Investigating the impact of strategic private sector intervention on the sustainability of emerging poultry farmers

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PREFACE

The roots of education are bitter, but the fruit is sweet

Aristotle

It is with the deepest appreciation that I would like to thank the following people and organisations who made this soul fulfilling endeavour possible:

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EXECUTIVE SUMMARY

Title: Investigating the impact of strategic private sector intervention on the sustainability of emerging poultry farmers.

Key words: Sustainability, strategic intervention, market participation, value chain, emerging poultry famers, competitive advantage, transaction costs, entry barriers, economies of scale, corporate social responsibility.

Broadly stated, emerging or small-scale egg farmers have to overcome constraints when attempting to be competitive in a free market economy. Government support is often lacking. Consequently, the implementation of sustainable business practices, within the value chain, intended to facilitate greater market access or participation, is a moot point. It is within the context of economic sustainability that the private sector, as a corporate social responsibility initiative, could add value to the endeavours of the emerging poultry farmer.

Based on an exploratory case study, the objectives of economic sustainability and a strategic private sector intervention were investigated. This investigation was conducted in three phases:

The first phase, in the form of a **literature review**, researched the future role of small-scale farmers across the world. Through the literature review it was established that this role, particularly in developing countries, was to provide food security and sustainability. With the proliferation of globalisation and market liberalisation, small-scale farmers face insurmountable competition from larger commercialised competitors, who have a greater degree of coordination to supply buyer-driven value chains. Therefore, the economic sustainability of small-scale farmers is largely dependent upon their ability to establish synergies within the value chain which would provide them with the commercialised competencies required to be active participants in formal sectors of the market. The reality is that this would require a degree of vertical and horizontal integration. These forms of integration are capital intensive and require extensive market intelligence. To mitigate these limitations, the formation of a strategic alliance, driven by a private sector stakeholder, was proposed. As a result of the literature review, the key success factors for successful market participation were established and the consequential transaction

costs expounded upon. The findings of the literature review were used as a basis for an industry analysis, which was performed in phase two of the investigation.

The **industry analysis**, conducted as phase two of the investigation, involved the application of analytical tools to industry data. Information was collated from current industry reports and statistics. These analytical tools were used to determine the industry attractiveness and the strategic interventions required, in order to achieve a comparable advantage for the emerging farmer. If the industry is not conducive to economic sustainability, then any further investigations would be futile. Overall, the industry analysis determined that future growth potential was positive and that profitability was largely dependent upon the volatility of input prices, such as feed, and the ability of small-scale farmers to gain access to more lucrative market segments located in higher-income yielding areas. This would in all likelihood only be possible if backward linkages were established by small-scale farmers. The favoured strategic option proposed, entailed the formation of a strategic alliance between a producer organisation and a feed mill company. Feed mills have the capital and competencies to develop strategic linkages between various actors in the current value chain.

Phase three is an **empirical study** of a small-scale egg farm. Results and findings from phase one and two of the study were used as benchmarks, in order to determine the competitive strength of this emerging farmer. As a result of an on-farm investigation and manager interview, it was found that the manager identified the same constraints as those expounded on in the literature review. By drawing up an income statement for the farm, the researcher was able to further investigate the effects of various strategic interventions on revenue streams and cost structures. Whilst the ‘critical farm size’ was a limiting factor for an efficient strategic intervention by a feed miller, it was also found that such an intervention would have cost reduction benefits.

Overall, a strategic intervention would increase profitability and ensure long term sustainability.

LIST OF ABBREVIATIONS

BBC	British Broadcasting Corporation
BFAP	Bureau of Food and Agricultural Policy
CBOT	Chicago Board of Trade
CSR	Corporate Social Responsibility
DPFO	Developing Poultry Farmers Organisation
DTI	Department of Trade and Industry
FAO	Food and Agricultural Organisation
IRMSA	Institute of Risk Management in South Africa
NDP	National Development Plan
NGO	Non-Government Organisation
OECD	Organisation for Economic Co-operation and Development
PESTLE	Political, economic, social, technological, legal and environmental
SAFEX	South Africa Futures Exchange
SAPA	South African Poultry Association
SARL	Sustainable Agriculture and Rural Livelihoods
SEDA	Small Enterprise Development Agency
SWOT	Strength, weakness, opportunities and threats
UN	United Nations
UNCED	United Nations Conference on Environment and Development

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CHAPTER 1: RESEARCH OVERVIEW

1.1 Study Orientation and Problem Statement

"In adopting a participative corporate governance system of enterprise with integrity, the King Committee in 1994 successfully formalised the need for companies to recognise that they no longer act independently from the societies and the environment in which they operate." (King Report II, 2002: 9)

The problem, broadly stated, is that emerging or small-scale poultry farmers face significant challenges when attempting to be competitive in a free market economy. Their reliance on government support is often misplaced and the attempted implementation of sustainable business practices within the egg industry's value chain, in order to become active participants in commercial markets, is often a futile exercise. It is within the context of economic sustainability that the private sector, as part of their corporate social responsibility, could add value to the endeavours of the emerging poultry farmer (Makhura, 2001).

The process of agricultural transformation in South Africa involves moving emerging farmers from a subsistence production paradigm to a market participative paradigm. A private sector facilitation of this paradigm shift would address both the issue of social justice, as part of the broader definition of sustainability, as well as the 'Corporate Social Responsibility' incumbent upon companies who have adopted the principles laid out in the King Commission mentioned above. Whilst there may be a plethora of literature which explores the sustainability of emerging farmers in various South African contexts, there seems to be a void of viable intervention models which a private institution could implement as part of their Corporate Social Responsibility. A model which facilitates the "vertical integration of small enterprises with processors, marketers or distributors in a promising avenue for sustained growth, which reduces transaction costs." (Delgado, 1999).

In addition, it has also been noted in the literature, that, whilst emerging poultry farmers are often used by Government and NGO's in development projects to improve food self-sufficiency and alleviate malnutrition within rural communities, they, however, fail to facilitate sustainable economic growth through income generating activities for the emerging farmer (Wynne & Lyne, 2003). In a free market environment where substantial market entry barriers exist and economies of scale have defined the market place, transaction costs, that is, observable and non-observable costs associated with exchange, are the embodiment of access barriers to market participation by resource poor smallholders (Coase, 1960; Delgado, 1999). These costs include; searching for a suitable trading partner with whom to exchange, the cost of screening partners, of bargaining, monitoring, enforcement and eventually transferring the product to its destination (Spradbrow, 1997). These competencies are often outside the scope of the small-scale farmer's reality.

By effectively addressing these costs within the value chain, emerging small-scale farmers could become economically sustainable in the long run. However, they will need the assistance and expertise of a private stakeholder. Whilst the literature reviewed for this investigation has revealed that the challenges which these farmers face could be quantified and qualified, there is no workable intervention model for private stakeholders who wish to assist these farmers in breaking down the entry barriers into the market. The proposed model will take the form of an all-inclusive strategic intervention within the value chain of the egg industry. In this case study the private stakeholder will be involved with all the inputs relating to the factors of production, in addition to facilitating linkages within the value chain in order to promote economic sustainability (Makhura, 2001).

The objectives of an investigation into such a model should be to determine the underlying factors within the value chain that; influence effective market participation of the farmers, affect the decision of these farmers to participate in output markets and contribute to increased participation in output markets (Makhura, 2001).

The outcomes of this investigation are expected to reveal that the Retail Sector's practices and policies, as a result of the 'liberalisation' of markets, impose significant entry barriers which are not conducive to sustainable growth or inclusive market participation by emerging poultry farmers, unless they enter into a collaborative partnership with a private stakeholder.

This investigation hopes to identify areas within the value chain which would effectively allow a private stakeholder to facilitate the breaking down of constraints and entry barriers which are currently limiting emerging poultry farmers. In order for a degree of 'vertical integration' to be successfully implemented, it may be necessary for a representative body to be established that aspires to good governance practises and fair representation of its members or shareholders i.e. a collective group of small poultry farmers (Wynne & Lyne, 2003). It is only through collective action that small-scale farmers would be able to establish a competitive advantage, by leveraging their purchasing power to increase their bargaining power within the supply chain.

In conclusion, the main body of this study will expound on the nature of the challenges facing emerging poultry farmers and ground these findings in the academic literature available on the subject. A mixed research approach will be followed to quantify and qualify the practical problems within the industry. An industry analysis will be used as a benchmark for making inferences about the case study under empirical scrutiny.

1.1.1 Research Question

What is the nature and extent of the intervention required by a private stakeholder in order for emerging poultry farmers to be economically sustainable in a free market system?

1.1.2 Secondary Research Questions

- What are the factors and influences that prohibit sustainable market participation of emerging egg farmers within the industry?
- Is the egg industry's future attractiveness conducive to inclusive competitive market participation?
- Which private sector stakeholder, within the value chain, would ideally be positioned to facilitate a strategic intervention?

1.2 Aim of the Study

This study addresses the possibility of emerging poultry farmers being sustainable market participants due to a private sector intervention. This intervention should develop vertically integrated linkages within the supply chain and mitigate some of the transaction costs, which favour participants with economies of scale. The purpose of this exploratory research design will be to generate a model which may be used by the private sector, in the poultry value chain, as a tool to implement their Corporate Responsibility policies. The recommendations should be practical and actually add value to the emerging farmer's operations.

1.2.1 **Primary Objective**

The primary objective of this research is to investigate the nature and extent of interventions that are required within the egg industry's value chain, by a private stakeholder, in order for emerging poultry farmers to be sustainable market participants.

1.2.2 **Specific Objectives**

The specific objectives of this research include:

- Developing a clear understanding of the constraints and key success factors which may limit or enable market access for emerging egg producers.
- Ascertaining whether the future role of emerging egg producers is economically sustainable.
- Investigating the degree and effects of a 'strategic alliance' intervention, in order to facilitate a sustainable value chain for emerging egg farmers within liberalised markets.

1.3 Research Methodology

Based on an exploratory research design, this study will utilise a case study format in order to address and achieve the primary and specific objectives stated above. This investigation will be conducted in three phases. The **first phase**, in the form of a literature review, will endeavour to identify the challenges small-scale farmers face worldwide. In addition, the key success factors for successful market participation will be determined and used as a basis for an industry analysis, to be performed in phase two of the investigation. The industry analysis, conducted as **phase two** of the investigation, would involve the application of analytical tools to industry data, obtained from industry reports and statistics. These analytical tools will be used to determine the industry attractiveness and the strategic interventions which are necessary, by a private stakeholder, in order to achieve a comparable advantage for the emerging farmer. **Phase three** is an empirical study on a selected emerging poultry farm. Results and findings from phase one and two will be used as benchmarks in order to determine the competitive strength of this emerging poultry farmer. From this situational analysis in phase three, a strategic intervention model will be proposed which advocates sustainable market participation.

1.3.1 Literature Review Approach

The methodology followed in undertaking the research study initially takes an academic research approach, aimed at providing a general overview of Agriculture and Commodity Markets worldwide. Consequently, the theoretical study undertaken will adopt a broad view *vis-a-vis* the challenges facing small-scale farming on the world stage. Through the examination of secondary data, the researcher will endeavour to determine the key success factors and major constraints to achieving a comparative advantage for small-scale farming. Once the factors affecting small-scale farmers have been benchmarked, the scope of the literature under review will be narrowed to focus on the current situation in the South African egg industry. The theoretical investigation into small-scale farming will form the foundation from which an empirical study may be conducted. The sources that have been consulted include:

- Academic Journals and peer reviewed Articles
- Published Dissertations and Theses
- Industry newsletters, publications and journals
- National statistical surveys open to the public

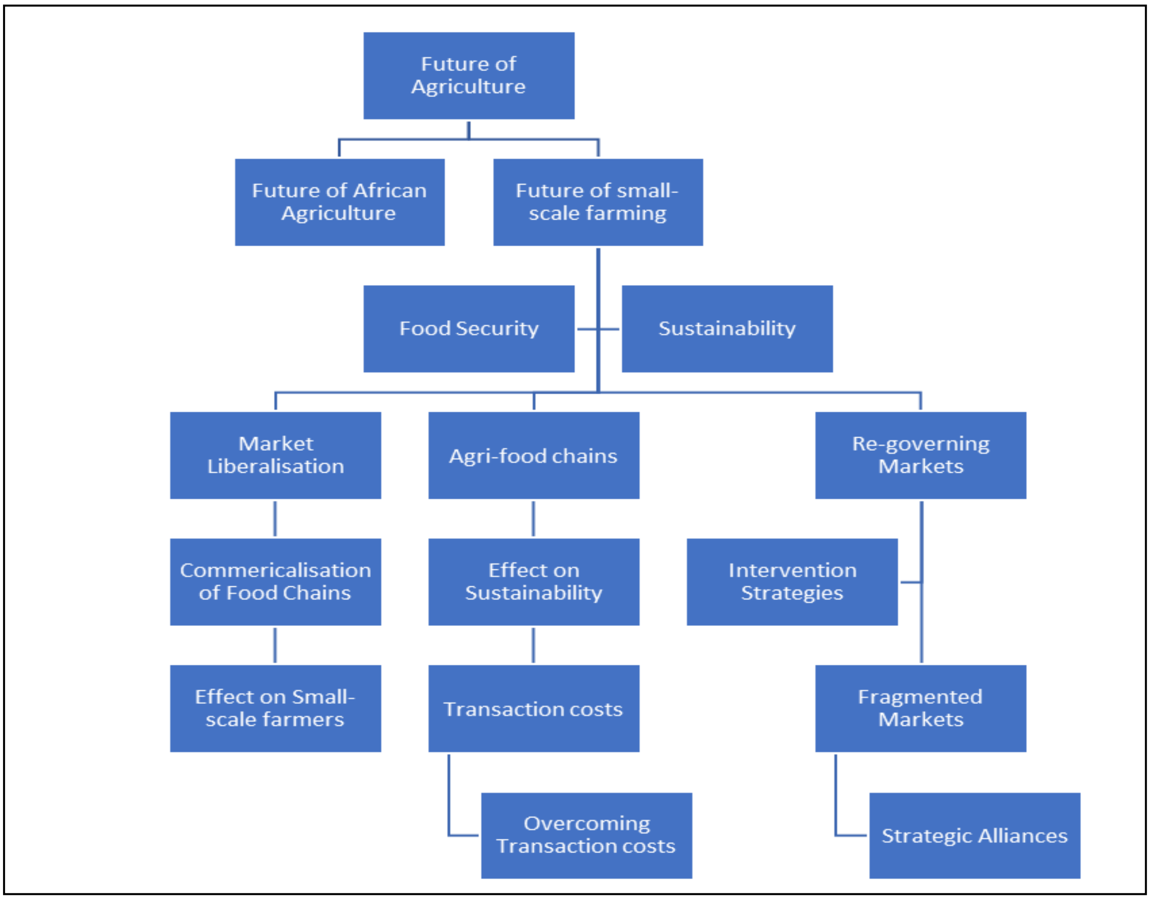
The structure of the literature review has been provided in Figure 1-1 below.

1.3.2 Empirical Research Approach

The empirical investigation will be a two-tiered cross-sectional study of a small-scale egg farmer. The first phase will involve the utilisation of analytical tools to conduct an industry analysis of the current Egg Industry. Results from this analysis will be used as a benchmark for the second phase of the study.

During the second phase of the empirical study, an adapted questionnaire from a previously conducted survey will be used to obtain an overview of the farm under investigation. Thereafter, the same analytical tools will be utilised to conduct a situational analysis on the case study farm, which would include financial data obtained during the investigation. In the process of this empirical study, the value chain of the small-scale farm, Mmadiboke, will be analysed and the transaction costs assessed, in order to determine whether a strategic intervention is warranted.

Figure 1-1: Structure of the Literature Review



1.4 Ethical Considerations

This study acknowledges that all respondents are primary sources of data and information. Therefore, ethically; inclusion and exclusion criteria were established and applied for all potential respondents.

> "...ethical behaviour helps protect individuals, communities and environments, and offers the potential to increase the sum of good in the world. As social scientists 'trying to make the world a better place' we should avoid (or at least minimise) doing long-term, systematic harm to those individuals, communities and environments..." (Israel & Hay, 2006).

The inclusion/exclusion criteria are dependent on the three principles of ethics which include informed consent, confidentiality and avoiding harm to do good.

- **Informed consent**: The researcher explained the implications and benefits of the study to the respondents before informed consent was given. No respondent was coerced into participating in the study, nor did the researcher lead any respondent through the process in order to achieve a desired outcome.

- **Confidentiality**: Confidentiality of information was assured and all respondents were made aware of their rights to anonymity. The owner of the small-scale farm under investigation did, however, give consent to the use and publication of all information obtained in the course of the study.
- **Avoid harm and do good**: Ethics can go so far as to suggest that research needs to not only avoid harm, but needs to ensure that its purpose is to do good. Time considerations or implications on respondents were also taken into account.

1.5 Concept Clarification

1.5.1 Strategic Intervention

A strategic intervention contributes to the alignment of the organisation with its environment. These interventions “link the internal functioning of the organisation to the external environment; transforming the organisation to keep pace with changing conditions” (Cummings & Worsely, 2001). A strategic intervention assists organisations to acquire a superior understanding of their current state and the industry they intent participating in. This understanding places the organisation in a position to target strategies for competing with other organisations. The use of the following analytical tools and processes are viewed as strategic interventions (Paradise, 2008):

- Developing a mission, vision, purpose statement for the business.
- Conducting strategic planning and goal setting,
- scenario planning,
- benchmarking,
- SWOT analysis
- Porter’s 5 forces analysis of industry attractiveness
- Value chain analysis
- Competitive strength analysis
- Financial analysis
- PESTLE Analysis

1.5.2 Sustainability

A broadly accepted definition of sustainability as promulgated by the King Report II of 2002 states that sustainable systems should meet the needs of the current generation without compromising the ability of future generations to meet their own needs (Kleyn, 2017). Therefore, the goal of sustainable agriculture will be to maximise the net benefits that society receives from agricultural production. This will require increased yields and efficiencies of resource use (nitrogen, water, protein and energy), ecologically based management practices, and the judicious use of chemicals (pesticides and antibiotics) (Kleyn, 2017). These systems will need to be able to cope with major shocks such as climate change (Tilman *et al.*, 2002). More specifically, the FAO (2012), have categorised four dimensions of sustainable systems: environmental integrity; social well-being; good governance (institutional sustainability) and economic resilience (FAO, 2012). Clearly, it is difficult for both business and government to balance all of these components. In the context of the emerging poultry farmer the following clarification is required:

- **Environmental sustainability** largely revolves around the management of resources such as water or protein (animal production competes with human food), environmental pollution and degradation.
- **Social well-being** is focused on both animal and human well-being. Animals, under man's control, should enjoy the compact of the five freedoms of well-being (Kleyn, 2017). Similarly, human well-being in terms of health, including the exposure to antibiotic-resistant bacteria and financial security needs to be considered. It is suggested that less than 1% of the anti-biotic resistance problem confronted by the medical profession is caused by food-producing animals (Bywater & Casewell, 2000). Regardless, it is public perception that needs to be dealt with, and the solution will be for the industry to be responsible stewards of the limited number of compounds that we have at our disposal.
- **Institutional sustainability** is "too often, actions to achieve objectives in one policy area that hinders progress in another" (FAO, 2012). Institutions that would need to be considered in this regard are the governments that promulgate and enforce regulations, as well as, companies which are expected to abide by the numerous protocols imposed upon them in terms of company law, their shareholders or their own standard operational procedures. Lastly, traditional and social norms also need to be considered as they may differ between the various societal groups.

- **Financial or economic sustainability** is, for most agri-businesses', the most important component of the sustainability debate. While consumers expect to buy cheap, safe products, originating from high welfare facilities, producers are often only a single failure away from insolvency (Kleyn, 2017). Any move away from what the industry would now consider to be conventional production systems, to alternative systems - which could include drug free, free range, slow growing and/or organic systems - could increase the capital and labour costs of production by as much as 20% (Cervantes, 2015).

1.5.3 Value Chain and Supply Chain

Every organisation consists of a collection of activities undertaken in the course of designing, producing, marketing, delivering and supporting its product or service (Thompson *et al.*, 2013). The difference between a value chain and a supply chain is that a supply chain is the process of all stakeholders involved in fulfilling a customer request, while a value chain is a set of interrelated activities a company utilises in order to create a competitive advantage or value for its customers.

The notion of a value chain was pioneered by Michael Porter. The five primary activities in the value chain which gives a company the ability to create value that exceeds the cost of providing its goods or services to customers, are:

- Supply chain Management
- Operations
- Distribution
- Sales and Marketing
- Service

By implementing these activities efficiently and effectively, a company could achieve a competitive advantage over competitors in its industry (Thompson *et al.*, 2013).

1.5.4 Emerging Poultry Farmers

According to the South African Poultry Association's (SAPA) fourth quarter report for 2016 on subsistence and small commercial farmers, the following size definitions for producers are accepted by the egg industry (SAPA, 2016):

- A subsistence producer has between 1 and 499 laying hens.
- A small-scale or emerging commercial producer has been 500 and 50 000 laying hens. Small-scale farmers could be sub-divided between those that display commercial characteristics and those that are wholly non-commercial.
- A large commercial producer has more than 50 000 laying hens.

1.5.5 **Competitive Advantage**

An organisation achieves a sustainable competitive advantage when it can meet customer needs more effectively and efficiently than rivals and when the basis for this is durable, despite the best efforts of competitors to match or surpass this advantage. An effective analytical tool to determine the competitive nature of an industry is Porter's five-force model of competitive advantage. This model holds that the competitive forces affecting industry profitability go beyond rivalry among competing sellers and include pressures stemming from four co-existing sources, namely: Potential new entrants into the industry, Competition from producers of substitute products, the degree of supplier bargaining power and the extent of customer bargaining power (Thompson *et al.*, 2013).

1.5.6 **Transaction Costs**

In an Agri-food value chain, transaction costs are the variety of costs accompanying the selling, buying and transferring of ownership for goods and services (Jaffee & Morton, 1995). These costs would include:

- The information costs incurred while identifying and screening different trading opportunities and partners.
- The costs of negotiating trading agreements.
- The costs of actually transferring goods, services and ownership rights.
- The costs of monitoring trade conditions to determine whether the agreed terms are complied with.

1.5.7 **Entry Barriers**

Entry barriers are the presence of exorbitant start-up costs or other impediments that thwart new competitors from gaining access to markets or market participation. These barriers often benefit firms already functioning in an industry because they shield such company's profits and revenues from being eroded away by new competitive rivals. Typical entry barriers include special tax benefits to existing firms, patents, strong brand identity or customer loyalty, and high customer switching costs, amongst many others.

Government regulation and policies could also impose entry barriers, whilst most are inherent to the type of industry and its market structure. Often, existing companies within an industry would petition government to establish new entry barriers. At face value, the justification is to safeguard the integrity of the industry and prevent opportunism from disrupting market structures. In reality, some companies, contentedly entrenched in an industry, favour entry barriers because they curb competition and allow for an industry's revenue to be ring-fenced.

1.5.8 Economies of Scale

Economies of scale is the cost advantage that arises with the increased output of a product. Economies of scale arise because of the inverse relationship between the quantity produced and the per-unit fixed costs; i.e. the greater the quantity of a good produced, the lower the per-unit fixed cost because these costs are spread out over a larger number of goods. Economies of scale may also reduce variable costs per unit because of operational efficiencies and synergies. Economies of scale can be classified into two main types: *internal* – arising from within the company; and *external* – arising from extraneous factors such as industry size.

1.5.9 Retail Sector

Retail is the process of selling consumer goods and services to customers through multiple channels of distribution to earn a profit. Retailers satisfy demand identified through a supply chain. Retailers, therefore, are the conduit between producers and end-users. Consequently retailers, as the 'gate keepers' to market access wield enormous bargaining power in the value chain.

1.6 Chapter Divisions

Chapter 1: Research Overview

The purpose of this chapter is to provide background information, in addition to clarifying the research methodology, purpose and scope of this dissertation. It is a synopsis of what will be focused on in chapter two and three, and an opportunity to clearly state the objectives of the study. It will allude to the methodology used to collect, analyse and interpret information in the subsequent chapters of the dissertation.

Chapter 2: Literature Review

The primary objective of this chapter is to establish a worldview on the study topic, by gathering and synthesising information from previously or similarly conducted studies. Even though this requires the analysis of secondary data pertaining to the emerging layer farmer, care will be taken to place emphasis on the most recently conducted studies which may be applicable within a South African context. Complementary and ancillary concepts affecting transaction costs and emerging poultry farming in South Africa will also be clarified and investigated. The effects of market liberalisation on the value chain of the egg industry will be scrutinised.

Chapter 3: Industry Analysis

This chapter investigates how applicable the theoretical findings of chapter two are when applied in a South African context. Analytical tools will be used in order to determine the industry attractiveness of the egg market, in addition to the competitive forces which exist within the industry. The aim of the industry analysis is to determine if economic sustainability is achievable and assess which strategies could assist the farmer to maximise economic profit. Through the assessment of the nature and characteristics of commodity markets, the preferred private or corporate stakeholder will be identified to facilitate the strategic intervention in the value chain.

Chapter 4: Case Study

In this chapter, analytical tools will be utilised to assess the competitive situation of Mmadiboke and the effects that a strategic intervention may have on the competitive situation. Synergies between role-players in the value chain will be determined which may inform the strategic interventions required. These synergies will take key success factors for successful market participation into account. The results of this situational analysis will form the foundation for the conclusions and recommendations provided in chapter 5.

Chapter 5: Conclusions and Recommendations

A summary of findings concerning the primary and secondary objectives is presented. This will include synthesised conclusions basis on the results of the investigation, which may add to existing knowledge on the field of study. Practical implications will be identified and strategies for effective implementation provided, within the theoretical frameworks available. Study limitations and recommendations for future research will also duly be noted.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This literature review is the first phase of the exploratory research study into the type of strategic interventions required in order for small-scale South African poultry farmers to be active participants in liberalised markets. The aim of this review is to identify and understand the nature and characteristics of the challenges these farmers face in Agri-food chains, both on a global as well as domestic level. By determining the constraints that limit market participation, the researcher hopes to establish the key success factors required for small-scale farmers to be sustainable in a South African context. Ultimately the scope of the research will be narrowed to focus on egg producers, in particular, within the commodity value chain of the poultry industry.

2.2 The Future Outlook on Agriculture Worldwide

In 2013, the United Nations predicted that the world population would grow to 8.1 billion by 2025 and burgeon to 9.6 billion by 2050 (UN, 2015). This eventuality would create a need for innovation, entrepreneurship, and leadership in Agri-business industries. In lieu of such predictions, future studies investigating how the world's agricultural potential could meet the growing world demand for food, water, and sustenance will be imperative. Based on economic theory, it is generally accepted that large commercial operations focus mainly on economies of scale as drivers of competitive advantage in any industry (Kleyn, 2017). In addition to this, economic theory also suggests that larger operations tend to focus less on environmental concerns or externalities - unless these directly affect profits. Therefore, decisions by management nowadays tend to be based rather on profitability - often at the expense of sustainability, in its holistic sense (Tweenten & Thompson, 2008).

As the current situation already dictates, the attention of Agri-business should be on food supply (food security) and sustainability (Rockström *et al.*, 2017). This dichotomous focus on 'food security' and 'sustainability' should underpin the future objectives that, firstly, there is enough food for everyone and, secondly, that our food production systems are holistically sustainable despite the increasing levels of demand and extraneous factors such as climate change (Rockström *et al.*, 2017).

Worldwide, livestock production forms an integral part of the human food chain, with animal agriculture currently accounting for about 13% of the calories, and about 28% of the protein consumed daily (Herrero & Thornton, 2013). Undeniably, many nutrients available in current human diets would not have been available were it not for domesticated livestock production systems. This is because these production systems have the ability to convert indigestible forage into something that humans can consume (Kleyn, 2017). Increasingly though, the meat, fish, eggs and dairy products that people eat are dependent upon the conversion of food crops into animal products and, in the future, the demand for these products will increase (Kleyn, 2017).

As stated before, the levels of animal-derived calories in an average person's diet are significant. Within the food chain, this demand, in turn, increases the demand for higher levels of plant calories, which ultimately would put pressure on land usage, production systems and the environment (Steinfeld *et al.*, 2006). It is therefore inevitable that the principles of sustainability, as they currently stand, would have to be incorporated into the Agri-business model.

All things being considered, over the last few decades agriculture has done well globally. Food prices, in real terms, have dropped by half in the last 50 years. The maize price, for example, fell at an annual rate of 1.3% from 1960 to 2006 (Tweenten & Thompson, 2008). The percentage of malnourished children under the age five, fell from 25% in 1990 to 14% by 2015 (The Economist, 2017). However, future predictions point to the likelihood that input costs and output prices may marginally increase in the long run (Rockström *et al.*, 2017). Whilst this may have a negligible effect on developed economies, where shortage has given way to glut, in the developing world the effects will be more acute. Evidence of such effects were seen when ingredient prices increased just prior to the world financial crisis in 2008, which led to widespread hunger in developing economies (UN, 2015). Such dire consequences substantiates the need for developing economies to appreciate the role of subsistence and small-scale farmers in fulfilling the need for food self-sufficiency, particularly in remote rural communities where transaction costs are a limiting factor (Kleyn, 2017). The duel burdens of nutrition (under-nutrition, over-consumption and food wastage) and the need to reduce the impact of food production on the environment will define research agendas and governmental policies all over the world, in the not so distant future (McMohan, 2013).

Nevertheless, it is a *non-sequitur* to hold a catholic view on agriculture as a single entity. There are huge contrasts between the realities of small-scale and subsistence producers - mostly found in remote rural communities in the developing world - and those of the high-intensity systems of modern agri-business which dominate free market systems. The outcome of these realities over the years, added to the fact that agricultural systems have continually evolved, is that fewer farmers are producing more food. The consequence of which is that the average citizen is becoming more removed from the realities of food production (Neeteson-van Nieuwenhoven *et al.*, 2016). Subsistence and, to some extent, small-scale farmers are largely dependent on local inputs for animal feed, fertiliser and water (rainfall) and would struggle to carry the transaction costs associated with location-specific factors (Bolton, 2015). It would, therefore, be remiss of society not to be cognisant of the fact that there are an estimated 2.5 billion small-scale farmers globally (FAO, 2013). Furthermore, these individuals are the primary stewards of our natural resources (Rockström *et al.*, 2017) . Agri-business, on the other hand, is almost entirely dependent upon an external supply of fuel, fertiliser, grains, proteins and water. Mainstream agricultural development still concentrates on productivity and places limited focus on sustainability (Rockström *et al.*, 2017).

Sadly, many city dwellers have a romanticised idea of agriculture and envisage farmers as gentle souls, who run a few cattle, keep some chickens and grow small fields of crops watered by rain and fertilised by animal manure. Nothing could be further from the truth. It is hard, physical work running a farm without mechanisation or even draught animals, and most subsistence or small-scale farmers struggle to exist. Furthermore, these farmers are often a single natural disaster away from life-threatening distress (Kleyn, 2017). In many Eastern European countries, the agricultural landscape has changed forever, because smallholding farmers (or their offspring) prefer the financial security offered by city jobs, and have simply left their farms and villages (Kleyn, 2017).

In conclusion, the sustainability of small-scale or emerging poultry farming, in the face of globalisation, and the constraints which are present in liberalised markets are major entry barriers to market participation. Current value chain models advocate economic viability at the expense of sustainability in its true sense. Through partnerships and collaboration within the current value chains of any industry, the fate of small-scale farming could be secured for future generations (Kleyn, 2017). This fate should answer to small-scale farmers' ability to provide a measure of food security and sustainability, which is in keeping with the future trends of agriculture worldwide.

2.3 The Future of Agriculture in Africa

When food security and sustainability is viewed in an African context, the issues seem ominous. Africa currently imports approximately 80% of its consumables. As a continent, Africa appears to be trapped between its inability to meet food security demands and the burdens placed on countries to service their national trading deficit debt. This predicament is a reflection of the general feebleness of Africa's agricultural system (Whitbread *et al.*, 2010).

