mechanization equipment, water, energy, including electricity and fuel, labour, finance, and land.

The following is the list of the related extracts from interviews pertaining to lack of production input:

Interviewee 1: “Delivery of seeds may be delayed due to other factors such as high demand for specific seeds. The demand of, for instance, maize seeds is very high.”

Interviewee 3: “Despite having submitted the cropping plan, there are moments whereby the needed fertilizers run out the situation which severely affects the cropping activities in terms of fertilizer application.”

Interviewee 6:“Appropriate and modern machinery is available, but not sufficient to meet the farmers’ needs at the same time and equipment is available on site at Etunda but sufficiency depends on the timing of the demand. Agribank provides production financing at 100% collateral to farmers, which makes it difficult for starters and farmers without collateral.”

Interviewee 7: “The small scale farmers have a share of 50% of serviced cultivation land with the service provider who is expected to competently farm while at the same time providing mentorship to the small scale farmers. This setup severely hampers the good performance of the project as this puts a lot of strain on the availability of the inputs.”

Interviewee 8: “There is limited technical capacity, especially on the engineering side. Agricultural engineering, mechanical and electrical engineering are really scarce.”

Implications of the finding:

Based on the SCOR model, the researcher assumes the lack of production inputs has the following repercussions on the Etunda supply chain:

The cultivation of crops exclusively depends on the availability of the relevant inputs in the right quantities at the right time for the timely commencement of the cropping season. This is essential for the timely delivery of the crops in the market place in accordance with the service level agreements, the seasonality of specific crops or the market factors related to demand and supply. Therefore, the non-availability of the specific crop production input may lead to adjustment of the cropping plan which may throw the established Etunda production resources plan for the cropping season out of balance. This, may have far reaching consequences in the chain as whole such as underutilised logistical facilities due low volumes, sub-optimal production, and shortages of certain crops in the market place.

Discussion

Extracts for the interview revealed that cropping plans are developed by each farmer per cropping season. While some extracts shows that the development of cropping a plan is only applicable to maize and not to the rest of the crops. It is further revealed that the cropping plan informs inputs sourcing. Nevertheless, the varying statements made by the small scale farmers, point to inconsistency in terms of the cropping programme development. Either some farmers develop it for maize only or some develop it for all crops including maize. The Auditor General (2013) on Green Scheme performance concluded that the lack of guidelines for the formulation of cropping programmes at the projects result in poor planning for production activities. The same report further revealed

that the development of the cropping programme by farmers is a matter of contractual obligation.

5.2.7. Lack of management skills

Lack of management skills denotes inability to manage financial resources, plan for sourcing, production, harvesting, marketing and sales.

The following is the list of the related extracts from interviews pertaining to lack of management skills:

Interviewee 1:"Financial literacy and discipline training are needed in order to alleviate the hand-to-mouth mind-set whereby farmers used up revenues before settling the service bill."

Interviewee 2: "Induction training is offered to every farmer from the onset. Every framer prepares a cropping programme which depends on the production group they are assigned to. The purpose of the group being to coordinate the produce readiness for the market place. This practice is mainly applicable to the maize production. Other crops are not included in the arrangement."

Interviewee 7:"Small scale farmers are still hanging onto subsistence, a government dependency tendency which in a way also does not enhance their progress towards commercialization."

Interviewee 8: "There is a perception that the set price for some commodities does not carry good margins. But that can be attributed to the fact that farmers, perhaps do not look at profitability in terms volumes sold, but rather in terms of price per unit sold for example via the informal markets. NAB set the minimum

price for maize simply to prevent price distortion, but that does not mean that it cannot be sold for more."

Implications of the finding:

Lack of management skills has the following repercussions on the Etunda supply chain:

Small scale farmers need to have the relevant skills to enable them for instance to profile the cost structures of each crop products identify opportunities for maximizing the production yields and profitability for their farming operations in response to the demands and preferences of the market place. The overall understanding of the competitive agribusiness environment, both at the domestic and international level is very much paramount to the survival as well as their market penetration endeavour.

