

# **University of Zululand**



**Submitted in partial fulfillment of the requirements for the degree of  
Master of Science in Agribusiness  
(In the field of Agriculture)**

**Viability of government funded small-scale broiler projects in Northern  
KwaZulu-Natal**

**Faculty of Science and Agriculture**

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## **DEDICATIONS**

I dedicate this work to my wife Bhekisile and my three kids (Bongani, Simphiwe and Usphile), my grandmother, my father, my mother, my three sisters (Fortunate, Tholiwe and Ntombifuthi), and to all my friends.

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## ORIGINALITY DECLARATION

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I acknowledge that I have read and understood the University's policies and rules applicable to postgraduate research, and I certify that I have, to the best of my knowledge and belief, complied with their requirements.

In particular, I confirm that I had obtained an ethical clearance certificate for my research (Certificate Number UZREC 171110-030) and that I have complied with the conditions set out in that certificate.

I further certify that this study is original, and that the material has not been published elsewhere, or submitted, either in whole or in part, for a degree at this or any other university.

I declare that this research is, save for the supervisory guidance received, and is the product of my own work and effort. I have, to the best of my knowledge and belief, complied with the University's Plagiarism Policy and acknowledged all sources of information in line with normal academic conventions.

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**Date:** 04 January 2016

## **PUBLICATION/S IN PREPARATION**

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## ABSTRACT

Broiler production is one of the largest segments of South African agriculture. The Kwazulu-Natal government of South Africa embarked on funding small-scale broiler projects since 2011/2012 financial year in the Northern region. This study investigated the viability (profitability) of government funded small-scale broiler projects in Northern KwaZulu-Natal. The aim of the study was to determine the viability and the factors that affect the profitability of government funded small-scale broiler projects in Kwazulu-Natal. The study employed a gross margin analysis to assess the viability of the government funded small-scale broiler projects and a multiple regression analysis to determine the factors influencing the profitability of government funded small-scale broiler projects. The data used in this study was primary data collected from 75 government funded small-scale broiler projects in Northern Kwa-Zulu namely in uMkhanyakude, uThungulu and Zululand Districts. Simple random sampling procedure was used. Social Package for Social Scientists (SPSS) program was used to analyse data.

The results showed that production challenges included lack of technical knowledge of producing broilers, high input costs and marketing challenges included long distances to the market, low price of live broiler and lack of access to formal markets. The gross margins and gross profit margin analysis shows that the government funded small-scale broiler producers have a positive gross and profit margin however they are not as much profitable and not doing well when compared to Rainbow Chicken (a large scale broiler producer). Results from the multi regression analysis indicate that gender, farm gate price, access to extension services all have a positive relationship to gross margins (used as a proxy for profitability) and access to market information had a negative relationship. The study recommends that the government funded small-scale broiler producers must use formal markets in order to sustain their broiler production.

**Keywords:** Government funded projects, Gross Margins, Gross Profit Margins, Northern KwaZulu-Natal, Small-Scale broiler Producers, Viability.

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## LIST OF ACRONYMNS

ARC	Agricultural Research Council
BRU	Bio-Resource Unit
BPFAP	Bureau for Food and Agricultural Policy
DAFF	Department of Forestry and Fisheries
DWAF	Department of Water Affairs and Forestry
FAO	Food and Agricultural Organization of the United Nations
GDP	Gross Domestic Product
IDP	Integrated Development Program
IDZ	Industrial Development Zone
ISRDP	Integrated Sustainable Rural Development Programme
KZN	KwaZulu-Natal
KZNDAEA	KwaZulu-Natal Department of Agriculture and Environmental Affairs
SA	South Africa
SADC	South African Development Community

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# CHAPTER 1

## INTRODUCTION

---

### 1.1 Background

Broiler production, especially broiler production is the largest segment of South African agriculture (Department of Agriculture Fisheries & Forestry (DAFF), 2012). Broiler production dominates the agricultural sector and it is the main supplier of protein in terms of food than all other animal proteins combined followed by beef (Hoverstadt, 2008). According to DAFF (2012) the growth of broiler production had spill-over effects in the grain and chicken industries.

According to DAFF (2011) broiler meat accounted for about 93.6% of the total poultry-meat production in South Africa in 2009/2010, with the rest made up of mature chicken slaughter (culls), small-scale and backyard broiler meat production and other specialized broiler meat products (geese, turkey, ducks and guinea fowl) (DAFF, 2011). The gross value of broiler meat is dependent on the quantity produced and prices received by producers. The per capita of broiler meat consumed in South Africa has increased from 19.7 kg per annum in 2000 to 32.96 kg per person in 2010 (DAFF, 2011). This is mainly driven by the increasing demand. South Africa consumes more broiler meat than it produces (DAFF, 2011). The gap widened from 2005/06 as rising living standards are pushing larger numbers of consumers towards protein filled diets.

The government of Kwazulu-Natal funded 134 small-scale broiler projects in the KZN Northern region in the 2011/2012 financial year with a total amount of about R700 000 (North region project office, 2015). According to the North Region Economists (2014) about 3% of these projects are fighting to survive and all others never made it to the second batch (second load of day old chicks) because of social problems, market

availability, poor infrastructures, poor financial management and poor resource management.

## **1.2 Problem statement**

Rural areas, in general, continue to experience tough economic times in poverty levels, income, employment, education, drought, crime and other indicators of well-being. Broiler projects are not the only source for economic growth; local development officials can play a major part in supporting these facilities. Drought has made it difficult for the small-scale farmers to plant grains and /or vegetables that they used to plant because of scarce water on the rivers and dams. The high cost of pumping the underground water adds to the economic pressure to the KZN Department of Agriculture and Rural Development. The situation pushes the small-scale farmers to divert from planting to broiler production. Farmers do not have capital for the broiler production, which is why the Department of Agriculture when they (small-scale farmers) ask the had to intervene in terms of funding the small-scale broiler producers . According to Kwa-Zulu Natal Project Management Office (2012), small-scale broiler projects that were funded in 2009/2010, 2010/2011 and 2011/2012 financial years are all collapsing. About 95% of the government funded small-scale broiler projects have left their broiler projects (KwaZulu-Natal Project Management Office, 2012). The question is what makes the government funded small-scale broiler projects falling because they use a grant capital?

## **1.3 Objective of the study**

This study assessed the economic viability (profitability) of the government funded small-scale broiler projects in Northern KwaZulu-Natal. Such an understanding or information can be crucial and helpful in the design of viable or sustainable small-scale broiler projects and this could go a long way into addressing or improving the small-scale rural livelihoods in the long run.

The specific objectives of the investigation were to:

- 1) Determine production challenges faced by government funded broiler projects in Northern KZN.

- 2) Analyse marketing channels used by the government funded small-scale broiler projects in Northern KZN.
- 3) Determine the marketing challenges faced by government funded small-scale broiler projects in Northern KZN.
- 4) Determine the viability (profitability) of government funded small-scale broiler projects in Northern KZN.
- 5) Determine the factors influencing profitability of government funded broiler projects in Northern KZN.

#### **1.4 Hypothesis**

The study formulates the following hypothesis; government funded small-scale broiler projects in Northern KZN are not viable (profitable) and their profitability is determined by production and marketing challenges as well as their socio-economic status.

#### **1.5 Significance of the study**

This study provides useful information that could assist the Department of Agriculture in making sound decisions in terms of whether to continue funding broiler projects for small-scale broiler projects. The information generated can assist the department especially the extension staff to figure out challenges and the possible solutions. The study also assists in understanding the requirements of the formal markets thereby assisting small-scale broiler producers to adhere to such requirements. The findings and recommendations made by this study are anticipated to be useful in the development of small-scale broiler producers.

#### **1.6 Limitations of the study**

This study was conducted in areas of North of KwaZulu-Natal, specifically uMkhanyakude, uThungulu and Zululand District Municipalities. The study concentrated on the production and marketing activities practiced by government funded small-scale broiler producers within the rural areas and excluded the small-scale broiler producers that are not funded by the government and large-scale broiler producers.

## **1.7 Organisation of the dissertation**

The dissertation is organized into seven chapters. Chapter 2 provides literature review on the broiler production and the marketing channels and profitability in South Africa. Chapter 3 presents and describes the selection of the study areas while chapter 4 presents and discusses the research methodology – research design, methods of data collection and data sources, the sampling and the analytic techniques employed. Chapter 5 presents and discusses the descriptive results; and Chapter 6 presents and discusses the empirical results of the study. The final chapter, Chapter 7 provides the summary, conclusions and recommendations of the study.



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# CHAPTER 2

## LITERATURE REVIEW

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### 2.1 Introduction

This chapter presents a review of literature which include on an overview of the broiler production in South Africa and in KwaZulu-Natal Province. Production and marketing challenges faced by broiler producers in South Africa is also reviewed. The challenges include limited infrastructure, lack of poultry abattoir facilities, lack of packing room facilities, lack of refrigeration, lack of transport to the market and religious prohibitions. Factors affecting profitability in agriculture are also reviewed and they include demographic characteristics and socio-economic factors such as access to extension services, access to electricity and access to formal markets.

### 2.2 An overview of the broiler production in South Africa and in KwaZulu-Natal Province

The production and consumption of broiler meat is generally non seasonal (*Jones et al., 2007*). Broiler meat can be sold throughout the year because it is not seasonal like other agricultural produce. Poultry is a basic food commodity that supplies human diet with protein and essential food nutrients (DAFF, 2012).

#### 2.2.1 Description of the broiler industry

According to DAFF (2011 broiler production, especially broiler meat production is the largest segment of South African agriculture. Broiler production is the main sector that dominates in agriculture and it is the main supplier in terms of protein food than all other animal proteins combined followed by beef (DAFF, 2011).

Broiler meat has increased to 93.6% to the total poultry-meat production in the country since 2005, with the rest made up of mature chicken slaughter (cull) and backyard

broilers meat production and other specialized broiler meat products (geese, turkey, ducks and guinea fowl).

The gross value of broiler meat is dependent on producer's decisions in terms of quantity produced and price received after sales. The trend in gross value follows a pattern of production. The contribution of broiler meat industry to the gross value of production increased continuously during the 2001 period under broiler meat consumption in 2001 analysis due to increasing production and consumption. The average gross value of production amounted to R 14 176 530 200 over ten years from the year 2001 (DAFF, 2012). The contribution to the value continued to increase due to higher production throughout that period.

According to DAFF (2011) the broiler meat is produced throughout South Africa with North West, Western Cape, Mpumalanga and Kwa-Zulu–Natal Provinces being the largest producers accounting for approximately 79% of total production (Table 2.1). The domestic market consists of approximately 265 formal abattoirs. These abattoirs sell mainly to five main retailers (Pick 'n' Pay, Shoprite-Checkers, Spar, Woolworths and Massmart) and Small Micro-Medium Enterprises (SMME's) in the retail sector. These retailers buy the largest share of domestic production.

In KwaZulu–Natal Province, the export of broiler meat was mainly from eThekweni District Municipality with dramatic increases of export values recorded from 2003 to 2007 followed by a remarkable decrease in 2005. Thereafter the value of broiler meat exports experienced slight increases until 2006 to 2008 then decreased again in 2009 due to recession (DAFF, 2011).

Most exports were recorded from uMgungundlovu, uMzinyathi, uThukela and uThungulu District Municipalities. According to DAFF (2010) broiler production within a value chain has the potential to function as a primary industry in the facilitation of empowering small-scale producers to a level of economic independence. It is a low capital, fast turnover enterprise; it therefore carries a lower financial risk than other enterprises and it has a strong existing market base (DAFF, 2012).

Table 2.1: Broiler production by province in South Africa

Provinces	Easter n Cape	Gaute ng	Free State	Limp opo	North ern Cape	West ern Cape	Mpumal anga	North West	KZN
Contribution (%)	7	5	5	1	1	22	18	25	16

DAFF, 2011

## **2.3 Production and marketing challenges faced by broiler producers in South Africa**

This section will review literature on the production and marketing challenges faced by the broiler producers in South Africa (SA) including infrastructural facilities, lack of knowledge as well as inadequate inputs.

### **2.3.1 Production Challenges**

According to DAFF (2011) socio-economic characteristics of the households seems to be the major challenge within the small-scale broiler producers, though there are other challenges that include high input costs, includes poor quality of raw materials used in the manufacture of feed, the supply of poor quality chicks and high feed costs.

#### **2.3.1.1 Poor quality of raw materials**

The prices of production inputs has been increasing radically in this season due to drought, this situation forces the small-scale broiler producers to look for the lower price inputs material which do not have all necessary ingredients for the growth of the broiler ( DAFF, 2012).

#### **2.3.1.2 Poor supply of quality chicks**

According to DAFF (2011) there are many newly started hatcheries in the country that uses low quality eggs to hatch their chicks which produces low quality chicks.

### **2.3.1.3 High feed costs**

The production costs of feed ingredients has increased in the last two years ( DAFF, 2012). This has pushed the price of feed to be very high. According to DAFF (2012) small-scale broiler producers encountered difficulties in buying feed because of its high price since they do not usually buy in bulk.

### **2.3.1.4 Limited infrastructure**

According to Clover and Darroch (2005) the small micro-medium enterprises located closer to urban centres often have better access to services compared to those in poorer rural areas because they are nearer better infrastructures. Physical infrastructure such as roads, telecommunications and transport is often poorly developed in rural areas (DAFF, 2012). This reduces chances of development and growth of small businesses in rural areas. Improvements in physical infrastructure would have a positive influence on the marketing of agricultural produce (Clover & Darroch, 2005). For instance, good roads would fast track the transportation of broilers to the market and telecommunication facilities would help farmers communicate well with the market.

Many challenges faced by small-scale broiler producers perceived by agribusiness owners arise because they are situated in remote rural areas with poor infrastructure (Clover & Darroch, 2005). Improving the supply and quality of infrastructure service is essential if business growth is to be realized. Business activities such as transportation of goods and storage depend upon infrastructural availability (Jones *et al.*, 2007). With the availability of good infrastructure, the development and growth of a business may be stimulated.

Transport availability and road infrastructure have an influence on small-scale farmers' market participation, especially if they are located at some distance from the consumption centres (Gabre-Madhin, 2005). Quality roads facilitate the movement of produce and enable farmers to get their produce to the market in a secure and timely manner. When

roads are of poor quality, movement of produce becomes inefficient. This is because poorly developed roads make it difficult to move the produce from the farm to the market.

### **2.3.2 Marketing challenges**

The broiler industry, especially small-scale broiler producers are faced with many marketing challenges that includes; unorganized marketing and inadequate extension services (DAFF, 2011).