If Africa is unable to increase its grain production yield in the future, it would be fair to surmise that chicken protein output, which includes table egg production, will remain static. Therefore, in order to address this quandary of food security and agricultural sector development, Africa would need to restructure its entire agricultural sector. The current limitations prohibiting the development of a comparative national advantage in the African Poultry Industry, and which requires investment, are (Whitbread *et al.*, 2010):

- **Cost effective feed production**: In order to produce low-cost, high quality feed a major investment in grain production is required. This would include an investment in diversifying ingredient sources, like maize, soya and sunflower.
- **The deficiencies in breeder stock, which generate point of lays**: The correct genetic breeds have efficient 'feed to production' conversion rates, which is essential to long run sustainability of production.
- **Disease management and Bio-security**: A form of risk management for food security and sustainability.
- **Poor infrastructure**: This issue is particularly acute in rural areas and is a major obstacle to market participation and industry growth. Poor infrastructure includes service delivery issues related to energy, water supply and transportation systems.
- **Access to credit and finance**: Whilst credit facilities with input suppliers mitigate cash flow pressures stemming from the trading terms with buyers, producers also require financing facilities in order to grow and acquire competencies for production.

It is therefore incumbent upon African Governments to lay the correct foundations which would enable emerging farmers to grow and thrive. Without investment in the limitations listed above, Africa will never achieve a level of self-sufficiency.

2.4 The Future of Small-scale Farming

In order for small-scale farmers to play a future role in agriculture, it would be critical to determine their role with regard to future food security and whether economic sustainability could be achieved despite the current structure of food market supply chains.

2.4.1 Small-scale Farming and Food Security

The guarantee of an adequate food supply (food security) will undoubtedly be the greatest concern faced by future generations (and by default agriculture). This is something that the well fed often forget. Unfortunately, developed countries naively confuse food security with food safety (Kleyn, 2017). Simply stated, matching food supply with food demand is rather a simplistic measure of food security (Bodirsky *et al.*, 2015). A more complex definition is required. The FAO (1996) analysed food security with respect to the following aspects: food availability; food stability over time; access to food, the potential of individuals to purchase food, and the utilisation of food to create an adequate and healthy diet (FAO, 1996). As such, the definition includes issues related to Agri-food value chains and consumer preferences for animal-based protein sources.

Food security is a global issue, and governments need to look beyond their own economies and citizens (Page, 2015). The idea that each country should be 'secure' is naive. Some countries, like Saudi Arabia, are simply not suited or are not able to produce the food crops that they require. Countries with large areas of arable land relative to the size of their population tend to be the most secure (Hofstrand, 2014). Other countries may be able to produce certain crops, but they do so ineffectually and would have been better off to focus on producing what they are best at. Europe's insistence that they will produce their own soy beans in the future, is perhaps an example of this (Kleyn, 2017). The European climate does not lend itself to soy production. Governments and economies need to rely on '*trust based trade*' to make up any shortfalls in agricultural production (Kleyn, 2017). China's reliance on imported soy products is a good illustration of this (Napier, 2001).

As stated earlier, there are 2.5 billion smallholding farmers globally (FAO, 2013), who act as stewards of our natural resources (Rockström *et al.*, 2017). It is estimated that backyard systems contribute 8% of global egg production and only 2% of poultry meat production (Mottet & Tempio, 2016). Clearly, this is an area where meaningful change could be brought about. However, in South Africa and the South African egg industry in particular, only 51% of the egg production is controlled by large commercial producers. Therefore, the role that subsistence and small-scale poultry farmers play in determining current and future egg supply is undisputable (SAPA, 2015).

Furthermore, South Africa is the richest country in Africa, and the only African country that has any form of social security. Despite this, the 2012 National Health and Nutrition Environment Survey concluded that 28% of South African households were at risk of becoming food insecure, while 26% were, in fact, going hungry. Such statistics are just cause for an argument that small-scale farming, in a South African context, could fulfil the need for food security. Even in the world's wealthiest nation, the USA, about 11% of households are not food secure for the whole year, and 3.5% suffer from hunger (Nord & Andrews, 2003). Access to food is only part of the solution and therefore, affordability is just as important as supply. High food prices are an impediment to resolving food security issues in areas where food cannot be grown (Skinner & Haysom, 2016). The high transaction costs which are to be found between the producer and the facilitator of market access, namely the Retail Industry, warrants scrutiny when affordability is the issue up for debate.

Nevertheless, poultry production has much to offer the disadvantaged subsistence or small-scale farmer. This has been recognised by the Gates Foundation who propose donating 1000 000 chickens to African farmers (BBC, 2016). Well managed small-scale production systems can ensure food security and lift farmers out of poverty, particularly in developing countries. A major advantage for small-scale poultry projects is that relatively little capital is required, and farmers see a return on investment within a few months (Kleyn, 2017). Sondeleni Ranching in Western Zimbabwe have partnered in, what they call, an out-grower scheme. Through this collaborative partnership, some 150 small-scale broiler farmers produce 40 000 birds per week and realise an income of between $0.50 and $ 1.00 per bird. Flock size per contract grower ranges from 500 to 5000 birds and six crop cycles are produced per annum. These birds are reared in open sided housing on earthen floors. At the end of each cycle, the earthen floor is removed and then replaced. The old floor is spread over the fields. In the process, nitrogen is made available to those farmers contracted to grow crops, which would in turn be used to produce feed for the contracted broiler growers. The scheme is dependent on a closed supply chain. By Kleyn's (2017) estimation, the nitrogen produced is the equivalent of about 1000 tons of LAN fertilizer per annum – this is but one example of a sustainable cross-subsidised cost reduction model. Within this out-grower scheme, the commercial partner provides access to inputs (chicks, feed and veterinary support) and a market for the broilers grown, which is how the contracted small-scale grower makes his profit (Cunningham, 2017). With the poverty datum line estimated at $ 700 per annum (BBC, 2016), all the producers who form a part of this scheme are economically viable. This project could serve as a model for similar projects in other regions, but it requires an energetic intervention by a commercial partner if it is to be successful (Kleyn, 2017). The Sondeleni model is a working example of how collaborative partnering within the supply chain could address the fundamental foci of Agriculture in addition to the future role of small-scale farming vis-à-vis food security and sustainability. And, whilst the Sondeleni out-grower scheme is based on broiler production systems, the model could easily be applied to small-scale egg producers.

2.4.2 **Small-scale Farming and Economic Sustainability**

In the years since the UNCED 'Earth Summit' held in Rio in 2001, global agriculture has been successful in terms of production being able to keep pace with population growth and demand. Thus far, in numerous countries, the success of sustainable agriculture and rural livelihoods (SARL) based on measurements of sustainability like, environmentally sound land management, the incentivising of robust rural economies, social justice, and public acceptability, has been left wanting. Consequently, a process of rural differentiation is currently underway (Vorley, 2001).

At the summit, Agenda 21 was promulgated and adopted by world leaders. The objectives of the agenda are premised on overcoming the constraints faced by small-scale farmers by improving local governance and providing access to resources. Governments are considered the principal agents of transformation. The summit proceedings also identified two key constraints facing subsistence and small-scale farmers, namely, access to markets and pricing - in as far as these are related to the terms of trade between the producers and the rest of the stakeholders in the Agri-food chain i.e. Transaction Costs.

It has become a reality that the agricultural sectors in many countries have been liberalised through privatisation and deregulation, often as a result of structural adjustment policies, stakeholder conditionality and compliance with trade agreements (Vorley, 2001). Within free market systems, governments have systematically withdrawn from interfering in production activities and the functioning of markets (which is commonly referred to as Market Liberalisation). Moreover, with the disbanding of marketing boards, most Agri-food markets worldwide have witnessed a transition towards globalisation (Vorley, 2001).

The mission and objectives agreed to by representative leaders attending the Earth Summit (Rio, 2001), as a basis for developing sustainable small-scale production systems, are (Vorley, 2001):

- A proactive and accountable government should collaborate with an organised rural civil society, in order to overcome the perception of exclusion from policy making and from markets.
- The dismantling of government interventions, in OECD countries, that distort world prices, because they prejudice developing countries and, in particular, the growth opportunities of poor rural communities.
- A socially responsible private sector should pledge itself to a similar agenda, which supports national rural development policies and plans.
- Producer and Government organisations should use benchmarks and sustainability indicators to monitor the performance of channel captains within value chains, apropos fair terms of trade.

Worldwide, small-scale farmers have had to deal with the withdrawal of government from the business of agricultural support and commodity trading. The void left by this traditional support base has mitigated any possibility of such farming operations exploiting a comparative advantage and has limited their ability of fostering relationships with the market (Harvey, 2005). In an ideal world, the increased risk from exposure to market fluctuations and the removal of safety nets would be countered by improved market information and reduced information asymmetries, efficient scales of production and marketing, contract farming, and improved liquidity (Vorley, 2001). The challenges of competitiveness, efficiency and quality on small-scale farms could be overcome through establishing a producer organisation, complimented by the involvement of a private sector contributor. The utilisation of social capital in the form of 'Producer organisations' are mechanisms for adapting to the demands of a market economy. Such forms of coordination are the means by which small-scale operators are meant to protect themselves from being marginalised by liberalisation and globalisation (Vorley, 2001).

World markets, however, continue to be skewed by dumping, especially from first world countries, of surplus products at prices below the cost of production. Unfortunately, due to globalisation and the liberalisation of trade, domestic market prices and quality standards are dictated to by international market trends (Vorley, 2001). Agriculture which is geared towards both the domestic and export markets must then supply products at a comparable cost and quality to those that could be purchased on the world market.

There are two other limitations, linked to risk management and market access, which entrenches a partiality within the process of liberalisation in favour of intensive commercialised operations. Firstly, governments have discontinued their involvement in research development, rural infrastructure investment and credit provision under the same fiscal constraints and global influences that triggered economic liberalisation (Vorley, 2001). This limits the access of resource deficient operators to technology, information and markets (Delgado *et al.*, 1998). Secondly, there has been a reorganisation of markets. Markets have experienced abrupt changes, in that closed supply chains have substituted the traditional spot markets (Vorley, 2001). The transitioning of markets and the subsequent increased buyer bargaining power has been somewhat overlooked in the research about sustainable agriculture and rural poverty. These trends were, at first, deemed a reflection of an industrialised country's agricultural markets rather than that of developing countries with more rural specific systems (Aromolaran Adetayo *et al.*, 2013).

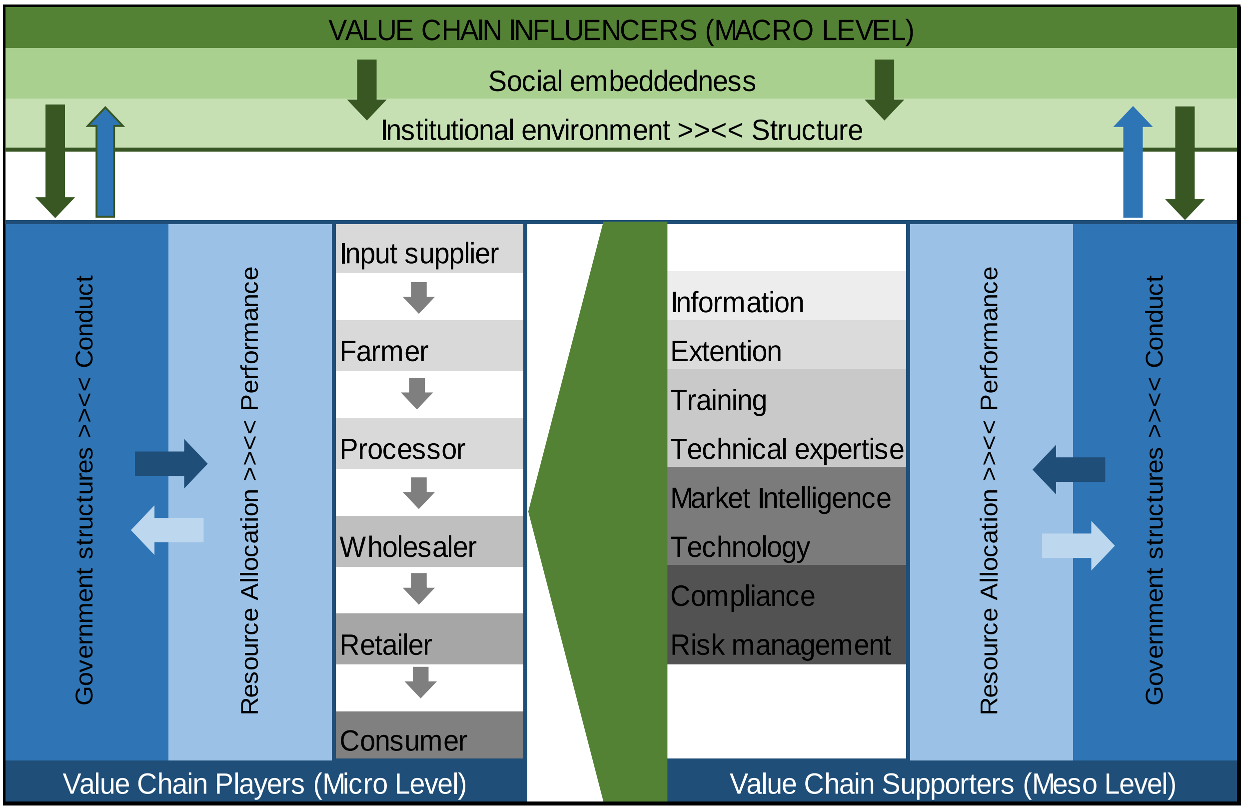
The liberalisation of agricultural markets transfers the risk from the government onto the individual (McDonald, 1999), and it also endorses the relevance of the private sector as intermediaries of sustainability. Subsequently, the investigation, thus far, into the sustainability of any farming enterprise has identified that the nature or characteristics of Agri-food supply chains in addition to the types of transaction costs within the value chain are crucial to active participation in free markets.

2.5 Liberalised Markets: The Reality of Agri-food Supply Chains

By reviewing liberalised markets and the value chains which function within such markets, the research focuses on the demand-side influences of the value chain. From this perspective, all the factors which flow upstream in the supply chain will be scrutinised in order to determine what bearing these may have on producer processes and the relevant support functions.

Agricultural marketing has changed dramatically worldwide, due to the liberalisation of markets. As already alluded to above, liberalisation refers to the slackening of government regulations and participation in markets. The void left by government has allowed privatisation and globalisation to dictate the nature and characteristics of market supply and value chains. The result of globalisation and privatisation is that small-scale farmers are increasingly expected to acquiesce to the market demands for quality and food safety, or more concentrated and integrated forms of coordination, whilst at the same time being more at risk to international competition (Hellin *et al.*, 2007).

Figure 2-1: Value chain influencers of fragmented Agri-food markets.



Source: (Jordaan *et al.*, 2014)

The influences within the Agri-food value chain are illustrated in Figure 2-1 above. These influences are integrated with the institutional, social and physical environment. Downward influencing constraints originate from non-economic institutions, known as 'social embeddedness', which in turn pressurises the institutional environment. The social and institutional environment thus places constraints on value chain players and supporters on a micro and meso level. The upward arrows are secondary influencing factors that are the result of feedback which flows from the consumer back up the value chain (Figure 2-1). These influences could result in structural changes in markets, supply chains, institutional policies and regulations, or the social environment.

At a macro level (Figure 2-1), *Structure* refers to the characteristics of the market which have a strategic influence on the nature of competition and market pricing (Jordaan *et al.*, 2014). Small-scale farmers are often constrained by factors on a meso level. The value chain supporters, like retailers, who control the intangible assets on a meso level, control the value chain. Meso level factors are those that reveal linkages between the micro and macro levels. In fragmented markets, which are buyer driven, these factors include all the activities that facilitate the coordination of information, negotiation, monitoring and compliance.

Therefore, buyer-driven, as opposed to producer-driven, supply chains expect complex forms of integration and coordination as prerequisites to market participation (Vorley, 2001). These coordination competencies attempt to mitigate the prohibitive nature of transaction costs, in that they are characteristically viewed as fixed costs which decrease per unit as volume of sales increase. The implications of this new form of Agri-food governance for small-scale farmers has been understated in past research (Delgado, 1999). The protocols and standards which govern market access in vertically co-ordinated supply chains, and the transaction costs brought on through contractual engagement with, and enforcement by intermediaries, appear to be forceful drivers of divergence and marginalisation within farm communities (Vorley, 2001). These transaction costs are drivers of divergence for the simple reason that small-scale farmers do not possess the economies of scale to chase volume sales, and therefore the cost per unit become prohibitive.

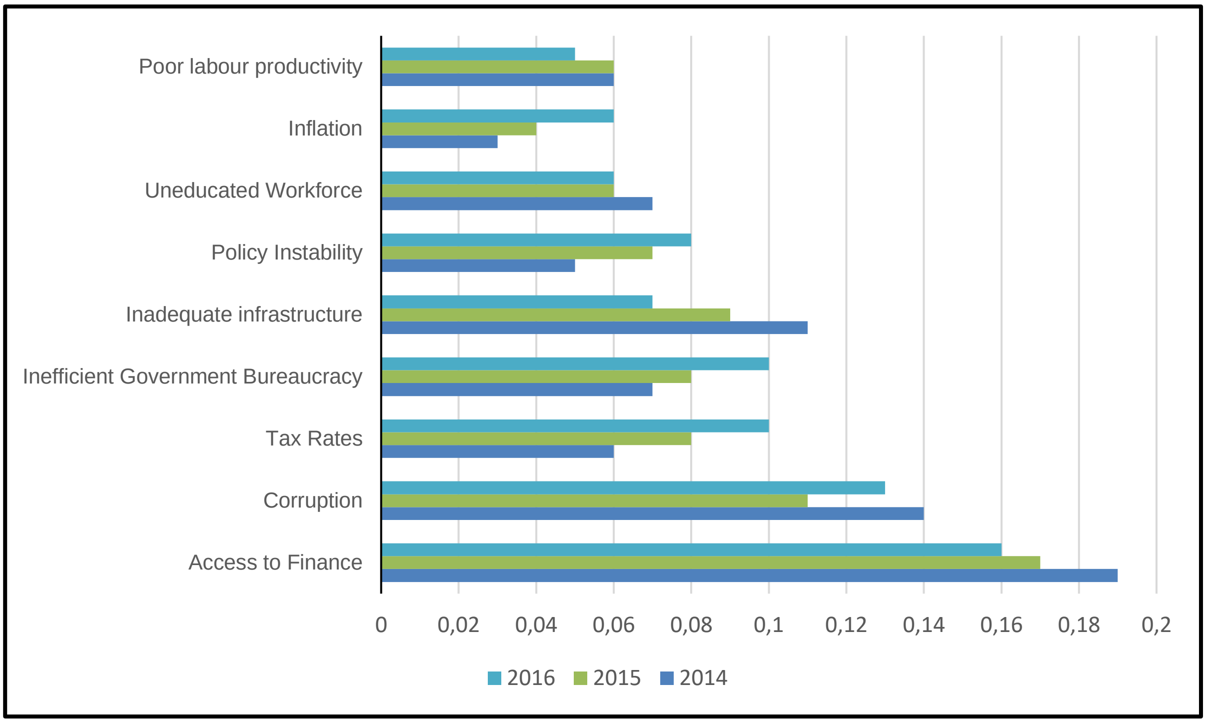
It is by understanding how the channel captains drive value within the supply chains, like their ability to concentrate capital flows, that one could get a clearer understanding of agricultural markets and the future sustainability of farming (Hellin *et al.*, 2007).

According to Wilkinson (2000), the analysis of commodity chains has its theoretical roots in demand orientations informed by neoclassical economics and the notion of the autonomous consumer, as compared to the supply orientation of political economy (Wilkinson, 2000). A traditional political economy approach to the Agri-food chain would propose that capital is accumulated through controlling the tangible means of agricultural production: land, labour, nutrients, chemicals, water, genetics and seeds, feed, equipment, and capital. However, the merging of supply chain analysis and political economy decrees that it is the ownership and control of intangible assets, especially product branding and information, rather than the control of the tangible means of production, which raises obstinate barriers to competition. Control of these intangibles allows for the concentration of capital within an area of a supply chain and the conversion of the capital into transferable financial capital (Pritchard, 2000). In other words, the governance of supply chains depends on who controls the means of co-ordination rather than the means of production. This has become a hallmark competency of large commercialised operations on the supply side of the value chain.

As markets have become more challenging, structural adjustments and privatisation programs within the supply chain have left many small farmers without sufficient access to critical inputs and services, like credit or financing. Figure 2-2 below, sourced from a report released by the World Economic Forum and based on an opinion survey conducted annually, substantiates that access to finance continues to be the most problematic factor for doing business in Africa.

Government structures also do not provide any direct marketing and service functions to small-scale farmers any longer, which has left a void for the private sector to fill (Kherallah & Kirsten, 2002). Notable factors also illustrated in Figure 2-2 are the concerns relating to the level of corruption, policy instability, inadequate infrastructure and the productivity levels of the labour force. Corruption and policy instability will have a negative impact on South Africa's economic outlook. The addition of factors such as inadequate infrastructure and labour productivity would add to the costs of doing business in a static market. Within this context, the prevailing academic opinion is that small-scale farming is no longer economically feasible, and that the future of agriculture depends on commercial farms' ability to develop linkages and relationships in the new structures of market chains (Jordaan *et al.*, 2014).

Figure 2-2: Most problematic factors for doing business in Africa



Source: World Economic Forum, Executive Opinion Survey 2014, 2015, 2016.

Nevertheless, small-scale farmers have important economic and social advantages to offer in low-income countries. According to Jordaan *et al.* (2014):

- They are efficient producers in labour-surplus economies, because family workers are less costly and more motivated than hired workers. In addition, such small-scale operations are more likely to use labour than capital-intensive technologies. This creates opportunities for job creation.
- They alleviate poverty by providing a basis for food safety and self-sufficiency.
- They slowdown the rate of urbanisation.
- In regionally orientated markets, the producer's proximity to the market may mitigate high transport and marketing costs associated with current Agri-food chains. This not only permits market access for the producer but also supports affordable pricing.

Jordaan *et al.* (2014) also noted that a competitive advantage would gradually dissolve as countries develop and labour became rarer relative to land and capital. This would lead to an expected transition toward commercialisation and a migration of farm labourers to towns and nonfarm jobs (Jordaan *et al.*, 2014). However, such a transition does not usually occur until the country has developed from a low-income status, and this typically takes several generations to manifest.

The issue, for most developing countries, is not so much that small farms are intrinsically unfeasible in today's marketplace, but that they need to negotiate on a lop-sided playing field which could lead to their premature demise. Key success factors to ensure the survival of small-scale farmers would be the improving or obtaining of education (technical expertise), technological capabilities, infrastructure, key input procurement and encouraging producer organisations to develop market intelligence. Small farmers do not possess the competencies or coordination abilities to do this on their own, and would, therefore, require collective action in the form of public, private, and non-governmental organisation sector intervention. The economic and social advantages from these kinds of interventions could be enormous (Jordaan *et al.*, 2014).

2.5.1 **Commercial Transformation of Food Production Systems**

The topic of agricultural commercialisation and the small farmer is by no means novel. Most developing countries have observed agriculture 'moving away from traditional self-sufficiency' to an activity where 'farm output is . . . more responsive to market trends' (Pingali & Rosegran, 1995).

It is implicit knowledge that with a country's economic expansion, small-scale production systems cannot remain stagnant and would need to commercially equip themselves in order to survive. As such, there is a need for a greater degree of integration between producers and the output market, with the emphasis on standards and regulations, where the transaction costs are not limiting factors to market participation.

By assuming commercialised characteristics, subsistence or small-scale farmers shift away from a self-sufficiency paradigm and toward profit and income-oriented decision making. Farm output, consequently, has to be more receptive to market expectations. With this paradigm shift, the earnings of subsistence production systems, which require high levels of labour inputs, generally decline relative to production. Strategically, sustainability would imply diversification (commercialisation) of the product offering to the market. Diversification would require the addition of other crops or livestock to the staple-based production system. Ironically, as the level of commercial orientation or diversification increases, this mixed farming system yields to specialised production units for the production of high-value crop and livestock products. Therefore, commercialisation, while leading to an increase in the diversity of marketed outputs at a national level, also leads to an increased regional and farm-level specialisation. Even though the rate of this structural transformation differs considerably between countries, the same trend is being observed worldwide (Pingali *et al.*, 2005).

Traditional food systems were, fundamentally, linear production systems, which only incorporated rudimentary forms of processing and minimal distribution. On the other hand, modern food systems are exceptionally integrated with complex forward and backward linkages, in order to meet market standards and regulations (Wynne & Lyne, 2003). Furthermore, they are systems that display a higher degree of technological and process innovation. As such, these modern food systems are much more discriminatory in terms of market entry. The inference is that there are more informational uncertainties now within the food system. This results in the need to exchange on a different contractual basis than before. New standards necessitate better screening and monitoring in order to ensure quality and safety requirements (Boehlje & Doering, 1999). These informational prerequisites induce costs that tend to diminish as the farm grows in size. The ability to enter the food system on a competitive basis is, therefore, problematic for small farmers because of the physical investments required and the associated transaction costs of the current agricultural market.

2.5.2 **Commercialisation: Effects on Small-scale Farmers**

There is a plethora of literature that attests to the productive efficiency of small farms. On that basis, it is argued that small farms, if they are able to overcome some constraints, are well placed to enter markets. Due to the empirical studies conducted by, amongst others, Delgado (1999), it could be surmised that small-scale family farms tend to be more productive than large farms. Makhura (2001) expounded on this study and cited a major contributing factor, for the higher levels of efficiency, to the higher productivity of farm-family labour and lower supervision costs in comparison to larger farms. Going forward, the challenge for small farmers would be to gear existing production structures toward the market with reduced or comparable cost implications in relation to commercialised farming operations.

For small-scale farmers specialising in high-value output, the critical question remains as to whether their size could profitably support such activities in the long term. In reality, for most small-scale farmers, commercialisation would offer the possibility of diversification, but not an overall specialisation.

The structure of supply chains and the relationships within commercialised food systems are often foreign to the small farmer (Napier, 2001), which raises the cost of entry into the market in two ways. Firstly, there are increased costs of production stemming from the investments needed to meet the requirements of the output market. Secondly, there is a greater level of exchange with new players in input and output markets, which is inevitably costlier. Moreover, poor public good provision and the absence of adequate regulations could interact with the specific requirements of commercial markets to exacerbate transaction costs further (Napier, 2001).

2.6 Agri-food Chains: Effects on Sustainable Agriculture and Rural Development

Through the literature review, it has already been noted that highly concentrated food processing, retail and food service industries, as key agents within buyer-driven chains, have the ability to consolidate their supply base and demand progressively stringent levels of quality, compliance with standards and codes of conduct, which would include traceable 'sustainable agriculture' production processes and post-production service from their suppliers (Vorley, 2001).

Hence, the question remains that if agricultural markets are subsumed into relatively closed supply chains governed by downstream private stakeholders, what does this mean for the sustainability of small-scale farmers and the opportunities for agriculturally led development? Participation in buyer-driven supply chains could connect small-scale farmers to the modern economy, with marginal market risk and superior access to inputs such as financing. A contract out-grower scheme, like Sondeleni Ranching, is one model enabling such a connection, which does not translate to 'turning farmers into wage labour on their own farms' (Harvey, 2005).

Nonetheless, the control of supply chains by bands of influential downstream actors could have a profound impact on agriculture, specifically in weakening the relationship between farm prices and food prices (Vorley, 2001). The farmers' share of the retail cost of a basket of food sold in supermarkets will erode once they have paid for inputs such as hens, feed, machinery, finance, labour and land rental costs. The size of the food market also contracts as intense retail competitive rivalry and increased retail buying power is converted into consumer surpluses. As such, farmers are generally trapped in a downward spiral of 'producing more for less'.

In lieu of what has been discussed, it would not be erroneous to presume that market access is no longer dependant on the classical notion of 'efficiency', but rather on the farmer's ability to; exploit a marketing advantage, satisfy a retailer's demands for consistency and quality of supply, deliver a speedy response, comply with standards, and pay transaction costs (Cuevas & Graham, 1986). Retailers preferentially contract with commercialised farms who are able to meet these demands, at lower transaction costs and with mitigated risk factors. By default, small-scale farmers present higher per unit costs for contractors, and have more difficulties in satisfying stringent quality and safety requirements (Reardon & Barrett, 2000).

Despite this, even highly capitalised commercial farmers struggle to prevent their bargaining power, and by extension their profitability, from being eroded as downstream agri-business becomes more concentrated. The negotiation of contracts with downstream agri-business actors are often high risk and low return. The 'captive supply' of livestock under contract to the large integrators is drying up markets for all the non-contracted animals and forcing wholesale prices down (Vorley, 2001). Independent farmers are often left with "take it or leave it" deals (Vorley, 2001). Price pressure will ultimately force farmers into unsustainable practices, like overstocking, in order to sustain their operations.

It must be emphasised that process standards are features of buyer-driven chains, marked by 'a shift in the centre of gravity from technical norms to reduced transaction costs, in broad homogenous commodity markets, to strategic instruments of product differentiation, Agri-food chain coordination, market creation and share growth' (Reardon *et al.*, 2001). These protocols have been marketed under the guise of sustainability by stakeholders within the supply chain, in order to consolidate contractual arrangements. Therefore, sustainability as a set of process protocols affords commercialised farmers the leverage to control markets and raise barriers to competition. These protocols also allow retailers, as governors of the supply chains, and commercialised producers to consolidate the supply of commodities within the value chain, whilst at the same time marginalising smaller producers. When a retailer develops a strategy for sourcing more ‘sustainable’ products, the influence of their purchasing power allows them to push all compliance costs and risks up to suppliers. The net result is that Standards and Codes of Practice favour well-capitalised farms.

Table 2-1 lists the constraints, based on the literature review. Supply-side factors, in Table 2-1, reflected those constraints resulting from factors of production and the forces that determine the producer’s comparable advantage within the value chain. The lack of bargaining power, unequivocally, is the most concerning supply-side constraint.

Table 2-1: Constraints limiting small-scale farmers from market participation

Supply-side factors		Demand-side Factors	
Constraint/Limitation	**Effect/Result**	**Constraint/Limitation**	**Effect/Result**
Access to Credit & Finance	Lack of liquidity	Poor Risk Management	Susceptable to Market Volatility
	Lack of purchasing power	Lack of Market intelligence	Lack of Marketing expertise
Proximity to Markets	Lack of Market Accessibility		Lack of Compliance capabilities
Logistical control	Lack of distribution networks	Closed supply chains	Specific contractual performance
Economies of scale	Capacity deficiencies		Compliance requirements
Education	Unskilled labour	Lack of Vertical/ Horizontal	Information asymmetries
	Lack of Technical expertise	Coordination	Lack of competencies
	Lack of Marketing expertise	Compliance requirements	Post-Production Service
Transaction Costs	Higher costs of exchange		Standardised Quality
Resource poor	Lack of capabilities		Reliability of supply
	(Technological etc)		Food Safety
Lack of bargaining power	Lack of comparative advantage		Traceability
Poor infrastructure	Pricing and cost challenges	Transaction Costs	Cost of Compliance
		Degree of Buyer power	Lack of Supplier bargaining power
		Intense competitor rivalry	Fragmented industry

These constraints are causally linked to; the lack of economies of scale, the lack of liquidity or purchasing power and the lack of competencies in the form of technical or marketing expertise. These constraints are reflected in the producer’s lack of coordination on the demand-side of the value chain. The net effect of these deficiencies, as listed in Table 2-1, is the inability to fulfil compliance requirements, absorb transaction costs and develop market intelligence.

2.7 Reducing Transaction Costs through Commercialisation

In reality, the structure of Agri-food supply chains and the factors which define the nature or characteristics of the market, albeit from a demand-side perspective, are beyond dispute. In order for small-scale farms to survive, mechanisms which would allow these farms to adopt the characteristics and competencies of commercialisation, on the supply-side of the value chain would need to be implemented. In essence, the reviewing of transaction costs within the value chain is, in fact, a complimentary investigation into many of the same causal factors which marginalise small-scale farmers in liberalised markets, except for the fact that it is done from a supply-side perspective.

In developing countries, changes in food markets are being fuelled by economic growth, higher disposable income, technological change, and urbanisation (Makhura, 2001). Higher levels of disposable incomes and the growing number of women in the labour force translates to a greater demand for high-value commodities, processed products, and pre-prepared foods. Furthermore, urbanisation widens the scope for economies of scale in food marketing and distribution, while reductions in transaction costs increase the size of the market for distributors and retailers. The upshot is the notable increase in the volume of commodity marketing managed by retailers, but also substantial organisational and institutional changes throughout the food-marketing chain (Pingali *et al.*, 2005). Such changes comprise, not only the enforcement of private standards for quality and safety, but also the conclusion of contracts between buyers and sellers at various stages in the marketing chain (Jordaan *et al.*, 2014). The burden to meet the requirements of a more demanding food system has ushered in a renewed interest in small farm welfare.