The report by the The World Bank (2013b) on Africa Agribusiness somehow augment the same sentiment by stating that supermarkets are poised to take off, with implications for traditional retail chains and smallholders. Supermarkets are being established across Africa, where they generally serve the upper-income population. Their benefits can include a broader supply of products, more streamlined supply chains, safer foods, economies of scale, and lower consumer prices. At the same time, their procurement systems can profoundly change supply chains and challenge small-scale farmers. Supermarkets have already influenced more traditional retailing in terms of the offer, quality, and more organized supply chains, and they frequently drive small retailers to upgrade their services. Capacity- building for small-scale farmers,

processors, and their organizations are important for them to benefit from the supermarket revolution the report concludes.

Discussion

The interview extracts reveal a broad range of capacity gaps such as financial skills, planning for production activities, and lack of commercial oriented mind-set. Management skills requirements in the supply chain context are broad as it may span all the processes as defined by the SCOR model. The observed lack of sensitivity among farmers on the essence of inter-linkages necessary for success in the chain is a matter of concern. For instance a small scale farmer would choose to ferry and sell the produce to the informal market in small quantities at a perceived high price instead of selling to the Etunda commercial unit simply because they feel prices on offer is low. This leads to losing out on the opportunity to concentrate on productive activities on the farm.

5.2.8. Lack of training

Lack of training denotes up Skilling needs in order to close the identified capacity gaps among the Green Scheme supply chain stakeholders. The following is the list of the related extracts from interviews pertaining to lack of training:

Interviewee 1:“Financial literacy and discipline training are needed in order to alleviate the hand-to-mouth mind-set whereby farmers used up revenues before settling the service bill.”

Interviewee 2: “Training is needed, but there seems to be no trainers domestically as the ones who used to come give training in the past used to

come from Kenya. This does not address the need for capacity development in terms of running a farm on business principles. The induction training which every farmer gets at the onset mostly covers the production side only."

Interviewee 7: "AgriBusDev is lining up specially focused training for small scale farmers on matters such as financial management and entrepreneurship."

Implications of the finding:

Lack of training has the following repercussions on the Etunda supply chain:

The contemporary business environment is becoming more competitive due to factors such as market liberalisation coupled with the change in trade policies, environmental challenges due to climate changes, and the proliferation of major retail chains from industrialised countries. As such the short term benefits which come with subsidies and protection might not be sustainable due to market integration. As such farmers as well as all the players in the Green Scheme need to become more sensitive towards the accepted best practices of sustainable farming, marketing as well as the contemporary approaches to gaining a competitive edge in the market place.

On the production level, though credit worthiness of each small scale farmer is the de facto to the sustainability of the crop farming operations and therefore there is a need to change the mind-set of the small scale farmers accordingly. The fact that the small scale farmers at Etunda receives production loans with the aid of government guarantees could be the reason why the interviewed participants did not highlight access to finance as a pressing issue.

However, the report by The World Bank (2013a) argues that agricultural loans by governments and development partners have often been seen, especially by small-scale farmer borrowers, as a hand-out not to be repaid and without cost. Therefore, it is further stressed that there is a need to re-educate borrowers at all levels and impose a “credit culture” via improved legal enforcement.

Discussion

The extracts from the interviews show that farmers get induction training, and some more training for the farmers is in the pipeline. It is worrisome that contributions through peer review meetings is not appreciated, although it is a well-known factor that experiential learning can be beneficial as farmers will share skills and in that way acquire new knowledge and sharing of best practices.

Furthermore, it comes out that there is perhaps a lack of understanding of the farmers on the practical implications of not honouring the financial obligations towards the government guaranteed bank loan. The audit report by The Auditor General (2013) discovered that a lack of a clause in the tri-partite agreement in terms of repayment of Agribank loans in case of death and breach of contract by small scale farmers leads to government incurring losses. It is further reported that the lack of a system to automatically deduct the repayment of loans by small scale farmers to Agribank at some of the projects results in the small scale farmers defaulting on the Agribank loans which results in the government paying the loans.

Having the terms and conditions in place is essential, but the common comprehension by the parties is vital. Small scale farmers, most of whom come from a subsistence farming background need to fully comprehend and appreciate the mechanisms put in place for them to have access to finance. Furthermore, the small scale farmers need to become aware of essential linkages necessary to fully integrate in the contemporary value chains.