#### **2.3.2.1 Lack of market information**

Marketing is finding out what customers want and supplying it at a profit (Gabre-Madhin, 2005). It is customer oriented because the customer will not buy an unwanted product. The supplier needs to ensure that he supplies a needed product at a profit. Hoverstadt (2008) argued that agricultural marketing involves the physical process of moving the product from the producer to the consumer. The activities involved in this physical process includes collection, packaging, transportation, processing, storage and retail sale of agricultural products. There are many contacts to be made in the marketing structure and these include producers, buyers, sellers and customers. All have information indicating the product which the customer demands (Jones *et al.*, 2007). According to Hoverstadt (2008) the knowledge of customer needs is important. Customers expect poultry to be a constant product, not changing with season, time of day and severity of rains. There is a standard of quality which the market demands (DAFF, 2012). Customers will not return to buy more if the product is unwholesome. At point of purchase, quality relates to presentation as much as anything else. Assessment of quality by customer may be fairly subjective if not almost unreasonable. (Jones *et al.*, 2007). According to DAFF (2012) it is of vital importance that the poultry farmer understands the poultry market. A market is any place where the sellers of particular goods or service can meet with buyers of that good and service where there is a potential for a transaction to take place. The availability of reliable information provides the opportunity to make profits and ultimately business development and growth (Jones *et al.*, 2007). Profit provides the incentive to continue with the business. According to Clover and Darroch (2005) poultry farmer need

to know that markets can be supplied under contract. For example, a particular buyer may want a constant order filled each week to a particular product specification for which he will pay a premium. Having the understanding of the poultry market helps the farmer to penetrate the market. Small-scale producers usually have limited marketing channels available for them to explore due to lack of information (Jones *et al.*, 2007).

### **2.3.2.2 Low farm gate pricing**

According to DAFF (2011) it is always easy to sell the produce on the site of production because that reduces marketing costs such as packaging costs, transport costs and other costs associated with marketing. In most cases; only live broilers soled on a farm gates; which exclude the abattoir cost, refrigeration costs, packaging costs and delivering costs.

### **2.3.2.3 Lack and poor condition of packing rooms**

The packing room must have sufficient space to stand parking tables and equipment, immediate storage of parking materials and trolleys for moving material in to the chillers or freezing system. Its size will depend on the nature of operations throughput and the nature of the operations to be performed. The room should be light, quiet, well organized so that grading, weighing, wrapping, marking, parking in to secondary containers are easily achieved. According to DAFF (2011) small-scale broiler producers find difficulties in keeping the packing house because most of them fear the responsibilities as packing house has the responsibilities such as keeping security, keeping record and to be in charge of the stork, though the majority of Small-scale farmers do not have such facilities.

### **2.3.2.4 Storage and refrigeration facilities**

Having produced a perishable commodity, it is necessary to maintain its quality by using an appropriate technology right through the moment it is to be used. The primary aim of meat refrigeration is protection against other forms of meat deterioration such as fat oxidation. This method of preserving is seen as the best way to preserve it right to the customer's kitchen. It is necessary therefore, to develop a cold chain. According to DAFF (2011) small-scale broiler producers have problems on keeping refrigerators as it needs large amount of power and its maintenance is costly.

### **2.3.2.5 High costs and unavailability of transport to the market**

Small-scale broiler producers have less access to transportation of the processed carcasses, part or products is usually by refrigerated truck. To assist with the design of the facilities, the following information should be considered:

- The number of birds to be slaughtered, their weight and over what time period.
- The availability of slaughter stock.
- The ownership of the birds at each stage.
- The nature of the production to be prepared.

This is difficult for the small-scale broiler producers due to cash flow problems as it needs more cash flow to run such a truck.

### **2.3.2.6 Distance to markets**

Most small-scale broiler producers are located in rural areas characterized by limited cash circulation (Clover & Darroch, 2005). According to DAFF (2012) these rural areas are dominated by low-income earners forcing producers to pursue larger and more developed markets which are situated at prohibitive distances. Small-scale broiler producers are therefore compelled to transport their products to a distant market at a higher cost. This in turn reduces the profits of the small-scale broiler enterprises given that a larger proportion of the income from sales will have to cover transport costs.

## **2.4 Factors affecting profitability in agriculture**

The expensive and very high price of red meat causes people to substitute red meat with white meat especially chicken due to its affordability. Also, it is believed that the recent scandals regarding red meat induced most people to opt for chicken consumption. Hoverstadt (2008) argued that one would therefore believe that a market is freely available for white meat products. However, one should not rely on such speculations but rather on scientifically proven facts. It has been speculated that the cause of unsuccessful broiler projects is a market related issue. According to Hoverstadt (2008) broilers are

often favoured as they provide a positive cash flow within a short space of time. Within a period of six weeks, broiler producers are able to sell their birds or broilers. However the broiler production is dependent on a wide variety of inputs such as chick hatcheries, feed producers, and veterinary services, processing facilities, transport and efficient cold chain (DAFF, 2011). It is therefore important that broiler projects be started with properly organized markets. Without a sustainable market the broiler business will head for failure (DAFF, 2011). There are many factors that have an influence on the profitability of any agricultural enterprise. They include farmer characteristics (age, education level and gender), production costs, farm gate prices, availability of markets, distance to markets, market information, access to infrastructure (such as storage facilities, transport, power sources (electricity)) and extension services.

#### **2.4.1 Age of the small-scale broiler producer**

According to Sibanda (2012) the age of the farmer is a very important aspect in agricultural productivity as it determines farming experience and also the ability of carrying out the farming activities. Furthermore, the age of a farmer always determines the ability of the farmer to acquire outside knowledge about production. Manona (2005) mention that age of the person involved on a business plays a major role on the way the business accumulates its profit. Manona (2005) mention that older people are more reliable on the business profits when compared with the young people. Though in terms of labour, it is more advisable to employ a younger person than an old person because they have an ability to carry out heavy work and the ability to work long hours.

#### **2.4.2 Education level of the small-scale broiler producer**

According to Karen (2006) educational level plays an important role on the way the business accumulates its profit, the more the educated the person the better the business makes its profit; educated farmer has an ability to read, write and calculate which makes them to control their business in terms of keeping all necessary reports. The ability to read and calculate will create awareness to determine whether the project is projected to profit or not.



### **2.4.3 Gender of the small-scale broiler producer**

According to DAFF (2011). women are more responsible than men when it comes to paper work such as keeping proper records, doing accountant work and other calculating work and this improves the business profitability; as keeping records makes the broiler producers to follow the good ways of production and marketing when comparing with the previous records.

### **2.4.4 Production costs**

According to DAFF (2011) the higher production costs affect gross margin and make it negative and if the gross margin is negative that means farmers are making losses. Producers of broilers must make it a point that the costs of production is always minimised either by minimizing the costs of inputs like feed.

### **2.4.5 Availability of formal markets**

Small-scale producers usually depend on the local market (their community members) which is not large enough to make meaningful sales. Marketing and gaining access to formal markets is a major problem confronting small-scale farmers (DAFF, 2011). Without a sustainable market there is no business. It is important to start a broiler project with properly organized market channels and markets (Jones *et al.*, 2007). It is very difficult to run a sustainable broiler project that produces only live-birds if there is no market to take them all at a particular time. Most of the small-scale broiler projects are targeting the local market resulting to the saturation of the local market. There are no arrangements that are made to supply the outside market. The main products of the small-scale broiler projects are live-birds (DAFF, 2012). This product is very difficult to keep it at the same price for a long time as the cost of production increases with time. Hoverstadt (2008) indicated that feeding cost become difficult to keep under control when the birds are ready for the market and there is no one to buy the birds. It is therefore advisable that co-operatives situated in areas which have a potential of a large production capacity to sign contracts with large buyers of live birds. DAFF (2012) indicated that companies such as Rainbow Poultry are potential contractors for small-scale broiler farmers.

#### **2.4.6 Availability of transport**

Transportation is of vital importance in the activities of a business. It connects businesses to customers, produce to markets, and inputs to farms. According to Clover and Darroch (2005) the lack of own transport markedly add to the transaction costs for farmers based in remote rural areas. If the public transport system is unreliable in the area, inputs may not be obtained on time. As a result, production is negatively affected and thus the profitability of the business.

#### **2.4.7 Storage infrastructure**

Storage is an important marketing function, which involves holding and preserving goods from the time they are produced until they are needed for consumption (Bhopal, 2005). It ensures a continuous flow of goods in the market and plays a pivotal role in protecting the quality of perishable and semi-perishable products from deterioration. Hoverstadt (2008) argued that storage facilities are usually complemented by electricity. Electricity is used not only for lighting and household purposes, but it also allows for mechanization of many farming operations, such as the functioning of storage cold rooms. With the availability of electricity, refrigerator storages increase the length of time that food can be stored, potentially preserving the produce.

#### **2.4.8 Access to electricity**

Unfortunately, for most rural farmers, access to electricity is limited while electricity plays a crucial role if broilers projects are to add value. Slaughtering live birds adds value to broiler projects and gives an opportunity to explore more markets (DAFF, 2012). However, necessary infrastructure such as refrigerator storage facilities needs to be in place to facilitate such an initiative. Electricity is therefore important in adding value to broiler projects.

#### **2.4.9 Access to extension services**

According to DAFF (2011), the more the extension services available to the producers the more viable the project is likely to be. The more extension visits to the broiler projects; the more the broiler producers gains because it make it easier for the extension staff together

with the small-scale broiler producers to identify challenges and discuss possible solutions .

## **2.5 Chapter summary**

This chapter presented a review of literature on the broiler production in South Africa and in KwaZulu-Natal Province. The production and marketing challenges faced by small-scale broiler producers in South Africa and factors affecting profitability in agriculture were explored. Factors that influence profitability in agriculture with a particular reference to broiler production were reviewed and they include age, gender, educational level, production costs, distance to markets, market information, electricity, transport, price at farm gate and extension services. A review of literature on these factors is helpful as it facilitates an understanding and formulation of the analytical factors that might be influencing the profitability of government funded small-scale broiler projects in the KwaZulu-Natal Province that were applied in the regression model in this study. The next chapter describes the study areas and their selection criteria.

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# **CHAPTER 3**

## **DESCRIPTION OF THE STUDY AREA**

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### **3.1 Introduction**

This chapter provides a spatial, socio-economic, and geophysical description of the study areas, within the broader context of the province. It starts by providing a description of the location of the study areas within the KwaZulu-Natal Province. The geophysical description of the study areas is provided with a focus on the selected district namely uMkhanyakude, uThungulu and Zululand District Municipalities in terms of its geophysical aspects, topography, climate, vegetation, land use, socio-economic status, population, unemployment, education, economic activities and agricultural potential.

### **3.1 Selection of the study areas**

Figure 3.1 is a map showing the location of KwaZulu-Natal Province in South Africa. This study was specific only to the areas of North of KwaZulu-Natal region, namely uMkhanyakude, uThungulu and Zululand District Municipalities. The choice of the northern region districts is because these districts were identified as the ones with high poverty rate especially uMkhanyakude and Zululand Districts compared to uThungulu District which is better in terms of poverty levels which are very high up to 40% (StatsSA 2011). The study concentrates on the production and marketing activities practiced by government funded small-scale broiler producers, and their profitability within the rural areas in these districts.



Figure 3.1: Map showing the location of KwaZulu-Natal province in South Africa  
 Source: KZN Top Business (2015)

## **3.2 Description of the study areas**

This section will describe three district municipalities in terms of geographical aspect, topography, climate, soils, agricultural, land use and socio-economic.

### **3.2.1 UMkhanyakude District Municipality**

The study was done in five local municipalities under uMkhanyakude District Municipality namely: Big 5 False Bay Local Municipality, Hlabisa Local Municipality, Jozini Local Municipality, Mtubatuba Local Municipality and uMhlabuyalingana Local Municipality.

UMkhanyakude District Municipality is situated in the North eastern region of KwaZulu - Natal. The District extends from Mtubatuba (St Lucia) in the south to Kosi Bay in the north, across to the Lubombo Mountains in the west. The N2 and part of Lubombo mountains form a physical divide within the district. The Lubombo mountains range is known for its spectacular scenery made up of dense natural forests, rugged rock faces, caves and rivers that wind through deep mountain gorges. Better east-west access routes need to be established along the coast and in the hinterland (uMkhanyakude Municipality, 2013).

UMkhanyakude is named after the yellow-barked fever tree, literally meaning “seen from afar”. It contains many areas of outstanding natural beauty such as the St Lucia greater wetland park, Sodwana Bay and Kosi Bay. Game parks include Hluhluwe-Umfolozi, Ndumu and Tembe Elephant Park. Figure 3.2 is a map showing uMkhanyakude District and its local municipalities.

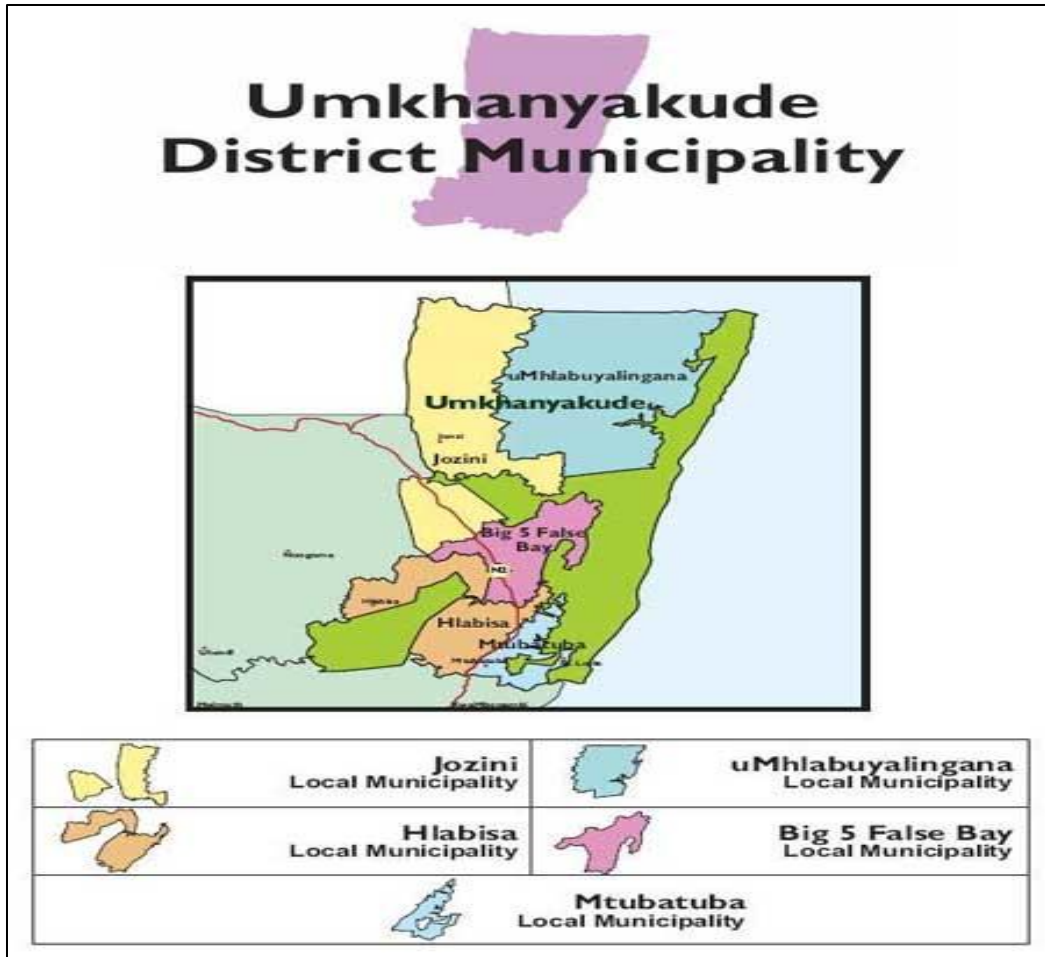


Figure 3.2: Map showing uMkhanyakude District  
Source: KZN Top Business (2015)

The uMkhanyakude Municipality (2013) further states that the district is mainly rural with the only formalised town being Mtubatuba in the south. However, several towns are growing rapidly, such as Hluhluwe, Jozini, Manguzi, Mbazwana and Mkuze.