Although agricultural commercialisation puts increased emphasis on specialisation, it is not only restricted to the production of high profit yielding products. For many farmers the changeover to commercial production is more pertinent. The structural changes within value chains, brought about by commercialisation have elevated the costs of exchange for both low and high profit yielding products.

These transaction costs are a weighty variable that could impede small farmer entry into competitive markets. Even commodities, because of the specified requirements to meet the quality, size, and delivery standards, are becoming differentiated products, and new transaction costs have emerged that have raised the cost of entry into certain product markets (Gulati *et al.*, 2007).

The primary challenge confronting governments and socially accountable private contributors is to ensure that small-scale farmers and the rural poor benefit from commercialisation, either through participation in the market or by successfully exiting agriculture and finding employment in different sectors.

2.7.1 Transaction Costs in current Agri-food Systems

Before elaborating on the new set of transaction costs that have arisen with the emergence of modern food systems, it would be prudent to expound on a definition for transaction costs. Transaction costs are the trade-offs between the costs of coordination within an organisation and the costs of transacting and forming contracts in the market (Makhura, 2001).

This trade-off is dependent on the magnitude of the transaction cost. It is as a result of the transaction costs associated with negotiating, coordinating, monitoring, and enforcing contracts and information that middlemen have emerge to take advantage of such costs (Coase, 1937).

Continuing on Coase's work, Hobbs (1997) classified transaction costs into information, negotiation, monitoring or enforcement costs. Information costs, for example, arise ex ante of an exchange. The costs of physically carrying out the transaction are known as negotiation costs, and costs which occur ex post of a transaction are monitoring costs, which include the costs of ensuring that the terms of the transaction (quality standards and payment arrangements) are adhered to by the other parties involved in the transaction (Hobbs, 1997). Prior research had segregated transaction costs into intangible costs, like market intelligence or risk management, and tangible costs, like input costs and transportation (Cuevas & Graham, 1986).

Current purchasing behaviour patterns reflect an escalation of consumer preferences for product attributes that include convenience, taste, variety, high quality, and Iow caloric intake (Napier, 2001). It is precisely because many small farmers, far removed, are locked into traditional modes of production that transaction costs of such systems have tended to become prohibitive. Therefore, further investigation relating to the nature of transaction costs and how they limit market entry is warranted.

2.7.2 **Specific Agri-business Transaction Costs**

Modern food systems are typically characterised by near-monopsonistic markets. Whilst the number of possible suppliers are numerous, the costs of exchange - that is the transaction costs, between small farmers and a few large buyers - should be functional. If the transaction costs are prohibitive, an exchange will not occur. The transaction costs that are typically incurred as a result of an exchange with large numbers of small farmers are as follows (Hayes, 2000):

- The administrative costs associated with managing and coordinating integrated production, logistical and marketing systems.
- The opportunity cost of time used to communicate with farmers and coordinate them.
- The costs involved in establishing and monitoring long-term contracts.
- The screening costs linked to uncertainties about the reliability of potential suppliers or buyers and the uncertainty about the actual quality of the goods.
- The transfer costs associated with the legal or physical constraints on the movement and transfer of goods. They also include handling and storage costs, transport costs, and so forth.

Whilst some transaction costs are linked to tangible costs such as transportation and packaging, other costs are the outcome of informational asymmetries and contract enforcement problems that force agents or distributors to incur expenses associated with the search, supervision, and management of exchanges.

2.7.3 **Transaction Costs: Farm-specific**

For farmers, transaction costs are those costs incurred as a result of their participation in the increasingly vertically coordinated markets. These costs could be household specific, like the access to assets, or they could be location specific, such as land quality, or even product specific, such as perishable eggs. It is the parcel of transaction costs that farmers encounter that determines market participation. The interaction between the distinctive characteristics of food system participation and other household, location or product specific features that could result in transaction costs becoming prohibitive. No farmers would enter into a market when the price of participating is outweighed by the costs of concluding the transaction (Pingali *et al.*, 2005).

Specific transaction costs could surface in the input (supply-side) and output (demand-side) markets, which would affect market participation. A study in Bangladesh (Ahmed, 1989) concluded that transaction costs resulting from loans from formal lenders were higher than those from informal lenders. This was because the borrower was usually known. By contrast, the transaction costs per unit of loan decrease with loan size, and informal loans were settled much faster than formal loans (Ahmed, 1989). Moreover, transaction costs in output markets affected the choice of market channels farmer's utilised. The study concluded that high transaction costs were linked to an increased reliance on the services of agents or distributors, because farmers lacked the competencies to search for information on markets and prices. In instances where farmers were more informed about prices and markets, due to the utilisation of social networks, transaction costs resulting from agent or distributor services were significantly less.

Jaffee (1995) expounds on the three main dimensions that determine the level of transaction costs in a trading environment:

- **Asset specificity**: the degree to which physical and other assets required for production and exchange are durable and specialised for a particular product or trading relationship. Investing in specific assets exposes the investor to the risk of severe bargaining and contractual enforcement problems, as they may be locked into a particular trade relationship. Point of lay production, with extended production cycles, are an example of asset specificity. For instance, layers take at least a year to justify their purchase price. Once the farmer has bought the point of lays, it is difficult to switch their investment to an alternative.

- **Uncertainty**: the overall degree of uncertainty surrounding the exchange leads to increased transaction costs because more effort needs to be expended collecting information in order to minimise risk, and monitor contract implementation. A farmer might need to incur costs to establish whether potential buyers will in fact pay their accounts.

- **Competitive market structure**: in particular, the number of alternative buyers and sellers affects the ability of trading partners to negotiate and enforce agreements. Where inaccessible farmers have only one or a few intermediaries offering to buy their produce at the farm-gate, they are in a poor negotiating position to get a good price, raising their transaction costs.

While these three elements may determine the level of transaction costs faced by market participants, a weak institutional environment can exacerbate transaction costs for all participants, and conversely changes to the institutional environment can help reduce overall transaction costs, reducing the cost of doing business. Table 2-2 below provides a synopsis of the sources of transaction costs related specifically to small agri-business' in a commodity trading environment.

Table 2-2: Transaction costs in a commodity trading setting

Types of transaction costs	Source of costs	Tangible forms of transaction costs
Seacrching costs	Lack of knowledge about opportunities - products, prices, demand, supply, trading rights and market outlets	Personal / Personnel time Travelling expenses Communication costs
Screening costs	Uncertainty about the reliability of buyer/suppliers. Uncertainty about the actual quality of products or services offered	Consulting service fees advertising/promotion costs
Bargaining Costs	Conflicting interest of transacting parties. Unwillingness to trade on certain terms Uncertainty about tranactor's rights or obligations	Cost of credit rating checks Licensing fees Insurance premiums
Transfer costs	Legal or physical constraints on the tranfer of goods	Handling and storage costs Transport costs
Monitoring costs	Uncertainty about transactors' compliance with specified terms Uncertainty about changes in quality and services	Auditing fees Quality control costs Investment in measurement technologies
Enforcement costs	Uncertainty about damages incurred through non-compliance Problems of exacting penalities through bi-lateral agreements or through the use of third parties.	Arbitration, legal or court fees Costs to bring social pressures

Source: (Jaffee & Morton, 1995).

2.7.4 **Transaction Costs: Location-specific**

The producer's location vis-à-vis input and output services within the value chain is a significant determinant of transaction costs. Farmers located in or close to high profit yielding areas also experience a reduced level of transaction costs than those located in low profit yielding areas. Firstly, farmers in high profit yielding areas have access to more reliable production inputs and markets with greater purchasing power (Pingali *et al.*, 2005). Better contribution margins will be realised due to reduced input costs and increased per unit sales prices. Secondly, higher profit yielding areas typically have better transport and communication infrastructure and, therefore, relatively lower search and information costs (Pingali *et al.*, 2005). Where road density is low, which is often the case in low-yielding areas, the transaction costs associated with accessing markets and information tend to be higher. Inferior road infrastructure lengthens transportation time and therefore costs. The returns that farmers realise will be net of these costs, reducing the incentive to enter commercial agriculture.

2.7.5 **Transaction Costs: Product-specific**

Transaction costs also vary according to product. Value added or high-value commodities, which are often perishable, like eggs, are usually associated with higher transaction costs. On the one hand, these stem from transportation costs due to poor infrastructure such as rural roads and a lack of a cold chain. On the other hand, such costs could be as a result of consumer preferences with regards to product attributes, which would include packaging requirements or various standards determined by retailers related to quality or grading (Pingali & Rosegran, 1995). Such costs could be more exorbitant depending on the relative distance to markets. Moreover, intangible transaction costs are incurred when asset-specific investments have been made. Such investments could include technologies related to automated packaging or grading, demanded by retailers within the monopsonistic buying structures. That lack of such investments may increase the risk of buyers behaving opportunistically or defaulting on the contract (Pingali *et al.*, 2005).

2.7.6 **Transaction Costs: Consumer-specific**

There are a number of consumer-specific variables, which may not be transaction costs in themselves, but have a significant impact on them. These variables are as a result of consumer preferences and the factors which govern purchasing decisions, such as age, gender, education; purchasing power or disposable income, product quality or attributes, and brand loyalty. All these variables have an effect on the costs of information seeking, negotiating, monitoring, and enforcement. The adoption of social networking and producer organisations as mechanisms to facilitate market participation, would substantially reduce these transaction costs within the value chain. Networking could ensure cooperation among farmers in order to scale outputs and increase supplier bargaining power. Moreover, small farmers may be better placed to understand their local environments in a way that ensures best use of existing resources in an environmentally sustainable way. In addition, uncertainty, as an intangible cost, may be exacerbated by greater market participation as the security of subsistence is replaced by the insecurity of unstable markets and adverse price trends. Small farmers are unlikely to substitute the known set of risks associated with subsistence production for an unknown set of risks that are a function of commercialisation (Pingali *et al.*, 2005).

Table 2-3: Comparative transaction cost advantage in fragmented markets

Transaction Cost Advantage	Coordination factors	Small-scale farms	Commercial Farms
Unskilled Labour - supervison, motivation etc.		x	
Local Knowledge		x	
Location (rural markets)		x	
Skilled Labour	Monitoring & Information		x
Market intelligence	Information		x
Marketing expertise	Negotiating		x
Technical expertise	Information & coordination		x
Bargaining power /Inputs	Negotiating		x
Access Finance and Capital	Negotiating & Enforcement		x
Land and Equipment	Coordination		x
Output markets	Monitoring & Information		x
Product traceability and quality assurance	Coordination & Monitoring		x
Economies of Scale (Reduced p/u fixed costs	Coordination		x
Risk Management	Information & coordination		x

Table 2-3, above, provides a synopsis of the transactions costs, identified in the literature review, which are deemed centrifugal to establishing a comparative advantage in fragmented markets. It has already been noted that coordination competencies carry a larger relative weighting in buyer-driven supply chains than factors of production. Commercial farming operations who are able to gain access to market information, in addition to, controlling the monitoring, negotiating and enforcement of contractual compliance obligations are in a better competitive position to participate successfully in these markets.

2.7.7 **Overcoming Transaction Costs: Private Sector Intervention**

Due to the variability of transaction costs, mitigating such costs would be a daunting proposition. However, there are various means by which the market entry of small-scale farmers could be developed. On the basis of a strategic alliance, which may include contract farming, development of producer organisations for marketing, the development of the supply chain for niche markets, the facilitation of market information and technical services, a private sector coordinated intervention could stimulate market participation (Makhura, 2001). Moreover, government policies need to create incentives and send signals that promotes specialisation, reducing the costs of market exchange, and enforcing contracts, in addition to encouraging private sector participation in developing rural economies (Wynne & Lyne, 2003).

- **Overcoming costs through vertical coordination**

With the widespread proliferation and growth of supermarkets in the developing world, many small farmers could potentially bypass market failures and substantially reduce their transaction costs (Wynne & Lyne, 2003). Contractual arrangements with supermarkets could enhance farmer's access to credit, inputs, and technologies as well as access to managerial expertise (Delgado *et al.*, 1998). Reardon *et al.* (2002) have revealed the positive effects for small farmers of contractual arrangements with supermarkets in Latin America, Africa, and many transition economies (Pingali *et al.*, 2005). Collaboration in the form of upstream strategic alliances with input suppliers could consolidate small-scale farmer efforts in fragmented and buyer-driven markets.

Such strategic alliances could contribute to key success factors like production-orientated managerial and technical expertise, in order to gain a comparative advantage. These alliances would also help farmers cope with changing technological conditions, in addition to lowering the transaction costs of adopting new technologies (Swinnen, 2005).

What is also apparent is that in the varied cohort of small-scale farmers, retailers tend to target those small farmers whose transaction costs are lower because of their asset base, human capital, and proximity to markets. Agri-food value chains, with its emphasis on quality and output, favour high profit yielding areas and commercial farmers because of the need for consistency in supply and quality, over and above the need to reduce transaction costs (Wynne & Lyne, 2003). Once again, the ability of a strategic alliance to strengthen vertical coordination, would facilitate consistent supply of quality products, besides reducing the administration costs associated with monitoring (Makhura, 2001).

- **Overcoming costs through horizontal coordination**

For marginalised producers, the underlying market failures are ever present, and the associated transaction costs could become costlier when seeking alternative contractual arrangements outside the system. By its very nature, commercialisation demands higher output, specialisation or possibly diversification.

The inverse relationship which exists between scale and transaction costs makes for a powerful incentive for small farmers to coordinate their activities so that they can jointly benefit from reduced transaction costs that are at similar levels to larger production units (Pingali *et al.*, 2005).

Collaborative action, under the auspices of a producer organisation, brings with it a set of undetermined transaction costs (Pingali *et al.*, 2005). Therefore, it is probable that farmer networking will only occur if the benefits from the collaboration exceed the value of investment needed. Such benefits could be in the form of increased productivity or increased negotiating power (Pingali *et al.*, 2005). Better prices are often mentioned; nevertheless some argue that receiving a better price is not the main concern, having a secured market outlet and access to technical assistance and credit being more important (Swinnen, 2005). Collaboration and successful networking requires management and entrepreneurial skills – competencies which many uneducated or unskilled small producers are unlikely to have.

In instances where coordinated collaboration has been successful, caution should be exercised. The underlying trend is that as the commercialisation of small-scale farmers' evolves, there is convergence toward large-scale production. The poultry industry in India initially started with several small-scale farms and was hailed as a victory for the small producer (Pingali & Khwaja, 2004). Over time, the situation has become very different. The industry is now characterised by an ever increasing average holding size (Pingali & Khwaja, 2004). The pertinent issue is to recognise which markets give small farmers a comparative advantage. Export, niche or organic markets may provide a solution for a few farmers, but many farmers are still likely to be marginalised (Pingali *et al.*, 2005).

Thus, horizontal and vertical collaboration could improve the stability of sales prices, provide better financial returns, improve each stakeholder's ability to supply what the market requires, provide economies of scale and marketing support (Boehlje & Doering, 1999). As strategic alliances engender trust within the collaboration, transaction costs diminish, which reduces the need for contracts and expensive negotiation. Vertical coordination contributes to a more efficient system. Despite a common economic rationale for collective action, collaborators remain competitors.

2.8 Intervention Strategies: Re-governing Markets

In developing countries, governments face the challenges of globalising supply chains, market liberalisation, limited government intervention, and reassessing the role of agriculture in terms of rural employment. Despite the rhetoric of poverty reduction through access to resources or the notion of more inclusive governance, it is becoming clear that improving governance through public policy making is not an effective strategy to reducing poverty (Bebbington, 2001).

A degree of influence over markets is crucial to the circulation rather than withdrawal of economic assets within Agri-food markets. Public policy reform and a private sector alliance could harness 'market liberalisation' as an inclusive force rather than a driver of rural differentiation. From the literature reviewed, it has been noted that public regulation is not geared to deal with supply chain structures. And, within the buyer-driven supply chains, where standards and prices are dictated by retailers, there are few opportunities for small-scale farmers to influence the market. Since there is a growing disconnect between demand-side production methods or technologies and supply-side production itself, there is a need for a more inclusive governance system over supply chains (Herrero & Thornton, 2013).

Following on from this acknowledgement, there are some key success factors, discussed below, for advancing the interests of equitable and sustainable rural development:

2.8.1 Collective Action: Driving Market Access

According to Hellin *et al.* (2007) the key issues within the Agri-food supply chain which Collective Action from various stakeholders should address, would include:

- Building linkages between small-scale rural producers, value-added processing firms, buyers in growing urban markets, and suppliers of critical inputs;
- Supporting small-scale producers to associate, collaborate, and coordinate to achieve economies of scale in their transactions with input suppliers and buyers;
- Making channels of information (e.g. about product specifications, market prices) and other business services accessible to rural producers;
- Enabling rural producers to understand and better satisfy the product, process, or delivery standards required by buyers in urban markets;

- Making relevant financial services that enable investment in diversification or upgrading available to rural producers.

These key issues listed above infer the need for close linkages between farmers, processors, traders, and retailers to coordinate supply and demand (Gulati *et al.*, 2007), and to access vital business development services such as market information, input supplies, and transport services. The mechanisms for delivering on these key services can vary, and there is a continuing debate about the role of the public and private sectors in contributing to such business development services (Miehlbradt & McVay, 2005).

The government provision of business development services has been criticised in that it distorts market prices in the form of subsidised service delivery or prices which are below those determined by market forces. Therefore, government intervention would undermine the provision of business development services by the private sector (Hitchins *et al.*, 2004). In recent years, there has been a paradigm shift from subsidised supply-led business development service provision to market-determined demand-driven services, where both the demand and supply sides of the market are developed (Hellin *et al.*, 2007). The private sector is envisioned to be the driving force behind a system of payment for services in a competitive and evolving market. Thus far, the private sector has unfortunately proven to be averse to replacing previously government provided services due to high transaction costs, dispersed clientele, and low profits (Lundy *et al.*, 2002). In response to this, policy makers are progressively encouraging small-scale producers to associate, collaborate, and coordinate amongst each other in order to access business development services and achieve economies of scale in their transactions with input suppliers and buyers. Collective action and producer organisations are, therefore, not surprisingly one of the foci of the pro-poor market approach.

2.8.2 **Producer Organisations or Cooperatives**

An organisation of small-scale farmers is generally seen as part of the solution to the challenges these farmers face in buyer-driven value chains. By developing organisational capacity, in the form of contract farming, these small farmers could extract more benefits and incur less risk. Governments could assist these organisations through recognising them as partners in decentralisation. This would involve the provision of a legal framework to oversee and regulate contracts within the supply chain or to facilitate the access to bank credit. The utilisation of these mechanisms would enable small-scale to access profitable value-added markets without losing out to intermediaries.

Producer organisations could provide farmers with the following services that are critical to their success in accessing markets (Hellin *et al.*, 2007):

- **Marketing services**: input supply, output marketing and processing, market information.
- **Facilitation of collective production activities.**
- **Financial services**: savings, loans and other forms of credit.
- **Technology services**: education, extension and research.
- **Education services**: business skills.
- **Policy advocacy**.
- **Managing common property resources**: water

Stringfellow et al. (1997) recognised three key market related factors that would determine a successful producer collaboration. Firstly, there needs to be a match between the existing skills and/or experience of members and what is required to undertake joint activities. Secondly, there should be internal cohesion and a membership driven agenda. Lastly, mechanisms need to be in place to facilitate a successful, commercially oriented, integration of the organisation into the wider economy (Stringfellow *et al.*, 1997).

2.8.2.1 **National Policy Support for Producer Organisations**

Three national policies exit which focuses specifically on supporting producer organisations. In reviewing these policies, the main focus has been to identify the implications of their vision, objectives, and mechanisms on the establishment and development of producer organisations in the poultry industry. The three national policies are:

- **The Cooperatives Development Policy for South Africa (2004)**

This policy was established to support the government’s economic policy which promotes the development of emerging economic enterprises (SEDA, 2013). The objective of the policy is to promote inclusivity within the business environment in terms of ownership, operations, service delivery, location and size. The policy views collective action in the form of cooperatives or producer organisations as the vehicle to driver inclusivity. Stipulated in the policy, 'a cooperative is 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' (DTI, 2004). According to the policy 'a viable, dynamic, autonomous, self-reliant and self-sustaining cooperative movement can play a major role in the economic, social and cultural development of South Africa, through effective and efficient services extended by cooperative enterprises to their members' (SEDA, 2013). If the policy objectives are attainable, then these producer organisations would contribute to: resource mobilisation, economic empowerment, job creation, income generation and the enhancement of sustainable human resource development within the country.

- **Integrated Strategy on the Development and Promotion of Cooperatives (2010-2020)**

The Integrated Strategy on the Development and Promotion of Cooperatives, 2010-2020, was developed in conjunction with Government's commitment to the development of cooperatives over a ten-year period (2010-2020). This strategy establishes an implementation framework for the Cooperatives Development Policy and the Cooperatives Act. It targets both the existing as well as the emerging cooperative enterprises within South Africa, and is aimed at the small to medium cooperatives. The vision of the strategy is to be consistent with that of the Cooperative Development Policy (2004) which states:

> *'To move towards a growing, self-sustainable and integrated cooperative sector, supported by all stakeholders, contributing to economic growth, poverty reduction and employment creation, as well as assisting in bringing about economic transformation and an equitable society in South Africa.'* (DTI, 2010)

The following objectives have been identified in the strategy, which are aligned with the Cooperative Development Policy (2004):

- Grow all types of cooperatives as mechanisms of job creation and poverty reduction through revenue generating activities.

- Strengthen cooperative sustainability through developing human resource and financial management capabilities.
- Encourage co-operation among cooperatives and raise its business profile as an institution which would allow the agglomeration of small-scale farmers.
- Promote cooperatives as an effective vehicle that contributes to the development of rural and peri-urban areas of the economy.

Four strategic pillars that focus on the support instruments for cooperatives were also identified in the strategy. Each strategic pillar consists of support programmes designed to respond to the various market segments and to address the challenges that cooperatives are faced with. The four strategic pillars are as follows:

- To increase the supply of non-financial support services to cooperatives.
- To create demand for cooperative products and services.
- To improve the sustainability of cooperatives.
- To increase financial support services to cooperatives.

- **Regulations for Cooperatives (2008)**

In 2008, the Department of Trade and Industry (DTI) compiled a user guide for the Regulations for Cooperatives under the Cooperatives Act, 2005. This user guide contains the definitions related to cooperatives; values of a cooperatives; registration process of the cooperatives, and rules and regulations for cooperatives. The regulations summarised in the Cooperatives User Guide (2008), identify a number of rules surrounding aspects such as registration, constitution, formation of cooperatives, documentation, management/directorship, membership, meetings, financial aspects, shares, loans and de-registration.

2.8.3 Government Support for Building Small Producers' Capacity

Governments are still deemed centrifugal to agricultural development and determining how markets should function. In addition to establishing supporting organisations, governments should also ensure that the legal system supports low-cost contract enforcement. In order to overcome information asymmetries, these mechanisms should facilitate the flow of market information through effective communication channels and make transport, electricity, water and other infrastructure systems widely available in order to help support small enterprises. Governmental support could also be advantageous in providing alternative structures to supply chains, such as school meals programmes, and local farmers' markets.

2.8.3.1 **Synopsis of Governmental and Institutional Support**

Table 2-4 below identifies organisations which currently provide support to small-scale farmers and producer organisations. It also details the purpose and function, main services and target group for each support mechanism (SEDA, 2013).

Table 2-4: Institutional support organisations for small-scale farmers or producer organisations.

	Support Organisation	Acronym	Type of support provided								
			Labour/ Entrepreneur	Land/ Infrastructure	Capital/ Incentives	Markets/ Accessibility	Agglomeration/ Scale Economies	Financial Support	Technical Support	Inclusivity	Inclusive Business
1	Small Enterprise Development Agency	SEDA	X			X	X	X	X	X	
2	Developing Poultry . Farmers Org. (SAPA)	DPFO			X	X	X			X	
3	National Youth Development Agency	NYDA	X		X			X	X		
4	Land Development Bank of South Africa	Land Bank	X	X	X			X	X	X	
5	Youth & Graduate Entrepreneurship	Y-Age			X			X	X		
6	South African Micro-Finance Apex Fund	SAMAF	X		X			X	X		X
7	Black Business Supplier Development Programme	BBSDP	X		X	X		X	X		
8	Co-operatives Incentive Scheme	N/A	X	X	X	X		X	X		
9	National Empowerment Fund	NEF	X		X	X		X	X		
10	Thambani International Guarantee Fund	N/A	X		X			X	X		X

Source: (SEDA, 2013)

Whilst there is a surfeit of institutional support for small-scale farmers or producer organisations, it should be noted that bureaucratic red tape is a major constraint. Access to these support structures are thwart with regulations, complicated application requirements and time delays (BFAP, 2016). Private stakeholders have the abilities to intervene on behalf of farmers or producer organisations, and in so doing open up access to these support mechanisms.

2.8.4 Competition Policy

A competition policy is an effective instrument for agricultural and rural development, in that it penalises collusion and prevents undue concentrations of economic power. A robust competition policy would also address buyer concentration or oligopsony, its effects on supplier welfare, the distribution of profits, as well as, the profit levels along the Agri-food chain. Additional mechanisms are: the creation of a legal environment which allows agricultural bargaining as a form of countervailing power; the appointment of an ombudsmen to protect producers and uphold principles of fairness, full information and equity in supply chains (Boehlje & Doering, 1999).

2.8.5 Corporate Ethics and Private Sector Policy

The accountability of retailers and food processors, as custodians of Agri-food markets, must extend beyond the consumer, to include national objectives for sustainable development. A commitment to sharing the cost of compliance would be a small but valuable gesture and would be in keeping with the principles espoused by Corporate Social Responsibility.

2.8.6 Dismantling Market Distortions

Trade liberalisation subjects "developing countries to highly subsidised models, potentially undermining more sustainable, less intensive local models of agriculture. If one country's 'sustainability' is achieved at the expense of another's (especially by putting up fences, and by throwing surplus production over that fence), then that is not 'sustainability' at all " (Vorley, 2001). There is an absolute responsibility on developed countries to end overt and disguised dumping of agricultural produce.

2.9 Fragmented Markets: Strategic Considerations and Options

A number of industries are populated by numerous small and medium sized companies, many of which are privately owned and none of whom command a substantial share of the total industry sales. Due to the lack of a notable market leader or because of the sheer number of operators servicing a significant portion of the market, the market is referred to as fragmented (Thompson *et al.*, 2013). Fragmented markets enable buyer-driven supply chains to dominate, which is duly the case in liberalised markets and Agri-food chains. These fragmented markets are characterised by a lack of brand loyalty and are typically insensitive to direct mass marketing. When analysing fragmented markets, the following points should be noted (Porter, 1985):

- Fragmented markets tend to be volatile. This is due to the intensity of competitor rivalry.
- Fragmented markets are often subjected to supply chain standards and policies.
- Comparatively low entry barriers tend to make the entry of new competitors a continual threat.
- The somewhat small size of the companies in these industries puts them in a relatively weak position to bargain with powerful suppliers and buyers.
- The scope of the geographic market for the product or service is transitioning from regional to national to global markets.
- Due to the volatile nature of the market, competitive intelligence is a key success factor to competing in these markets.

By understanding the nature and characteristics of the market, a company or producer may determine the competitive attractiveness of the industry, in addition to establishing a comparative advantage within the market. Such competencies could only be acquired by knowing (Koltler, 1984):

- Why the market is fragmented. The market may have an outdated distribution system with wholesalers in the middle of the value chain. It may also be an area that requires some level of personalised service.
- What the growth prospects for the market are.
- What the future profit prospects for the market are. Companies should always think about growth prospects in terms of future profit margins. Highly competitive markets are at a greater risk of diminished profit margins.
- What the geographic considerations of the market are. Sometimes regional markets exist due to high transportation costs or government regulations. Changes in any of those factors could change the attractiveness of the fragmented market.

The factors that need to be considered depends on whether it’s an existing or emerging market. In existing markets additional research may need to be conducted in order to identify the key drivers that led to fragmentation and to determine the potential value of the market. The competitive intelligence gained from identifying the key drivers that led to fragmentation could facilitate the development of strategic alliances based on a matrix styled organisation structure. The strategic options for such an alliance could involve, amongst others, becoming a low-cost provider, specialising by product type, specialising by customer type or focusing on a limited geographical area (Thompson *et al.*, 2013).

2.10 Strategic Alliances: Consolidating Fragmented Markets

Strategic alliances in the form of collaborative partnerships offer a means to attaining some of the benefits offered by vertical integration, outsourcing and horizontal mergers, whilst mitigating some of the associated risks (Thompson *et al.*, 2013). A strategic alliance is a formal agreement between two or more separate companies who have agreed to work co-operatively toward common objectives. It is therefore not to be confused as being a merger (Thompson *et al.*, 2013). Accordingly, there are five factors that make an alliance 'strategic' and not just a convenient business arrangement (Wakeam, 2003):

- It facilitates building, sustaining or enhancing core competencies or a competitive advantage.
- It is a mechanism to block a competitive threat.
- It scales the bargaining power of the alliance members over suppliers or buyers.
- It unlocks new market opportunities.
- It mitigates the major risks to a company's business.

Whilst a strategic collaboration is often found in industries where new technology has a disruptive influence on market participation, such alliances could also aid in consolidating supply-side actors in buyer-driven supply chains. This would especially be true in fragmented markets where there is a need for capacity building and a sharing of competitive intelligence amongst collaborative members in order to develop a competitive, or at the very least, a comparative advantage. The extent to which companies benefit from entering into alliances is a function of six factors (Anslinger & Jenk, 2004);

- **Choosing the right partners**: Who are able to bring complementary strengths to the alliance, which would generate synergies in the value chain.
- **Acknowledging cultural differences**: Symbiotic organisational cultures would allow for employees to work together effectively.

- **The alliance should benefit all members**: Information and gains should be shared fairly, which would allow the relationship to remain forthright and trustful.
- **Ensuring that members live up to their commitments**: Members need to deliver on their commitments in order for the alliance to achieve its objectives.
- **Structuring the decision-making process so that actions may be taken swiftly**: Disruptive technologies and changing competitive conditions dictates that equally fast decision-making structures are in place, in order to adapt strategies to deal with such changes.
- **Managing the learning process and then adjusting the alliance agreement over time to fit new circumstances**: The collaborative arrangement must be flexible in order for it to evolve with shifting market conditions.

In principle, strategic alliances have advantages over vertical integration or horizontal acquisition strategies, in that, they lower investment costs and risks for each partner by facilitating resource pooling and risk sharing (Thompson *et al.*, 2013). In essence, a well-structured alliance allows the collaboration to acquire many of the benefits or competencies available to vertically and horizontally integrated competitors without individually having to absorb the transaction costs in their entirety. The alliance will allow for capacity building, scaling and shared competencies on the supply-side of the value chain, which are crucial features of market participants in fragmented markets. In fact, strategic alliances have the potential of protecting individual members from the opportunism of channel captains in buyer-driven supply chains.

2.11 Poultry Farming put into Perspective

As already mentioned, poultry and egg production will probably need to double by 2050. Egg production has many competitive advantages over other forms of animal protein. These would include convenience, the absence of religious restrictions, a healthy image, an efficient low-cost production and affordability (Kleyn, 2017). The level of protein contained in poultry diets is of relevance to the debate on sustainability. Not only are high-protein diets more expensive, but they drive up a system’s carbon footprint. In addition, they lead to increased levels of nitrogen in poultry manure, putting environmental sustainability under pressure.

Climate change will impact on poultry production in two ways. Firstly, there will be a direct effect on poultry producers, in that they will be operating under less favourable environmental conditions and may well face new disease challenges. Secondly, and perhaps more importantly, climate change will have an impact on the supply and ultimate cost of feed ingredients. The poultry industry already understands production in unfavourable (warm) conditions as is evidenced by vibrant poultry industries in less than ideal environments (Kleyn, 2017). The supply of feed ingredients will be more of an issue, but the reality is that the economic law of ‘supply and demand’ will apply. Those industries that are prepared to pay the asking price will be guaranteed of supply. This places the poultry industry, as the most efficient user of feed grains, in a more competitive situation than most other animal production enterprises. The long-term reality of this is that although poultry products will become more expensive, they may well become far cheaper than other protein sources. Consumers will simply have to pay more if they are to continue to enjoy them.