5.3 RESEARCH QUESTIONS REVISITED

The main research question is “What are the supply chain challenges faced by small scale farmers at Etunda irrigation crop farm?” The data analysis in chapter 4 has revealed that the main supply chain challenges faced by the small scale farmers, listed randomly, to be:

1. Lack of suitable storage facilities
2. Lack of production input
3. Lack of suitable transportations services
4. Lack of market access
5. High cost of input
6. Lack of training
7. Limited flow of information
8. Lack of management skills

Indeed the findings confirm that small scale farmers are facing supply chain challenges in their day to day farming operations at Etunda irrigation farm. The philosophical assumption, made in chapter 3, that the supply chain challenges

faced by small scale farmers at Etunda are yet to be known was partially incorrect. The reason being that NDP_4 for instance, highlight the high cost of inputs and lack of market access as some of the challenges faced in the Green Scheme sector of which Etunda is one of them.

On the other hand different sets of themes, which have not been documented at the domestic level on supply chain challenges have emerged. These are: limited flow of information, lack of suitable storage facilities, lack of suitable transportation services, lack of management skills, lack of production input.

5.4 SUMMARY

This chapter has highlighted and presented the meaning of the main themes which emerged from the analysis of collected data, answers to the main research question were presented. It has become clear that small scale farmers are facing challenges in their day-to-day farming operations. The presented practical implication for each finding which is based on the framework has been backed up by the literature. Thus confirming that the findings do have practical implications within the supply chain context.

CHAPTER 6 CONCLUSIONS AND RECOMMENDATION

6.1 INTRODUCTION

This chapter focuses on presenting a recap of the research objectives, summary of the key findings, the contribution of the study, recommendation for possible interventions and future research and last but not least the final remarks.

6.2 OBJECTIVES REVISITED

The main objective of this study is to identify the supply chain challenges faced by small scale farmers at Etunda irrigation farm. The supply chain challenges were identified through analysis of empirical data by means of interviews.

The sub-objectives of the study are as follows:

- To explore the current supply chain environment in which the small scale farmers operate in. Highlights of the progress made in Green Scheme sector in the supply chain context were addressed in chapter 1.
- Identify the supply chain challenges experienced by the small scale crop farmers in the daily operations.
- Search for practical solutions to overcome the supply chain challenges for the small scale crop farmers.

The main objective has been met by means of finding answers to the main research question which is “What are the supply chain challenges faced by small scale farmers at Etunda irrigation farm?” The empirical data collected through

interviews was analysed and the themes, listed under 5.3 in chapter 5 reveal that the supply chain challenges faced by small scale farmers at Etunda irrigation farm in their day to day operations.

The first sub objective has been met by means of finding answers to the first sub question which is “What is the noticeable progress made in the Green Scheme to date?

“The findings from the preliminary desktop study which formed part of chapter 1’s introduction section highlight the documented, observed status quo in the Green Scheme sector at the domestic level within the supply chain context.

The second sub objective has been met by finding answers to the second sub question which is “What are the typical supply chain challenges faced by the small scale crop farmers?” The findings of the comprehensive literature review outlined in chapter 2 reveals the typical supply chain challenges endured by small scale farmers across the globe.

The third sub objective has been met by means of finding answers to the third sub question which is “What are the practical solutions for overcoming the supply chain challenges?” The findings of the comprehensive literature review outlined in chapter 2 reveals some of the practical approaches to addressing the supply chain challenges most endured by small scale farmers.

6.3 SUMMARY OF KEY FINDINGS

The key challenges have been established and discussed and, therefore, to sum them up on these findings the discussion will elaborate on the possible

root causes of the identified challenges on broader views and context of the Etunda supply chain.

6.3.1 Summaries

The effects of high cost of input and non-availability of input are not limited to the crop production as they affect the development and performance of other sectors such as the retails and food processing (referred to as agribusiness in this study).

Poor and inconsistency planning for crop production is among the contributing factors to the inputs non-availabilities challenges faced at Etunda irrigation farm.