### 3.2.1.1 Geophysical aspects

This section describes the geophysical aspects of the study area (uMkhanyakude District). These include topography, climate, vegetation, soils and land use.

### 3.2.1.2 Topography

UMkhanyakude is composed of both steep slopes and flat lands. UMhlabuyalingana Municipality, which is one of the local municipalities within UMkhanyakude, topography is flat but other local municipalities have slopes, such as Big 5 and Mtubatuba Local Municipalities while Jozini Local Municipality is dominated by the steep slopes (uMkhanyakude Municipality, 2016).

### 3.2.1.3 Climate and vegetation

Table 3.1 shows the monthly rainfall of uMkhanyakude with an annual mean rainfall of 650mm, it also shows that the winter months has low rainfall when compared with the summer months. Table 3.2 shows that winter months are colder than the summer months and with an average of 21.4°C.

Table 3.1 Average monthly rainfall (mm) for uMkhanyakude District

	Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Median	709	108	96	80	41	28	13	10	17	34	77	98	107
Mean	650	97	82	74	37	29	14	21	20	37	77	84	78

Source: UMkhanyakude BRU (2015)

Table 3.2: Average, minimum and maximum monthly temperature (°C) for uMkhanyakude District

	Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean	21.4	24.6	25.0	23.9	22.1	19.9	17.7	17.6	18.9	20.6	21.0	22.2	23.6
Min	16.1	19.7	20.1	18.9	16.9	14.3	11.7	11.8	13.1	15.2	15.9	17.4	18.6
Max	26.7	29.5	29.9	28.9	27.3	25.5	23.6	23.4	24.7	26.1	26.0	27.1	28.6

Source: UMkhanyakude Bio-Resource unit (BRU) (2015)

Summers are very hot and winters have no frost, thus summer crops can also be grown in winter. The above climatic parameters exhibit sub-tropical conditions, with no frost hazard and temperatures above 15°C throughout the year, the site makes it ideal for most vegetables and field crops to be successfully produced throughout the year.



### **3.2.1.4 Soils**

This area has different soil patterns and types, ranging from well-drained high potential soils to duplex, moderately drained soils. An In-depth soil classification is necessary on this area so as to optimize the high potential soils. These soil ecotopes are H.2.4. and H.3.4. A soil ecotope is a class of land defined in terms of soil form, texture, depth, wetness, slope and soil surface characteristics (UMkhanyakude BRU, undated). An ecotope is defined by soil texture, clay percentage, depth, slope and rockiness. Therefore, ecotope B: 1:1 found in the site defines soils that are well drained, with clay percentage of less than 15% and a soil depth of greater than 800m. These soil ecotopes represent the best soil classes and have a high crop potential. Soils in most areas of uMkhanyakude District Municipality are poorly drained except for Jozini Local Municipality.

### **3.2.1.5 Land use**

Table 3.3 indicates the agricultural enterprises and land use practiced at uMkhanyakude taking from Natural veld, dry-land pasture, irrigated pastures, arable lands under irrigation and dry-land and others. Natural veld is mostly kept as game reserves as well as grazing and browsing, while pastures and arable lands are kept for agricultural purposes.

Table 3.3: Agricultural enterprises and land use practices in the study area in 2015

<b>Enterprise</b>	<b>Comments</b>
Natural veld	These lands are kept for natural grazing and browsing, this area comprises 30% of the total district.
Dry-and pasture	These lands are reserves for planted pasture without irrigation; it's about 0.5% of the total district.
Irrigated pasture	These lands are reserves for planted pasture with irrigation; it's about 10% of the total district.
Arable land under irrigation	These lands are reserves for planted crops especially vegetables and green mealies with irrigation, it's about 15% of the total district.
Arable dry-land	These lands are reserves for planted crops grains and forest; it's about 25% of the total district.
Farmyard, Homesteads and roads	These lands are not used for production purposes; it's about 19.5% of the total district.

Source: UMkhanyakude IDP (2015)

### **3.2.1.6. Socio-economic status**

This section describes the socio-economic status of the study area (uMkhanyakude District). This includes population distribution, unemployment, education, infrastructure and economic activities.

### **3.2.1.6.1 Population**

UMkhanyakude District has a population of approximately 504 000 people who are distributed unevenly among five local municipalities (Stats SA, 2011). The population of this district municipality increased by 0.3% in 2010 to 2017(Stats SA, 2011).

### **3.2.1.6.2 Unemployment**

UMkhanyakude District is one of the two most deprived districts in South Africa in terms of poverty and or unemployment (Stats SA, 2011). UMkhanyakude is sitting at 61.23% of unemployment rate though the increase on unemployment rate is still anticipated to be high due to drought predictions in the area (Stats SA, 2011).

### **3.2.1.6.3 Education**

In uMkhanyakude District, those with no schooling accounted for 27,4% of the total population in 2010, those with Matric accounted for 25,2% and those with a higher education qualification accounted for 20% and the rest of the population were unspecified (Stats SA, 2011). Education is the key to the economic development of an area; the higher the number of people without schooling; the fewer the people that can be able to read, write and calculate.

### **3.2.1.7 Economic activities**

UMkhanyakude is one of the four district municipalities in Kwazulu-Natal that were selected as Presidential Nodes for the implementation of the Integrated Sustainable Rural Development Programme (ISRDP). Agriculture and tourism are the main economic activities in this District.

### **3.2.1.7.1 Agricultural potential**

UMkhanyakude has outstanding potential for agriculture and tourism development, with the district having a wealth of natural beauty and outstanding land scape, as well as a favourable climate and fertile soils for major agricultural production. The district is closely associated with the iSimangaliso, "Maputaland", the Makhathini Flats and the Pongola-Poort/Jozini Dam (constructed in the 1970s with the intention of unleashing the agricultural potential of the area). Several initiatives have been taken in an effort to boost economic activity in the sub region. The alluvial soils surrounding the river have considerable agricultural possibilities, Jozini dam is designed to irrigate more than 80 000 hectares of agricultural lands (DAFF, 2011). Crops include; sugar cane, rice, coffee, cotton, fibre crops and various sub-tropical fruits. Other agricultural products in the region include timber, tomatoes, chillies and pineapples. A high proportion of the district is under thicket, grassland and wetland; located in the traditional authority areas under the jurisdiction of the Ingonyama Trust. The remaining areas are under state conservation, private ownership with limited formal urban areas (Stats SA, 2011).

### **3.2.2 UThungulu District Municipality**

UThungulu District Municipality is one of the 11 district municipalities of KwaZulu-Natal Province and comprises of six local municipalities that include Nkandla, Mbonambi, , , uMhlathuze, uMlalazi, Ntambanana and Mthonjaneni (uThungulu IDP, 2015). Figure 3.3 is a map showing uThungulu District and its local municipalities.

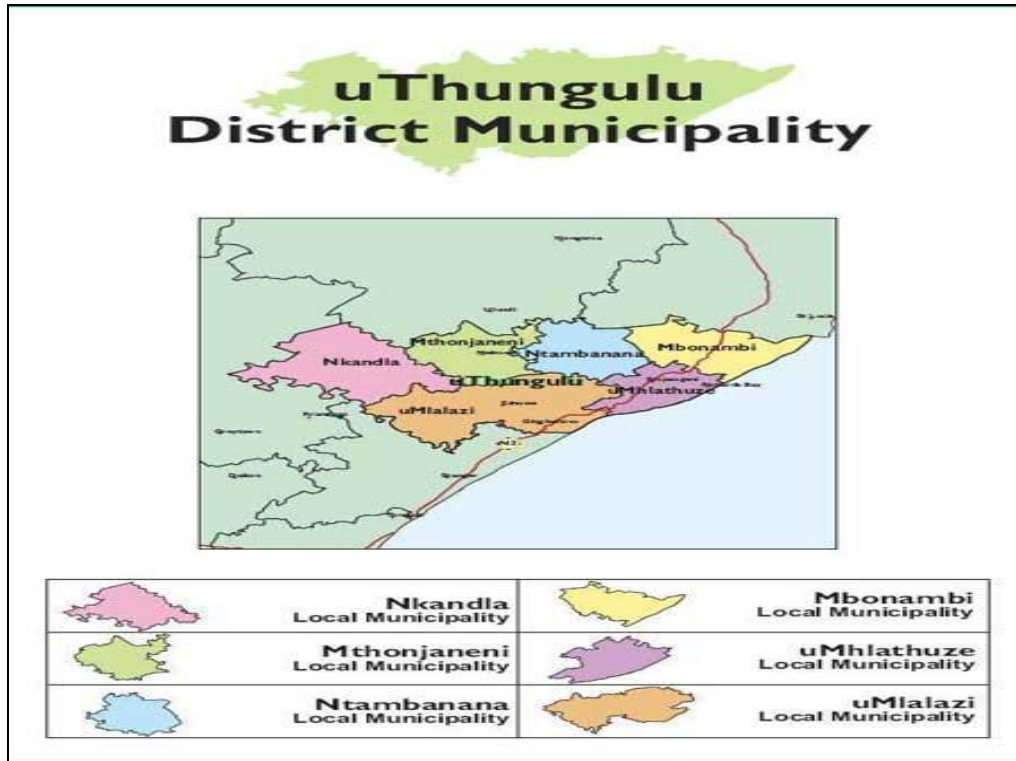


Figure 3.3: Map showing uThungulu District  
Source: KZN Top Business (2015)

UThungulu District Municipality is located in the North-Eastern region of the KwaZulu-Natal Province and covers a servicing area of 9 000km<sup>2</sup> with close to 1 million inhabitants (KZN Top Business, 2015). The main agricultural activities in the districts are mainly sugar cane and forestry with some citrus, nuts and animal husbandry (uThungulu IDP, 2015).

### 3.2.2.1 Geophysical aspects

This section describes the geophysical aspects of the study area (uThungulu District). These include topography, climate, vegetation, soils and land use.

### **3.2.2.1.1 Topography**

UThungulu District Municipality is made up of steep slopes while; Mhlathuze and uMlalazi Local Municipalities have gradual slopes, Mthonjaneni and Nkandla Local Municipalities have steeper slopes (uThungulu IDP, 2015).

### **3.2.2.1.2 Soils**

UThungulu District has a moderate to poor soils; drainage is good on the coast and getting poor as you go further in-land. UThungulu District has diverse soil types ranging from Hutton to Mispar soil forms. Agronomic crops such as sugarcane adapt well in this district, crops such as bananas are also doing well because of soils and favorable temperatures (KZN BRU, undated).

### **3.2.2.1.3 Land use**

UThungulu District is dominated by sugarcane and bananas in the local municipalities such as Umlalazi and uMhlathuze Local Municipalities along the coast and forest in the inland local municipalities such as Mthonjaneni and Nkandla Local Municipalities.

## **3.2.2.2 Socio-economic status**

This section describes the socio-economic status of the study area (uThungulu District). This includes population distribution, unemployment, education, infrastructure and economic activities.

### **3.2.2.2.1 Population**

The seat of UThungulu is Richards Bay. The majority of its 885 944 people speaks isiZulu with 177 189 households (Stats SA 2011). The district code is DC28. It has the third highest population in the province after eThekweni Metro and uMgungundlovu District Municipality (Stats SA, 2011).

### **3.2.2.2 Unemployment**

UThungulu District has an unemployment rate of 47.5% including youth unemployment of 59.9% with a growth rate of 3% (Stats SA, 2011). Unemployment rate is so high but not as high as uMkhanyakude and Zululand Districts.

### **3.2.2.3 Education**

UThungulu District has a literacy rate of 60% of the total population and those that have primary education account for 30% of the population, those with secondary education (23%) and a tertiary education (30%) and 30% of the population has no formal education (Stats SA, 2011).

### **3.2.2.4 Infrastructure**

UThungulu's gateway to the world markets is the Port of Richards Bay, which is the largest deep-water port on the African continent. The harbour facilities at Richards Bay are world-class and there is tremendous potential for further expansion of this Industrial Development Zone. This has resulted in Richards Bay becoming the fastest growing urban centre in South Africa, boosting economic activity and attracting international investors. The port imports the highest volume of bulk cargo of all African ports and has double the capacity of the Port of Durban, handling in excess of 75 million tons of cargo annually.

The city of uMhlathuze comprises the economic powerhouse of Richards Bay and Empangeni and its supporting areas of eSikhawini, Felixton, Ngwelezane, Nseleni and Vulindlela rural areas. The city of uMhlathuze is not only financially stable, but offers investors and visitors first class facilities, service and infrastructure. The city is the home to world class industry and has the world's largest export coal terminal (Richards Bay Coal Terminal). Richards Bay and eMpangeni serve as industrial and service centers to many other parts of the district. Bucanana, KwaMbonambi, Eshowe Melmoth, Nkandla and, Ntambanana are other administrative nodes of economic significance in the district (UThungulu IDP, 2015).

### **3.2.2.2.5 Climate and vegetation**

UThungulu District has a warm climate all year round, with very mild winters and hot, humid summers with an annual mean temperature of 20<sup>0</sup>C. There is also a good seasonal rainfall with a mean rainfall of 750mm (UThungulu BRU, 2015). The temperate climate and warm seas off the coastline make it an ideal location for the development of agricultural projects and tourism facilities.

### **3.2.2.2.6 Economic activities**

UThungulu is well endowed with natural resources. Its comparative advantages include a good climate that opens up avenues for productive agricultural and tourism development. Agricultural and irrigation infrastructure in place, a scenic environment and coastal terrain which create opportunities for tourism infrastructure development.

Important sectors in the district include mining and forestry. UThungulu is popular for its mineral-rich land homes two mining giants. Richards Bay Mineral a leading producer of titanium mineral, high purity iron and zircon supplying the country is situated on the coastal sands of the district. Exxaro KZN sands are involved in the mining, beneficiation and smelting of mineral sands, mainly to produce titanium slag from smelting ilmenite. Other products include zircon, rutile, leucoxene and low manganese pig iron.

#### **3.2.2.2.6.1 Manufacturing**

The manufacturing sector is the largest economic contributor to gross geographic product in the district, contributing over 50% of the district's GDP (UThungulu IDP, 2015). The manufacturing activity in uThungulu is minerals, metal products and equipment, chemical products, wood and paper. The sector is highly specialized and focuses on exports.