The poultry industry, because it has the ability to supply the cheapest protein sources in the most environmentally friendly manner, has a bright future ahead of it. The projected growth in the industry is exponential and this signals opportunities for small-scale farmers to become feasible participants in markets. Governments in many developing countries should realise the potential of small-scale farming to develop rural communities, help with poverty alleviation, be a vehicle for entrepreneurship and provide food security (Kleyn, 2017). The withdrawal of government from market intervention and the subsequent privatisation of markets has not only marginalised but also left the small-scale farmer exposed to market forces primed to benefiting operations with economies of scale. However, it must be noted that many coordination and production factors are interconnected and interdependent.

Table 2-5, below, lists the key success factors for poultry farmers participating in current liberalised markets. Weightings have subjectively been assigned to the key success factors based on evidence obtain from the literature review. In fragmented markets, value chains are governed by the bargaining powers of buyers. Therefore, an overall weighting of 45% has been allocated to demand-side factors, namely, market outputs and coordination factors. Tangible factors relating to the factors of production have been allocated, 35% for access to inputs and 20% for production processes respectively.

However, it must be noted that many coordination and production factors are interconnected and interdependent.

Table 2-5: Key success factors to ensure successful market participation of egg farmers

KEY SUCCESS FACTORS	Rating	Comment
1. ACCESS TO INPUTS	**0.35**	
Point of Lays	0.05	Reliable supplier - good forward planning & Cash flow required: usually 7 day account
Feed	**0.12**	Reliable supply & market related pricing: Noted difference between bulk and bag prices. Credit terms usually 60 days: Credit agreement act prohibitive
Credit facilities	**0.11**	Determined by provisions of Credit Agreement Act & dependant on creditworthiness
Labour Productivity	0.02	Generally more expensive than automation in the long run.
Equipment & Maintenance	0.02	Positive cash flow and access to finance is crucial
Utilities & infrastructure	0.02	Cost and transaction cost reduction strategies required
Bio-security	0.02	Adds to total costs - Responsiveness to disease control essential to maintain production
2. PROCESS CAPACITY & COMPE	**0.2**	
Marketing Expertise	0.05	Power to negotiate - market intelligence - coordinated in fragmented market
Technical Expertise	0.04	Compliance competencies - Quality, quantity, packaging, regulations
Logistical & Distribution Networks	0.05	Market access - able to service agreements with buyers
Economies of Scale	0.04	Compliance & transaction cost capabilities
Technological capability	0.02	Reliability of supply & technical capabilities to meet compliance standards
3. MARKET & OUTPUT COORDIN/	**0.45**	
Compliance	**0.14**	Terms of trade agreements & government policies, regulations
Convenience	0.05	Proximity to markets & logistical capability to access markets
Reliability	0.05	Compliance - supply of quality and quantity at right grade.
Affordability	0.05	Comparative advantage to competitive rivals
Responsiveness	0.02	Can adapt to market changes and consumer preferences
Traceability	0.02	Compliance - sustainability requirement
Risk Management	0.05	Adapt to market volatility.
Market Intelligence	**0.09**	Control of market information to facilitate better decision-making strategies
	1	

Source: Author (2017).

Whilst not mutually exclusive, the following factors have been assigned the highest weightings and are deemed to be critical to the success of egg producers servicing a fragmented market: bargaining power with regard to feed costs, access to credit or finance, compliance coordination and market intelligence. The comparative advantage resulting from these factors, mentioned above, resides firmly with larger commercialised operations, who possess economies of scale.

2.12 Conclusion

If small-scale farmers are to be feasible in such markets, they would need to adopt, acquire or mimic the characteristics of commercialisation. ‘Adopting’ or ‘acquiring’ implies horizontal and vertical integration, which is not within the reach of any small operator. However, the formation of a strategic alliance between private stakeholders and a ‘collective’ of farmers, would create a mutually beneficial mechanism which is able to mimic the competencies and scale of commercialised operations. This alliance will display all the hallmarks of vertical and horizontal coordination.

CHAPTER 3: INDUSTRY PROFILE AND ANALYSIS

3.1 Introduction to South Africa's Poultry Industry

The poultry industry has three substrates; the day-old chick suppliers, the table egg producers and the broiler growers. However, this study will only focus on, and hopefully add value to, the egg producer substrate of the industry. Chapter three is the second phase of the investigation and involves an industry profile, compiled from various industry related reports, as well as an industry analysis, which utilises analytical tools to establish the competitive environment and attractiveness of the egg industry.

Table 3-1: Egg Industry production and consumption summary 2016.

Egg Consumption	UOM	2014	2015	2016	Growth %	Acc. Growth %
Total Number	tons	449 364	456 422	460 692	0.93	2.46
Per capita per annum	eggs/person	147	150	148		
Egg Production						
Total Weight	tons	436 544	446 388	448 067	0.37	2.57
Large Commercial producers	tons	222 637	227 658	228 514	0.37	2.57
Small Commerical producers	tons	195 573	199 982	200 735	0.37	2.57
Subsistence farmers	tons	18 334	18 748	18 818	0.37	2.57
Egg Imports						
Total imports	tons	462	342	216	-36.81	-53.20
Shell eggs	tons	58	8.50	0.50	-94.12	-99.14
Egg products	tons	404	334	216	-35.33	-46.57
Liquid	tons	0.40	1.30	0.10	-92.31	-75.00
Dry	tons	404	333	216	-35.13	-46.56
Imports as % of production		0.11	0.08	0.05	-37.50	-54.55
Egg Exports						
Total exports	tons	5 977	9 057	6 410	-29.22	6.76
Shell eggs	tons	4 695	7 828	5 367	-31.44	12.52
Egg products	tons	1 281	1 229	1 044	-15.11	-22.79
Liquid	tons	666	200	113	-43.67	-491.39
Dry	tons	616	1 029	931	-9.56	33.89
Exports as % of production		1.37	2.03	1.43	-29.56	4.20
National Layer Flock						
Size	hens	24 340 500	24 851 161	24 801 065	-0.20	1.86
Cull age	hens	74	74	74		
Price						
Avg egg price per producer (all sizes)	R/doz	11.09	11.84	12.88	8.07	13.90
Graded	R/doz	11.70	14.14	14.25	0.77	17.89
Ungraded	R/doz	9.20	10.12	11.16	9.32	17.56
Cull price	R/hen	26.72	27.78	27.84	0.22	4.02
Layer feed price	R/ton	3 405	3 422	4 069	15.90	16.31
Gross Value (source: DAFF)						
Poultry Meat	R'000	34 216 286	38 807 151	36 669 836	-5.83	6.69
Eggs	R'000	9 200 230	9 832 850	10 191 731	3.52	9.73
Total animal products	R'000	102 445 524	113 684 641	120 128 778	5.36	14.72
Total agricultural products	R'000	220 982 565	233 237 242	259 770 510	10.21	14.93
Human Population (source: STATS SA)	people	54 002 000	54 956 900	55 653 654	1.25	2.97

Source: Collated from SAPA report. 2017. Industry production and consumption summaries 2016.

As a result of its two-thirds contribution of the consumable protein in South Africa, poultry farming is not only the largest sector within agriculture but also plays a vital role in providing food security.

The Southern Africa Poultry Association (SAPA) is the representative organisation for all three substrates of the poultry industry and is responsible for coordinating, promoting and driving value for poultry farmers in the industry. Table 3-1 above is a collation of data obtained from various quarterly and annual industry reports published by SAPA on their website. For practical purposes, national data has been set against data from Allem Brothers Feed Mill clients (Table 3-2), in order to set benchmarks during the analytical evaluation process.

Table 3-2: Average delivered bulk and bag feed price per ton.

Year	Bulk Delivered (per ton)	National Avg	Bags Delivered (per ton)	Annual % Chg In Bulk Price	Annual % Chg In Bag Price
2012	R 2 929	R 2 900	R 3 529		
2013	R 3 169	R 3 248	R 3 669	7.57	3.82
2014	R 3 434	R 3 405	R 3 884	7.72	5.54
2015	R 3 446	R 3 422	R 3 896	0.35	0.31
2016	R 4 158	R 4 069	R 4 558	17.12	14.52
2017	R 3 097	R 3 169	R 3 697	-34.26	-23.29

Source: Allem Brothers (pty) ltd.

Over the years, and since the de-regulation of South African Industries, the poultry industry has experienced many changes. Over the past decade, egg production in South Africa has grown extensively, reaching 460 000 tons in 2016 (Table 3-1). Since 2012, however, escalating feed costs has applied pressure on producer margins and the 40% industry growth seen from 2006 to 2012, has plateaued (SAPA, 2015). Despite these changes having pegged production growth and squeezed producer margins, the retail sector has shown a steady gain in its profit share (SAPA, 2017).

The record maize harvest of 2017, marked the return to normal weather conditions after the drought of 2016, and has induced a sharp decline in feed prices (Table 3-2). Therefore, purely due to reduced input costs, short to medium term prospects for profitability are set to improve. Additionally, the affordability of eggs as a protein source, creates opportunities for the industry to expand in the foreseeable future. Historical data contained in Table 3-1 indicates that the per capita consumption of eggs has been static over the last three years. Despite this, in the long run the industry is expected to show a steady growth - driven by population growth, higher disposable income and a growing consumer preference for animal protein diets over cereal/grain based diets (BFAP, 2016). Moreover, household consumption accounts for 70% of the total egg production output, whilst the remaining 30% of consumption is attributed to food service, industrial and commercial utilisation (SAPA, 2017). Access to household market segments is controlled by retailers, whilst the corporate segment could be accessed through specialised wholesalers, agents or direct marketing agreements.

No matter which segments are targeted, trade conditions and terms would have to be negotiated. Such trade conditions would include factors of compliance relating to quality of the product, reliability of supply, affordability, convenience and consumer preferences. The demands and market expectations placed on product related outputs and services applies addition pressure on input and productivity factors.

The DPFO, in 2016, pointed out that large and small commercialised producers accounted for 96% of domestic egg production in South Africa, whilst small non-commercialised producers accounted for 2% and subsistence farming for a further 2% (SAPA, 2016). Even though the expected 4% industry growth (SAPA, 2017) this year is nothing to get excited about, the potential for small-scale farmers to make inroads on larger commercial farmer's market share exist. This market penetration will, however, not be possible unless small-scale farmers acquire some characteristics of commercialisation and become more coordinated.

SAPA currently classifies small-scale commercial farmers as those housing less than 50 000 layers per cycle. Traditionally the key issues influencing the productivity of poultry farmers include the following:

- **The maize price**: Which constitutes 60% of the feed ration and which is susceptible to exchange rate volatility, CBOT, local crop size, and SAFEX speculation.
- **Poultry related diseases:** Newcastle Disease and Avian Influenza.
- **Urbanisation:** Which benefits larger commercial farmers who are logistically competent and coordinated.
- **Redistribution of land**
- **Market distortions**: Dumping results in poor cull prices.

- **Raw material prices:** Packaging costs vary due to volume of purchases and consumer packaging preferences in various market segments.
- **Compliance:** Standards and regulations
- **Food safety certification.**

The influences and effects of commercialisation on markets and productivity of small-scale farmers is a determining factor for any strategic intervention. Consequently, there is a minimum threshold under which economic sustainability is not feasible.

3.2 Critical Farm Size

A BFAP report (2016) compared farm-size specific revenues and production costs in a progress report focussing on transformation and inclusivity within the poultry industry. It concluded that a small-scale egg producer would require 1880 layers in order to generate income comparable to that of an entry level mine worker. The value of the spent hens was not included in the calculations because the revenues generated from the culls were to be reinvested into stocking the farm.

The report inferred that farms that housed 1000 layers could be classified as non-commercial and that those that housed between 1000 and 2000 layers displayed characteristics of commercialisation (BFAP, 2016). In addition, farms that housed less than 2500 layers were, in all likelihood, operated on a part-time basis with the need for off-farm revenue to supplement the farmers' income.

The report highlighted additional factors as determinants of farm size:

- According to pullet suppliers, a minimum order quantity of 1000 birds was required in order to justify delivery costs. Distance from the supplier could also affect the minimum ordering quantity.
- In terms of deliverable, monthly bulk feed procurement, the critical farm size is set at 3000 birds. This is calculated by dividing the minimum payload of 10 tons by the number of days in the month to get the total daily feed requirement. The total daily feed requirement is, in turn, divided by the average daily feed intake per bird of 115 grams. Bulk feed orders are dependent on silo storage capacity, which if not available, forces the farmer to purchase feed in 50kg bags, at substantially higher prices.

- The third determinant of farm size also relates to feed procurement and the ability of farmers to reduce feed input costs. The BFAP report calculated the minimum size that would justify the use of a feed mixer was pegged at 30 000 birds.

A similar study was commissioned by the Cape Agency for Sustainable Integrated Development in Rural Areas (CASIDRA), the results of which were published in their November 2017 newsletter (CASIDRA, 2017). The aim was to investigate the technical and financial viability of small-scale layer farms. The objective of the study was to determine the number of layers that are needed in order to have a profitable and viable business, as well as, the costs associated with operating such a business. Four scenarios of varying farm capacities were tested.

The study assumptions were that in each scenario the farming operation was deemed a start-up business. Table 3-3 provides a summary of the profitability, capital and input requirements for the four scenarios.

Table 3-3: Summary of small-scale layer feasibility study

Capital Requirements	UOM	1 000 layers	5 000 layers	10 000 layers	10 000 Auto
	Rands				
Buildings	Rands	654 000	1 227 500	1 979 000	1 897 000
Equipment	Rands	113 000	439 500	923 400	1 526 400
Vehicles	Rands	275 000	540 000	490 000	790 000
Total	Rands	**1 042 000**	**2 207 000**	**3 692 400**	**4 213 400**
Total Input cost per unit	Rands	**13,17**	**11,56**	**11,52**	**10,95**
Profitability					
Sales	Rands	231 360	1 249 344	2 498 688	2 429 280
Production costs	Rands	160 311	863 452	1 672 530	1 568 345
Gross margin	Rands	71 049	385 892	826 157	860 934
Overheads' expenses	Rands	64 800	183 000	442 500	368 400
Hen Depreciation	Rands	27 591	139 110	258 461	554 400
Profit and loss before Depreciation	Rands	-21 343	63 782	125 197	235 963
Profit and loss after depreciation	Rands	-120 343	-149 543	-224 093	-68 072

Source: CASIDRA, 2017.

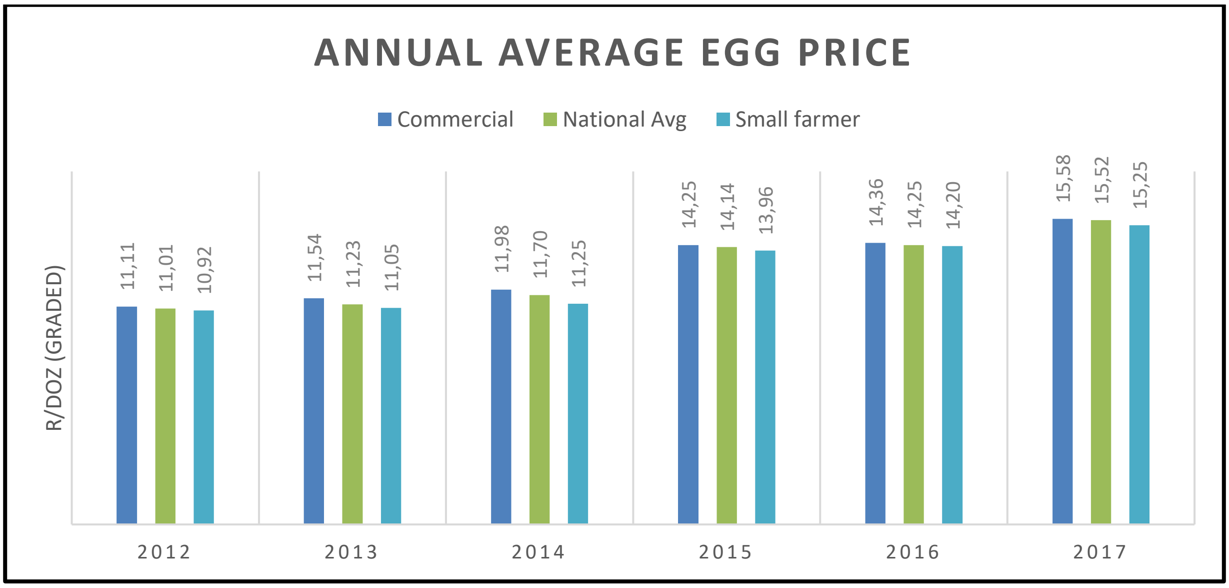
The summary of the profit and loss statement revealed that all the different options generated profit in the first year of operation (before depreciation was deducted) except for the farm with 1000 layers. After deducting depreciation, all the different units operated at a loss throughout the 10-year projected period. It is only in the sixth year that the automated production systems would start operating profitably. The main driver of the losses was the high input costs, particularly feed.

The study concluded that a 1 000-capacity layer unit, or smaller, would not be economically viable and under normal market forces would not generate sufficient revenue to sustain sufficient income for a family unit. At normal market prices this size of operation will operate at a loss. In order for a farm of this size to generate sufficient income, specialised alternative niche markets would need to be developed. As far as the 5 000-capacity layer operation was concerned, it could be economically viable and would generate sufficient revenue to sustain a household income of R7 500 per month. This would only be the case if the operation was operated as a family unit and both spouses were involved. According to the study, this was considered to be the smallest farm size that would prove to be viable over the long term. This is also on the proviso that eggs would be sold into a market in which normal forces prevail. Results from the 10 000-layer farm size showed that the operation would be economically viable, but that its size was of such a nature that competition with larger producers would be inevitable. This sized farm would require a highly motivated and skilled operator to manage the business over the long term to ensure good technical performance, as well as the highest possible market prices. This size of operation would no longer be seen as a small-scale farm, but would move into being a medium sized operation.

3.3 Trends and Benchmarks: The South African Egg Industry

Any subsequent figures or tables in this chapter, which refer to commercial or small-scale farmer, are to represent Golden Valley and Mmadiboke respectively. The commercial farmer, Golden Valley cc, is located in the Welkom area (Free State) and houses 50 000 Amberlink Silver layers. Golden Valley has been in operation since 2012 and has a client base which is fairly regional, which includes Welkom, Henneman, Odendalsrus, Bultfontein, Wesselsbron and Virginia. Golden Valley markets graded eggs predominately through formalised wholesale and retail channels. The small-scale farmer, Mmadiboke, is a black-owned farm based outside Klerksdorp and has been producing since 2010. Mmadiboke's client base is also regional and includes Klerksdorp, Jouberton and Kanana townships. They farm with 3500 Amberlink Silver layers and the bulk of their production is marketed through less formalised channels in the nearby townships of Jouberton and Kanana, which includes spaza shops and hawkers.

Figure 3-1: Average annual egg price (graded)

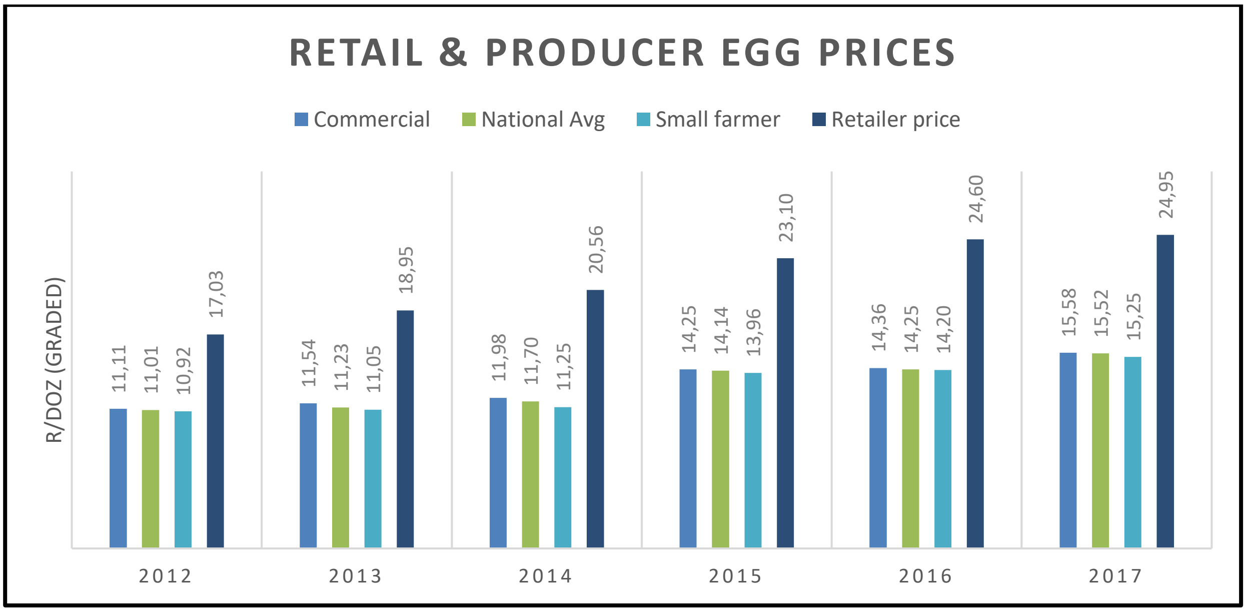


Source: Collated from SAPA report. 2017. Key market signals in the Egg Industry.

Hitherto for 2017, as illustrated in Figure 3-1 above, Golden Valley has realised an average price of R15.58 per dozen (graded), which is a year on year increase of 7.8%. By comparison, Mmadiboke has realised an average price of R15.25, which is an increase of 6.9% on 2016 prices. Despite the 6.88% increase, Mmadiboke has yielded prices 1.8% below the national average and 2.1% below that of Golden Valley. Due to economies of scale, the significance of this 2.1% price advantage would be reflected in the annual turnover growth of the benchmarking farm, Golden Valley. All things being equal, this 2.1% price advantage could also be used to set predatory prices, as part of a growth strategy, to penetrate competitor's markets.

Nationally, feed prices, for the same period, decreased on average by 28.4% (Table 3-2). In real terms, however, Golden Valley, a bulk purchaser of feed, saw a price decrease of 34.3%, whilst Mmadiboke, a purchaser of bagged feed, realised a 23.3% decrease. The net effect is a 42% turnaround in the fortunes for Golden Valley and 30% for Mmadiboke. Whilst this, in all probability, would have a positive impact on the bottom-line, it should be borne in mind that it comes on the back of a lean period in the industry, 2010 – 2016. During this period, margins were under severe pressure at a producer level, due in part to escalating feed prices and an over-supply of eggs in the market.

Figure 3-2: Average retailer and producer egg prices.



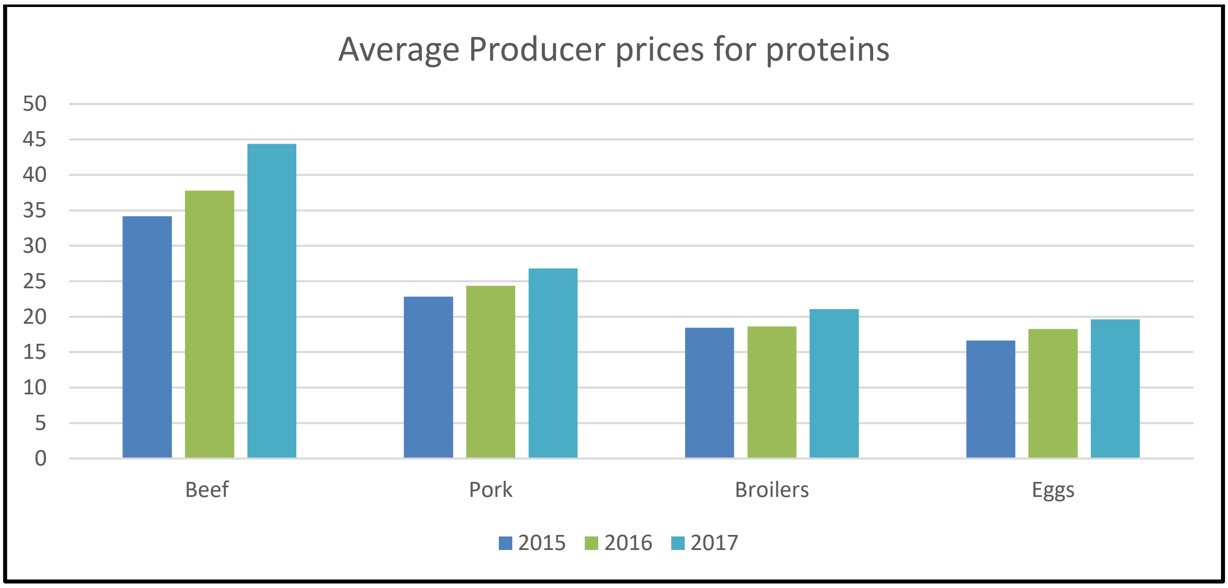
Source: Collated from SAPA report. 2017. Key market signals in the Egg Industry.

Since 2012, producers have increasingly realised a static share of the consumer price. By contrast, consumer egg prices have continued to increase (Figure 3-2) as retailers have sought even bigger returns, a fact which saw overall per capita consumption for eggs decrease from 162 to 148 eggs per capita between 2012 and 2016 (Figure 3-4). The retail mark-up for 2017 was R9.43 per dozen, which equates to 60.8% of the purchase price and a 6.1% increase from the 54.7% mark-up of 2012 (Figure 3-2). In rand per dozen terms, retailer have yielded a 31.7% increase over the last five years, whilst the national average producer price per dozen only increased by 29% (Figure 3-2). Therefore, during this period, retailers have managed to drive an extra 2.7% of value from consumer prices. The trade-off, between the producer's inability to negotiate for a portion of the 2.7% and their need to conclude trading terms with retailers, should be viewed as a transaction cost for the supplier.

As a result of the excessive margins taken by the retail sector, the gap between white meat prices and egg prices has closed (Figure 3-3). Eggs no longer hold an overwhelming advantage as the outright cheapest protein source, and consequently egg demand has been substituted by demand for white meat.

Unlike eggs, increasing white meat prices have been curbed by dumping. Whilst South Africa is, by and large, self-sufficient with regard to egg supply, this has not been the case with broiler production. Cheap imports, as a result of international trade agreements, have flooded the domestic markets and the excess supply has meant that retailers have not been able drive higher mark-ups like they have with eggs.

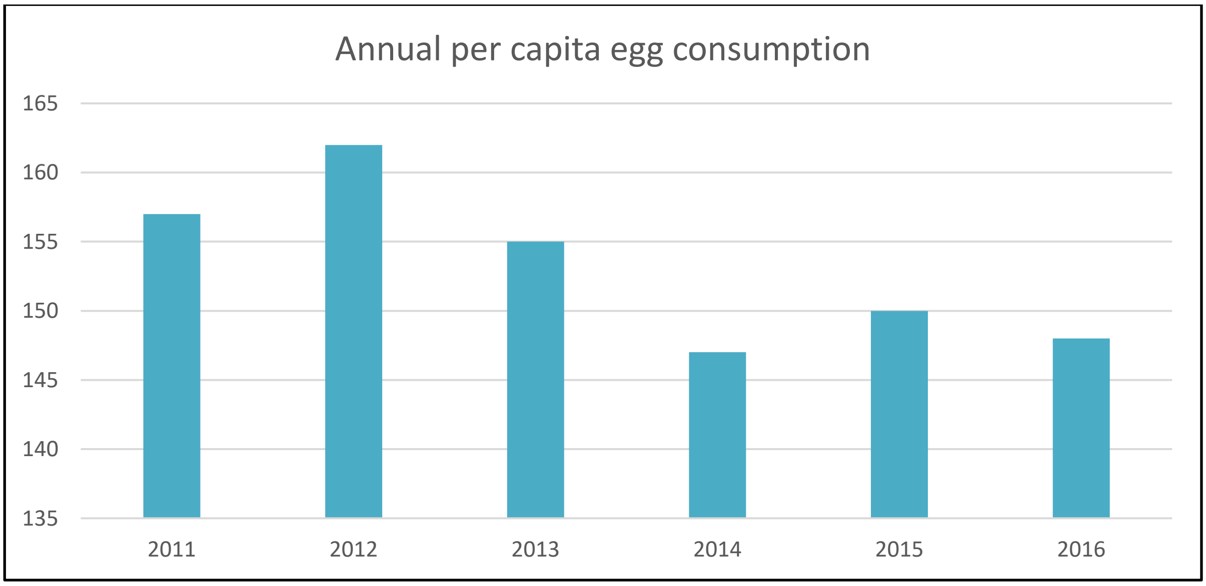
Figure 3-3: Comparison of substitute protein prices



Source: Collated from SAPA report. 2017. Key market signals in the Egg Industry.

As already mentioned, per capita consumption of eggs in South Africa continues to be suppressed, with the average pegged at approximately 150 eggs per person per year.

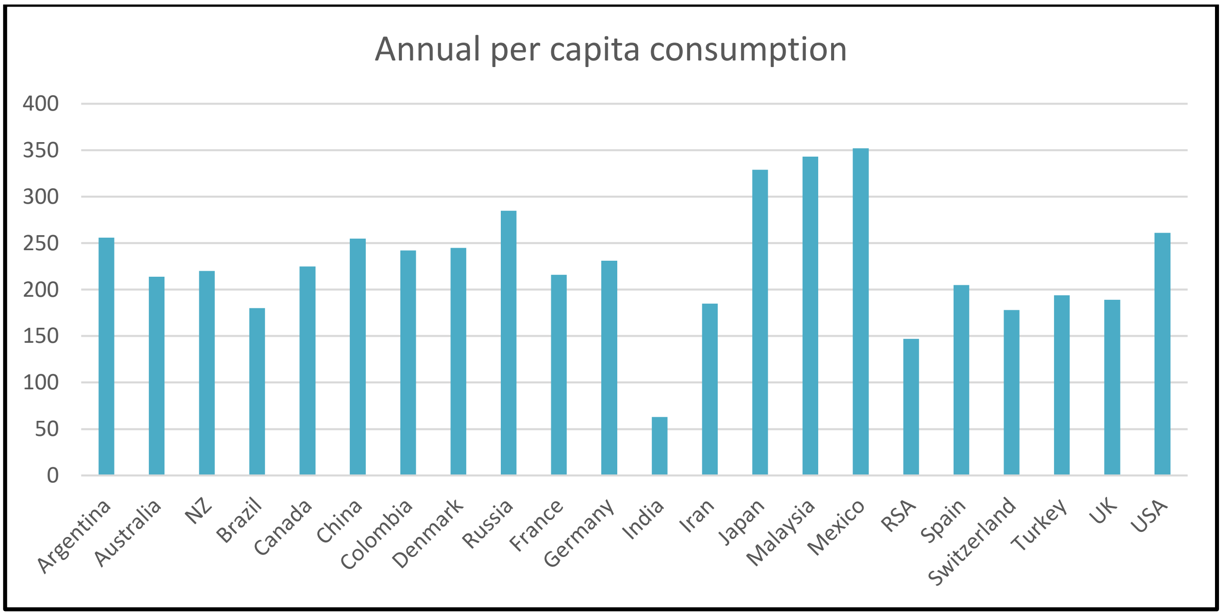
Figure 3-4: The annual per capita egg consumption in South Africa



Source: SAPA report. 2017. Key market signals in the Egg Industry.

This is in stark contrast to consumption figures of between 250 and 350 eggs per person in countries like Mexico, Russia, Argentina, and the US (Figure 3-5).

Figure 3-5: Global per capita consumption of eggs in 2015



Source: SAPA report. 2017. Key market signals in the Egg Industry.

In fact, the FAO (2015) has set the world average for per capita consumption at 210 eggs per person per year. This is an encouraging benchmark, which indicates that all things being equal, South African consumption has a 29% room for growth (Figure 3-4).

The relatively low consumption of eggs in South Africa, in comparison to the rest of the world, is also as a result of the following trends:

- At current comparative prices, there is a consumer preference for white meat over eggs. This indicates an increasing threat of substitution.
- The perceived and baseless cardiovascular and cholesterol fears related to egg consumption (Kleyn, 2017).
- The lack of a well-directed advertising campaign. Unfortunately, data contained in reports have shown that egg consumption does not increase with affluence as it does with broiler meat (SAPA, 2017).
- Value for money. There is a general lack of appreciation for the nutritional value of eggs as a high-quality protein source relative to its price.