Some of the reasons behind the limited flow of information is the fact that the guiding strategy and policy outlined in the, agricultural marketing and trade policy and strategy document, is not supply chain oriented. For instance, it emphasizes the establishment of information dissemination centres and the related infrastructure at hubs only leaving out the much needed links to the centres of production such as Etunda irrigation farm. Contrarily, the same document emphasizes the importance and preference of a market orientation approach to marketing of local produce over the production orientation approach.

There is a lack of coordination and emphasis on matters relating to the design and acquisition of suitable storage and transportation equipment, respectively. For instance, the Green Scheme performance audit report falls short on matters relating to suitability of storage and transportation.

There is no clear market entry strategy for the local produce which defines for, instance, whether the basis of entry is based on competing with the existing supply chains or retail chain, or via forging relationships with the existing retail chains.

The logistical investments made to date by the government provides a good launching pad for the market penetration by local produce, but it is not an automatic ticket to market access via retail chain shelves who are mostly privately owned.

There is a lack of supply chain oriented capacity development schemes for small scale farmers and all the relevant stakeholders in the Etunda supply chain. It has come to light that the training offered to small scale farmers focuses mainly on the crop production side alone leaving out other facets of the chain such as marketing.

The existence of supply chain challenges in the Etunda supply chain is not necessarily due to lack of policy or government commitment, but due to lack of implementation and monitoring thereof of the relevant policies and commitments towards agriculture. For instance the Green Scheme policy alludes to the usage of the public procurement as a mechanism for enhancing market access by local produce. But the audit report does not mention anything to do with the implementation and monitoring thereof of the same. The Green Scheme policy, which was released in 2008, further alludes to the establishment of an input supply network, yet by 2013 there is still huge outcry about the cost of input.

The literature reviewed mostly takes a piecemeal approach coupled with the assumptions that, for instance, fixing issues at the production level is all that it takes to be competitive in the market place. For instance, most literature suggests the formation of productive alliances via cooperatives as a means of gaining economy of scale benefits and market share. While overlooking the basis of market penetration in the modern markets such as those adopted by international chain like Walmart. The researcher, therefore, concur with van der Heijden & Vink (2013) who stresses that most of the current policy initiatives to address market exclusion seem woefully inadequate. Furthermore stating that, improving the quality of production, and small farmers' access to skills and assets is important and necessary, but these actions on their own are not sufficient to guarantee access into modern supply chains.

6.4 CONTRIBUTION OF THE STUDY

The main purpose of the study was to establish the supply chain challenges faced by small scale farmers at Etunda irrigation farm. This study is important in that it contributes towards the Green Schemes supply chain literature in Namibia given the fact that it is one of the very few researches ever done in Namibia on this topic. In addition, the study could trigger debate on the importance of supply chain management in the Green Scheme sector at national level; and this would assist as far as policy formulation and policy improvements are concerned. The study is also important in that if the green schemes are run and managed well, this contributes towards the creation of permanent occupations for the people who own smaller scale farms. In addition, improvements in the performance of

the small scale farms contribute positively to economic growth and the welfare of the families owning these small farms. It cannot be overemphasised that studies like the current one are very significant, particularly in Namibia where there is a dearth of literature on the subject of supply chain management as it relates to the small scale farming sector.

6.5 RECOMMENDATIONS FOR PRACTICAL AND FUTURE RESEARCH

6.5.1 Practical recommendations

Lack of production input

The researcher, therefore, concurs with the The Auditor General (2013) which recommends that the line-ministry should develop a guideline in order to guide the formulation of cropping programmes for the projects to ensure proper planning of the production activities. Furthermore, it is recommended that the development of input supply networks as flagged by the Green Scheme Policy (2008, p. 3) be seriously considered in order to bring about input supply competitiveness which could possibly reduce the cost of input.

Lack of suitable storage facilities

The report by The Auditor General (2013) recommends that the line-ministry should do a need assessment and develop a guideline on adequate grain storage, cold storage, and packing facilities. It looks as if the emphasis fell on adequacy while overlooking the suitability. It is, therefore, recommended that a specialist input be sought in order to address the storage suitability concerns.