#### **3.2.2.2.6.2 Mining**

The district is home of two mining giants who have capitalized on the mineral-rich land in UThungulu. Richards Bay Mineral is a leading producer of titanium minerals, high purity



iron and zircon. Exxaro KZN sands is a SA's flagship empowerment mining company, involved in the mining, beneficiation and smelting of mineral sand

#### **3.2.2.2.6.3 Forestry**

The commercial forestry sector is well developed with large plantations by private companies such as Mondi and Sappi.

#### **3.2.2.2.6.4 Tourism**

UThungulu District is well developed with an abundance of natural resources. It forms a gateway to some of the country's finest game reserves and is rich in cultural heritage, offering a unique Zulu Kingdom experience. The uThungulu District also has a number of wetlands, the most notable being Cubhu and Greater uMhlathuze Wetlands to the south of Richards Bay at Esikhaleni.

#### **3.2.2.2.6.5 Agricultural potential**

UThungulu District practices both commercial agriculture and subsistence agriculture. Subsistence agriculture is mainly practiced in the rural areas of uThungulu District. In these areas, there are limited economic opportunities and poor infrastructure - throughout the district there is a great concern of transport infrastructure to rural communities. Agricultural Production by small-scale farmers is practiced in tribal areas which are characterized by high levels of poverty and under-development (KZN Top Business, 2015). The major land uses in the district are: commercial agriculture; sugarcane, grown largely in the lower-lying coastal belt. The production of horticultural crops includes citrus, sub-tropical fruits and vegetables.

### **3.2.3 Zululand District Municipality**

Zululand District Municipality is one of the 11 District Municipalities of KwaZulu-Natal Province and comprises of five Local Municipalities: Nongoma, Paul Pietersburg, Pongola Ulundi and Vryheid.

Figure 3.4 is a map showing Zululand District and its local municipalities.

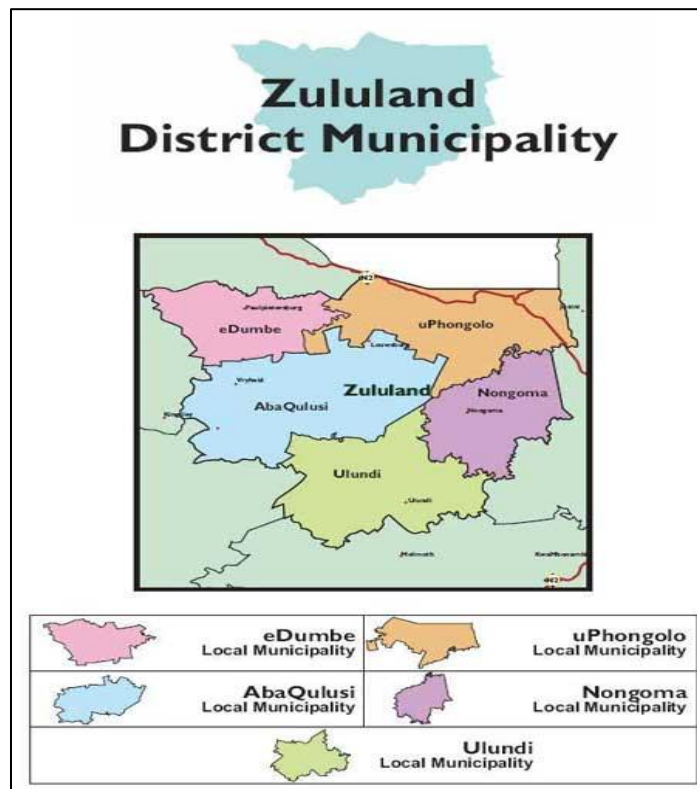


Figure 3.4: Map showing Zululand District  
Source: KZN Top Business (2015)

### 3.2.3.1 Geophysical aspects

This section describes the geophysical aspects of the study area (Zululand District). These include topography, climate, vegetation, soils and land use.

#### 3.2.3.1.1 Topography

Zululand District Municipality has a variety of land scape. Abaqulusi, Dumbe and Pongola Local Municipalities have slopes in other areas while Nongoma and Ulundi local municipalities have more areas with steep slopes in the district.

### 3.2.3.1.2 Climate and vegetation

The area receives an annual mean rainfall of 800mm and has occasional frost. Despite these climatic limitations, a wide range of crops can be successfully produced. The major limitation in this area is low rainfall during certain months. Table 3.4 indicates the average, minimum and maximum monthly temperatures in Zululand District; the annual mean temperature is 20.9°C. Table 3.4 shows that the temperatures are high on the summer months and low on the winter months.

Table 3.4: Average, minimum and maximum monthly temperature (°C) for Zululand District

Temp (°C)	Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean	20.9	24.8	24.5	23.7	21.4	18.7	16.0	16.0	17.8	19.9	21.2	22.4	24.1
Min	14.6	19.1	19.1	18.2	15.4	11.7	8.5	8.5	10.6	13.4	15.2	16.7	18.3
Max	27.3	30.5	30.0	29.4	27.5	25.7	23.6	23.7	25.1	26.5	27.3	28.1	29.9

Source: Zululand BRU (2015)

Summers are very hot and winters have frost, thus summer crops can be stunted in winter. According to Zululand BRU (2015) the above climatic parameters exhibits sub-tropical conditions, with no frost hazard and temperatures above 15°C throughout the year, the site makes it ideal for most vegetables and crops to be successfully produced throughout the year.

### 3.2.3.1.3 Soils

Zululand District has moderate to poor soils though some areas has very good soil, places such as most of Abaqulusi, Babango, Bululwane, Dabhasi, Dumbe, Emahhashini in Nongoma Nkonjeni in Ulundi and Pongola , (Zululand BRU, 2015).

The area has different soil patterns and types, ranging from well-drained high potential soils to duplex, moderately drained soils.

A general description based on crop ecotopes factors was used to estimate crop capability. These soil ecotopes are H.2.4. and H.3.4. . According to Zululand BRU (2015) ecotope B:1:1 found in the site defines soils that are well drained, with clay percentage of <15% and a soil depth of > 800m.

The analysis of the natural resources found in this site, as described above, reveals a highly suitable area for most agricultural enterprises. With right crop choices, good management and technical support, there is a great opportunity for this area to be commercially viable. The high agricultural potential of the land is considered to be the key to the future development of the region.

#### **3.2.3.1.4 Land use**

The high population number and stock concentrations in the freehold settlements highlight the need for additional land and create possible land conservation majors. A large percentage of the district is communal land. Within these areas there is considerable pressure to extend grazing rights in to adjoining areas. Strategy to deal with the need to accommodate the increasing demands for grazing land need particular attention.

#### **3.2.3.2 Socio-economic status**

This section describes the socio-economic status of the study area (Zululand District). This includes population distribution, unemployment, education, infrastructure and economic activities.

##### **3.2.3.2.1 Population**

Zululand District is one of the 11 district municipalities ("districts") of KwaZulu-Natal province. The seat of Zululand is Ulundi. The majority of its 804 456 people speak isiZulu (Stats SA, 2011). The district code is DC26. It is a larger historical area also known as Zululand.

##### **3.2.3.2.7 Unemployment**

Zululand District has an unemployment rate of 49.3% including youth unemployment of 59.9% with a growth rate of 3% (Stats SA, 2011). This is a slightly higher rate when

comparing with uThungulu District, especially when considering the coal mines that are closed at Abaqulusi only leaving one functional coal mine at Ulundi.

#### **3.2.3.2.8 Education**

Zululand District has 82% of its population with an educational status; those with primary education of account for 32%, secondary education (30%), tertiary education (20%) and the remaining 25% of the total population in the district has got no formal education (Stats SA, 2011). Educational status shows the number of people that can be able to read, write and calculate.

#### **3.2.3.2.9 Infrastructure**

Zululand's main internal road is dominated by three routes which form a triangle linking Vryheid, Ulundi and Pongola. Up to the early 1990's, Zululand economic base depended heavily on coal mining, supported by agriculture, transport, trade and government services. The potential for economic growth in Zululand lies in tourism and agriculture.

#### **3.2.3.2.10 Economic activities**

Vryheid and Ulundi are the major towns. Vryheid is a commercial and business centre, while Ulundi is an administrative centre with the seat of the district municipality and a well-equipped airport. The potential for economic growth in Zululand lies in tourism and agriculture. The district experiences the high level of poverty and has a high incident of HIV/AIDS infection (Stats SA, 2011). Another major setback is poor accessibility to basic services and facilities. Agriculture provides the economic base of the area and opportunities range from commercial sugarcane and wattle farming, to livestock farming and small-scale agricultural production. Products farmed are maize, groundnuts, soya beans, sunflowers, and sorghum as well as sub-tropical fruit. Many private game farms, hunting lodges and photographic safaris operate in Zululand District. Zululand District is home to the origin of the Zulu's and the Valley of the Kings, where King Shaka was born, is part of heritage Park, where the spirit of emakhosini memorial has been elected in honour of the Zulu kings whose graves lie. The site of battle of Blood river and various

other battlefields on the battle fields route are popular tourist attractions. Here young Zulu maidens take part in the colourful culture festival, the Zulu Royal reed dance. Zululand District has a rich diversity of wildlife, attracting many tourists, both internationally and local.

### **3.3 Chapter summary**

This chapter presented a description of the study areas. It has outlined and explained the geographical and socio-economic aspects of the three district municipalities (uMkhanyakude, uThungulu and Zululand). An unemployment rate in the areas is generally high on all three district municipalities. The chapter has provided an understanding of the study areas and its characteristics, which is important in the interpretation of the research outcomes from this study. The next chapter presents and describes the research methodology applied in the study.

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# **CHAPTER 4**

## **RESEARCH METHODOLOGY**

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### **4.1 Introduction**

The research methodology for collecting and analyzing the data is very important as it is the key of any study and its perfectness means the study findings are reliable. This chapter presents the research methodology applied in the assessment of the viability of government funded small-scale broilers projects in the study areas. It describes the research design including units of analysis, sampling method employed, sample size, data collection and data analysis methods employed which include, gross margin (GM) analysis, and the multiple regression modeling.

### **4.2 Research design**

This study collected data by a quantitative method using interviewer-administered questionnaires. The quantitative approach with descriptive design in this study was applied to assess the profitability of government funded small-scale broiler projects by the use of gross margins and gross profit margins to describe the farmers' motivations and incentives of raising broilers and the marketing channels used to market their produce.

#### **4.2.1 Units of analysis**

The unit of analysis is the major entity that is analyzed in a study (Trochim, 2006). In this study, individual government funded small-scale broiler producers provided primary data. The projects involved were only those that were funded by the government in 2012/2013 financial year and the broiler producers were selected from the Northern KwaZulu-Natal (UThungulu District (Mthomaneni, Nkandla, uMhlathuze and uMlalazi Local Municipalities); Zululand District (Dumbe, Nongoma, Pongola, Ulundi and Vryheid Local Municipalities) and UMkhanyakude District (Big Five False Bay, Hlabisa, Jozini,

Mhlabuyalingana and Mtubatuba Local Municipalities). Data was collected through a formal survey. A personally administered questionnaire was used as the main instrument of data collection.

#### **4.2.2 Sampling procedure**

A probability sampling procedure was employed to sample 75 small-scale broilers producers in the KZN North region. Probability sampling is said by Bless and Smith (2000) to refer to that case where the probability of including each element of the population in a sample is known. Simple random sampling was the probability sampling procedure used. The advantage for using a random sample is that broiler producers had an equal chance of being selected.

#### **4.2.3 Sampling frame and size**

Not all small-scale broilers producers in the study areas were selected for the study; but a sample was drawn. For the sample to best represent the total population, a complete frame was employed. Bless and Smith (2000) defines a sampling frame as a list of all units from which a sample is to be drawn. A complete sampling frame was obtained from the KZN Department of Agriculture. In total there are about 134 small-scale broiler projects that have been funded by the KZN Department of Agriculture. Due to time and financial constraints, a total of 75 small-scale broiler projects (25 broiler projects in each district - uMkhanyakude District Municipality, uThungulu District Municipality, and Zululand District Municipality) were investigated using a random pick method. Table 4.1 shows the number of government funded small-scale broiler producers in KZN northern region.



Table 4.1: Number of government funded small-scale broiler producers in KZN northern region in 2015.

Study area		Number of government funded small-scale broiler producers	Actual Sample size
Zululand	Ulundi	9	5
	Abaqulusi	14	5
	Nongoma	15	5
	Pongola	8	5
	Dumbe	5	5
UMkhanyakude	Mtubatuba	10	5
	Hlabisa	11	5
	Big 5 False Bay	7	5
	Jozini	9	5
	Mhlabuyalingana	8	5
UThungulu	Mlalazi	9	6
	Nkandla	12	7
	Mhlathuze	9	6
	Mthonjaneni	8	6
<b>Total</b>		134 (N)	75 (n)
<b>Percentage of total population</b>		56%	

#### 4.2.5 Data collection

The relevant authorities (local Induna or councillor) were contacted with the assistance of the extension officer(s) responsible for their respective ward(s), for permission to collect information from government funded small-scale broiler producers.

In this study, face to face interviews were conducted using a semi-structured interview schedule consisting of both open and close ended questions. Face to face interviews have the distinct advantage of enabling the researcher to establish a rapport with the respondents and therefore gain their co-operation. Face to face interviews allows the researcher to clarify ambiguous answers and when appropriate seek follow-up information.

Semi-structured questionnaires were used by the researcher because this type of questionnaire enabled the researcher to obtain multiple responses to a set of questions asked and allowed for detailed responses. The questionnaire was designed to extract

information such as demographics, production challenges, marketing channels, and information on the viability of broiler projects.

Primary data collected included production and marketing challenges faced by government funded small-scale broiler projects and information on the factors that influences the profitability of the small-scale broiler projects. The interviews were individually conducted so that other respondents will not know what other respondents said in answering the questionnaire. The researcher understood the respondent's vernacular (isiZulu) and was therefore able to translate the questions to isiZulu.

#### **4.2.6 Data analysis**

After the data was collected, it was captured and encoded in the form of spread sheets in Microsoft Excel and exported to Statistical Package for the Social Science (SPSS) software version 23.0 for analysis.

For objective 1, 2 and 3; descriptive statistics was applied; here frequencies and means were used.

For objective 4, a gross margin (GM) and gross profit margin (GPM) analysis was employed to assess the profitability of government funded small-scale broiler projects in the Northern KZN region.

For objective 5, to determine the factors influencing the profitability of government funded small-scale broiler projects, a multiple regression model was employed.

A model fit was computed in the regression analysis by determining how well the model fitted the data using the R-Square and Adjusted R-Square coefficients (See Table 6.1). R-Square and Adjusted R-Square quantify the 'model quality', or the proportion of the results variance that can be explained by the model.

##### **4.2.6.1 Gross margin (GM) analysis**

Chetroui and Lurchevici (2012) said among the economic indicators used in the management of production activities of agricultural holdings, the gross margin has a central place, due to the fact that it provides opportunities and relevant information that substantiate decisions in the specific farm conditions, relating to: planning the structure of

production, reducing variable costs based on the analysis of different combinations of resources allocated, establishing deviation causes between partial planned results and the achieved ones. Gross product (GP) of an activity includes: primary and secondary production value priced delivery, plus subsidies to business. The data used to calculate the total production value and specific variable costs, meet a production period of 12 months (either calendar year or agricultural production year).