- The effect on consumption due to the country's climate. Consumption increases during the colder, winter months. Unfortunately, South Africa only has three really cold months in the year.
- Soaring food inflation and constrained disposable income has had a negative impact on consumer spending (BFAP, 2016).
- High commodity prices due to volatile input costs. These fluctuations have been driven by drought, poor exchange rates and increasing interest rates.
- Weak export demand. It is estimated that for every 10 000 tons of eggs or egg products exported, 318 jobs would be created in the egg industry (SAPA, 2017).

Based on the industry benchmarks and trends discussed above, it would be safe to conclude that there is scope to increase consumption of South African eggs and egg products both at home and abroad.

3.4 PESTLE Analysis

South Africa's risk landscape continues to evolve at a rapid rate. Political, economic and societal risks, Table 3-4, still dominate the national top 10 risk profile for 2017, making it increasingly difficult for the country's international reputation to remain in a positive light. These consequences also indicate that the achievement of the South African Government's National Development Plan (NDP) priorities and objectives for 2030 could become a more gruelling task.

Table 3-4: Industry and Country risks for South Africa, 2017.

Top 10 Industry Risks in RSA for 2017	Ranking	Ranking	Top 10 Country Risks for RSA for 2017
Increasing Strike Action	1	1	Increasing Corruption
Exchange Rate Fluctuations	2	2	Water Crisis
Lack of Innovation	3	3	Unemployment/Underemployment
Regualtory\ Legislative Changes	4	4	Drought is RSA
Increasing Corruption	5	5	Lack of Leadership
Profound Political\Social instability	6	6	Fiscal Crisis \ Credit Rating Downgrade
Fiscal Crisis \ Credit Rating Downgrade	7	7	Economic Slowdown\ Recession
Escalating Cyber Attacks	8	8	Increasing Strike Action
Governance Failure	9	9	Profound Political\Social instability
Education & Skills Development	10	10	Governance Failure

Political | Economic | Social | Technology | Environment | Legal

Risks that appear as both Industry and Country Risks

Source: Institute of Risk Management of South Africa 2017

- **Political**

The political climate remains volatile as the ruling party, the ANC, battles factionalism within its ranks and embraces more Populist narratives in an attempt to remain politically relevant and to ensure its survival. The parties implicated in the State of Capture report, such as the Gupta family and former Eskom CEO Brian Molefe, reflects why widespread corruption in both the private and public sectors is such a concern for the South African risk management fraternity (IRMSA, 2017). It is not surprising that corruption, Table 3-4, has moved from the second highest national risk to the highest risk since November 2016, following the firing of Finance Mister Nene and the cabinet reshuffling which saw Finance Minister Gordhan being removed from his position. All indications from Table 3-4 are that escalating corruption will have both short-term and long-term consequences for the country. Political and economic consequences seldom occur in isolation and these events have not been ignored by international investors, which has resulted in Ratings Agencies' Standard and Poor, as well as, Fitch's downgrade of South Africa's credit rating to junk status.

- **Economic**

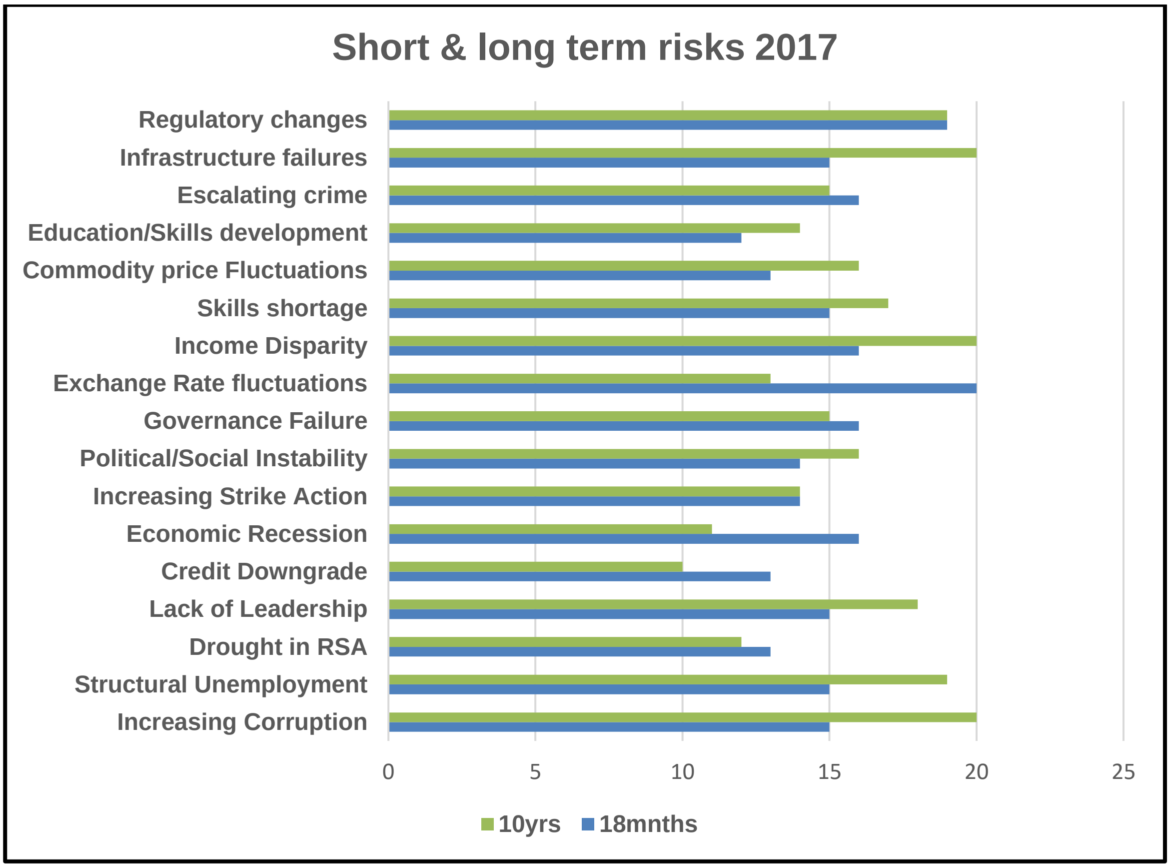
In April 2017, South Africa's economic outlook took a turn for the worse after Fitch became the second credit ratings agency, after Standard and Poor Global, to downgrade the country's sovereign rating from investment grade to junk status. Both downgrades are the direct result of a cabinet reshuffle carried out by President Jacob Zuma on 31 March 2017, in which he sacked his internationally respected Finance Minister Pravin Gordhan and four other ministers, and replaced them with loyalists. President Zuma's decision has been perceived as foreshadowing a potential retreat to fiscal prudence, a rise in wasteful expenditure (including the controversial plan to implement a nuclear power program) and increased opportunities for patronage.

Such politico-economic consequences are directly reflected as the second highest Industry risk (IRMSA, 2017). However, the Fitch downgrade is potentially more damaging than Standard and Poor's, apart from cutting South Africa's foreign currency credit rating to junk, the ratings agency also lowered the country's domestic currency credit rating by the same margin. South Africa's local-currency rating is arguably a more important measure, as foreign-held rand-denominated debt exceeds the country's foreign-currency debt. Should two ratings agencies denominate South Africa's local-currency debt to non-investment grade, this would induce investment funds to dispose of their holdings, prompting massive capital flights and putting pressure on the balance of payments. The ultimate consequences of which will induce a fiscal crisis and probably catapult this risk further up the rankings from its current position of 6th in terms of Country Risks for 2017 (Table 3-4). Risks to South Africa's economic outlook, investment and much-needed capital flows are tilted to the downside, as they depend to a large extent on the direction of politics. The economic environment remains challenging, characterised by high public debt and low GDP growth, investment and trade. Growth of around half a percent was experienced during 2016 and is expected to pick up to just over one percent in 2017. All indications are that in the short-term, Figure 3-6 below, economic threats like unemployment, the potential for economic recession, exchange rate fluctuations and commodity price fluctuations will dominate the risk landscape. However, in the long-term political and policy uncertainty due to high levels of corruption, lack of leadership, failure of critical infrastructure and potential Regulatory/Legislative changes will dominate how international investors view our country and may retard any significant economic growth resulting in higher levels of structural unemployment and more pronounced levels of income disparity.

- **Legal**

Signalling a new twist in the long-run land reform debate, President Zuma called in both February and March 2017 for expropriation without compensation. Recognising that such a policy shift will require a change in the country's constitution, President Zuma called on the ruling African National Congress (ANC) party to seek support from other parties, as it is 18 seats short of the threshold required to make constitutional amendments. The ANC is unlikely to heed the President's call since it remains committed to compensation in cases of expropriation. The dispute nevertheless highlights the rising divisions within the party and stresses the risks of President Zuma pushing an increasingly populist agenda, which will not do much to encourage private sector investment in the country.

Figure 3-6: Short and long-term country risks on disposable income



Source: Institute of Risk Management of South Africa, 2017.

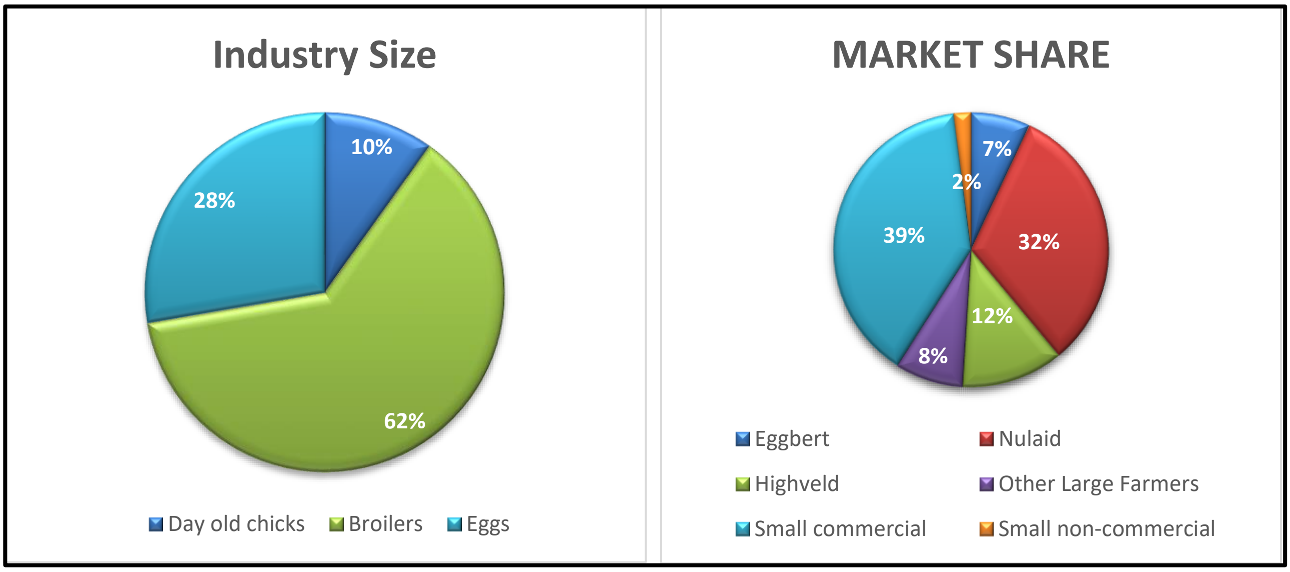
These five risks are the major macro-environmental issues threatening the business environment and should be centrifugal when any strategic intervention or planning is being considered. Over and above which, these risks have a significant impact on South Africa's national level of competitiveness, especially if a holistic credit rating downgrading is realised. The effects of a credit rating downgrade will not only increase the cost of capital for business', but will be detrimental to the standard of living or purchasing power of ordinary citizens because it will adversely affect an individual's level of disposable income.

3.5 Size, Growth and Profitability of the Industry

According to the SAPA's Industry summary report (2016), the gross value of the Egg Industry, at a producer level, was R10.2 billion (Table 3-1). This translates to a total contribution of 27.8% of the R46.86 billion total gross turnover realised by the Poultry Industry. The percentage proportions of each substrate for the industry has been graphically represented in Figure 3-7 below.

Since 2014, the Egg Industry has only been able to achieve a growth rate of 2.5% (Table 3-1). These poor growth figures are in all likelihood due to the drought in 2016. The drought caused a 17.2% increase in feed prices (Table 3-2), which squeezed producer margins to such an extent that many small and subsistence farmers elected to get out of the industry. Consequently, Pullet suppliers had to readjust their stocking levels and this, in turn, resulted in a marginal retraction in the National flock size by 0.2% (Table 3-1). Waning feed prices for 2017 has certainly meant that those farmers who elected to stop producing in 2016, would try to start up again. However, Pullet suppliers have not made provision for this. Consequently, the current short supply of eggs in the market has been the primary reason for the favourable producer prices seen in 2017 (Figure 3-2).

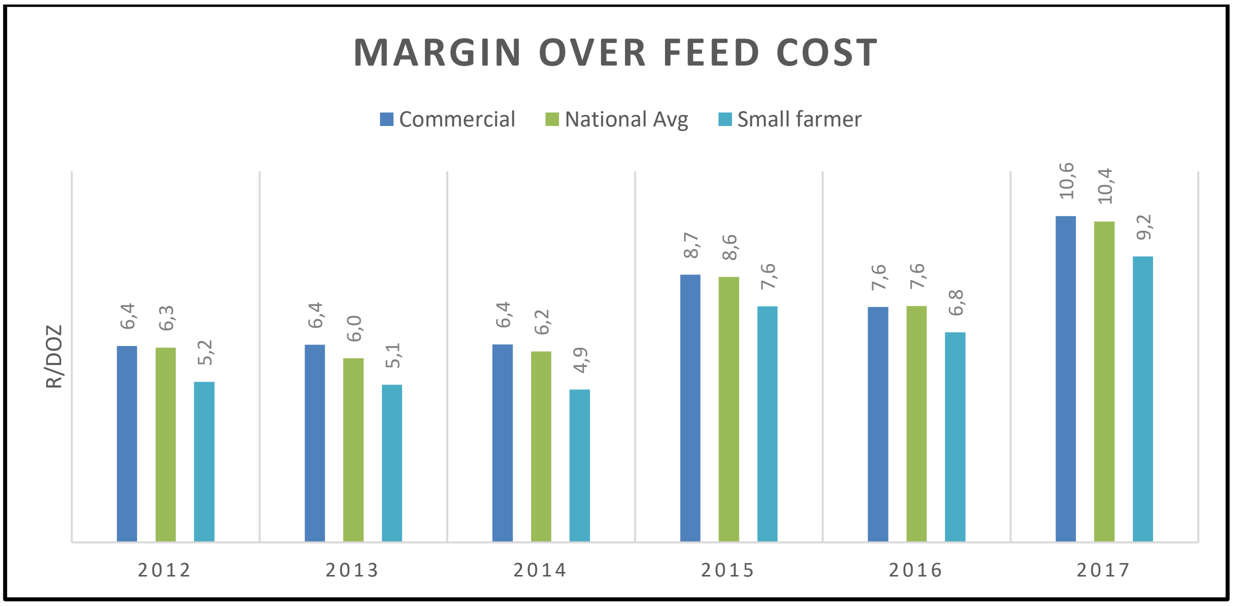
Figure 3-7: Industry size and producer market share for 2016.



Source: Collated from SAPA report. 2017. Key market signals in the Egg Industry

With the FAO (2015) global average per capita consumption set at 210 eggs, South Africa has a growth potential of 29%. In order to achieve double digit growth figures in the industry for the medium to long term, favourable economic conditions and political stability are required. This would ensure a growth in disposable income and an increase in the number of families earning double incomes.

Figure 3-8: Margin over feed cost



Source: Collated from SAPA report. 2017. Key market signals in the Egg Industry

Margin over feed cost (Figure 3-8) would give a good indication of the contribution margin per dozen eggs sold by the producer and, all things being equal, the profitability. Based on Figure 3-8, Golden Valley and Mmadiboke's gross profit margin should have increased in 2017 by 39.5% and by 35.3% respectively. This should be compared to the National margin over feed cost increase for 2017 which is 36.8%. Both benchmarking farms' performance is in line with the National trend, with Golden Valley marginally outperforming Mmadiboke. Whilst both farms are regionally focussed, this is rather a reflection of the market segments targeted and the cost difference of bulk versus bagged feed prices. The sharp spike in 'margin over feed cost' prices for 2017 has already been explained. These figures are an abnormality and not indicative of long term growth or long term profitability. The National price per dozen of graded eggs showed an accumulative growth percentage of 17.9% between 2014 and 2016 (Table 3-1). If averaged over the three period, it translates to an expected annual turnover growth of 5.96%. Per capita consumption peaked in 2012 at 162 eggs. Given the favourable supply and demand conditions for 2017, the potential for short term growth is, therefore, the difference between 2016 and 2012 per capita consumption, which is 9.5%. The combination of expected revenue growth (price per dozen eggs) and potential sales volume growth (per capita consumption) would indicate that the outlook for potential industry growth is positive, provided that input costs, like feed prices, remain stable.

For small-scale farmers hoping to enter the market and benefit from any prospective industry growth, strategies to penetrate the 51% market share held by large commercialised operators, are essential.

3.6 Industry Players

The main players in the industry include the following:

Input Suppliers/ Support functions	Producers	Markets
Pullet growers	Large Commerical Farmers	Informal Traders
Feed Millers & medical additive suppliers	Small-scale & Emerging farmers	Retailers
Veterinary Services	Subsistence farmers	Wholesalers
Transporters		Corporate Buyers
Industry Organisations (SAPA)		Hospitality Industry
Government Departments &		Agents & Distributors
NGO's (DAFF)		Exporters

The Industry's market share is distributed between commercial producers, distributors and non-commercial small-scale producers. The greater the percentage market share owned by medium to small-scale producers, the easier to implement strategies for market penetration. Market share is currently divided up as follows:

- Small to medium sized producers account for 49% of domestic production. These producers are divided between commercialised and non-commercialised producers. Non-commercial producers account for 2% of the 49% market share held by small to medium sized producers (Figure 3-7).
- 51% of the domestic production is dominated by three large commercialised producers/distributors, namely: Eggbert (7%), Nulaid (32%) and Highveld (12%).

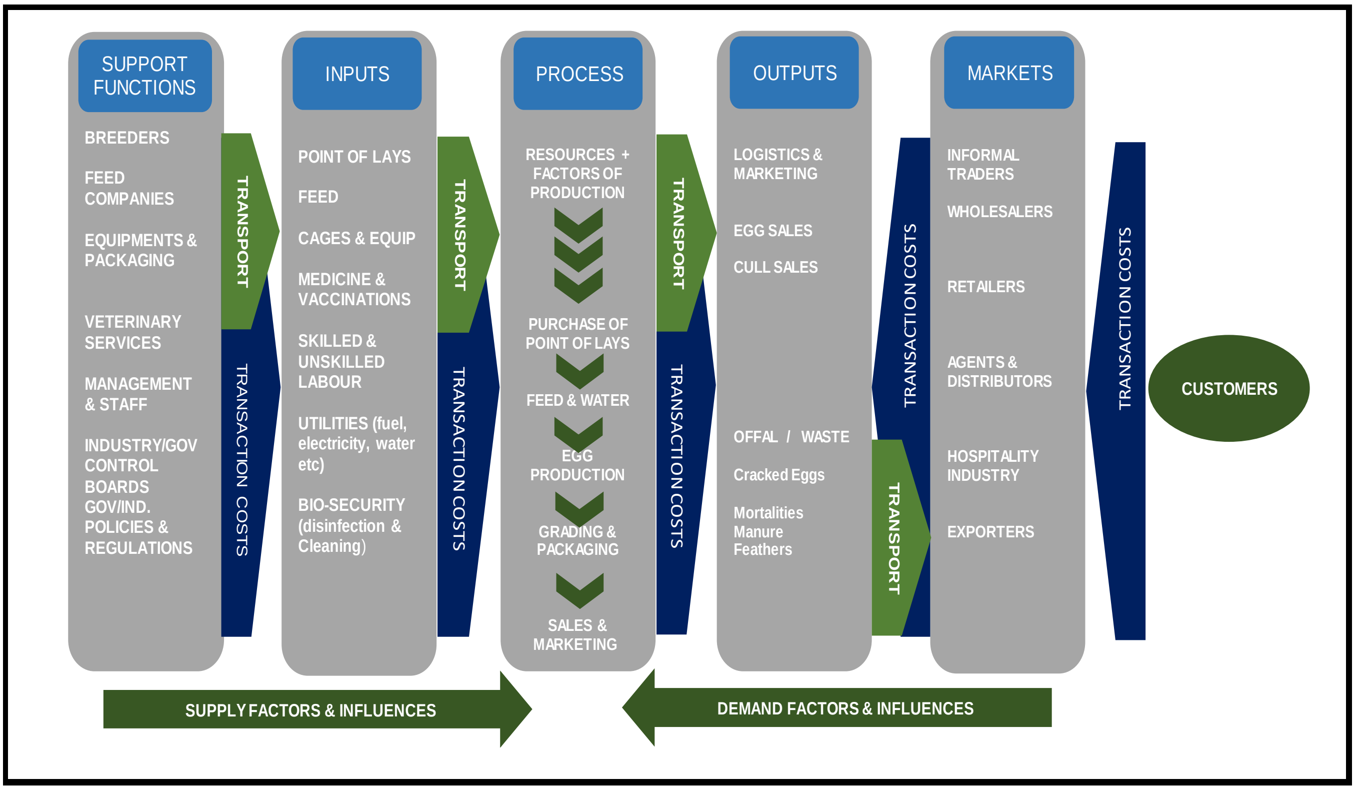
3.7 Value Chain Analysis

The role players involved in the marketing and production of eggs need to be protected from opportunistic behaviour. In fragmented or concentrated markets, like the egg market, such opportunistic behaviour could come from retailers, who control access to the individual market segments, or from Feed suppliers, who account for 60% of the input costs. Therefore, the institutional environment, and in particular Governments, need to put formal protection mechanisms in place to effectively mitigate these risks. These mechanisms are in the form of laws, regulations, Acts or NGO's (Jordaan *et al.*, 2014).

Unlike small-scale farmers, commercial farms wield a degree of buyer power with regards to inputs. Due in part to their size, their purchasing power and their ability to service credit terms, commercial farmers are able to negotiate settlement discounts or preferential volume-based purchase agreements with their suppliers. Consequently, commercial farms are able to pass some of the transaction costs up to suppliers, unlike small farms who often feel the squeeze from both ends (Figure 2-1).

Figure 3-9 shows the current value chain of the Egg Industry, from support functions through to the end consumer. It is important to note that in fragmented markets, such as the egg industry, competitor rivalry and buyer bargaining power is intense within the value chain. Consequently, demand factors filter back up the supply chain and impose constraints on the competitive advantage of the producer. Buyers often expect preferential credit terms, rebates, stock credits and stock returns for damages, amongst others. These transaction costs are passed back up the supply chain and are absorbed by the producer.

Figure 3-9: Egg Industry Value Chain



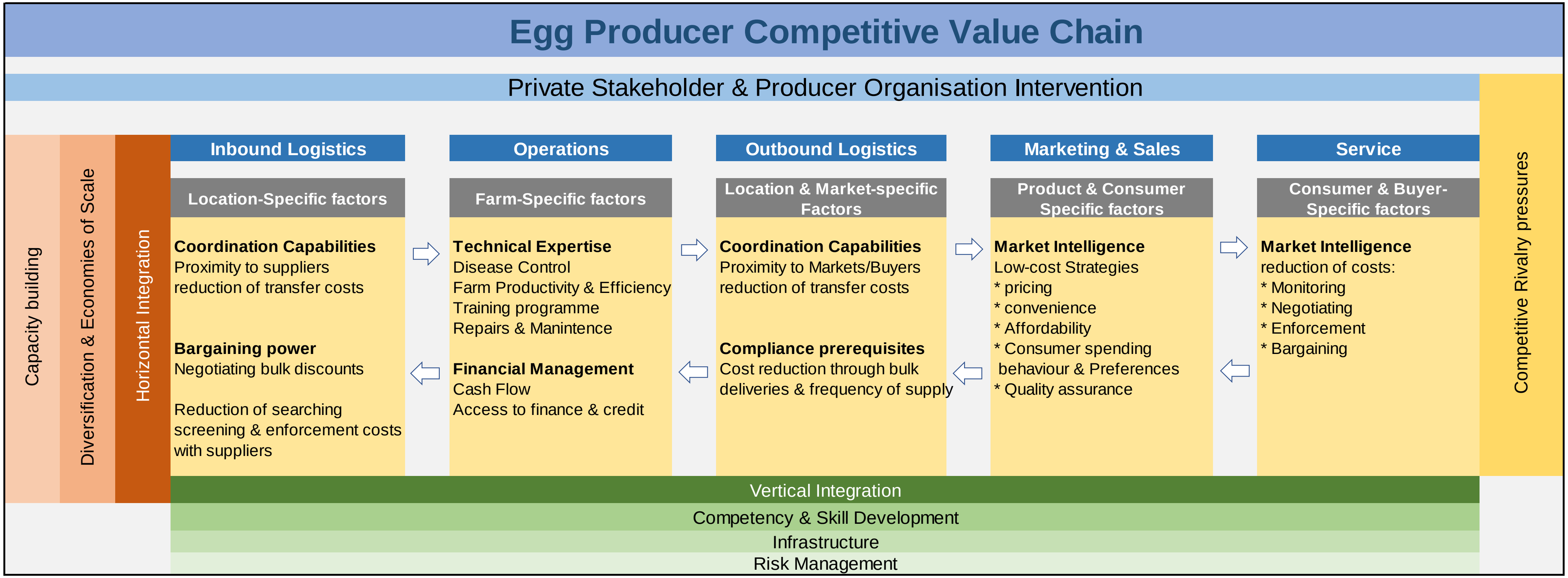
The administration of supply agreements and the control of information or market intelligence has become a function of the producer's size and its degree of commercial intensity, rather than the monopolistic nature of the market (Wilkinson, 2000). The size of the producer is often complimented by intrinsic competencies related to logistical control, reduced transaction costs, economies of scale, improved market intelligence, access to and control of intellectual property and a comprehensive distribution network (Pritchard, 2000). In short, producers with operational scale have an 'absolute cost advantage' over smaller farmers with regard to their ability to:

- procure resources and inputs
- gain market intelligence
- reduce transaction costs and competitive pricing
- risk management
- access to finance and capital
- Marketing and technical expertise.

In compliment to this, Retailers command a central role in controlling access to markets (Reardon *et al.*, 2001). In general, there has been a trend away from supermarkets residing only in niche urban markets, to one that penetrates deeply into the food markets of the poor (Reardon, 2005). Retailers are pushing the food marketing system towards vertical coordination, in order to ensure a standardised quality and reliable supply of perishable goods. This should theoretically improve producer bargaining power, and push farmers towards economies of scale (Echánove & Steffen, 2005). The growth of supermarkets has seen a shift from exclusive reliance on spot markets toward the use of specialised wholesalers (Shepherd, 2005). The issue for poultry egg farmers is that eggs are perishable and are characteristically associated with high transaction costs (Pingali *et al.*, 2005). Therefore, small-scale egg producers, who have succeeded in entering these higher profit-yielding markets, find it difficult to stay in it due to the high risks and cost of production involved.

Figure 3-10 below illustrates how a strategic intervention from a private stakeholder could facilitate the development of a comparative advantage for the small-scale egg farmer.

Figure 3-10: Competitive Producer Value chain



Notwithstanding the pressures exerted through competitive rivalry or market dynamics, small-scale egg producers should be able to sustain a comparative advantage against such influences and pressures. This is on condition that the 'intervention' addresses the key success factors and constraints which either prohibit or induce market participation.

The ideal private stakeholder to assume the function of value chain coordinator would be a Feed Mill. Feed Mills are already active role players in the current value chain. They possess the capabilities and competencies required for small-scale farmers to be competitive in commercialised markets. The flow of consumer and buyer pressures usually stops at an operational point in the value chain. This is because Feed Mills compete with competitors at a point in the value chain, where if their feed prices are market related, then producers have no choice but to accept the feed prices. A Feed Mill employs nutritionists and industry representatives who have the necessary skills and knowledge to address the key technical constraints experienced at an operational level. In addition, a Feed Mill has the necessary logistical and negotiating capabilities to facilitate transaction cost reduction both up and downstream of the producer. At 60% of the total input cost, a Feed Mill could alleviate the producer's cash flow pressures by granting a credit facility to the small-scale farmer. This credit facility would be contingent on the Feed Mill's continued involvement in the coordination of activities within the value chain of the producer. The arrangement would have to be that payment by buyers would have to move through the bank account of the Feed Mill before it ends up with the farmer. In this way, the purchase agreement with buyers serves as surety that the feed account is serviced. It goes without saying that such an intervention would fundamentally be built on the trust between the parties involved.

Whilst such an intervention develops vertical integration in the supply chain, there would be limitations related to critical farm size which may prohibit Feed Mill operators from assuming the role of value chain coordinator. This limitation will only be overcome if a producer organisation is established which would allow for chain-blocking to occur amongst the feed mill and various other small-scale farmers. If the egg farming density in a particular region is favourable, economies of scale may be developed and the bargaining power of this collective action would increase.

3.8 Market Analysis

By analysing the market, segments or groups which display common characteristics may be identified. The aim of the market analysis is to identify those segments that would appear to be most lucrative for small-scale farmers to service. Traditionally, market segments for the egg producers are as listed below:

Formal sector	Informal sector
Grading & Packaging entities	Hawkers
Wholesalers & distributors	Spaza shops
Retailers	
Processing entities	
Exporters	

However, for this market analysis, the segments will be regrouped under Individual and Corporate markets.

3.8.1 Individual Market Segments

The individual consumer market segment which essentially pertains to household consumption, has been expounded upon within the context of behavioural, demographical and psychographic segmentation. Individual segments are found in both the formal and informal sectors of the market. The formal sector purchases graded eggs exclusively, unlike the informal sector which prefers ungraded eggs, mainly due to the lower price point.

- **Behavioural segmentation**

Consumer spending patterns indicate that egg purchases are a monthly or, at most, bi-monthly occurrence. Whilst per capita consumption is approximately a dozen eggs per person per month, family or household once-off purchases are 30 to 60 eggs per month (SAPA, 2016). Therefore, the taxi-pack of 30 eggs is the most popular unit packaging size. The key product attributes sought by individuals are bright yellow egg yolks, taste, the convenience of bulk purchases, and the versatility of eggs (SAPA, 2015). Eggs are integral inputs in the confectionary industry and is incorporated into various baby foods in egg powder form.

- **Demographic segmentation**

Egg markets are regionally based. Within this market segment, the product is age indiscriminate and caters for both male and female consumers. The market features low to high income earners, from a diversity of educational backgrounds (SAPA, 2015).

- **Psychographic segmentation**

In terms of psychographics, the market features consumers with an array of lifestyles. For low-income consumers, eggs are an aspirational purchase. Because of the nutritional value of eggs, the product appeals to individuals who are seeking a healthier lifestyle or diet (SAPA, 2015).

3.8.2 Corporate segments

The corporate segment could be subdivided into small, medium and large businesses. In turn, this segment also purchases graded and ungraded eggs, depending on the use for the product.

- **Small and medium businesses**

These businesses would include small fast food stalls, bed and breakfast guesthouses, restaurants and holiday resorts. Grading and packaging requirements are not as stringent.