Lack of market access

It is recommended that, the market entry strategy be reviewed or else be clearly defined so that the domestic crop produce can gain the international market share. Furthermore, the usage of the public procurement and the market share promotion to facilitate market access by the domestic produce should be further enhanced and a guideline be developed or is reviewed and be communicated across all the public institutions for implementation. Another alternative would be to come up with an incentive scheme for encouraging local sourcing of produce, encourage private sector investment and participation in the retail of local produce. Whichever consideration, proper and objective monitoring and evaluation should be done by an independent body say, for instance, by the office of the Auditor General in order to continually assess the implementation.

High Cost of input

The notion of competitive sourcing has a potential for input cost reduction with an eventual decrease in the cost of production. It is therefore recommended that viable ways of enforcing this approach be considered and be implemented .Furthermore given the economic importance of reducing production cost for the local produce, the monitoring and evaluation mechanism be established by the relevant government ministries.

Limited flow of information

It is evident that significant progress has been made in the Green Scheme sector as regards to development of logistical and production infrastructure thanks to government funding. The fact that none of the challenges which came to the fore have to do with lack of infrastructure is a clear testimony. It is,

therefore, recommended that the next area of focus could be on the enhancement of information flow which is essential for proper coordination and the management of production and marketing activities in the Etunda supply chain. Furthermore, the marketing and communication strategy for the Etunda supply chain need to be developed in order to address information flow among the chain participants as well as all the other stakeholders.

Lack of training

The audit findings point to capacity gaps which are perhaps not limited the small scale farmers, but also including some other stakeholders to the Etunda supply chain. Given the adage that the chain is as strong as it weakest links, it is therefore recommended that a continuous learning and growth scheme be developed in order to fast track the commercialisation of the Etunda farming activities.

Lack of suitable transportation services

The usage of inappropriate transportation facilities, be it, on-site or off-sit, Etunda may have serious implications on the reputation of the produce from Etunda. It therefore recommended that on-site and off-site transportation suitability needs are seriously assessed. Furthermore, perhaps the development of guide on minimum quality standards could be helpful as it could inform the scope of monitoring and evaluation going forward.

Lack of management skills

Equipping the farmers with the right set of management skills is a capacity development issue which should be addressed via a continuous learning and growth scheme suggested above.

6.5.2 Recommendation for future research

This study, given its qualitative nature, brought to the fore the challenges in a thematic form. For instance high cost of input is made up of several crop production inputs such as fertilizers, water, energy, mechanisation just to mention a few. Quantifying the contributing factors towards the identified supply chain challenges such as high cost of input is beyond the scope of this study. Therefore, in the absence of quantifiable data, a quantitative study zooming into the specifics of the contributing factors towards identified supply chain challenges is needed in order to inform the key interventions for mitigating the impact of these to the food value chain as well as market penetration by the Green Scheme produce.

Furthermore, given the observed limitations of the study, there is a need to establish the scale by which specific supply chain challenges such as cost of inputs impact the competitiveness of Green Scheme produce in the market place.

Efforts could as well be made to augment the findings of this study by extending the sample size or even to establish whether the challenges faced at Etunda are reminiscent of these faced at other Green Scheme projects at the domestic level.

Future research should be focused on understanding the market structure in terms consumer base, preferences, retail chain concentration, and the basis of

competition. This should be carried out with the prime objective of finding facts based on which relevant interventions and marketing strategies. Such findings could facilitate the development of an alternative food market for the Green Scheme produce which might not be as attractive to major food retail chains.

The mechanism on how to best mitigate the identified supply chain challenges also need to be further investigated within the framework of the domestic policies and strategic focus on Green Schemes, as well as, international commitments on agriculture and the relevant trade and economic policies. Worth noting is the fact that some instruments such as infant industry protection has a limited lifespan. Furthermore, the source of input is mostly from within the SADC region and SACU therefore intervention measures have to be in harmony with the respective provisions of these bodies.

6.6 FINAL REMARKS

The implicit objective of this study was to bring to the fore the essence of supply chain approach and the related business philosophy as the de facto for competitiveness and business sustainability in the contemporary business environment.

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