According to Chetroiu and Lurchevici (2012) the main characteristics of the gross margin are:

- Differs from one product to another, from one period to another, from one farm to another, due to the technological conditions, level of production and prices, which affect the gross product value and variable costs;
- Gross margin is a tool for analyzing the activity efficiency and for planning technologies that allow, through the variable costs level, in relation to the products obtained, achieving a positive gross margin and bigger;
- The product negative gross margin indicates that the activity causes losses and must be improved at farm level, some activities may have negative gross margins, and some positive, but overall the total gross margin must be positive.

The gross margin is the difference between the gross product value and specific variable costs (Chetroiu & Lurchevici, 2012). For this study, to achieve a meaningful assessment of the profitability of the government funded small-scale broiler projects under study; a comparison of gross margins was made with those of an ideal broiler enterprise gross margins per hectare (ha). The ideal broiler enterprise gross margins were obtained from Rainbow Chickens and compared to those of the small-scale broiler producers' gross margins.

Equation 1 shows a simple mathematical expression of gross margin for an enterprise and can be presented as:

$$GM = GI - TVC \quad (1)$$

Where:

GM = Gross margin measured in terms of the Rand (ZAR)

GI = Gross income measured in terms of the Rand (ZAR)

TVC = Total variable costs measured in terms of the Rand (ZAR)

#### 4.2.6.2 Gross profit margin (GPM) analysis

Computation of gross margins alone has the disadvantage of not showing the profit obtained by each enterprise. Therefore, a gross profit margin (GPM) was also computed. A gross profit margin is gross margin expressed as a percentage or in total financial terms or the ratio of gross profit to costs. A higher margin percentage is a desirable profit indicator. Equation 2 is an expression of a gross profit margin for an enterprise:

$$\text{Gross Profit Margin (GPM)} = \frac{\text{Gross Profit}}{\text{Net Sales (Revenue)}} \times 100\% \quad (2)$$

Where:

Gross Profit = Sales - Cost of Goods Sold

Net sales (Revenue) = Gross Sales - Total Sales Discounts + Returns

#### 4.2.6.3 Multiple regression model

The multiple regression model was used to identify the factors influencing the profitability of government funded small-scale broiler projects in the study areas. The multiple regression model was adapted from a study by Zulu (2011) who conducted a study on the profitability of smallholder cowpea production in Zambia. The dependent variable for this study was a profitability measure, where the gross margin (GM) was used as a proxy for profitability following Zulu (2011). The predictive association for profitability or the independent variables was the socio-economic characteristics of the small-scale broiler producers. The multiple regression models is specified as follows (equation 3):

$$Y (GM) = \beta_0 + \beta_1X_1+ \beta_2X_2+... + \beta_nX_n + U_i \quad (3)$$

Where Y is the dependent variable measured by the gross margin (GM)

$\beta_1, \beta_2, \dots, \beta_n$  are coefficients of independent (explanatory) variables;

$X_1, X_2, \dots, X_n$  are the independent (explanatory) variables and

$U_i$  is the error term.

The multiple regression analysis was used in this study because it allows one to discriminate between the effects of the explanatory variables, making allowances for the fact that they may be correlated (Zulu, 2011). The regression coefficient of an independent (X) variable provides an estimate of its influence on the dependent variable (Y), which is the profitability of small-scale broiler projects in this case, controlling for the effects of all the other explanatory (X) variables. Guided by literature, the factors that affect profitability (gross margin) were regressed against the independent variables that included demographics of the small-scale broiler producer (age, gender, education), farm production costs, farm gate price, availability of markets, distance to markets, market information and access to infrastructure (such as storage facilities, transport, electricity and extension services) already discussed in Chapter 2.

#### **4.2.6.4 Explanatory variables used in the multiple regression model and their expected outcomes**

Table 4.2 provides a brief description of the explanatory variables used in the multiple regression model (factors influencing profitability of small-scale broiler projects) and their expected outcomes and how each variable was measured.

##### **4.2.6.4.1 Age of small-scale broiler producer**

Age is an important variable that determines the commitment of a producer in agricultural practices. The older the farmers the more chances there are to have more resources at their disposal (Mushunje *et al*, 2003). This variable was measured by the actual number of years of the small-scale broiler producer. It was hypothesized to have a negative relationship with the profitability of small-scale broiler projects.

#### **4.2.6.4.2 Gender of small-scale broiler producer**

This variable is intended to show whether the household is male or female. Agriculture in rural areas is usually practiced more by women than men because men tend to move from rural areas to urban areas to look for paid employment. So that means women are responsible for farming in rural areas to a much greater extent and especially in subsistence agriculture, as well as in food processing (Food and Agricultural Organization of the United Nations (FAO), 1995). The gender of small-scale broiler producers was hypothesized to have a either negative or positive relationship with the profitability of small-scale broiler projects.

#### **4.2.6.4.3 Years of schooling of small-scale broiler producer**

Literacy rate was measured by the number of formal years in schooling by a small-scale broiler producer. Education is an important attribute to agricultural production, as it contributes to the knowledge of many aspects in agriculture. Education is also important in decision-making. The number of years of schooling by a small-scale broiler producer was hypothesized to have a positive relationship with the profitability of small-scale broiler projects.

#### **4.2.6.4.4 Farm production costs**

Farm production costs were measured by calculating production costs such as feed, sawdust, medication, water and marketing costs. Farm production costs were hypothesized to have a negative relationship with the profitability of small-scale broiler producers as they reduce profit if they are not minimized.

Table 4.2: Explanatory variables used in the multiple regression model and their expected outcomes

<b>Variable</b>	<b>Description</b>	<b>Type of measurement</b>	<b>Priori expectations (+/-)</b>
Age	Actual years of the small-scale broiler producer.	Continuous	-
Gender	The sex of the small-scale broiler producer (male/female).	Dummy	+/-
Years of schooling	Number of years in schooling by the small-scale broiler producer.	Continuous	+
Farm production costs	Operational costs.	Continuous	-
Farm gate price	Price of broiler on the farm.	Continuous	+
Access to markets	Availability of ready output markets for broilers (yes/no). Dummy	Dummy	+
Distance to market	The physical units in km of distance to the market.	Continuous	-
Market information	Whether the small-scale broiler producer has access to information on broiler marketing (yes/no). Dummy	Dummy	+
Access to storage facilities	Whether the small-scale broiler producer has access to storage facilities and refrigeration (yes/no). Dummy	Dummy	+
Access to own transport	Whether the small-scale broiler producer has access to own transport (yes/no). Dummy	Dummy	+
Access to electricity	Whether the small-scale broiler producer has access to electricity (yes/no). Dummy	Dummy	+
Extension contact	Whether the small-scale broiler producer has access to extension services (yes/no). Dummy	Dummy	+/-

#### **4.2.6.4.5 Farm gate price**

Farm gate price was measured by computing income received on the farm where individual customers buy directly from the farm, this type of marketing excludes other marketing costs such as abattoir and delivery costs. Farm gate price was hypothesized to have a positive relationship with the profitability of small-scale broiler producers because it excludes other marketing costs.

#### **4.2.6. 4.6 Availability of formal markets**

Availability of formal markets was measured by calculating the number of sustainable markets where small-scale broiler producers has a written agreement to sell and it was hypothesized to have a positive relationship with the profitability of small-scale broiler production.

#### **4.2.6. 4.7 Distance to markets**

The actual distance in kilometers travelled by the broiler producers to reach the marketing place to sell the broiler product measured this variable. The distance to markets was hypothesized to have a negative relationship with the profitability of small-scale broiler producers because the longer the distance to the market; the higher the costs associated with the travelling.

#### **4.2.6. 4.8 Availability of market information**

Market information was measured by asking whether the small-scale broiler producer had ready access to market information in terms of broiler prices during sales, national and international broiler prices and inputs costs. Market information was hypothesized to have a positive relationship with the profitability of small-scale broiler producers.

#### **4.2.6. 4.9 Availability of storage facilities**

Availability of storage facilities was measured by asking whether the small-scale broiler producer had access to storage facilities and refrigeration. Availability of storage facilities



was hypothesized to have a positive relationship with the profitability of small-scale broiler producers.

#### **4.2.6.4.10 Own transport**

Own transport refers to whether the small-scale broiler producers had own transport for the transportation of both inputs and produce to the market. Access to own transport was hypothesized to have a positive relationship because own transport is more reliable in terms of reducing costs with the profitability of small-scale broiler producers.

#### **4.2.6.4.11 Access to electricity**

Access to electricity was measured by asking whether the small-scale broiler producer had access to electricity. Access to electricity was hypothesized to have a positive relationship with gross profit margin because electricity makes it easy to feed, control temperature, control vaccine and other production and marketing operations that used to be manual and labour intensive.

#### **4.2.6.4.12 Access to extension services**

Access to extension services was measured by asking whether the small-scale broiler producer had access to extension services. It was expected to have a positive relationship since extension services gives a guide to the farmers based on a new technological ways of producing broilers, best broiler breeds, medication and many more with the strategies aimed at enhancing the profitability of small-scale broiler production.

### **4.3 Ethical considerations**

The researcher adhered to the University's Policy and Procedures on Research Ethics and its Policy and Procedures on Managing and Preventing Acts of Plagiarism. The researcher followed the ethical considerations as follows:

#### **4.3.1 Informed consent**

The respondents were made aware of the research prior to participating. The nature and the purpose of the research project were explained to the respondents in a language they

understood. An informed consent was made available to participants in both isiZulu and English. Participants were asked to sign a consent form before participating in the study.

#### **4.3.2 Confidentiality**

All information received from the small-scale broiler producers was kept as confidential as possible. The information was only used for the research and nothing else. No names directions, household information on broiler projects including receipts, pamphlets, and/or any other information were used for any other reason beside for this research only.

#### **4.3.3 Privacy and anonymity**

Privacy and anonymity means that all information received during data collection that contains names or surnames were only used for the purpose of this study only and were not be shared to anyone no matter the circumstances. Neither names nor surnames were used to explain the findings in this research and outside of this research. All information received during the collection of data was kept private and anonymous.

#### **4.3.4 Honesty**

Honesty of the researcher during a study is very important. The researcher must always keep his/her words. Honesty is very important for the quality and/or integrity of the study. A researcher is obliged to tell the truth about the information required and to be honest with participants and members of the research team when sharing information about a research project and answering questions honestly and as fully as possible. The researcher undertook to be honest in all aspects during this research.

#### **4.3.5 Authorities**

Each and every place/land/site has its own authorities; the research must follow the protocol in order to enter the land and collect the data. It is important for the researcher to follow the protocol when collecting data. The researcher contacted extension officers of the area; together the extension officer and the researcher went to the agricultural local office to introduce the concept to the local Manager, then to the agricultural district

manager, to the local and district municipality, to ward counselor, induna and then to the chairperson of the project and down to the small-scale broiler producers.

#### **4.3.6 Acknowledging sources**

Acknowledging sources is not only important but it also give a dignity to the study conducted and to the source of such information, the researcher need to avoid plagiarism, referencing correctly and acknowledging ideas and concepts that are not originally yours; the fact is that there will be no study without sources; their acknowledgement is very important. perusing the Harvard style, the researcher acknowledged all borrowed ideas.

#### **4.4 Chapter summary**

This chapter provided a description of the research design; sampling method employed, data collection, and explaining what data and how it was obtained and analytical methods used to obtain the results. It also highlighted and explained the explanatory variables considered in the multiple regression model on factors influencing small-scale broiler profitability and their expected outcomes. This chapter further informs about the ethical obligations that were considered in the course of this study and in data collection that include confidentiality measures taken, privacy and anonymity, honesty, observing authorities in the study areas and the acknowledgement of sources. The following chapter presents and discusses the descriptive results of the study.

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# **CHAPTER 5**

## **DESCRIPTIVE RESULTS AND DISCUSSIONS**

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### **5.1 Introduction**

In this chapter the results and discussion of the descriptive analysis are presented. The data under analysis was collected from 75 government funded small-scale broiler projects in the Northern KwaZulu-Natal (uMkhanyakude, uThungulu and Zululand Districts). Twenty-five (25) government funded small-scale broiler projects were selected from each district. The first section begins with explanations of the demographic characteristics of the sampled government funded small-scale broiler producers; to describe their relation with the dependent variable which is broiler viability (profitability). Demographic characteristics presented here include age distribution of the small-scale broiler producer, gender of small-scale producer and educational level of the small-scale broiler producer; followed by the farm characteristics (production and marketing information) describing their relationship with the viability of the small-scale broiler projects. The farm characteristics presented in this chapter include costs of producing broilers, level of knowledge of the small-scale broiler producers and the marketing aspects of broiler produce and lastly the gross margin and gross profit margin analysis. Within the chapter, descriptive statistics such as mean values, frequencies and percentages are presented in the form of Tables and Figures and narrative description.

### **5.2 Demographic characteristics**

In this section, small-scale broiler producers' (demographic) characteristics such as gender, age and highest educational levels are discussed. Demographic characteristics of households are essential when analyzing economic data because such factors influence the economic behavior. It then follows that demographic attributes are relevant in analyzing factors influencing the profitability/viability of government funded small-scale broiler projects.

### 5.2.1 Age distribution

According to Sibanda (2012) the age of the farmer is a very important aspect in agricultural productivity as it determines farming experience and also the ability of carrying out the farming activities. Furthermore, the age of a farmer always determines the ability of the farmer to acquire the outside knowledge about production. According to Hofferth (2005) age is a vital aspect in agricultural productivity as it determines farming experience. Table 5.1 summarizes the age distribution of the respondents. The minimum age of respondents in uMkhanyakude, uThungulu, and Zululand was 28, 34, and 24 years respectively. The maximum age in uMkhanyakude, uThungulu, and Zululand was 64, 69, and 89 years respectively. The mean age of the small-scale broiler producers in uMkhanyakude, uThungulu, and Zululand Districts was about 49, 51 and 61 years respectively. These results suggest that the small-scale broilers are fit enough to produce broilers and old enough (experienced) to understand the production of broilers; creating opportunities for a viable business broiler enterprise.

Table 5.1: Age distribution of respondents

N.O.R	Mean	Minimum	Maximum	Standard deviation
UMkhanyakude	25	28	64	10.18
UThungulu	25	34	69	12.29
Zululand	25	24	89	13.97

UThungulu (n=25)		UMkhanyakude (n=25)		Zululand (n=25)		
Age range	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
<30	-	-	-	-	2	8
30-39	3	12	4	5	4	16
40-49	6	24	4	20	6	24
50-59	12	36	5	25	8	32
>60	4	16	12	50	5	20
Total	25	100	25	100	25	100

Source: Survey data (2015)

## 5.2.2 Gender distribution

Table 5.2 summarizes the gender distribution of the interviewed government funded small-scale broiler producers in uMkhanyakude, uThungulu and Zululand Districts. In uThungulu, females were the majority accounting for 67% while males accounted for 33%. In contrast, uMkhanyakude and Zululand Districts had more males (80%) than females (20%) in both cases. Stats SA (2011) noted that women are more responsible than men when it comes to paper work such as keeping proper records, doing accountant work and other work involving calculations and this may improve their business profitability as the proper and detailed records are kept. The results may suggest that uMkhanyakude and Zululand Districts may not be doing well in terms of their business (broiler production) viability, and this becomes clear when looking at their gross margin and gross profit margin when comparing with uThungulu District which was female dominated (Table 5.4 & 5.5).