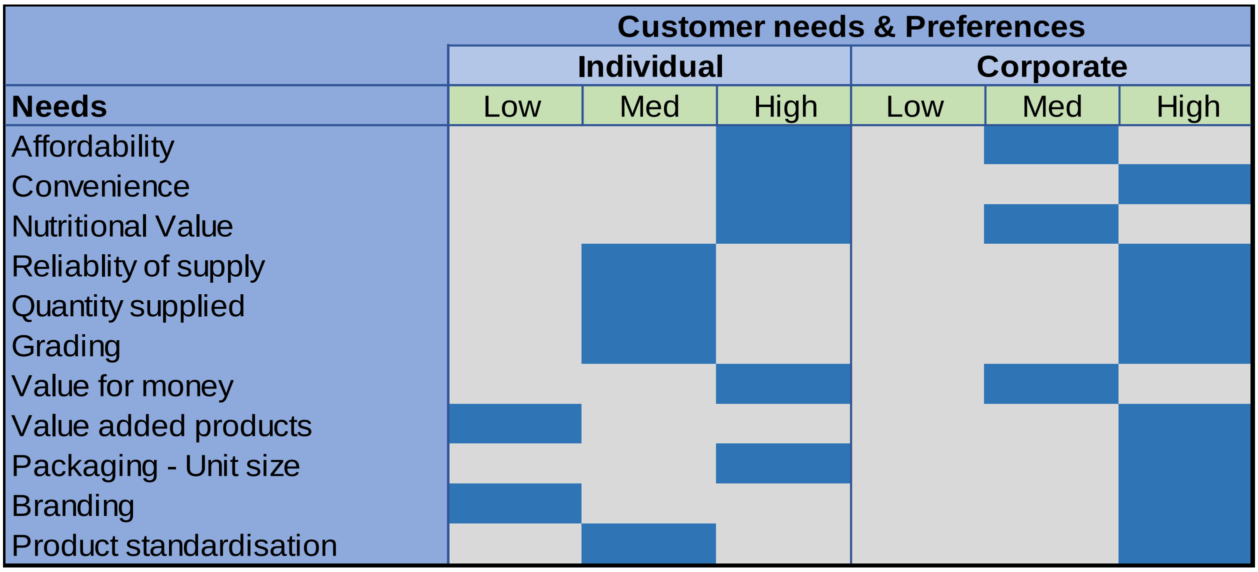
- **Large businesses**

This segment features large, well established retailers/wholesalers, exporters, hotels and large companies within the baked goods industry. Government contracts and feeding programmes would also fall under this segment. Compliance requirements feature strongly in this segment vis-à-vis quality, reliability of supply, branding and packaging requirements (SAPA, 2015).

3.8.3 Consumer Needs and Preferences

An assessment of consumer needs and preferences within the various segments identified, indicates that affordability, convenience of purchase and packaging attributes are highly valued. This would be particularly true in low income groups, where bulk ‘family’ purchases of eggs forms part of their monthly staple basket of goods. Given the economic environment, middle income earners will become more price sensitive because of pressures being applied to disposable income. Corporate segments place higher priority on compliance issues related to standardisation of packaging, reliability of supply, grading (quality) and branding (Figure 3-11).

Figure 3-11: Customer needs and preference matrix



Overall, the corporate segments would appear to offer better returns (Figure 3-11). However, the cost of compliance would need to be determined first before any conclusions are to be made. The corporate segments' greater need for quantity of supply may have a cost reduction effect on smaller producers in that it would significantly reduce transaction costs related to marketing and transportation costs. Even though this may be the case, the old adage of 'not putting all your eggs into one basket' may also have an effect on the strategic decision-making process going forward.

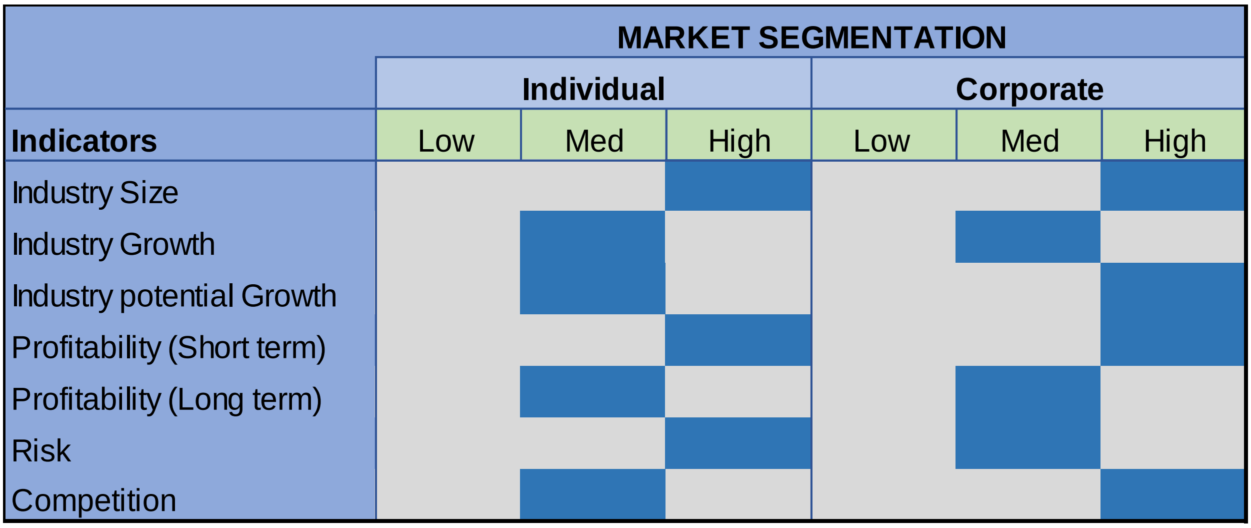
3.8.4 **Segment Attractiveness Matrix**

The attractiveness of the various market segments is based on the market size, growth potential of the segment, profitability, the risk associated with the segment and the nature of competition in the market segment.

The corporate segment would appear to be more attractive to producers because it offers lower risks and higher profits (Figure 3-12). The risks related to fluctuations in demand are largely mitigated in this segment because it has greater market reach and penetration.

However, the ability of this segment to offer consumers the convenience of purchase and its ability to sell large volumes, means that they have a higher degree of bargaining power. The competitive advantage they extract from their ‘buyer power’ means that suppliers run the risk of delayed payment or would need to finance credit facilities that extend to 90 days or more. Only businesses that are highly capitalised would be able to contract on such terms.

Figure 3-12: Segment attractiveness matrix



3.9 Competition Analysis

3.9.1 Direct and Indirect Competition

As a result of the fact that the egg market is not only fragmented but also regionally focused, direct competition will stem mostly from producers locally based. On the occasions where supply and demand forces are such that there is an oversupply of eggs, dumping may occur. Under such circumstances, large commercial producers, who are logistically coordinated, may dump eggs outside of their markets in order to recover costs. Bearing in mind that eggs are perishable goods, this would adversely affect local producer prices and demand. Dumping will usually occur in informal sectors of the market.

Indirect competition will emanate from affiliated markets within the gambit of the poultry industry (SAPA, 2015). This form of competition is two-fold, namely:

- **Broiler growers** effect the cull price of hens. Firstly, oversupply of white meat or competitive import prices has a direct influence on the price of spent hens sold into the live chicken market. Returns from cull sales are usually reinvested in new laying stock purchases. Poor cull prices, therefore, means that additional capital is required to purchase point of lays. Point of lay suppliers give credit terms of 7 days at most, the net effect of these two factors is that a larger amount of working capital will be required by the small-scale farmer. Secondly, the threat of substitution is high in the egg industry. When the gap between white meat and egg prices close, consumers are proven to substitute egg purchases for white meat.

- **Breeders** also compete in the table egg market. Any unfertilised eggs are sold in the egg market, often at reduced prices. These sales enable breeder growers to recover a portion of their input costs.

3.9.2 Competitive Intensity

- **Threat from New Entrants: MODERATE**

The threat from new entrants is moderate. To establish a poultry farm requires a fair amount of capital investment. However, the greatest threat on this competitive force comes from farmers who see poultry farming as a means of diversifying their farming activities. Such farmers have enough capital to enter and exit the market whilst there is economic profit to be made. These entrants are location specific and as such become direct competition in regional areas.

Poultry farming requires high levels of knowledge, skills, competencies and expertise in order to be productive and sustainable. These competencies would include knowledge about animal husbandry, disease prevention and market intelligence.

- **Threat from Customers: HIGH**

Customer needs and preferences are such that there is an expectation that eggs need to be affordable, convenient to purchase, abundantly available, graded according to specification, packaged to specification and branded correctly.

Behavioural characteristics of individual (household) segments would suggest that the switching costs are low and that preferences for substitution are a reality.

- **Threat of Substitution: HIGH**

As already discussed, brand loyalty and switching costs are low in fragmented markets. Therefore, suppliers need to be sensitive to customer preferences and needs. This would also apply to compliance expectations from retailers and wholesalers.

At comparative pricing, consumer behavioural patterns would indicate that eggs as a protein source will be substituted by chicken meat as a protein source. Price sensitivity has become an influential determining factor.

- **Threat from Suppliers: MODERATE**

The poultry feed industry is fairly concentrated and competitive. Market related pricing is to be expected from feed suppling companies. Volatility in feed ingredient prices, which are often traded commodities - largely effected by global supply and demand trends, and exchange rates – are a significant threat the farmer's comparative advantage and profitability. The distance to the farmer and the quantities ordered have an overall effect on the landed cost of feed, as it would do for the supply of point of lays.

- **Intensity of Competitor Rivalry: MODERATELY HIGH**

The intensity of rivalry is centred on factors such as price, reliability, quality, and brand recognition. The intensity of rivalry in the Industry is relatively high as evidenced by the high frequency of marketing promotions, internet advertising, number of new players entering the market, new strategic alliances being formed and the subsequent closure of certain poorly performing businesses in the market. Any growth potential will be based on the farmer's ability to develop market reach and penetration. This would mean that farmers would have to market outside the confines of regional markets.

3.10 Drivers of Change in the Egg Industry

Whilst the industry has only achieved a 2.5% growth rate since 2014, the potential of per capita consumption growth (29%) and the competitive pricing of eggs as a protein source (Figure 3-3), the prospects for long-term growth in the industry is positive.

Growth, however, is not the only prerequisite for industry attractiveness. The threat of changing market dynamics, linked to globalisation and market liberalisation, may translate to an escalation of compliancy within the value chain. Given retailer's propensity to indulge in excessive product mark-ups (Figure 3-2), producer profit margins may not necessarily mirror the market growth projections predicted earlier. Despite this, margin over feed cost increases at a producer level since 2012 have been 5% year on year.

Emerging new Internet capabilities and applications will define how producers coordinate, negotiate and monitor compliance prerequisites or access information to develop market intelligence. Acquiring these competencies will not only lower transaction costs, but will ultimately secure a competitive advantage for the producer.

Finally, health trends will in all likelihood have a positive impact on the per capita consumption of eggs in the long-term. With both disposable income projected to increase in the long-term (BFAP, 2016) and consumer preferences for greater protein dietary intakes (Kleyn, 2017), the overall attractiveness of the industry appears to be positive for the future.

3.11 Competitive Strength Assessment

A competitive strength assessment of various industry rivals, based on the key success factors identified in the literature review (Table 2-5), is shown in Table 3-5 below.

Table 3-5: Competitive strength assessment of rivals in the Egg Industry

COMPETITIVE STRENGTH ASSESSMENT							
		MMADIBOKE		GOLDEN VALLEY		NULAID	
KEY SUCCESS FACTORS	WGHT	STRENGTH RATING	WGHT SCORE	STRENGTH RATING	WGHT SCORE	STRENGTH RATING	WGHT SCORE
1. ACCESS TO INPUTS	0.35	(1-10)	1.14	(1-10)	2.01	(1-10)	3.06
Point of Lays	0.05	5.00	0.26	6.00	0.32	9.00	0.47
Feed	0.12	4.00	0.49	6.00	0.74	9.00	1.10
Credit facilities	0.11	0.00	0.00	5.00	0.53	9.00	0.95
Labour Productivity	0.02	8.00	0.14	7.00	0.12	7.00	0.12
Equipment & Maintenance	0.02	6.00	0.11	7.00	0.12	8.00	0.14
Utilities & infrastructure	0.02	6.00	0.11	6.00	0.11	8.00	0.14
Bio-security	0.02	2.00	0.04	5.00	0.09	8.00	0.14
2. PROCESS CAPACITY & COMPETENCIES	0.2	(1-10)	0.42	(1-10)	1.00	(1-10)	1.95
Marketing Expertise	0.05	3.00	0.15	5.00	0.25	9.00	0.45
Technical Expertise	0.04	4.00	0.16	6.00	0.24	10.00	0.40
Logistical & Distribution Networks	0.05	4.00	0.20	5.00	0.25	10.00	0.50
Economies of Scale	0.04	1.00	0.04	5.00	0.20	10.00	0.40
Technological capability	0.02	1.00	0.02	3.00	0.06	10.00	0.20
3. MARKET & OUTPUT COORDINATION	0.45	(1-10)	1.31	(1-10)	2.34	(1-10)	3.94
Compliance	0.14	1.00	0.14	5.00	0.68	10.00	1.35
Convenience	0.05	6.00	0.27	6.00	0.27	7.00	0.32
Reliability	0.05	5.00	0.23	6.00	0.27	8.00	0.36
Affordability	0.05	6.00	0.27	5.00	0.23	7.00	0.32
Responsiveness	0.02	4.00	0.09	6.00	0.14	8.00	0.18
Traceability	0.02	2.00	0.05	4.00	0.09	9.00	0.20
Risk Management	0.05	2.00	0.09	5.00	0.23	9.00	0.41
Market Intelligence	0.09	2.00	0.18	5.00	0.45	9.00	0.81
OVERALL COMPETITIVE STRENGTH	1		2.86		5.35		8.95

As a result of current market dynamics, Mmadiboke has scored far below that of commercial producers, Nulaid and Golden Valley. Below par scores, particularly in key areas such as access to finance/credit, feed prices, ability to meet compliance prerequisites and lack of market intelligence are to blame for their poor showing. Scores that are comparable to those of the larger producers include labour productivity, convenience and affordability of their product offering. This is due to fact that Mmadiboke is supplying informal sectors of the market, and therefore, they are delivering the product to channels that are in closer proximity to the consumer. Spaza shops are numerous and therefore offer competitive price points to consumers. This however does not affect Mmadiboke’s bottom line. With the inability to achieve economies of scale, Mmadiboke would have to look to higher profit-yielding market segments.

If Mmadiboke wishes to trade in higher yielding formal segments, it would have to develop and strengthen those competencies which are vital to successful competition. These would include, the ability to negotiate cheaper feed prices, risk management (Bio-security), market intelligence and compliance capabilities, in relation to affordability, reliability, responsiveness and traceability.

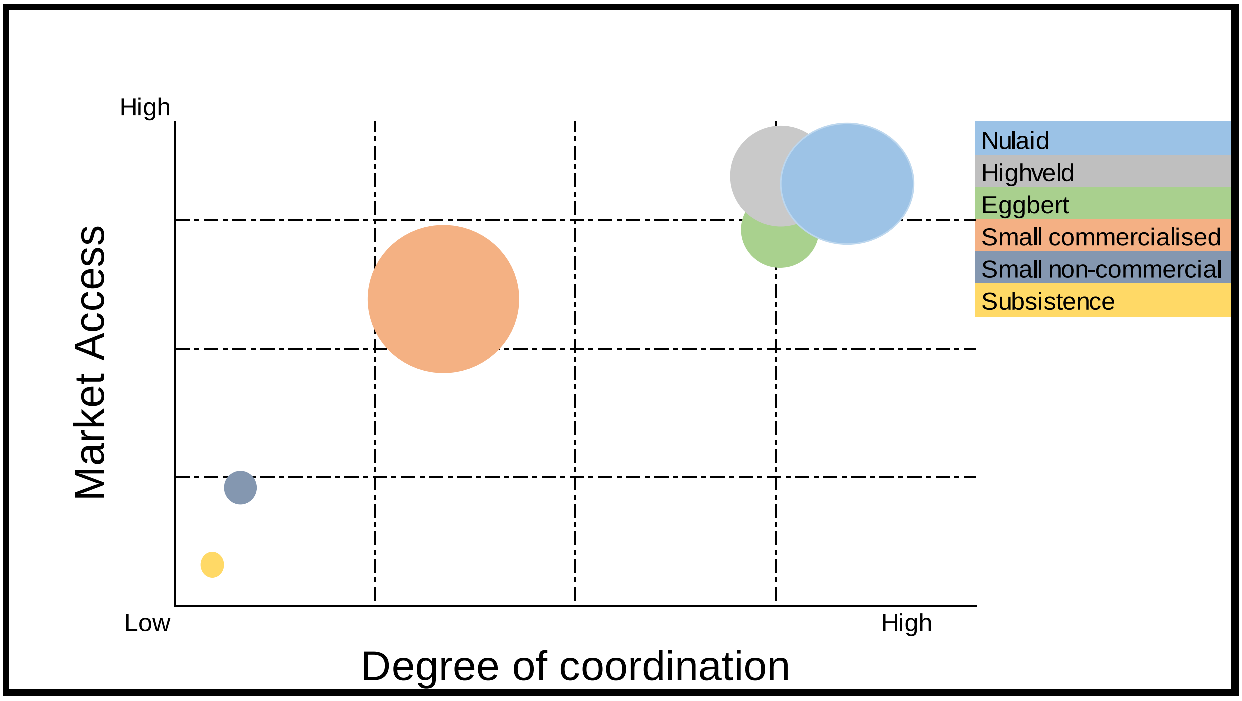
3.12 Strategic Group Mapping

The cluster of industry rivals have been graphically represented in Figure 3-13 below. The strategic positioning of country-wide suppliers, Nulaid, Highveld and Eggbert, reflect that their market reach is intrinsically linked to their degree of coordination within the value chain. As a result of their economies of scale and their horizontal integration, they are able to not only move volumes in sales but are also able to realise an overall net price per dozen greater than that of small commercial and non-commercial egg producers. Whilst collectively, small commercial producers still command a relatively large portion of the market share, it must be borne in mind that markets are regionally focussed and that the concentration of suppliers in potentially high-yielding profit areas would mitigate supplier bargaining power.

Unfortunately, non-commercialised producers have limited market access, which is entirely as a result of their lack of coordination competencies. Any strategic interventions aimed at increasing market share or market access would have to take coordination factors into account. Figure 3-3 shows that the average realised price for eggs per dozen was higher for commercial farmers supplying large corporates in the formal sector, than those of small farmers who regionally supply the informal sectors. The strategic map below (Figure 3-13), therefore, indicates that there is a gap for small-scale farmers to achieve great market access if they improve their degree of coordination. Greater market access does not have to be linked to scale for the small-scale farmer, in that, a strategic alliance between input suppliers and a producer organisation would mitigate scaling limitations.

Should an alliance facilitate a higher degree of coordination, then small-scale farmers within the alliance would collectively have access to markets which give higher returns.

Figure 3-13: Strategic group map of rivals within the Egg Industry



3.13 Competitor Strategies

Egg suppliers all implement low-cost strategies. Therefore, any attack on their market share, whether regionally or nationally focussed, would evoke the use of predatory pricing. By matching a new entrant's prices, a competitor would be able to block new entrants by relying on either exchange agreements or their relationships with buyers.

3.14 Strategies for Emerging Farmers

Proposed growth strategies for market penetration must be ancillary to the generic competitive strategy of being a low-cost provider, which characterises the industry. Discussed below are various options for market penetration, of small-scale egg farmers, into formal market segments.

- **Strategy 1**: Co-operative Marketing

Under the auspices of AgriBEE policies and regulations, black owned producer organisations could be a mechanism for penetrating the formal market segments. However, this strategy would also need intervention from a private stakeholder at a producer level. Such an intervention would include the sharing of technical expertise, distribution networks and market intelligence. Through producer organisations, farmers could ensure the supply of quantities, create a brand name, and increase their bargaining power when negotiating prices.

- **Strategy 2**: Contract Production

Small-scale farmers could conclude a contract with a processing/packaging company or with a corporate company to supply a specified number of eggs or at a time. Whilst this removes many of the externalities or producer level risks from the value chain, it would require the commitment of a highly capitalised and coordinated private stakeholder. The transaction costs in searching for, identifying or establishing such an agreement would be too exorbitant for small-scale farmers to pursue. Such agreements would need to be initiated by the private sector. A contract grower scheme, like Sondeleni Ranching, takes most of the risk off the individual farmers' shoulders.

- **Strategy 3:** Strategic Alliances

Strategic alliances could incorporate the benefits of established producer organisations and contract producer agreements. A strategic alliance would place the small-scale farmer in a more competitive position in relation to rivals and market expectations or specifications. Strategic alliances create scope for vertical and horizontal integration. A strategic alliance would require collaboration based on mutual trust, however, it would need someone to drive or steer the alliance in the correct direction. Identifying the right private stakeholder to drive the alliance is crucial. This strategy would require that synergies exists between stakeholders within the activities of the value chain.

The overriding benefit of this strategy is that it pools resources, reduces transaction costs and shares the risks amongst each participant in the alliance. This strategy is potentially the most effective and flexible option to achieve market penetration. Ideally, the private stakeholder should already be a participant in the value chain of the industry. Input suppliers are intrinsically vested in the supply chain, and therefore would be ideally positioned to assume the role of the private stakeholder in the strategic alliance. A feed mill, for example, should already have a high degree of coordination and should be able to transfer knowledge vis-à-vis technical expertise, market information, negotiating, monitoring and enforcement capabilities. In addition to this, feed mills could also strength the linkages between suppliers of pullets or medication and farmers. Feed mills would have the transport infrastructure to supply feed and move eggs to the market at the same time.

3.15 Synopsis of Industry Analysis

The industry analysis has established many factors and indicators which are determinants of the overall egg industry attractiveness. The most notable of these have been summarised below.

Since 2014, the industry has only achieved a growth rate of 2.5% per annum and a per capita consumption rate of 150 egg per person per year. Given that the world average is 210 eggs, there is a 29% potential for growth. With the national consumption split between household (70%) and corporate (30%), projected growth will depend largely on disposable income and consumer preferences for protein diets. Egg prices must remain competitive in relation to white meat prices to avoid the threat of substitution from taking place. Overall, 2017 has marked a change in the fortunes of egg producers, with a 28% decrease in feed costs and an 11% increase in retail prices. Profitability will remain stable as long as feed prices remain static. Unfortunately, it is not only environmental factors that have cause volatility in input prices, but Political and economic uncertainty as well.

Because egg markets are regionally focussed, 41% of the market share is already owned by independent small-scale commercial farmers. Location-specific factors clearly have a determining impact on market access and sustainability. In order for small-scale farmers to transition from informal to formal markets, they would need to acquire competencies related to commercialisation. A recent CASIDRA report (2017) determined the critical, feasible size of a small-scale farm was 5 000 birds. This number may however not be suited to a strategic intervention by a private stakeholder. The minimum threshold to justify a strategic alliance would need to be determined.

Profitability appears to be a function of feed price and target market segments. Formal market segments appear more attractive; however, they are inaccessible to those farmers who are not coordinated. Strategic alliances would need to establish synergies within the value chain in order to be competitive. The degree of coordination required is largely dependent on consumer preferences for affordability, convenience, packaging and branding, and behavioural factors related to lifestyle choices.

The combination of all these factors and influences translates to a competitive environment which is moderately intense. Emerging farmers would need strategies that are able to contend with the constant threat of substitution, low switching costs, lack of producer bargaining power and the ease of entry of new competitors. Unfortunately, egg production is asset specific and exiting the market may come at a cost.

If small-scale farmers are able to organise and coordinate themselves, the potential to penetrate formal sectors does exist. Market penetration would illicit strategic action from competitors in the form of predatory pricing. However, on the back of AgriBEE policies, contractual agreements with large retailers and wholesalers ought to be possible.

In conclusion, the industry analysis has determined that the overall industry attractiveness for the small-scale farmer is positive and conducive to sustainable market participation. More importantly, the analysis has identified Feed Milling companies as the best positioned stakeholders in the value chain to develop synergies between the various input/output activities. Therefore, Feed Milling companies should drive the coordination process within the ‘strategic alliance’ strategy.

CHAPTER 4: EMPIRICAL CASE STUDY

4.1 Assessment Approach

This chapter provides the details obtained through an actual on-farm investigation and interview conducted with the owner/manager of Mmadiboke. The purpose of this chapter is to present the results of the investigation and to provide an analysis of the findings. The aim of the investigation is to determine whether a strategic alliance would develop synergies within the value chain of Mmadiboke, and in so doing, increase profitability or economic sustainability. In addition, the investigation will expound on a proposed stakeholder engagement, in order to determine the impact that such an intervention would have within the value chain. The findings would highlight the opportunities and challenges which may inform the strategic decision-making process. Any conclusions about the strategic decision-making process would be supplemented by information obtained from secondary research sources, explicated on in Chapter 2 and 3. The findings of the literature review and industry analysis have set the parameters against which the empirical study has been conducted.

The interview questionnaire (Annexure D) was adapted from a survey commissioned by SEDA and conducted by Urban-econ: Development Economists in 2013. The reason for the adaption of the questionnaire was to include findings from the literature review and industry analysis. The original survey focused on the challenges and support that would be required in order to develop Producer Organisations within the Poultry Industry. The survey included small-scale farmers from 28 existing Producer Organisations, within each substrate of the Industry. Through the survey, it was noted that only 2 out of the 28 Producer Organisations surveyed were involved in egg production. The existence of Producer Organisations in the egg production sector is not a common occurrence and deserves further development (SEDA, 2013).

4.2 Investigation Results and Findings

The adapted interview questionnaire (Annexure D) was used to establish an overview of the particular challenges facing Mmadiboke and to determine the areas or activities that warranted further investigation. The manager was interviewed on 13 September 2017. As it pertained to the objectives of this investigation, further analysis of the notable challenges was conducted and findings are presented below.

4.2.1 **Background and Demographics**

Mmadiboke is a black-owned layer farm situated 10km outside Klerksdorp and has been operational since 2010. A key indicator of sustainability is the length of time that the farm has been in operation for. On this basis, initial indications are that the farming operations are sustainable, however, it may not be operating as efficiently as it should.

Results from the interview with the manager revealed that the initial start-up challenges were due to the fact that there was no business plan or access to credit facilities. In addition to that, there was a lack of skills related to managing the finances, technical expertise and market intelligence. Other than the initial start-up capital, the manager was oblivious to any governmental or institutional support structures available to him.

The manager elaborated on the fact that the initial challenges related to cash flow and technical expertise persists. Feed and pullets are still bought on a cash only basis. Due to cash constraints, the manager is forced to buy feed on a 'need only' basis from the local cooperative, at much higher prices. For the same reason, the capacity of the farm is at 70%, because the availability of cash at the time of pullet replacement is constrained. By his own admission, his technical expertise is limited. He admitted in the interview that he is not experienced enough to determine the cause of production drops. As an aside, the investigation has revealed that there is no disease control or prevention protocols in place. This exposes the farm to higher levels of risk related to disease outbreaks and production loss. In the unfortunate event that a disease outbreak should befall the farm, there are no additional funds or insurance against production loss that would ensure the continuation of farming operations.

Whilst the farm has the necessary equipment to operate, the manager has indicated that silo storage tanks for feed would allow him to purchase monthly bulk orders at cheaper prices. However, cash flow and the size of the farm are two constraints prohibiting this acquisition. A minimum payload for feed, from most bulk feed suppliers, would be 10 tons per delivery.

Any strategic intervention considered would have to account for the lack of a business plan, marketing plan, budget and formal training programme. Additionally, the 'critical farm size' may be a determining factor for a private stakeholder intervention, particularly if that stakeholder was a feed mill operator.

4.2.2 Human Resources: Manager and Employees

The staffing complement and their respective duties and responsibilities is listed below:

Human Resources	Duties and Responsibilities	Full time	Part time
General Manager	Manages the production and employee activities Manages the finances - payments and sales Marketing and customer relations Procurement - feed, pullets, medication & packaging Logistical activities - collecting & delivering feed and eggs	1	
Production/Site Employees	Ensure that chickens are watered and fed Clean manure out of the house Collect eggs for packaging Repairs and maintenance	1	
Packaging & Quality Control Employees	Grading Packaging (according to order) Assume some administration duties	1	
General Assistants	Used where required - production or packaging		1

Table 4-1 below lists the manager's perceived skills rating of his employees. The manager noted that the lack of financial records or financial management was a limiting factor to the strategic decision-making process. During the interview, the lack of financial management was linked, in part, to the manager's poor computer literacy skills. Whilst the manager felt that his people skills were good vis-à-vis managing customers and employees; a lack of bargaining power and access to information, conversely, affected his ability to manage suppliers, negotiate bulk discounts or fulfil compliancy prerequisites.

The manager felt that by developing these skills, he would be more profitable. The key foreseeable challenges continue to include access to finance or credit facilities, information asymmetries and logistical constraints, which are related to the collection and delivering of feed and eggs respectively.

Table 4-1: Employee skills rating

Competencies	Poor	Average	Good
Managing the business activities		X	
Managing employee issues			X
Bookkeeping/Budgeting	X		
Managing credit	N/A		
Managing products & services		X	
Fulfilling compliance prerequistes	X		
Computer Literacy	X		
Managing suppliers	X		
Technical skills related to production	X		
Managing customers			X
Negotiating discounts for bulk buying	X		
Product pricing		X	

4.2.3 Financial Management

As per the interview, there is a glaring lack of financial management in the business. Other than a crude ledger which keeps track of monthly sales and expenses, there is a basic budget which is used as a decision-making tool. The record keeping duties are fulfilled by the manager himself or one of the quality control employees - when the manager is too busy to attend to it. There is no income statement, balance sheet or cash flow statement. In order to investigate how costs could be reduced and revenue increased through a private stakeholder intervention, an income statement would have to be drawn up. The overall impression is that the business operates on a 'hand to month' basis, in that any surplus cash is ploughed back into feed purchases as a matter of default.

As a cost saving measure, the manager has elected not to appoint an official bookkeeper or accountant to keep record of the profitability or financial position of the business.

The manager was asked to rate the impact of the following expenses on the operations of the farm. The results are listed in Table 4-2 below:

Table 4-2: Impact of expenses on operations.

Expenses	Low	Medium	High
Salaries		X	
Transport			X
Feed and Packaging			X
Advertising and Marketing		X	
Administration	X		
Insurance and Security costs	X		

Feed and packaging costs, operated on a cash only basis, are reported to account for 60% of the input costs. Given the cash flow constraints, it would be understandable that the impact of feed costs would be rated as high. The manager alluded to the fact that sales aren't necessarily on a COD basis, and that he could wait up to three weeks before getting paid. So, even in informal markets, credit terms are negotiated by buyers or stock is supplied on a consignment basis.

In the past, an application for a credit facility was made with a feed supplier, however, this application was unsuccessful. Reasons given by the supplier for not granting the credit was based on the fact that the farm was not creditworthy, nor was the owner in a position to sign surety for the credit. In all probability, a credit check, as required by the Credit Agreement Act, would have returned a negative result, especially if purchases are made with cash from sales before it is able to pass through the farm's bank account. Even so, the manager is of the opinion that he would be able to service a monthly credit facility for feed and that such a facility would make a huge difference to the sustainability of his operation.

4.2.3.1 **Income Statement**

In order for a more in-depth analysis of Mmadiboke's revenue and expenses to be conducted, an Income Statement was drawn up from current data obtained from the farm manager and is shown in Table 4-3 below. The supporting data and calculations used to draw up the Income Statement have been provided in the addendum as Annexure A, B and C. For those line items that had no supporting documentation, data was taken from the existing budget or in consultation with the manager. A Contribution Approach Income Statement was drawn based on the assumption that this was a start-up business with no opening stock or materials to account for. Further assumptions were based on industry documentation. The Amberlink Production Standard's manual was consulted in order to determine daily feed intakes, depletion times and productivity cycles.

A value for fixed assets was determined through consultation with the manager, and is not necessarily reflective of replacement values. The value of the fixed asset estimation has been depreciated over a five year period. Utility expenses are an approximation because the manager lives on the farm and his personal utilities are included in the monthly utility bill. Purchases relating to repair and maintenance are not always recorded in the expenses ledger and therefore a monthly expense amount has also been estimated. Expenses related to delivery costs had to be separated from personal costs because the vehicle is used for both purposes. Delivery costs were calculated on an estimated 80km round trip per delivery, on an average delivery frequency of 20 trips per month and a delivery capacity of 360 dozen eggs at a time.

Table 4-3: Contribution Approach Income Statement for Mmadiboke.