Table 5. 2: Gender distribution of respondents

	uMkhanyakude_(n = 25)		uThungulu_(n = 25)		Zululand_(n = 25)	
<b>Gender</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Frequency</b>	<b>Percentage</b>
Male	20	80	8	33	20	80
Female	5	20	17	67	5	20
<b>Total</b>	<b>25</b>	<b>100</b>	<b>25</b>	<b>100</b>	<b>25</b>	<b>100</b>

Source: Survey data (2015)

## 5.2.3 Level of education

Ngemntu (2010) indicated that small-scale producers especially in rural areas of South Africa have little or no formal education, which makes them to be unable to make informed choices regarding farming. Usually they produce to bring food on the table for their families. Literacy has been noted to be one of the factors enabling farmers to acquire and process relevant information effectively. Bester *et al.* (1999) indicated that educational levels influence the adoption of new innovations by farmers.

The highest education level reached by uMkhanyakude small-scale broiler producers was high school, in which most farmers, about 71% had primary education and 29% had

reached high school. In uThungulu, 7% of the small-scale broiler producers never went to school at all, 36% had primary education, 50% had high school education and 7% reached tertiary education. In the Zululand District, about 31% of the small-scale broiler producers never went to school and 31% had primary education respectively, and about 33% and 4% had reached high school and tertiary education respectively. Generally the majority of the respondents had attained some formal education in all districts.

According to DAFF (2011) lack of education can affect the profitability of broiler production. Since most of the producers in the study area have some formal education, this may make it possible for them to interpret and process information systematically. This implies that with better information available to the small-scale broiler producer; the higher the likelihood of being profitable. Figure 5.1 below shows the educational levels of the small-scale broiler producers in Northern KZN Region.

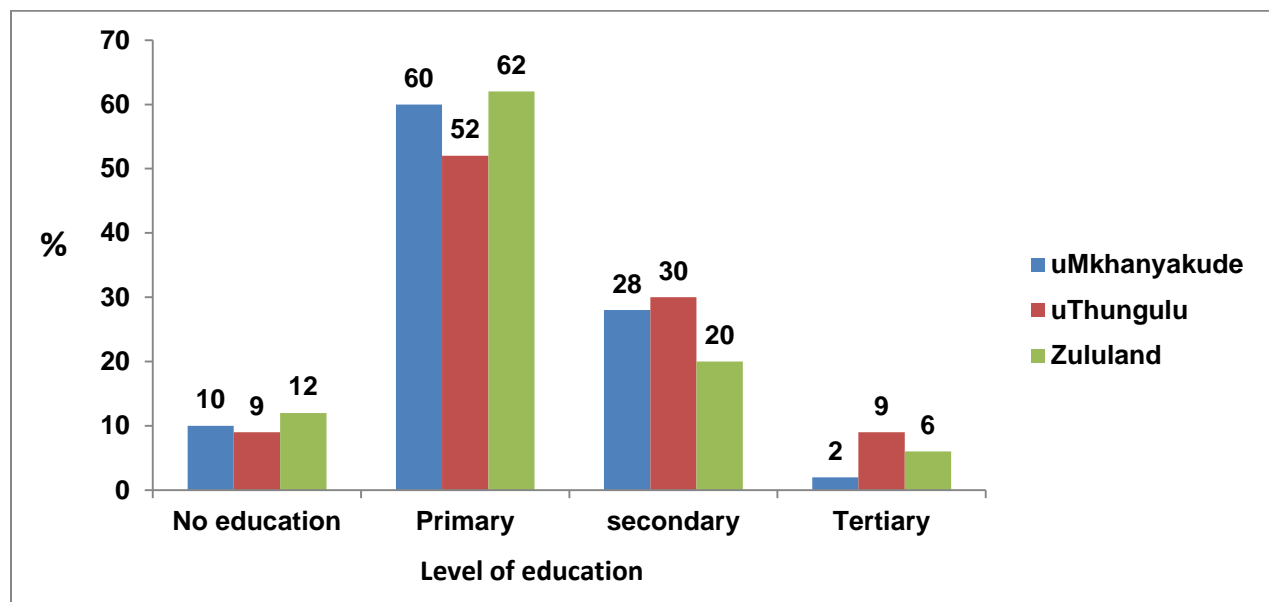


Figure 5.1: Level of education

Source: Survey data (2015)

### 5.3 Broiler production and marketing information

Broiler production and marketing information in this section refers to the production, technical and marketing information of broilers by small-scale broiler producers in the study areas. This section describes the data collected in respect to broiler production and

marketing in Northern KwaZulu-Natal (uMkhanyakude, uThungulu and Zululand Districts).

A place of selling refers to the place where marketing of broilers take place; either within the production area, in the village, pension points, retailers or in any other place set for selling to customers.

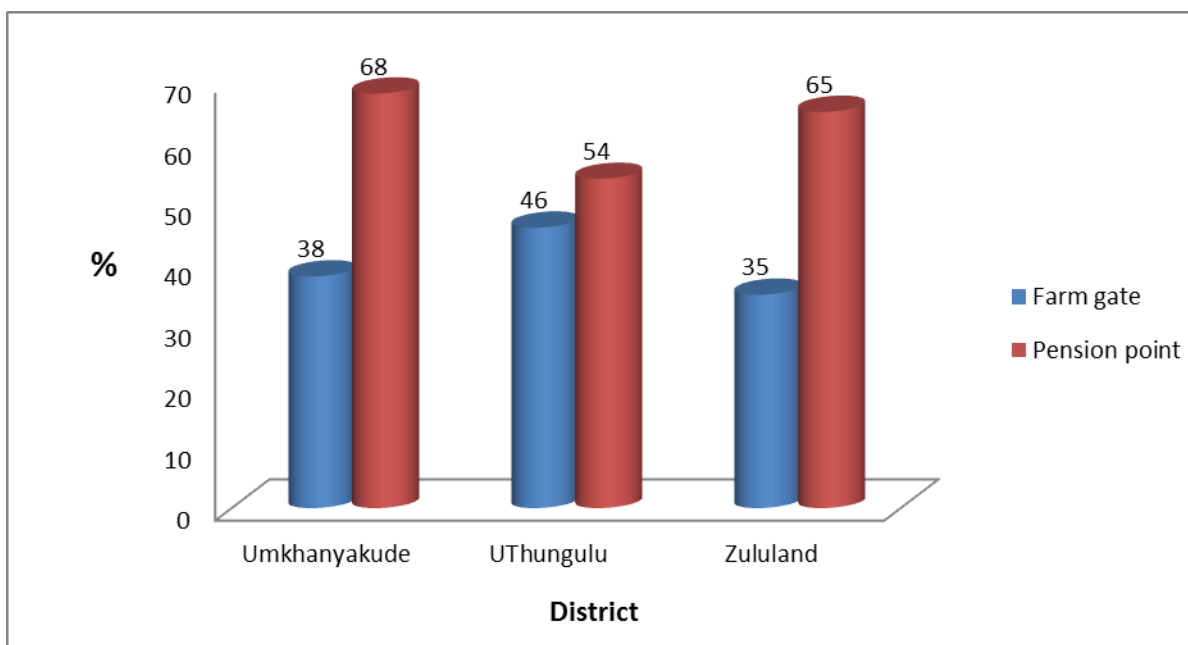


Figure 5.2: Places of selling

Source: (Survey data, 2015)

Figure 5.2 shows that most small-scale broiler producers depended on pension points for selling their broilers. The majorities (68% in uMkhanyakude, 54% in uThungulu and 65% in Zululand) indicated that their selling place was at pension pay points while the minority (35% in uMkhanyakude, 46% in uThungulu and 38% in Zululand) indicated that they sell at farm gate. None of the small-scale broiler producers travelled to sell at the nearest town or practiced bakkie trading. Possible reasons for not doing bakkie trading might be lack of own transport and that of not taking produce to the nearest town could be transport costs and at the same time not being sure if any broilers would be sold. At least, at pension pay points the seller is confident to find buyers as it is a norm for many pensioners to buy live birds when they get paid. However pensioners get paid at least once a month and this does not guarantee continued sales throughout the production



cycle. According to Bhopal (2005) lack of transport by small-scale broiler producers is a major problem and the main reason for the small-scale producers and their business not to be viable.

### 5.3.1 Small-scale broiler production challenges

Small-scale broiler producers have challenges on producing their broiler produce, these challenges includes farm production costs that are high, lack of production knowledge and theft.

#### 5.3.1.1 High farm production costs

Farm production costs refer to the costs of production inputs including day old chicks, feed (starters, finishers and post finishers), vaccine/medication, brooders and marketing costs. Table 5.3 shows the average costs of production by the small-scale broiler producers in the North Region of KZN. Costs used in this table are average costs taken from all three district municipalities (uMkhanyakude, uThungulu and Zululand).

Table 5.3: Average input costs per producer

ITEM	UNIT	COST/UNIT (R)
Feed		
Starter	50 Kg	395.00
Pellets	50 Kg	372.00
Finisher	50 Kg	358.00
Total		1 125.00
Vaccine		
Gumboro	1000 doses	65.00
Medication: Lassotta		45.00
Total		110.00

Source: Survey data (2015)

According to Table 5.3, feed prices are estimated in 50kg units and vaccine in doses. Results show that feed only (starter, pellets and finishers) costs up to R1 125.00 when combining units while dose's costs R110.00.

Inputs costs are a critical element when computing the profitability of a business. According to Naude (1998) the higher the cost of the broiler inputs the lower the gross margin which would translate to lesser profit. Small-scale broiler producers must buy inputs in bulk to reduce the costs of individual interest and to share the transport costs.

### 5.3.1.2 Skills and basic training on broiler production



Figure 5.3: Skills and basic training on broiler production Source: Survey data (2015)

Results in Figure 5.3 show that the majorities (98%) of the government funded small-scale broiler producers in the study areas across all districts agreed that they have received some training and skills on broiler production which is a good thing in terms of sustaining their production.

### 5. 3.1.4 Lack of broiler production knowledge

Relevant broiler production knowledge, financial knowledge, marketing knowledge and human resource knowledge are the key elements in good and sustainable broiler projects (FAO, 1995). Small-scale broiler producers usually lack skills of producing best broilers for market purposes. Keeping proper records for future references is always vital for future use. Clover and Darroch (2005) is of the notion that giving skills and training is very important to farmers for their broiler production to be sustainable.

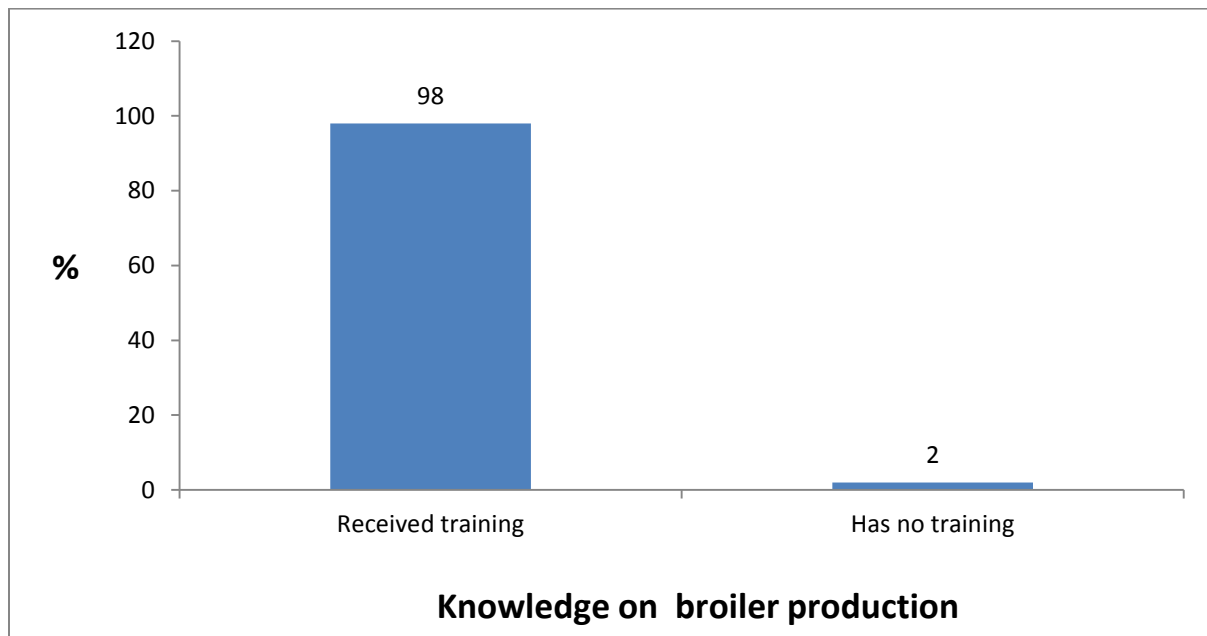


Figure 5.4 Knowledge on broiler production

Source: Survey data (2015)

Figure 5.4 indicate that most (98%) small-scale broiler producers across all districts had basic knowledge on broiler production and this has a positive impact on the profitability of the small-scale broiler projects. This helps the small-scale broiler projects to quantify the profit or loss made by the project.

### 5. 3.1.5 Access to electricity

Access to electricity imply that small-scale broiler producers are able to use modern advanced technologies for their broiler projects such as refrigeration, lighting and other technologies that require power. Respondents were asked to indicate whether they had access to electricity.