Contribution Approach Income Statement for Mmadiboke		Current
Sale of Eggs (Sales Mix)	1 329 713	
Cull Sales	104 247	
Manure sales	17 623	
Total Sales		**1 451 583**
Less Variable Expenses		
Pullets	210 000	
Feed	524 789	
Medication	14 400	
Advertising	8 400	
Utilities - electricity and water	48 000	
Delivery costs	25 902	
Packaging costs	66 110	
Total variable costs		897 601
Contribution Margin		**553 982**
Less Fixed Expenses		
Salaries	342 000	
Insurance	51 600	
Repairs and maintenance	24 000	
Accounting fees		
Telephone account	3 600	
Office supplies	1 200	
Depreciation	181 000	
Internet	6 000	
Total fixed costs		609 400
Total costs		**1 507 001**
Profit Before tax		**-55 418**
Tax at 28%		
Net income		**-55 418**

Revenue streams were calculated on the current sales mix of 60% and 40% per dozen units and tray units respectively. Because cull and manure sales are accounted for in feed and pullet procurement expenses, the revenue generated from these sales have been recalculated into equivalent per dozen units.

The net income, from the income statement above, compliments those shown in the CASIDRA (2017) study and substantiates some of the answers obtained from the interview. With a net loss of R55 418, all indications are that this operation is not only marginal but rather unsustainable. This operation is able to continue operating because they don't account for depreciation. This, however, puts into question the long term sustainability of the farm. The lack of bio-security protocols or insurance against production loss and the epidemic spread of Avian influenza, puts this operation one natural disaster away from absolute financial distress (Kleyn, 2017).

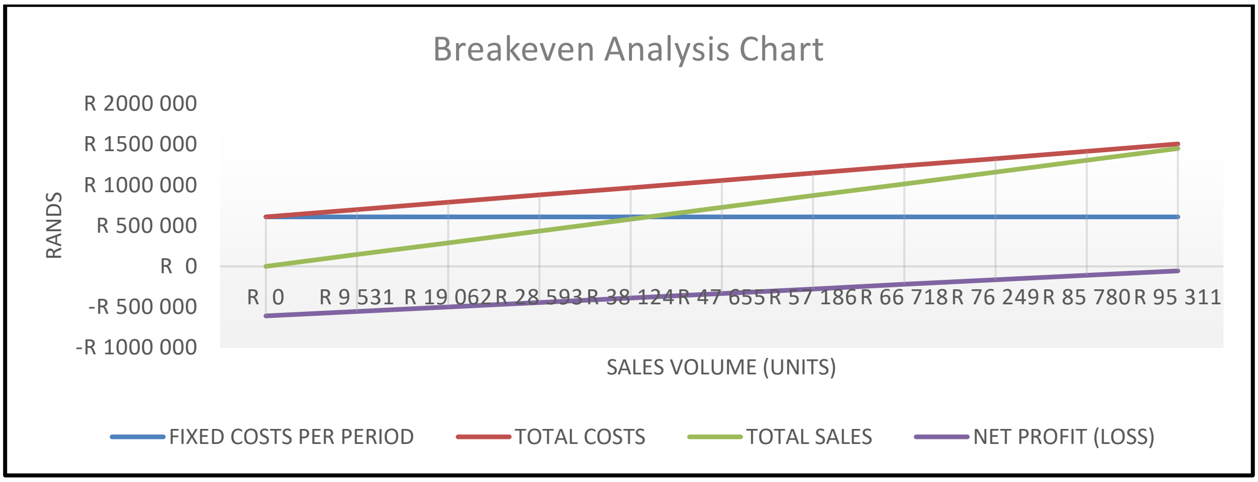
By comparing the manager's perceived impact of expenses on operations (Table 4-2) with the income statement, it should be noted that feed costs constitute 58.4% of the total variable costs of the farm. Delivery and Advertising costs, rated as high and medium, only contributes 2.9% and 0.9% of the total variable costs respectively. A reason for the high rating could be as a result of the personal time spent fulfilling these activities (transferring and searching transaction costs).

At 56% of the total fixed costs, salaries have a significant impact on the overall profitability and also sets the minimum size of the farming operation. This impact could only be reduced through achieving economies of scale. Therefore, it would be important to determine the 'critical farm size' which delivers a contribution margin large enough to cover fixed costs i.e. breakeven analysis. Results for the current breakeven analysis are provided in (Figure 4-1) below.

On the current figures, Mmadiboke will only breakeven once they have sold 104 845 dozen eggs (Figure 4-1). Total egg production capacity of the farm will only deliver 95 311 dozen (with revenue generated from cull and manure sales recalculated into equivalent units). If depreciation is removed from the income statement, the breakeven point improves to 73 705 units. Despite this, any volatility in the variable costs, like feed, would result in a contribution margin which is insufficient to cover monthly fixed expenses and would put the sustainability of the operations into question.

Reducing variable costs is of paramount importance. The manager needs to be in a position to negotiate discounts on bulk purchases for feed, packaging and pullets. In addition, efficiency factors related to production have the potential to increase the volume output, whilst reducing the related variable costs. Technical expertise will ultimately be a determining factor in a turnaround strategy for Mmadiboke. Any improvement in daily feed intake, mortality rate or rate of lay would have a compounding effect on total volume output and consequently on total revenue.

Figure 4-1: Breakeven Analysis on Mmadiboke's current operations.



SALES	
SALES PRICE PER UNIT	R 15,23
SALES VOLUME PER PERIOD (UNITS)	95 311
TOTAL SALES	**R 1 451 582,56**
VARIABLE COSTS	
DIRECT MATERIAL PER UNIT	R 8,55
DELIVERY COST PER UNIT	R 0,27
ADVERTISING	R 0,09
UTILITIES	R 0,50
OTHER VARIABLE COSTS PER UNIT	R 0,00
VARIABLE COSTS PER UNIT	**R 9,42**
TOTAL VARIABLE COSTS	**R 897 600,68**
UNIT CONTRIBUTION MARGIN	**5,81**
GROSS MARGIN	**R 553 981,88**
FIXED COSTS PER PERIOD	
SALARIES	R 342 000,00
INSURANCE	R 51 600,00
REPAIRS & MAINTENANCE	R 24 000,00
ADMINISTRATION EXPENSES	R 10 800,00
DEPRECIATION	R 181 000,00
TOTAL FIXED COSTS PER PERIOD	**R 609 400,00**
NET PROFIT (LOSS)	**-R 55 418,12**
RESULTS	
BREAKEVEN POINT (UNITS):	**104845,24**

Therefore, a strategic intervention would need to improve the realised selling price of eggs per dozen, whilst at the same time reducing the variable costs. In addition, the lack of technical expertise and bio-security protocols puts the operation at great risk of production drops which would be detrimental to economic sustainability or profitability.

4.2.4 **Customers and Suppliers**

Mmadiboke's client base is regional and includes Klerksdorp, Jouberton and Kanana townships. They farm with 3500 Amberlink Silver layers. Almost two thirds of the farm's production is sold in dozen units to spaza shops and hawkers, in the nearby townships of Jouberton and Kanana.

Due to logistical and time constraints, farm-gate sales do occur. In such instances, spaza shop owners collect eggs directly from the farm. Whilst this may be a convenient arrangement, it erodes the producers' bargaining power and net realised egg price. Buyers often negotiate the price down because they are collecting the eggs themselves. During the interview, the manager demonstrated an eagerness to conclude a formalised agreement in the formal sector. Whilst, the 'all-in-all-out' option of a contract with a large retailer appealed to the manager, he did express his concerns as to whether he would be able to negotiate a fair price. Furthermore, he admitted that he would not know how to go about concluding such an agreement. As concluded in the industry analysis, the formal markets have the potential to realise a higher per unit selling price for the producer. Strategies to access these markets and at what cost, would need to be investigated further.

Any supply agreement with retailers is chiefly dependant on the regularity and quantity of supply. Farm size is, therefore, a determining factor but not necessarily a prohibitive factor. Strategic alliances which operate on the collective action of many small-scale farmers may mitigate this limitation. Nevertheless, this would require a fair amount of logistical coordination.

Farm size is also a limiting factor vis-à-vis bulk feed supply. Feed mills have a minimum payload before delivery will take place. For the purposes of this study, it will be crucial to establish a minimum threshold for farm size, if the envisioned strategic intervention aims to develop logistical synergies with suppliers in the supply chain.

4.2.5 **Current Challenges and Support**

As shown in the Literature Review (Table 2-4), there are various organisations which offer support to small-scale farmers. The support covers a wide spectrum, from financial and technical support through to training programmes. However, as concluded in the Urban-econ survey, this support is thwart with bureaucratic red tape. The time delay between the application process and actually receiving support, renders the whole process futile and counter intuitive.

Whilst the owner was given financial assistance to buy the equipment and start the farming operation, no ancillary support was forthcoming. As per the interview, the manager stated that continual support in logistics, credit, technical and marketing expertise was necessary to sustain his operation. These challenges span across the entire value chain, and therefore would require an all-inclusive strategic intervention.

4.2.5.1 **Critical Farm Size**

As identified in the industry analysis, the ideal private stakeholder to coordinate such an intervention would be a feed mill operator. Such an intervention would not be without its limitations. The limiting factor would be the critical farm size required for an intervention to make sense. The assumption upon which this requirement is based, is that weekly feed deliveries must accommodate the possibility that a synergy exists to move eggs to the market with the return trip. Calculations were based on bagged feed prices because the same eight ton flatbed truck would be used to move eggs to the buyer. Loading space on the truck can only accommodate eight, one ton pallets of feed per delivery. Based on this limitation, each empty pallet can hold 15 cases at 30 dozen per case. Only actual (excluding equivalent) dozen units were considered. Further limiting factors have been highlighted in red (Table 4-4).

In order to move eggs to a formal sector buyer, regular weekly deliveries are required at a cost of R2 000 per trip. The prerequisite for weekly deliveries is based on the assumption that regular deliveries to a formal sector buyer is required and because of the lack of on-farm storage space for the eggs. Capacity limitations for feed and egg deliveries are, therefore, 8 000 kilograms and 3 600 dozen respectively (Table 4-4).

Current weekly egg production totals 1 735 dozen (exclusive of mortality rate) and weekly feed usage 2 818 kilograms (Table 4-4). On this basis alone, a farm size of 3 500 laying birds would not appear to be conducive to developing a logistical synergy with a feed supplier.

Table 4-4: Critical Farm Size for a Feed Mill intervention at Mmadiboke.

Determining Factors	UOM	No. of Layers				
		3500	4000	4500	5000	10000
Delivery prerequisite	kg	8000	8000	8000	8000	8000
Monthly feed usage	kg	12075	13800	15525	17250	34500
Frequency of delivery	no. per month	1,5	1,7	1,9	2,2	4,3
Weekly feed usage	kg	2818	3220	3623	4025	8050
Delivery cost/feed usage	R/kg	0,71	0,62	0,55	0,50	0,25
Delivery cost/feed/doz eggs	R/doz eggs	1,15	1,01	0,89	0,80	**0,40**
Weekly egg production (doz)	doz	1 735	1 983	2 231	2 479	4 958
Bulk Feed & Del. Cost	Rands/doz	6,17	6,02	5,91	5,82	5,42
Bag Feed & Del. Cost	Rands/doz	6,28	6,28	6,28	6,28	6,28
Transaction cost	Rands/doz	-0,12	-0,26	-0,37	-0,46	-0,86

Assumptions	UOM		Assumptions	UOM	
Current Capacity	No. birds	3500	Max Bulk loading capacity	doz eggs	3600
Rate of lay		0,85	Bulk delivery cost	Rands/Egg	0,046
Total capacity	No. birds	5000	Current loading capacity	doz eggs	360
Daily feed intake	Grams/bird/Day	0,115	Current delivery cost	Rands/Trip	106
Minimum Feed Payload	Kg	8000	Current delivery cost	Rands/Egg	0,025
Bulk delivery cost	Rands/Trip	2000	Current delivery cost	Rands/doz	0,29
Bulk delivery cost	Rands/kg	0,25	Feed required per Doz. Eggs	kg	1,620
Bulk Feed cost per kg	Rands/Kg	3,097	Bag Feed per kg	kg	3,697

In fact, only a farm capacity of 10 000 birds would meet the minimum weekly threshold of eight tons of feed and 3 600 dozen eggs. Since Mmadiboke's current farm capacity is 3 500 birds, there would be an increase in the transaction cost of such an intervention. Results summarised in Table 4-4 indicate that there would be a net realised difference of R0.75 per dozen due to the forgone opportunity cost of housing 10 000 birds. Should the strategic intervention include a capacity building option, then the difference in opportunity costs between 3 500 and 5 000 birds would decrease the transaction cost by R0.35.

Despite the opportunity costs related to farm capacity, there would in actual fact be a net decrease of R0.12 per delivered dozen, at a capacity of 3 500 birds, between Mmadiboke's current delivered cost per dozen and that of a feed mill intervention. Despite the 'intervention's' higher delivery cost per dozen, when the bulk discount received per kilogram of feed is multiplied by the feed required to produce a dozen eggs and then added to the delivery cost per dozen (Table 4-4), there is an overall cost reduction in the transaction.

In spite of the fact that a capacity of 3 500 layers is below the minimum threshold required for an efficient feed/egg delivery synergy to exist between Allem Brothers (feed miller) and Mmadiboke, there would still be a net transaction cost reduction if such an arrangement was in place. Even though the agreement would not be efficient, the feed miller will not be losing on transport costs and would be in a position to close his supply chain. Such an arrangement would be appealing, especially if the feed miller is able to chain-block this model with many small-scale farmers. For this to be a reality, farming density per region needs to be favourable. If a region has a high farming density, then the model could be re-worked to accommodate those farms, like Mmadiboke, which are below the minimum threshold for efficient intervention. Multiple drop offs and collections between farms could be netted off against the minimum per delivery limitations.

4.3 Transaction Cost Reduction

Observable transaction costs have been collated and listed in Table 4-5.

Table 4-5: Observable cost reduction through strategic intervention

Strategic Intervention Observable Costs	UOM	Current	Scenario 1	Scenario 2	Scenario 3
Critical Size					
Farm capacity	birds	3500	3500	3500	5000
Technical & Production Efficiency					
Mortality rate	%/week	0,15	0,144	0,144	0,144
Efficiency result per layer bird	%	0,85	0,9	0,9	0,9
Feed consumption	gr/bird/day	0,115	0,112	0,112	0,112
Transaction Cost intervention					
Average selling price of eggs	Rands/doz	15,25	15,25	15,52	15,52
Average selling price of eggs	Rands/tray	38	38	38,8	38,8
Current sales mix (per dozen)	%/doz	0,6	0,3	0,3	0,3
Current sales mix (per tray)	%/tray	0,4	0,7	0,7	0,7
Delivery costs (actual)	Rands/doz	0,29	1,15	1,15	0,8
Packaging Cost	Rand/doz	0,91	0,88	0,88	0,88
Packaging Cost	Rand/tray	1,32	1,25	1,25	1,25
Feed cost	Rand/kg	3,697	3,097	3,097	3,097

Transaction costs have been classified, amongst others, as being either observable or unobservable, tangible or intangible. It has also been discussed, in the literature review, that transaction costs are farm, location, product or consumer-specific. The varying combination of these variables mean that intangible transaction costs are also time specific or susceptible to volatility. Due to time constraints and lack of resources, only observable costs have been included in the strategic intervention options to be discussed below. In order for a more comprehensive understanding of the costs involved, a costly and time consuming Activity Based Costing Analysis would be required. The effect of the various strategic interventions and the subsequent observable costs reductions (Table 4-5) were based on Cost Volume Profit principles instead.

The investigation found that the farm is currently operating at 70% capacity. Should the degree of intervention include an increase in production capacity, the effects on profitability would need to be determined. An option to increase the stocking volume was considered because it featured as the minimum threshold for an efficient intervention by a feed mill stakeholder. Technical and production efficiency factors were obtained from the Amberlink breeder manual. Selling prices and sales mix percentages for formal sectors have been identified in the industry analysis and are reflective of national averages or trends. Delivery costs are based on calculations which determined the critical farm size (Table 4-4) and have been adjusted to include equivalent units in each scenario discussed below. Bulk and bagged feed costs were provided by Allem Brothers and are shown in Table 3-2. Packaging costs for bulk purchases were obtained from Highveld Corporation.

4.4 Strategic Intervention

Three intervention scenarios have been considered and represent varying degrees of intervention by a feed mill stakeholder.

4.4.1 Scenario 1

This intervention focusses on strengthening operational efficiencies and backward linkages in the value chain. By facilitating a backward integration in the value chain, this strategic alliance option allows the negotiating of bulk discounts from suppliers to take place. When the cost reduction of inputs are combined with the marginal technical improvements in mortality rate, laying percentage and feed consumption, the business shows a profit (after tax) of R75 459. Total sales increased by R78 706 and the total variable costs decreased by R81 530. Profitability was driven by a sharp decline in feed and packaging costs, and even though delivery costs doubled, it had a negligible effect on overall profitability. Notably, the improvements in technical efficiencies should not be underestimated. The effect that technical and production interventions have on sales volume is the cause of an increase in total sales revenue. This effect was comparable to the effect that an input cost reduction had on total variable costs.

Table 4-6: Effects of a scenario analysis on the income statement of Mmadiboke

Contribution Approach Income Statement for Mmadiboke	Current	Scenario 1	Scenario 2	Scenario 3
Sale of Eggs (Sales Mix)	1 329 713	1 408 552	1 436 788	2 052 554
Cull Sales	104 247	104 548	104 548	149 354
Manure sales	17 623	17 190	17 190	24 557
Total Sales	**1 451 583**	**1 530 289**	**1 558 525**	**2 226 465**
Less Variable Expenses				
Pullets	210 000	210 000	210 000	300 000
Feed	524 789	428 749	428 749	612 499
Medication	14 400	14 400	14 400	18 720
Advertising	8 400	8 400	8 400	8 400
Utilities - electricity and water	48 000	48 000	48 000	62 400
Delivery costs	25 902	49 680	49 680	34 560
Packaging costs	66 110	56 842	56 842	81 203
Total variable costs	897 601	816 071	816 071	1 117 781
Contribution Margin	**553 982**	**714 218**	**742 454**	**1 108 683**
Less Fixed Expenses				
Salaries	342 000	342 000	342 000	378 000
Insurance	51 600	51 600	51 600	51 600
Repairs and maintenance	24 000	24 000	24 000	31 200
Telephone account	3 600	3 600	3 600	3 600
Office supplies	1 200	1 200	1 200	1 200
Depreciation	181 000	181 000	181 000	181 000
Internet	6 000	6 000	6 000	6 000
Total fixed costs	609 400	609 400	609 400	652 600
Total costs	**1 507 001**	**1 425 471**	**1 425 471**	**1 770 381**
Profit Before tax	**-55 418**	**104 818**	**133 054**	**456 083**
Tax at 28%		29 349	37 255	127 703
Net income	**-55 418**	**75 469**	**95 799**	**328 380**

This scenario provides a measured strategic intervention approach, in that the producer is still responsible for driving his own sales and is left feeling in control of his own operation. The feed miller also limits his exposure to risk whilst being in a position to close his supply chain. If this type of intervention is chain-blocked amongst other small-scale farmers, it would increase feed sale volumes with little threat from competitive rivals.

4.4.2 **Scenario 2**

The second scenario builds on the first and includes forward integration in the value chain. In this option, the feed miller would be involved in transferring stock to a formal sector buyer in an ‘all-in-all-out’ contract grower arrangement with the small-scale farmer. In this option there should be a higher net realised price per dozen for the producer’s eggs. This would come at no additional cost to the producer in that the delivery costs in scenario 1 already accounted for this cost. The reduction in transaction costs as a result of the producer no longer having to search for new markets or screen potential customers would have to be accounted for.

In scenario 2, the intervention results in a net income (after tax) of R95 799. With this degree of intervention, the feed mill would be in a position to grant a credit facility with limited exposure to risk or credit default. The credit facility would be contingent on the fact that all payments by the buyer pass through the feed mill’s bank account first. The credit facility would mirror the payment terms negotiated with the buyer, and in so doing, would alleviate the cash flow pressures that feed procurement has on the farming operation.

4.4.3 **Scenario 3**

This last intervention builds on scenario 1 and 2. This strategic option should only be implemented once either one of the first two options have been tested. In this scenario, the feed miller would facilitate an increase in stocking capacity. During the investigation, it was found that the farm, Mmadiboke, was operating at 70%. In this scenario, the feed miller would increase his exposure to risk. The reward for both strategic alliance parties would be a compounding of sales revenue and volume.

This would be an all-inclusive strategic intervention option, which fulfils the minimum threshold for intervention efficiency. Under this type of intervention, control over variable costs would remain relative to market changes and volatility, or, in other words, Mmadiboke would be able to sustain a comparative advantage with other competitors.

An increase in stocking density by 30% would require the appointment of two additional part time assistants, which adds to the total fixed costs of the operation. And, despite a 30% adjustment to repairs and maintenance expenses, a net income (after tax) of R328 380 is projected.

4.5 Conclusion

An empirical study, conducted through an interview with the manager of the farm Mmadiboke, has substantiated many of the constraints and challenges faced by small-scale egg producers. These constraints include a lack of credit facilities, technical expertise, logistical capabilities and market intelligence.

Whilst the critical farm size which supported an efficient feed delivery synergy was found to be 10 000 layer birds, it was also found that even at inefficient levels, the strategic intervention would provide an overall variable cost reduction for the producer. Further investigation concluded that vertical integration options existed which limited exposure to risk, whilst at the same time added value to both parties involved in the strategic alliance. The nature of intangible transaction costs are such that the cost would first need to be incurred before it could be quantified. This was beyond the scope of the study and therefore only observable costs were considered.

The three strategic options considered provides a natural progression of intervention possibilities, which if implemented progressively, would engender trust between the parties involved in the alliance. Replication of this model amongst many similar small-scale farmers is possible, which would create an opportunity for a producer organisation to be established. Chain-blocking this model would, however, require that there are a sufficient number of farms within the same region.

CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The future of emerging or small-scale egg farmers depends entirely on their ability to overcome the constraints of liberalised markets. In developing countries, their role in providing food security is beyond contestation. However, market liberalisation has also expedited the process of commercialisation, which is especially true in fragmented industries like the egg industry. Subsequently, the combined effects of commercialisation and buyer-driven supplied chains have effectively prohibited small operators from participating in formal market sectors. Moreover, bureaucracy has rendered any governmental support mechanisms futile, as far as small-scale farmer’s needs are concerned. Notably, of all the protein sources, poultry farming has the lowest environmental impact and the most cost-effective conversion of grains to protein. Traditionally eggs have been viewed as a cheap source of protein, therefore economic sustainability is largely dependent on economies of scale. Consequently, any strategic intervention from a private stakeholder would have to negotiate market dynamics as well as low-cost strategies from large commercialised operators.

5.2 Research Summary

Based on an exploratory case study, the objectives which relate to economic sustainability and a strategic private sector intervention were investigated. This investigation was conducted in three phases:

The first phase, in the form of a literature review, researched the future role of small-scale farmers across the world. The aim of the literature review was to determine the factors and influences that prohibit sustainable market participation. By identifying the constraints and key success factors necessary for competitive participation in egg markets, the economic sustainability of small-scale egg producers could be improved.

The industry analysis, conducted as phase two of the investigation, involved the application of analytical tools to industry data. Information was collated from current industry reports and statistics. These analytical tools were used to determine the industry attractiveness and the strategic interventions required, in order to achieve a comparable advantage for the emerging farmer. If the industry is not conducive to economic sustainability, then any further investigations would be futile.

Phase three is an empirical study of a small-scale egg farm. Results and findings from phase one and two of the study were used as benchmarks to determine the competitive strength of this emerging farmer. The findings of an on-farm investigation and manager interview, concluded that this case study farm faced the same constraints as those expounded on in the literature review. By drawing up an income statement for the farm, the researcher was able to further investigate the effects of various strategic interventions on revenue streams and cost structures. Whilst the 'critical farm size' was a limiting factor for an efficient strategic intervention, it was also found that such an intervention would have cost reduction benefits.

5.3 Research Objectives and Findings

5.3.1 Objective 1: Key Success Factors and Market Constraints

The factors and influences that prohibit successful and sustainable market participation are as a direct result of market liberalisation and the effects of commercialisation. The combined effects of these two phenomena have clearly defined the key success factors required for successful market participation. These key success factors include access to finance, technical expertise, logistical coordination and market expertise. In addition, it was found that with the proliferation of market liberalisation, market access depended on the producer's ability to coordinate operational activities throughout the value chain. This would require a degree of vertical and horizontal integration. For small-scale farmers who are relatively resource poor, this is unattainable. In fragmented markets, like the egg market, buyer-driven value chains dictate the compliancy prerequisites for formal market access. The implications of compliancy prerequisites and vertical integration have an effect on the transaction costs implicit in the supply chain activities. Farms that have economies of scale as an advantage, are able to withstand changing market dynamics and reduce costs related to searching, screening, negotiating, transferring, monitoring and enforcing of trade exchanges. Since egg markets are regionally focused, theses transaction costs are also location, farm, product and consumer-specific. The formation of a strategic alliance between small-scale farmers and a private stakeholder may mitigate the absolute competitive advantages held by large commercial producers in the marketplace.

5.3.2 **Objective 2: Industry Attractiveness**

Overall, the industry analysis determined that future growth potential was positive and that profitability was largely dependent upon the volatility of input prices, such as feed, and the ability of small-scale farmers to gain access to more lucrative market segments located in higher-income yielding areas.

Since 2014, the industry has only achieved a growth rate of 2.5% per annum and a per capita consumption rate of 150 egg per person per year. Given that the world average is 210 eggs, there is a 29% potential for growth. With the national consumption split between household (70%) and corporate (30%), projected growth will depend largely on disposable income and consumer preferences for protein diets. Egg prices must remain competitive in relation to white meat prices to avoid the threat of substitution from taking place. Unfortunately, it is not only environmental factors that have cause volatility in input prices, but Political and economic uncertainty as well.

Since egg markets are regionally focussed, 41% of the market share is already owned by independent small-scale commercial farmers. Location-specific factors clearly have a determining impact on market access and sustainability. In order for small-scale farmers to transition from informal to formal markets, they would need to acquire competencies related to commercialisation. This would in all likelihood only be possible if backward linkages were established by small-scale farmers. The favoured strategic option proposed, entailed the formation of a strategic alliance between a producer organisation and a feed mill company. Feed mill operators have the capital resources and competencies to develop strategic linkages between various actors in the current value chain.

The combination of all these factors and influences translates to a competitive environment which is moderately intense. Emerging farmers would need strategies that are able to contend with the constant threat of substitution, low switching costs, lack of producer bargaining power and the ease of entry of new competitors. Unfortunately, egg production is asset specific and exiting the market may come at a cost.

5.3.3 **Objective 3: Nature and Value of a Intervention**

An on-farm investigation revealed that Mmadiboke is ill-equipped to compete with larger commercial competitors. The operation faces many of the challenges identified through the literature review which relate to the lack of access to credit, technical expertise, logistics and market intelligence.

If depreciation is accounted for, the current operation shows a net loss of R55 418. In addition, the critical farm size required for a local feed mill intervention was determined to be 10 000 layers. Nevertheless, the less than optimal intervention would have no cost implications for the feed mill stakeholder and would add value to the operations of Mmadiboke. Three strategic interventions were considered, each of which had a positive impact on the bottom line. The intervention options were presented in a step-up strategy. The first scenario involved variable cost reduction possibilities due to the greater degree of vertical integration offered by the strategic alliance. Cost reduction and technical efficiency improvements had the duel effect of increasing volume output, which in turn increased turnover, and lowering variable costs. A strategic intervention which only concentrates on strengthening operational efficiency and backward linkages in the supply chain, would the first step in a turnaround strategy.

The intervention investigated in Scenario 2 included forward integration. This involved moving products to markets which would increase the net realised price per dozen eggs for the producer. Based on the current national average price per dozen eggs, profitability would increase to R95 000 (after tax). Implementation of scenarios one and two on a step up strategy, would allow enough time to pass by for relationship based on trust to develop between the alliance partners. At this point scenario 3 should be implemented, which would increase the capacity and scale of the farming operations. Even though this would increase the total fixed costs of the farming operation, the effects on profitability would be negligible.

The systematic implementation of each strategic option investigated in the scenario analysis would ensure economic sustainability for the small-scale egg farmer.

5.4 Limitations of the Study

The limitations of this study are due to the fact that egg markets are, by and large, regionally orientated. Findings or recommendations inferred through this investigation may only apply to farms which are inherently or characteristically similar to the farm under investigation. Market dynamics may also differ due to the degree of concentration of suppliers or the income yielding potential of various regions. The market dynamics in urban areas will intrinsically differ from rural areas, in that the levels of disposable income per consumer or the population density of the market will differ. Consequently, transactions costs will also behave differently, depending on the distance to the market or the bargaining power of producers that are coordinated through economies of scale. Due to the various effects that changing market dynamics have on transaction costs, these costs should be viewed as time specific.

In addition, there is limited empirical evidence available on the nature and importance of transactions costs for small-scale farmers, which is a result of the number of conceptual and measurement difficulties associated with these costs. Firstly, when transactions costs are so high as to prevent exchanges from taking place, by definition the costs cannot be observed because no transaction exists. Subsequently, the nature of observable transactions costs will, in all probability, differ to prohibitive transactions costs. Secondly, current policy interventions are intended to encourage market access through mitigating the inherent transactions costs. Despite this, limited market access for small-scale farmers persist, therefore, the reduction of observable transactions costs does not provide a full measure of the factors limiting market participation.

When viewed holistically, in order to accurately assess observable transactions costs and the associated behavioural implications, a considerable commitment of resources for data collection would be required. This is because, all participants in the value chain would need to be investigated. And, because marketing channels are diverse, such a study would need to be conducted simultaneously and for a period of time, in order to adequately capture the inter-seasonal variation in costs and marketing decisions. Consequentially, a study into transaction costs would need to be longitudinal and not cross-sectional. Given time constraints and limited resources, a longitudinal study was not a viable option.

In conclusion, constantly changing market dynamics may mitigate suggested strategic interventions recommended in this study.

5.5 Recommendations for Future Research

After concluding this investigation, the recommendation for future research is possibly the most clearly defined outcome. Whilst the literature acknowledges that transactions costs potentially have a significant bearing on market development and integration, there is a paucity of studies that verify the level and determinants of transactions costs. Due to changing market dynamics and the nature of transactions costs, a longitudinal study, that implements ABC costing, is required to ascertain the true weight these costs bear on market participation or exchange agreements.

In addition, the opportunities to accurately account for observable transactions costs exist. Such observable transactions costs include: direct processing and transport costs, damage resulting from the uncertainty of market outlets, the additional searching costs resulting from a changing of exchange agreements between market outlets and producers over time and the opportunity costs of time spent by producers in marketing. The impact of transaction costs incurred by small-scale farmers to secure inputs, like land, labour credit and feed would also warrant a thorough investigation.

In conclusion, an all-inclusive study of transactions costs in egg marketing would account for transactions that may arise between the proposed strategic alliance and the complex marketing channels of fragmented industries. In hindsight, what is required is a conceptualised framework, based on a methodological approach, of transactions costs and how to measure them. This would include an investigation into the causal linkages between consumer and farm-specific models that vertically integrate existing transactions costs between value chain actors and the factors that facilitate individual transactions. Such a model would provide policy insights for better rural agricultural development, in addition to promoting the sustainability of rural livelihoods. A model which improves small-scale farmers' ability to react to changing market dynamics would facilitate market access, market participation and economic sustainability.

5.6 Conclusion

The future of the small-scale farmer is being threatened by the influences of market liberalisation and the effects of commercialisation. As the custodians of our nature resources and the champions of poverty alleviation, the economic sustainability of these producers should be a national priority. Furthermore, it is incumbent on the private sector, in the absence of government support, to strategically intervene in the endeavours and challenges which these farmers face. The purpose of such an intervention should be aimed at levelling the playing fields between small-scale farmers and large commercial operations. Through the implementation of various strategic intervention options, under the auspices of a strategic alliance, economic sustainability for small-scale egg producers is attainable.