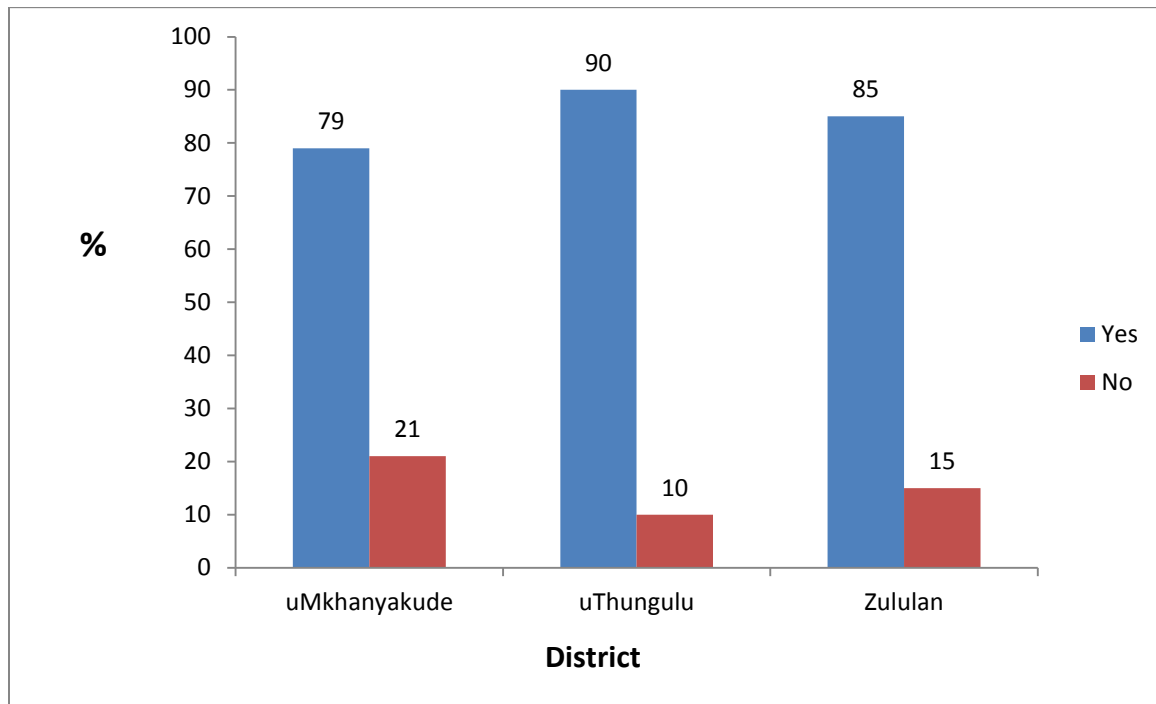


Figure 5.5 Access to electricity Source: (Survey data, 2015)

Results in Figure 5.5 shows that the majorities (79% - uMkhanyakude, 90% - uThungulu and 85% - Zululand) of small-scale broiler projects indicated that they have access to electricity. For a high and effective growth rate of the broilers; they need to get light during the dark, further more broilers need brooders for heat (DAFF, 2011).

### 5. 3.1.6 Theft

Crime in South Africa has increased from 40% to 60% in the year 2009 to 2011 (Census, 2011). This has increased the need for the small-scale broiler producers to protect their

broiler products from theft, this is why fencing is very important to be done in broiler projects.

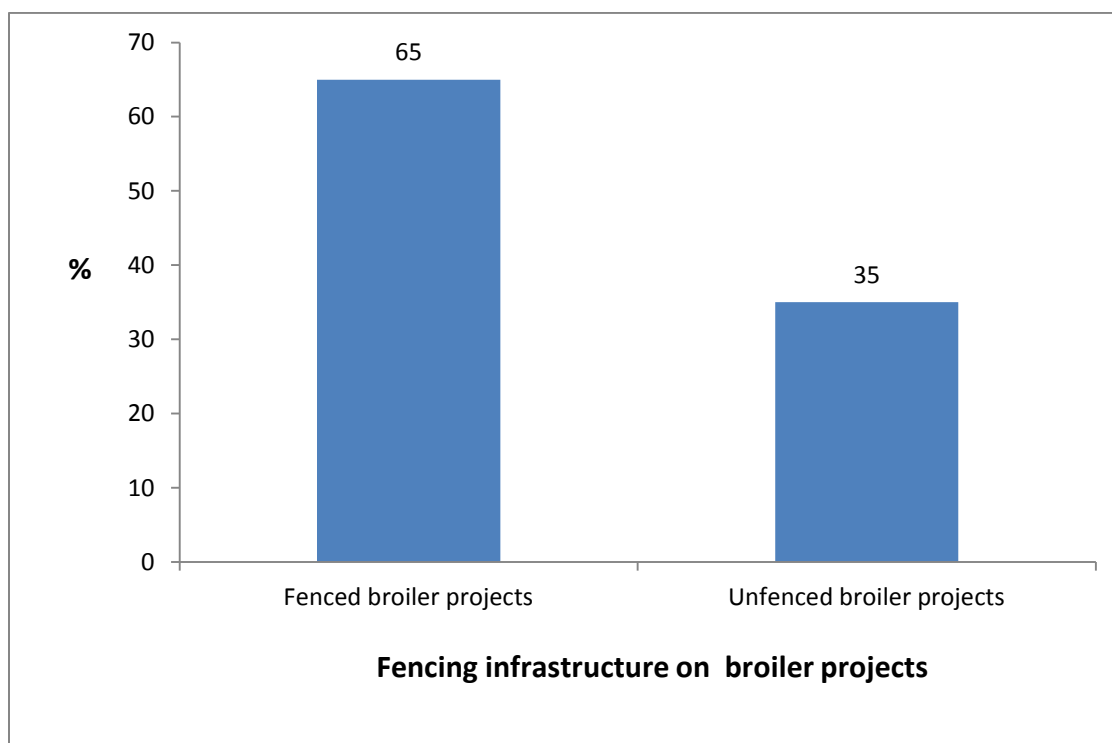


Figure 5.6 Fencing on broiler production

Source: Survey data (2015)

Results in Figure 5.6 indicate that the majorities (65%) of the government funded small-scale broiler projects are fenced; which is accepted as it reduces theft. Therefore fencing infrastructure is likely to have a positive impact on the viability of the small-scale broiler projects.

### 5. 3.1.7 Knowledge on broiler diseases

According to Clover and Darroch (2005) the poor control of known diseases can affect broiler project up to 50% mortality rate. It is very important to vaccinate and control all known disease including Newcastle.

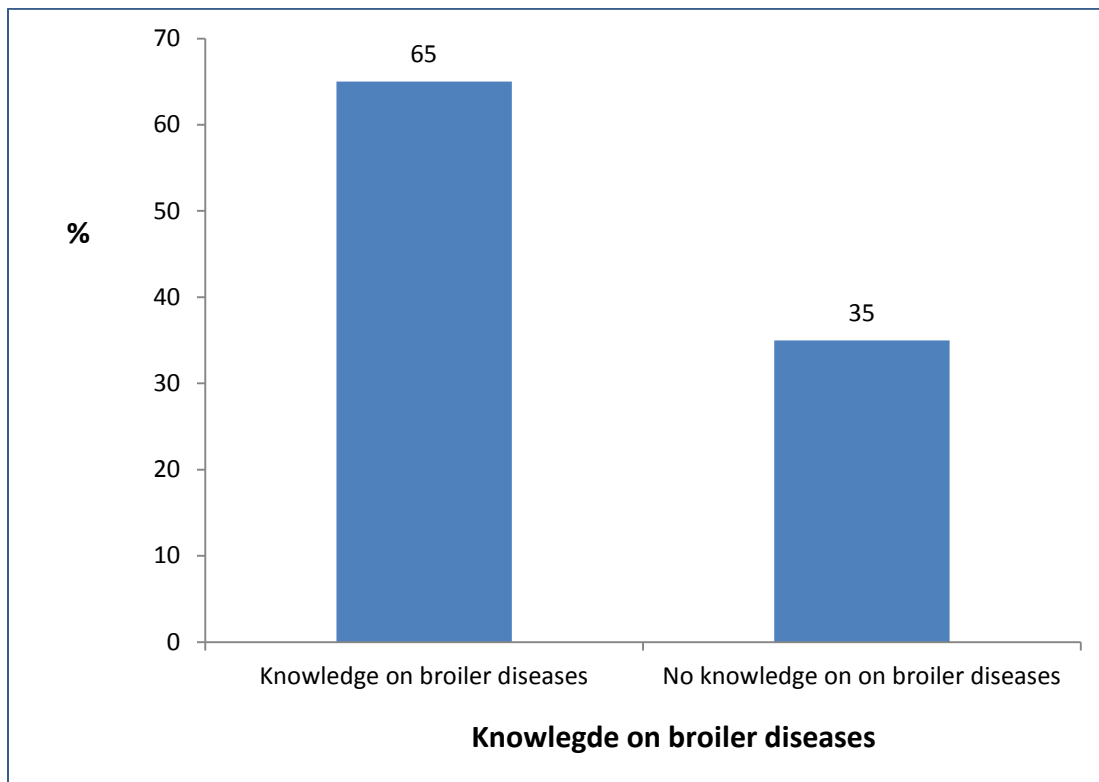


Figure 5.7 Diseases on broiler production

Source: Survey data (2015)

Results in Figure 5.7 shows that the majorities (65%) of the government funded small-scale broiler producers indicated that they have knowledge of known broiler diseases and on controlling them which is good for them to make profit on their broiler production.

#### 5.4 Small-scale broiler marketing challenges

Small-scale broiler producers have multi-challenges on marketing their broiler produce especially to the formal markets, these challenges includes access to formal markets, unsold broiler market and lack of regular customers.

##### 5. 4.1 Lack of access to markets

All small-scale broiler producers across all three districts (uMkhanyakude, uThungulu and Zululand) indicated that they did not have access to formal markets. This makes it difficult for the small-scale broiler producers to sell all their products on time because

most formal markets prefer slaughtered broilers. This is likely to have a negative implication on the profitability of the broiler enterprises due to unsold broilers. All the interviewed government funded small-scale broiler producers across all three districts (uMkhanyakude, uThungulu and Zululand) indicated that they had a problem of having their broilers left after selling some to the informal market. The challenge is that of keeping the unsold broilers.

When asked what is done to the unsold chickens, all respondents (100%) indicated that they keep them and sell at a later date. Apparently, they cannot slaughter the broilers because they do not have freezers to keep slaughtered chickens. Therefore, they are forced to keep the birds live. However, this is costly in terms of feeding costs and they end up not making profits. The finding is in line with those of DAFF (2012) that more than 60% small-scale broiler producers receive lower gross margin because of feeding the matured broilers that are ready for the market but remain unsold.

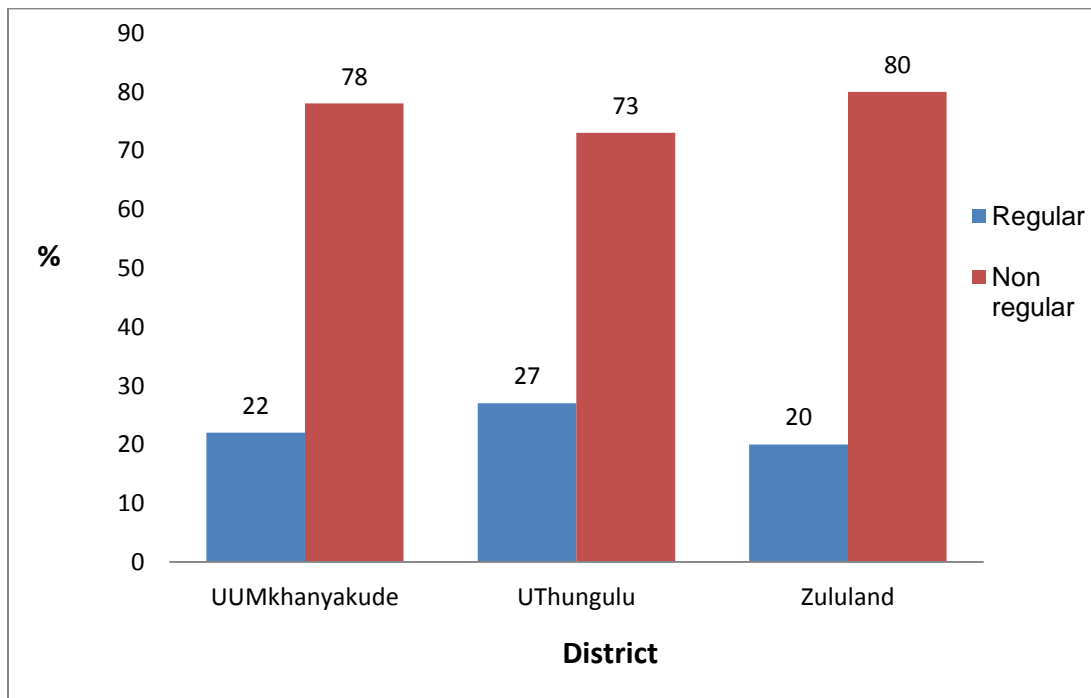


Figure 5.8 Proportion of regular customers

Source: (Survey data, 2015)

Results in Figure 5.8 show that the government funded small-scale broiler projects have less than 30% regular customers. The majorities (78%, 73% and 80%) in uMkhanyakude,

uThungulu and Zululand Districts of the government funded small-scale broiler projects indicated that they do not have regular customers. According to Gabre-Madhin (2005) it is not good for a business to have few regular customers because there is no assurance that produce will be marketed. With lesser regular customers; there is no surety of selling all the broilers produced; that means no surety of the profit on the recorded time.

#### 5.4.6 Lack of transport and high cost of transport

Problems encountered in moving the product to the market refers to the challenges that small-scale broiler producer's encountered during marketing when they deliver their broilers to the market.

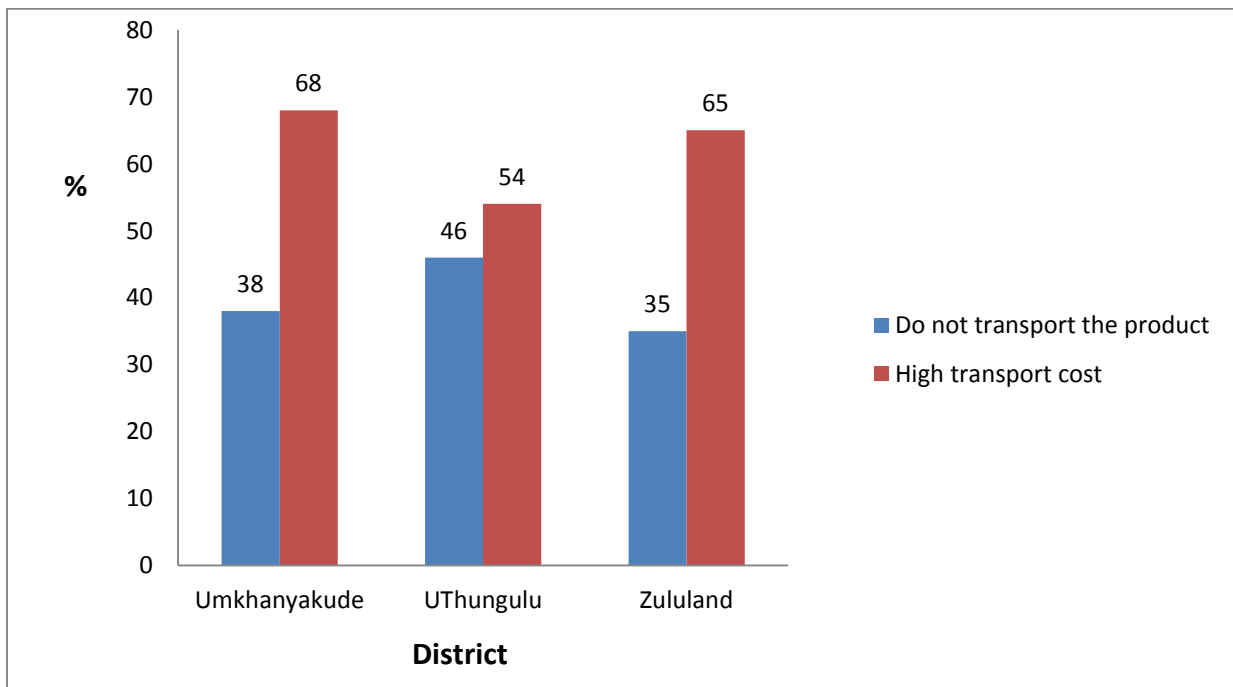


Figure 5.9 Problems encountered in moving the product to the market

Source: (Survey data, 2015)

Figure 5.9 shows that most small-scale broiler producers depended on a hired transport which is associated with high costs. The majorities (68% in uMkhanyakude, 54% in uThungulu and 65% in Zululand) indicated that their ways of transporting their produce is through hired transport while the minority (38% in uMkhanyakude, 46% in uThungulu and 35% in Zululand) indicated that they do not transport their broiler products. According to



the respondents, transport for hire is available. However, the problem is the high fee that is charged by the owners of bakkies. The study found that no producer owned a vehicle that could be used in the operation of the project. Figure 5.8 shows that most small-scale broiler producers do not have transport to move their produce and therefore rely on hired transport. According to Gabre-Madhin (2005) the high transport cost reduces the profit as it increases the transaction costs.