ADDENDUM

Annexure A: Assumptions

Item Assumptions	Current	Scenario 1	Scenario 2	Scenario 3
Working days per month	26	26	26	26
Debtors collection period	30	30	30	30
Creditors payment period	cash only	30 days	30 days	30 days
Revenue growth	0,1	0,1	0,1	0,1
inflation rate	0,06	0,06	0,06	0,06
Stock turnover rate (Days)	7	7	7	7
Farm capacity (No of Layers)	3500	3500	3500	5000
Mortality rate (Per week)	0,15	0,144	0,144	0,144
Efficiency result per layer bird	0,85	0,9	0,9	0,9
Rate of lay (P/bird/Month)	25,5	27	27	27
Total eggs laid per annum (dozen)	87309	37031	1436788	2052554
Laying period (18 - 74 weeks)	74	74	74	74
Laying period feed per bird (in kg)	45,08	43,904	43,904	43,904
Feed consumption (Grams per bird per day)	0,115	0,112	0,112	0,112
Feed required to produce a dozen eggs (in kg)	1,62	1,58	1,58	1,58
Weight of feed per bag per Kg	50Kg	50Kg	50Kg	50Kg
Average selling price of eggs (per dozen)	15,25	15,25	15,52	15,52
Average selling price of eggs per tray (30 eggs)	R 38	R 38,00	R 38,80	R 38,80
Current sales mix (per dozen)	0,60	0,30	0,30	0,30
Current sales mix (per tray)	0,40	0,70	0,70	0,70
Packaging Cost (per Dozen unit)	R 0,91	R 0,88	R 0,88	R 0,88
Packaging Cost (Per Tray unit)	R 1,32	R 1,25	R 1,25	R 1,25
Sale of manure (in 25kg bags) - once a year	R 26,00	R 26,00	R 26,00	R 26,00
Delivery frequency (Month)	20	0	4 188	1
Delivery Capacity (Dozen per trip)	360	3 600	3 600	3 600
Cull sales (74 wk age)	74	74	74	74
Point of Lay price	R 60	R 60	R 60	R 60
Cull sales (avg weight in kg)	1,8	1,8	1,8	1,8
Cull sales (ex farm price in Rands)	32	32	32	32

Annexure B: Labour and Expenses

LABOUR AND EXPENSES (Current)						
Employee Job title	**Type**	**Salary/Wages**	**Number**	**Total per Mnth**	**Annual Total**	
General Manager	Indirect	R 20 000	1	R 20 000	240000	
Site employees	Direct	R 3 500	1	R 3 500	42000	
Packaging/Quality control employees	Direct	R 3 500	1	R 3 500	42000	
General assistants (part time)	Direct	R 1 500	1	R 1 500	18000	240000
Total			4	R 28 500	342000	102000
Production Expenses		**Annual**	**Monthly**			
		(Rands)	**(Rands)**			
Pullets	Fixed	210 000				
Feed	Variable	524 789	43732			
Packaging	Variable	66 110	5509			
Medication	Variable	14 400	1200	(Budgeted)		
Salaries (Production)	Fixed	102 000	8500			
Direct Material		815 299				
Direct Labour		102 000				
Selling Expenses						
Advertising/promotion	Variable	8 400	700	(Budgeted)		
Utilities (Water&Electricity)	Variable	48 000	4000	(Budgeted)		
Repair & Maintenance	Variable	24 000	2000	(Budgeted)		
Vehicle						
Delivery Exp	Variable	25 902	2158			
Insurance	Fixed	51 600	4300			
goods in transit						
G&A Expenses						
Salaries (Admin)	Fixed	240 000	20000			
Accounting fees	Fixed		0			
Telephone account	Fixed	3 600	300	(Budgeted)		
Office supplies	Fixed	1 200	100	(Budgeted)		
Internet	Fixed	6 000	500	(Budgeted)		
Depreciation	Fixed	181 000	181000	Fixed Assets	905 000	
		1 507 001	274000			

LABOUR AND EXPENSES (Scenario 3)						
Employee Job title	**Type**	**Salary/Wages**	**Number**	**Total per Mnth**	**Annual Total**	
General Manager	Indirect	R 20 000	1	R 20 000	240000	
Site employees	Direct	R 3 500	1	R 3 500	42000	
Packaging/Quality control employees	Direct	R 3 500	1	R 3 500	42000	
General assistants (part time)	Direct	R 1 500	3	R 4 500	54000	240000
Total			6	R 31 500	378000	138000
Production Expenses		**Annual**	**Monthly**			
		(Rands)	**(Rands)**			
Pullets	Fixed	300 000				
Feed	Variable	612 499	51042			
Packaging	Variable	81 203	6767			
Medication	Variable	18 720	1560	(Budgeted)		
Salaries (Production)	Fixed	138 000	11500			
Direct Material		1 012 421				
Direct Labour		138 000				
Selling Expenses						
Advertising/promotion	Variable	8 400	700	(Budgeted)		
Utilities (Water&Electricity)	Variable	62 400	5200	(Budgeted)		
Repair & Maintenance	Variable	31 200	2600	(Budgeted)		
Vehicle						
Delivery Exp	Variable	34 560	2880			
Insurance	Fixed	51 600	4300			
goods in transit						
G&A Expenses						
Salaries (Admin)	Fixed	240 000	20000			
Accounting fees	Fixed		0			
Telephone account	Fixed	3 600	300	(Budgeted)		
Office supplies	Fixed	1 200	100	(Budgeted)		
Internet	Fixed	6 000	500	(Budgeted)		
Depreciation	Fixed	181 000	181000	Fixed Assets	905 000	
		1 770 381	288448			

Annexure C: Revenue & Costs (Current, Scenario 1, 2 and 3)

Current Production and Revenue

	Mortality Rate	Number of Birds	No. Eggs/month	Dozen/month	Tray/month	Revenue/Doz	Revenue/Tray	Current Sales mix	Current Sales Mix	Egg Sales Mix	Average realised Price	Manure output	Manure Sales
Assumptions	0,15	3500	0,85	(/12)	(/30)	15,25	38,00	0,6	0,4	(Actual Revenue)	(Rev Sales M/Sales Mix)	(12% Mnth Usage)/25	(R26 per 25kg)
UOM/Calc	(0.15*52/12)		(Birds*rate/Lay)			(Rands)	(Rands)	(No.Dozen)	(No.Tray)	(Rands)	(Rands)	(25kg bags)	(Rands)
Jan'17	**0,65%**	3500	92225	7685	3074	117 203	116 818	4611	1230	117 049	15,23	60	1 557
Feb'17	**0,65%**	3477	82759	6897	2759	105 172	104 827	4138	1103	105 034	15,23	54	1 397
Mar'17	**0,65%**	3455	91030	7586	3034	115 684	115 305	4551	1214	115 532	15,23	59	1 537
Apr'17	**0,65%**	3432	87521	7293	2917	111 224	110 860	4376	1167	111 079	15,23	57	1 478
May'17	**0,65%**	3410	89850	7488	2995	114 185	113 811	4493	1198	114 035	15,23	56	1 459
Jun'17	**0,65%**	3388	86387	7199	2880	109 783	109 423	4319	1152	109 639	15,23	58	1 497
July'17	**0,65%**	3366	88686	7391	2956	112 705	112 336	4434	1182	112 558	15,23	57	1 488
Aug'17	**0,65%**	3344	88110	7342	2937	111 973	111 606	4405	1175	111 826	15,23	55	1 430
Sept'17	**0,65%**	3322	84713	7059	2824	107 656	107 303	4236	1130	107 515	15,23	56	1 468
Oct'17	**0,65%**	3300	86968	7247	2899	110 522	110 159	4348	1160	110 377	15,23	54	1 412
Nov'17	**0,65%**	3279	83616	6968	2787	106 261	105 913	4181	1115	106 122	15,23	56	1 449
Dec'17	**0,65%**	3258	85841	7153	2861	109 090	108 732	4292	1145	108 947	15,23	56	1 449
Total/Average	**0,078**	3378	**1047705**	**87309**	**34924**	**1 331 459**	**1 327 094**	**52 385**	**13 969**	**1 329 713**	15,23	**678**	**17 623**

Delivery Cost/Trip		
Frequency	Month	20
Avg Distance/trip	km	80
Fuel consumption/trip	10L/100km	8
Current Fuel Price	R/Liter	13,35
Cost per trip	Rands	106,8
Cost per Month	Rands	2158

Current Production and Variable Costs

	Mortality Rate	Number of Birds	Daily Feed intake	Monthly Usage	Monthly Feed	Cost per bag	Avg Feed price	Feed Cost	Feed Cost per Unit	Packaging Costs	Packaging Costs	Package Cost Mix	Package Cost Mix	Delivery Frequency	Delivery cost/Trip	Total Fuel Cost	Delivery Unit Cost
Assumptions	0,15	3500	0,115	(kg)	(50kg bags)	(Rand/50kg)	(Rands per Kg)	(Rands)	('R/Doz)	(Total Rands/doz)	(Total Rands/trays)	(Total Rands/units)	(Rand/unit)	(Trips per month)	(Fuel Cost 'R)	(per month)	('R/Doz/Trip)
Months	(0.15*52/12)		(Total Birds)							R 0,91	R 1,32			360			360
Jan'17	**0,65%**	3500	403	12478	250	R 222,95	4,459	55 637	7,24	6 994	4 058	5819	1,00	21	106,8	2 280	0,16
Feb'17	**0,65%**	3477	400	11197	224	R 217,55	4,351	48 717	7,06	6 276	3 641	5222	1,00	19	106,8	2 046	0,18
Mar'17	**0,65%**	3455	397	12316	246	R 212,95	4,259	52 453	6,91	6 903	4 005	5744	1,00	21	106,8	2 250	0,16
Apr'17	**0,65%**	3432	395	11841	237	R 212,95	4,259	50 431	6,91	6 637	3 851	5523	1,00	20	106,8	2 164	0,17
May'17	**0,65%**	3410	392	12156	243	R 184,25	3,685	44 796	5,98	6 814	3 953	5670	1,00	21	106,8	2 221	0,16
Jun'17	**0,65%**	3388	390	11688	234	R 166,80	3,336	38 990	5,42	6 551	3 801	5451	1,00	20	106,8	2 136	0,17
July'17	**0,65%**	3366	387	11999	240	R 166,80	3,336	40 028	5,42	6 725	3 902	5596	1,00	21	106,8	2 193	0,16
Aug'17	**0,65%**	3344	385	11921	238	R 166,80	3,336	39 768	5,42	6 682	3 877	5560	1,00	20	106,8	2 178	0,17
Sept'17	**0,65%**	3322	382	11461	229	R 166,80	3,336	38 235	5,42	6 424	3 727	5345	1,00	20	106,8	2 094	0,17
Oct'17	**0,65%**	3300	380	11766	235	R 166,80	3,336	39 252	5,42	6 595	3 827	5488	1,00	20	106,8	2 150	0,17
Nov'17	**0,65%**	3279	377	11313	226	R 166,80	3,336	37 739	5,42	6 341	3 679	5276	1,00	19	106,8	2 067	0,17
Dec'17	**0,65%**	3258	375	11614	232	R 166,80	3,336	38 744	5,42	6 510	3 777	5417	1,00	20	106,8	2 122	0,17
Total/Average	**0,078**	3378	388	**141748**	**2835**	**R 184,85**	3,697	**524 789**	6,00	**79 451**	**46 099**	**66 110**	1,00	**20**		**25 902**	0,17

Current Production and Revenue (Scenario 1)

	Mortality Rate	Number of Birds	No. Eggs/month	Dozen/month	Tray/month	Revenue/Doz	Revenue/Tray	Current Sales mix	Current Sales Mix	Egg Sales Mix	Average realised Price	Manure output	Manure Sales
Assumptions	0,144	3500	0,9	(/12)	(/30)	15,25	38,00	0,30	0,70	(Actual Revenue)	(Rev Sales M/Sales Mix)	(12% Mnth Usage)/25	(R26 per 25kg)
UOM/Calc	(0.144*52/12)		(Birds*rate/Lay)			(Rands)	(Rands)	(No.Dozen)	(No.Tray)	(Rands)	(Rands)	(25kg bags)	(Rands)
Jan'17	**0,62%**	3500	97650	8138	3255	124 097	123 690	2441	2279	123 812	15,22	58	1 517
Feb'17	**0,62%**	3478	87650	7304	2922	111 388	111 023	2191	2045	111 132	15,22	52	1 361
Mar'17	**0,62%**	3456	96435	8036	3215	122 553	122 151	2411	2250	122 272	15,22	58	1 498
Apr'17	**0,62%**	3435	92742	7728	3091	117 860	117 473	2319	2164	117 589	15,22	55	1 440
May'17	**0,62%**	3413	95235	7936	3175	121 028	120 631	2381	2222	120 751	15,22	55	1 422
Jun'17	**0,62%**	3392	91588	7632	3053	116 393	116 012	2290	2137	116 126	15,22	56	1 461
July'17	**0,62%**	3371	94051	7838	3135	119 523	119 131	2351	2195	119 248	15,22	56	1 452
Aug'17	**0,62%**	3350	93464	7789	3115	118 777	118 387	2337	2181	118 504	15,22	54	1 396
Sept'17	**0,62%**	3329	89884	7490	2996	114 228	113 853	2247	2097	113 966	15,22	55	1 433
Oct'17	**0,62%**	3308	92301	7692	3077	117 299	116 914	2308	2154	117 030	15,22	53	1 379
Nov'17	**0,62%**	3288	88766	7397	2959	112 807	112 437	2219	2071	112 548	15,22	54	1 416
Dec'17	**0,62%**	3267	91153	7596	3038	115 840	115 460	2279	2127	115 574	15,22	54	1 416
Total/Average	**0,07488**	3382	**1110918**	**92577**	**37031**	**1 411 792**	**1 407 163**	**27 773**	**25 921**	**1 408 552**	15,22	**661**	**17 190**

Current Production and Variable Costs

	Mortality Rate	Number of Birds	Daily Feed intake	Monthly Usage	Monthly Feed	Cost per bag	Avg Feed price	Feed Cost	Feed Cost per Unit	Packaging Costs	Packaging Costs	Package Cost Mix	Package Cost Mix
Assumptions	0,144	3500	0,112	(kg)	(50kg bags)	(Rand/50kg)	(Rands per Kg)	(Rands)	('R/Doz)	(Total Rands/doz)	(Total Rands/trays)	(Total Rands/units)	(Rand/unit)
Months	(0.144*52/12)		(Total Birds)							R 0,88	R 1,25		
Jan'17	**0,62%**	3500	392	12152	243	R 192,95	3,859	46 895	5,76	7 161	4 069	4996	1,06
Feb'17	**0,62%**	3478	390	10908	218	R 171,55	3,431	37 424	5,12	6 428	3 652	4485	1,06
Mar'17	**0,62%**	3456	387	12001	240	R 162,45	3,249	38 991	4,85	7 072	4 018	4934	1,06
Apr'17	**0,62%**	3435	385	11541	231	R 157,95	3,159	36 459	4,72	6 801	3 864	4745	1,06
May'17	**0,62%**	3413	382	11852	237	R 157,95	3,159	37 439	4,72	6 984	3 968	4873	1,06
Jun'17	**0,62%**	3392	380	11398	228	R 146,80	2,936	33 463	4,38	6 716	3 816	4686	1,06
July'17	**0,62%**	3371	378	11704	234	R 146,80	2,936	34 363	4,38	6 897	3 919	4812	1,06
Aug'17	**0,62%**	3350	375	11631	233	R 146,80	2,936	34 149	4,38	6 854	3 894	4782	1,06
Sept'17	**0,62%**	3329	373	11186	224	R 146,80	2,936	32 841	4,38	6 592	3 745	4599	1,06
Oct'17	**0,62%**	3308	371	11486	230	R 143,30	2,866	32 920	4,28	6 769	3 846	4723	1,06
Nov'17	**0,62%**	3288	368	11046	221	R 143,30	2,866	31 659	4,28	6 510	3 699	4542	1,06
Dec'17	**0,62%**	3267	366	11343	227	R 141,70	2,834	32 147	4,23	6 685	3 798	4664	1,06
Total/Average	**0,07488**	3382	379	**138248**	**2765**	**R 154,86**	3,097	**428 749**	4,63	**81 467**	**46 288**	**56 842**	1,06

Current Production and Revenue (Scenario 2)

	Mortality Rate	Number of Birds	No. Eggs/month	Dozen/month	Tray/month	Revenue/Doz	Revenue/Tray	Current Sales mix	Current Sales Mix	Egg Sales Mix	Average realised Price	Manure output	Manure Sales
Assumptions	0,144	3500	0,9	(/12)	(/30)	15,52	38,80	0,30	0,70	(Actual Revenue)	(Rev Sales M/Sales Mix)	(12% Mnth Usage)/25	(R26 per 25kg)
UOM/Calc	(0.144*52/12)		(Birds*rate/Lay)			(Rands)	(Rands)	(No.Dozen)	(No.Tray)	(Rands)	(Rands)	(25kg bags)	(Rands)
Jan'17	**0,62%**	3500	97650	8138	3255	126 294	126 294	2441	2279	126 294	15,52	58	1 517
Feb'17	**0,62%**	3478	87650	7304	2922	113 360	113 360	2191	2045	113 360	15,52	52	1 361
Mar'17	**0,62%**	3456	96435	8036	3215	124 723	124 723	2411	2250	124 723	15,52	58	1 498
Apr'17	**0,62%**	3435	92742	7728	3091	119 946	119 946	2319	2164	119 946	15,52	55	1 440
May'17	**0,62%**	3413	95235	7936	3175	123 171	123 171	2381	2222	123 171	15,52	55	1 422
Jun'17	**0,62%**	3392	91588	7632	3053	118 454	118 454	2290	2137	118 454	15,52	56	1 461
July'17	**0,62%**	3371	94051	7838	3135	121 639	121 639	2351	2195	121 639	15,52	56	1 452
Aug'17	**0,62%**	3350	93464	7789	3115	120 880	120 880	2337	2181	120 880	15,52	54	1 396
Sept'17	**0,62%**	3329	89884	7490	2996	116 250	116 250	2247	2097	116 250	15,52	55	1 433
Oct'17	**0,62%**	3308	92301	7692	3077	119 376	119 376	2308	2154	119 376	15,52	53	1 379
Nov'17	**0,62%**	3288	88766	7397	2959	114 804	114 804	2219	2071	114 804	15,52	54	1 416
Dec'17	**0,62%**	3267	91153	7596	3038	117 891	117 891	2279	2127	117 891	15,52	54	1 416
Total/Average	**0,07488**	3382	**1110918**	**92577**	**37031**	**1 436 788**	**1 436 788**	**27 773**	**25 921**	**1 436 788**	15,52	**661**	**17 190**

Current Production and Variable Costs

	Mortality Rate	Number of Birds	Daily Feed intake	Monthly Usage	Monthly Feed	Cost per bag	Avg Feed price	Feed Cost	Feed Cost per Unit	Packaging Costs	Packaging Costs	Package Cost Mix	Package Cost Mix
Assumptions	0,144	3500	0,112	(kg)	(50kg bags)	(Rand/50kg)	(Rands per Kg)	(Rands)	('R/Doz)	(Total Rands/doz)	(Total Rands/trays)	(Total Rands/units)	(Rand/unit)
Months	(0.144*52/12)		(Total Birds)							R 0,88	R 1,25		
Jan'17	**0,62%**	3500	392	12152	243	R 192,95	3,859	46 895	5,76	7 161	4 069	4996	1,06
Feb'17	**0,62%**	3478	390	10908	218	R 171,55	3,431	37 424	5,12	6 428	3 652	4485	1,06
Mar'17	**0,62%**	3456	387	12001	240	R 162,45	3,249	38 991	4,85	7 072	4 018	4934	1,06
Apr'17	**0,62%**	3435	385	11541	231	R 157,95	3,159	36 459	4,72	6 801	3 864	4745	1,06
May'17	**0,62%**	3413	382	11852	237	R 157,95	3,159	37 439	4,72	6 984	3 968	4873	1,06
Jun'17	**0,62%**	3392	380	11398	228	R 146,80	2,936	33 463	4,38	6 716	3 816	4686	1,06
July'17	**0,62%**	3371	378	11704	234	R 146,80	2,936	34 363	4,38	6 897	3 919	4812	1,06
Aug'17	**0,62%**	3350	375	11631	233	R 146,80	2,936	34 149	4,38	6 854	3 894	4782	1,06
Sept'17	**0,62%**	3329	373	11186	224	R 146,80	2,936	32 841	4,38	6 592	3 745	4599	1,06
Oct'17	**0,62%**	3308	371	11486	230	R 143,30	2,866	32 920	4,28	6 769	3 846	4723	1,06
Nov'17	**0,62%**	3288	368	11046	221	R 143,30	2,866	31 659	4,28	6 510	3 699	4542	1,06
Dec'17	**0,62%**	3267	366	11343	227	R 141,70	2,834	32 147	4,23	6 685	3 798	4664	1,06
Total/Average	**0,07488**	3382	379	**138248**	**2765**	**R 154,86**	3,097	**428 749**	4,63	**81 467**	**46 288**	**56 842**	1,06

Current Production and Revenue (Scenario 3)

	Mortality Rate	Number of Birds	No. Eggs/month	Dozen/month	Tray/month	Revenue/Doz	Revenue/Tray	Current Sales mix	Current Sales Mix	Egg Sales Mix	Average realised Price	Manure output	Manure Sales
Assumptions	0,144	5000	0,9	(/12)	(/30)	15,52	38,80	0,30	0,70	(Actual Revenue)	(Rev Sales M/Sales Mix)	(12% Mnth Usage)/25	(R26 per 25kg)
UOM/Calc	(0.144*52/12)		(Birds*rate/Lay)			(Rands)	(Rands)	(No.Dozen)	(No.Tray)	(Rands)	(Rands)	(25kg bags)	(Rands)
Jan'17	**0,62%**	5000	139500	11625	4650	180 420	180 420	3488	3255	180 420	15,52	83	2 167
Feb'17	**0,62%**	4969	125214	10434	4174	161 943	161 943	3130	2922	161 943	15,52	75	1 945
Mar'17	**0,62%**	4938	137764	11480	4592	178 175	178 175	3444	3215	178 175	15,52	82	2 140
Apr'17	**0,62%**	4907	132489	11041	4416	171 352	171 352	3312	3091	171 352	15,52	79	2 058
May'17	**0,62%**	4876	136051	11338	4535	175 959	175 959	3401	3175	175 959	15,52	78	2 032
Jun'17	**0,62%**	4846	130840	10903	4361	169 220	169 220	3271	3053	169 220	15,52	80	2 087
July'17	**0,62%**	4816	134358	11196	4479	173 770	173 770	3359	3135	173 770	15,52	80	2 074
Aug'17	**0,62%**	4786	133520	11127	4451	172 685	172 685	3338	3115	172 685	15,52	77	1 994
Sept'17	**0,62%**	4756	128406	10701	4280	166 072	166 072	3210	2996	166 072	15,52	79	2 048
Oct'17	**0,62%**	4726	131858	10988	4395	170 537	170 537	3296	3077	170 537	15,52	76	1 969
Nov'17	**0,62%**	4697	126809	10567	4227	164 006	164 006	3170	2959	164 006	15,52	78	2 022
Dec'17	**0,62%**	4667	130218	10851	4341	168 415	168 415	3255	3038	168 415	15,52	78	2 022
Total/Average	**0,07488**	4832	**1587026**	**132252**	**52901**	**2 052 554**	**2 052 554**	**39 676**	**37 031**	**2 052 554**	15,52	**944**	**24 557**

Current Production and Variable Costs

	Mortality Rate	Number of Birds	Daily Feed intake	Monthly Usage	Monthly Feed	Cost per bag	Avg Feed price	Feed Cost	Feed Cost per Unit	Packaging Costs	Packaging Costs	Package Cost Mix	Package Cost Mix
Assumptions	0,144	5000	0,112	(kg)	(50kg bags)	(Rand/50kg)	(Rands per Kg)	(Rands)	('R/Doz)	(Total Rands/doz)	(Total Rands/trays)	(Total Rands/units)	(Rand/unit)
Months	(0.144*52/12)		(Total Birds)							R 0,88	R 1,25		
Jan'17	**0,62%**	5000	560	17360	347	R 192,95	3,859	66 992	5,76	10 230	5 813	7138	1,06
Feb'17	**0,62%**	4969	557	15582	312	R 171,55	3,431	53 462	5,12	9 182	5 217	6407	1,06
Mar'17	**0,62%**	4938	553	17144	343	R 162,45	3,249	55 701	4,85	10 103	5 740	7049	1,06
Apr'17	**0,62%**	4907	550	16487	330	R 157,95	3,159	52 084	4,72	9 716	5 520	6779	1,06
May'17	**0,62%**	4876	546	16931	339	R 157,95	3,159	53 484	4,72	9 977	5 669	6961	1,06
Jun'17	**0,62%**	4846	543	16282	326	R 146,80	2,936	47 805	4,38	9 595	5 452	6695	1,06
July'17	**0,62%**	4816	539	16720	334	R 146,80	2,936	49 090	4,38	9 853	5 598	6875	1,06
Aug'17	**0,62%**	4786	536	16616	332	R 146,80	2,936	48 784	4,38	9 791	5 563	6832	1,06
Sept'17	**0,62%**	4756	533	15979	320	R 146,80	2,936	46 916	4,38	9 416	5 350	6570	1,06
Oct'17	**0,62%**	4726	529	16409	328	R 143,30	2,866	47 028	4,28	9 670	5 494	6747	1,06
Nov'17	**0,62%**	4697	526	15781	316	R 143,30	2,866	45 227	4,28	9 299	5 284	6488	1,06
Dec'17	**0,62%**	4667	523	16205	324	R 141,70	2,834	45 925	4,23	9 549	5 426	6663	1,06
Total/Average	**0,07488**	4832	541	**197497**	**3950**	**R 154,86**	3,097	**612 499**	4,63	**116 382**	**66 126**	**81 203**	1,06

Annexure D

Interview Questionaire - Interview conducted on 3 September 2017

The questionaire was an adoption of a questionnaire used by Urban-econ to ascertain the sustainability of Cooperatives in 2013. The aim of the questionnaire was to compile a set of guidelines and recommend interventions to promote the development of small-scale poultry farmers and collectively owned enterprisse in poultry and related industries. The purpose of the questionnaire is to identify the needs, opportunities and challenges faced by small-scale farmers in the poultry sector. Verbal consent to publish the results of this interview was obtained for the purposes of this investigation.

SECTION A: CONTACT DETAILS

A1)	Name of the Farm	Mmadiboke
A2)	Contact Person: Name and Surname	Fos Mhlangu
A3)	Cell number	083 425 3189 / 084 297 5033
A4)	Landline	None
A5)	Email address:	info@thutoyasetshaba.co.za

INTERVIEW QUESTIONS:

A6)	On what date did this farm start production?	13-Sep-17			
A7)	Location of cooperative (Tick one)	Rural	x	Urban	
A8)	What is the nearest town?	Klerksdorp			
A9)	What substrate of the industry does the farm participate in?	Broiler	Breeder	Layer	
				x	

SECTION B: BACKGROUND OF MMADIBOKE

B1) When this farm started, what were the challenges that were faced? (Tick if applicable)

Difficulty in compiling a business plan	x
Difficulty in managing the finances	x
Finding money to start the farm	x
No basic start up equipment	
Lack of technical skills	x
Difficulty in securing credit	x
Lack of business skills	x
Access to information and support organisations	x
Other: Specify	

Describe:

Cash Flow issues - challenges getting regular supply of feed and pullets. Forced to buy feed when cash was available from the nearest co-op at high prices.
It is a challenge to get feed to farm and get eggs to customers at the same time.
When production dropped, I didn't know what the cause of the drop was.
How do I get a contract with Pick n Pay or Shoprite etc?

B2) Does the farm have the appropriate equipment, tools and machinery to properly operate the farm?

No	Yes
	x

B3) What additional equipment do you still need to help you do your work better?

Silo storage tanks so that I can order feed in bulk for the whole month at cheaper prices.

B4) What are the main challenges in getting the required equipment or machinery?

Money

B6) Which of the following does the farm currently have? Does your farm have the following?

	Yes	No
Written business plan		x
Written marketing plan		x
Written budget	x	
Formal training programme		x

SECTION C: FARM EMPLOYEES

C1) How many employees are there?

Full time	Part time
3	1

C2) Please rate the skills of Manager/employees in dealing with the following things:

	Poor	Average	Good
Managing the business activities		x	
Managing employees/ staff issues			x
Book keeping/budgeting	x		
Managing credit	x		
Marketing the products/services		x	
Applying for tenders or fulfilling compliance prerequisites	x		
Computer literacy	x		
Managing the suppliers	x		
Technical skills related to the product/service	x		
Managing customers		x	
Negotiating discounts for bulk buying	x		
Product pricing		x	

C3) What are the main skills the owner would like to obtain for its employees?

Technical expertise - workers must be able to identify why production may be affected
Computer literacy and bookeeping skills.

C4) What are the main challenges experienced in managing the farm?

Obtaining credit and access to finance.
Transport problems. Getting eggs to customers and collecting the feed.
Access to information - pricing, markets, suppliers and buyers - battle to transact

SECTION D: MONEY MANAGEMENT AND BANKING

D1) Is the business affiliated to any industry organisation?
(If yes, who? If no, why not?)

No. I could belong to the Egg Board of SAPA but it costs money and I get nothing in return. No help.

D2) Does the farm keep financial records or accounts ?
(If yes, who is responsible? If no, why not?)

Yes. The manager keeps track of monthly expenses and revenue from sales.
No financial income statement, balance sheet or cash flow statement exists
There is evidence of a budget that is used.

D3) How do you decide what should happen with the profits?

If there is money left at the end of the month, then it is kept to pay for feed. Without it there is no eggs. Once a year new pullets or point of lays are bought and then money is used to buy the new layers. Cash from culls is also used for this purpose.

D4) Are any of the profits reinvested into the business?

Yes	No
x	

D5) What are the biggest challenges with management of the business's finances?

I'd like to learn how to do the books myself, it will help me make better decisions
Money from sales goes straight back into paying for feed, packaging and pullets.
These expenses never stop. I don't know how much profit I make each month.

D6) Rate the level of impact that the following expenses have on the operations of the farm.

	Low	Medium	High
Salaries and wages		x	
Transport			x
Feed and Packaging			x
Advertising and Marketing costs		x	
Administration costs	x		
Insurance or Security costs	x		

D7) Please explain the main challenges around input expenditure:

I don't have credit facilities. I must pay cash. The pakistani's sometimes take three weeks to pay me my money so I battle to buy enough feed, packaging and pullets at the right time. I must fetch, no one will deliver because I don't buy enough at a time.

D8)	Does the farmer have a bank account?	Yes	x	No	
D9)	Have you applied for Loans or credit facilities?	Yes	x	No	

(If yes, were you successful? If no, why not?)

No. They say I'm not creditworthy and I cant give surety.

D10)	Are you able to repay the loan or credit facility?	Yes	X	No	

(If no, why not?)

Yes, I will pay evertime I get my money from the spaza shops. All I need is a facility for one month. If I get a facility I will feel like I can breathe again, otherwise I will continue to battle like I am now.

SECTION E: CUSTOMERS AND SUPPLIERS

E1) Which of the following are your main markets or customers?

Government departments/agencies	
Communities/Individuals	x
Municipalities	
Small Shops	x
Large companies	
Markets	
Small private companies	
Supermarkets	
Hospitals	
Schools	

E2) What are your main challenges in getting customers /securing contracts?

I supply the location (Jouberton & Kanana). The spaza shop owners sometimes come to fetch the eggs. That helps but they negotiate the price. When the price is too high they don't take the eggs. I don't know who to see about a contract with a Supermarket.

E3) What are your main challenges with suppliers?

They want the money first. They don't deliver if the order is too small.

E4)	Does your farm work with other cooperatives?	Yes		No	x

(If Yes, what are the challenges? If no, why not?)

I don't know what a cooperative is. No there is no such thing here!

SECTION F: CURRENT CHALLENGES & SUPPORT

F1) Have you received assistence from an Instituition or the Government?
(If yes, who and what level of support did you received?)

Yes, Land bank gave me some money to start this farm.

F2) What part of the business received support? (Tick if applicable)

	Yes	No
Business Plans		x
Financial assistence	x	
Equipment	x	
Marketing		x
Technical		x

F3) What is your opinion about the level of support available to small-scale farmers?

If you are lucky then you can get some money from the government to start a farm.
But they don't continue to help you. They give the money and then that is all. They don't teach you how to be a good farmer, or what to expect from being a farmer.

F4) In which areas do you need more or continual support?

Transport.
Access to finance or credit facilities
Technical and marketing expertise.

F5) Do you expect the business to grow or be more profitable in the future?

No. But the prices of eggs is better and feed is cheaper so I will make more money.
I will not be able to fill the house with the 5000 layers that it was built for.

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