#### 5.4.7 Long distance to markets

Distance to market refers to the distance from the broiler project location to the marketing place, which has an impact on the transport costs. Respondents were asked to indicate the distance in kilometres to the market – selling point.

Table 5.4: Minimum, maximum and average distance to markets (km)

	Minimum (km)	Maximum (km)	Mean (km)
UMkhanyakude	2	30	16
UThungulu	3	24	13.5
Zululand	3	27	15
All districts	2	30	14.6

Source: (Survey data, 2015)

Table 5.4 shows that on average, small-scale broiler producers travelled longer distances (about 15km) to selling points. The maximum distance travelled was 30km in uMkhanyakude, 24km in uThungulu and 27km in Zululand. The minimum distance traveled was 2km in uMkhanyakude, 3km in uThungulu and 3km in Zululand. These results generally show that the small-scale broiler producers in some cases had to travel longer distances to selling points. According to Clover and Darroch (2005) the longer the distance traveled the higher the transport costs thus the lesser the profits realized.

#### 5.4.8 Lack of access to market information

Access to market information is very important to consider as this gives a guide on the present and future prices of broiler produce. Respondents were asked to indicate whether they had access to market information.

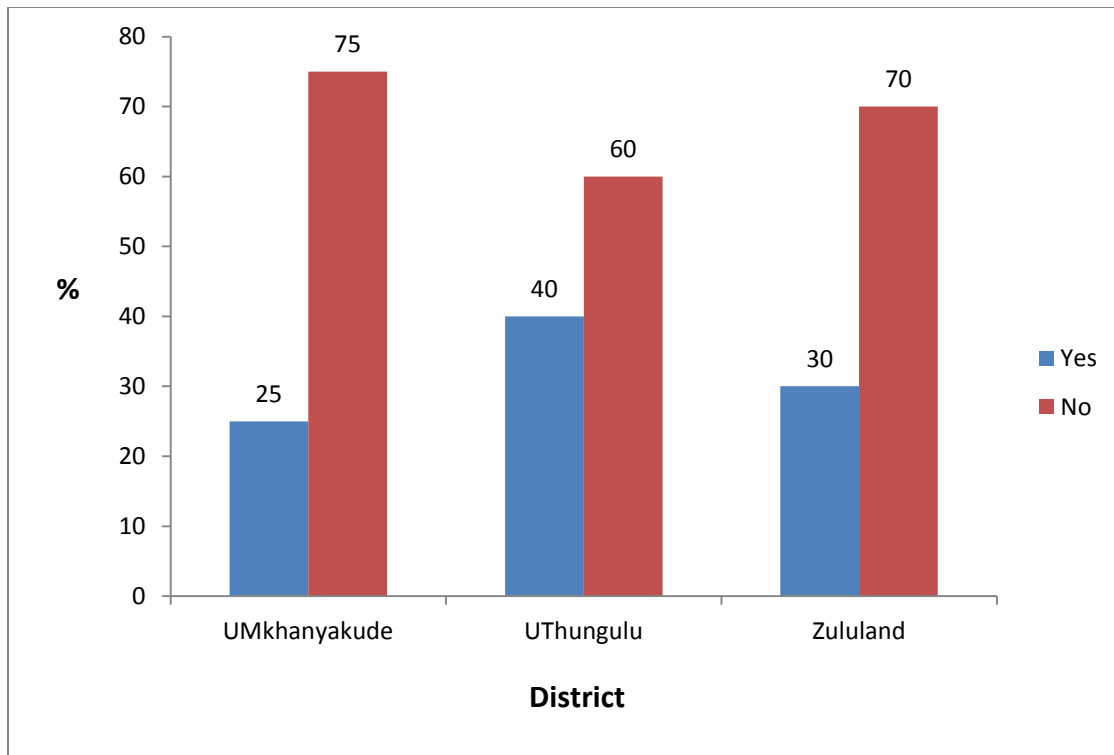


Figure 5.10: Access to market information

Source: (Survey data, 2015)

Figure 5.10 shows that most small-scale broiler producers have no access to broiler market information. The majorities (75% in uMkhanyakude, 60% in uThungulu and 70% in Zululand) indicated that they had no access to market information while the minority (25% in uMkhanyakude, 40% in uThungulu and 30% in Zululand) had access to market information. According to Gabre-Madhin (2005) lack of market information reduces the viability of the project because there is no guarantee that all broiler will be sold on time.

#### 5. 4.8.1 Sources of market information

Sources of market information refer those with broiler marketing information. Respondents were asked to indicate the sources of market information.

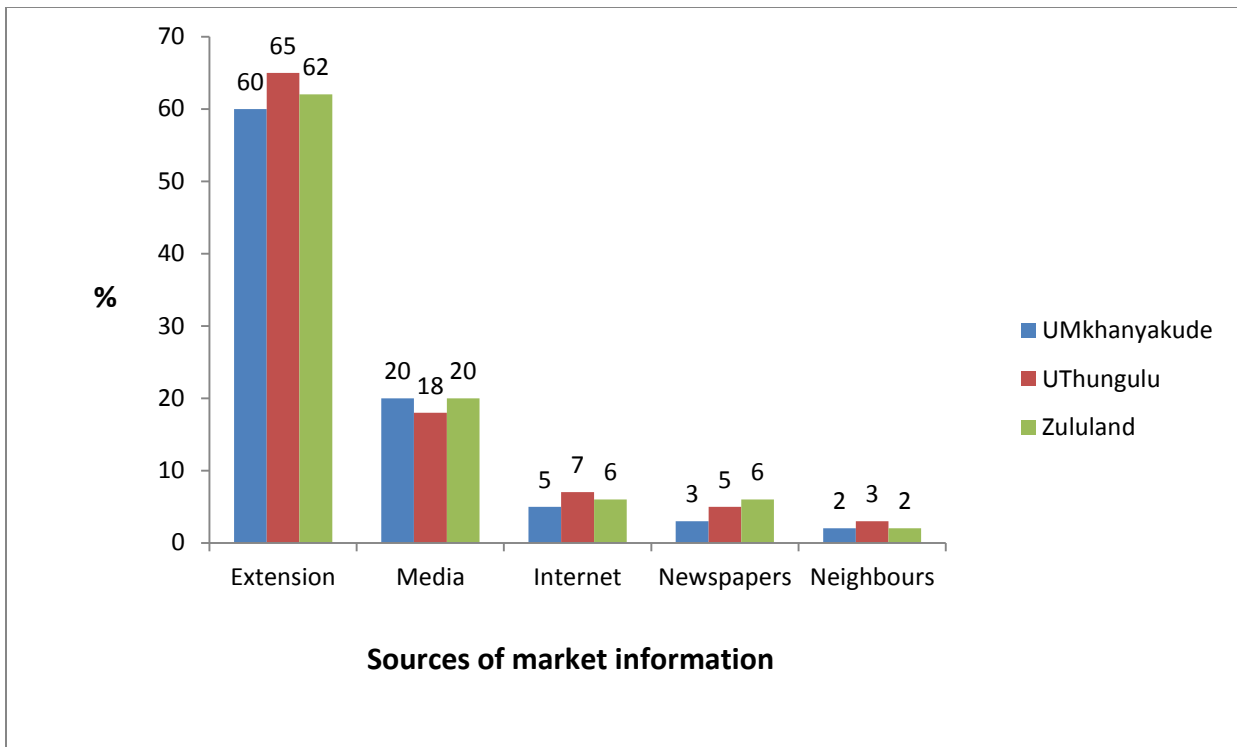


Figure 5.11: Sources of market information Source: (Survey data, 2015)

Figure 5.11 shows that most (60% in uMkhanyakude, 65% in uThungulu and 62% in Zululand) small-scale broiler producers depended on extension services as a source of market information. The second most important source of market information as indicated by the government funded small-scale broiler producers was the media (radio and television). Other sources of market information though to a lesser extent included the internet and newspapers. According to Naude (1998) lack of sources of market information has a negative impact on the viability of small scale broiler projects.

#### 5.4.9 Lack of proper processing and storage facilities (abattoirs/refrigeration)

Access to storage facilities refers to the facilities that are kept to store the produce that are ready for market. Respondents were asked to indicate whether they had access to processing and storage facilities such as abattoirs and refrigerators. All respondents (100%) indicated that they did not have access to proper processing and storage facilities such as abattoirs and refrigerators. According to Bhopal (2005) most formal markets prefer buying slaughtered broiler produce. The live broilers deprive small-scale broiler

producers from selling all of their broiler production on time and thus this can have negative impacts on broiler profitability.

### 5. 3.1.19 Lack of extension services

Extension plays a crucial role in empowering farmers with farming knowledge, techniques and skills (Kaliba, Verkuijl & Mwangi, 2000). Therefore, it is critical to assess the availability of extension services as it can influence a farmer’s decision on broiler production by the small-scale broiler producers.

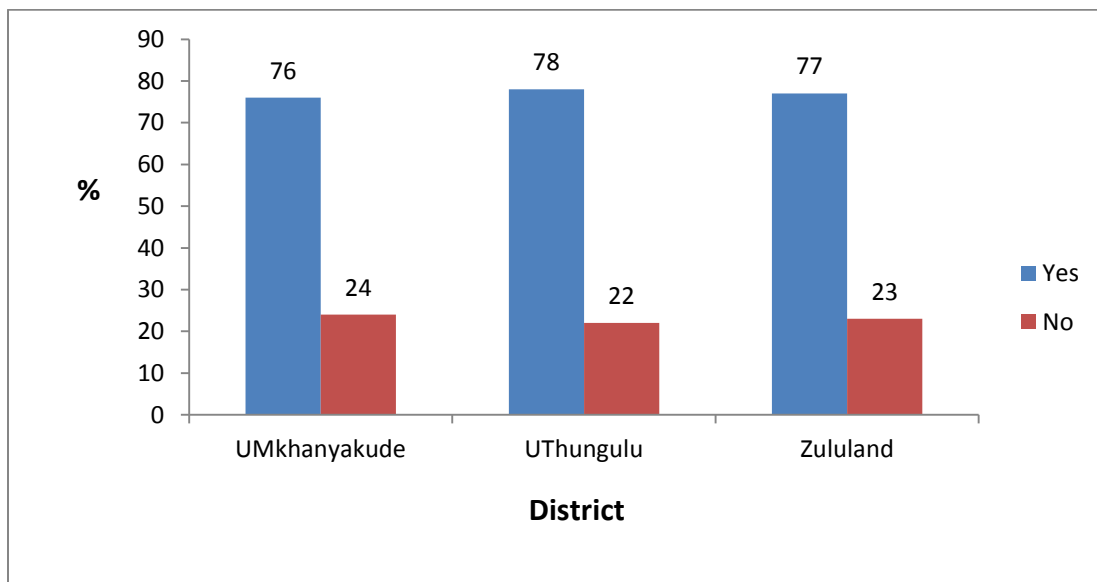


Figure 5.12 Access to extension services

Source: (Survey data, 2015)

Figure 5.12 shows that most government funded small-scale broiler producers had access to extension services. The majorities (76% in uMkhanyakude, 77% in uThungulu and 78% in Zululand) indicated that their broiler production depended on extension services while the minority (24% in uMkhanyakude, 23% in uThungulu and 22% in Zululand) indicated that they did not have access to extension services. According to DAFF (2011) extension services plays an important role on improving broiler production and improving marketing ability of small-scale broiler production.

## **5. Gross profit margins analysis**

This section presents the gross margin and gross profit margin analysis. Here gross profit margin from government funded small-scale broiler producers are compared with those from Rainbow Chicken (a large scale broiler producer) in terms of its gross margin per production term for the period of 2014/15 financial year. Data for Rainbow Chicken gross margins was obtained from Rainbow Chicken SA. Rainbow chicken is the largest chicken producer in the country. Rainbow Chicken does sign grower contract agreements with broiler farmers.

The farmers who meet Rainbow Chicken requirements can sign the grower contracts and then grow broilers on behalf of Rainbow Chickens. One of the main requirements for a farmer to qualify for consideration is that farmer's production site should be within a radius of 80 km. Since the North Region is outside the postulated radius, the farmers of North Region cannot be considered for the grower contract agreement with Rainbow Chickens. The small-scale broiler producers keep broilers for seven weeks and the "rest period" for the house is two weeks. This gives 5.8 batches per annum. According to DAFF (2011) a four percent mortality rate is expected in small-scale broiler producers, and it was used in the computation of the gross margins and gross profit margins.

### **5.4.1 Gross margin analysis**

Gross margins were calculated for all the government funded small-scale broiler producers under study (*see appendix 1* for the average gross margins). The mean gross margin was obtained from the interviewed government small-scale broiler producers and compared to that of Rainbow Chickens' gross margin to assess their viability. Table 5.5 indicates the minimum, maximum and mean gross margin for the government funded small-scale broiler producers in comparison to that of Rainbow chicken.

The results show that the government funded small-scale broiler producers are getting a mean gross margin of R1 935.01 per 100 broiler batch across all districts and Rainbow chickens producers are getting a mean gross margin of R3 050.06 per 100 broiler batch. The results show that Rainbow chickens producers are getting a higher average gross

margin compared to the government funded small-scale broiler producers. This is expected due to the fact that Rainbow chickens producers use bulk feed, medication and controlled environments that contribute to the increased gross margins. Government funded small-scale broiler producers have a lower mean gross margin because they are still using the low input technology which may affect their gross margin. Nonetheless, the gross margins obtained by the government funded small-scale broiler producers is positive suggesting that this enterprises is viable (profitable).

Table 5.5 Comparison of mean gross margin for government funded small-scale broiler producers versus those of Rainbow Chickens (R/ 100 broiler batch)

	Government funded small-scale broiler producers				Rainbow Chickens
	uMkhanyakude	uThungulu	Zululand	All 3 Districts	
Mean Total Gross Income	4,320.00	4,320.00	4,320.00	4,320	5248.00
Mean Total Allocable Costs	2,797.28	2,389.28	2,521.88	2 569.48	2,197.94
Mean Gross margin	1,522.72	1,930.72	1,798.12	1 750.52	3,050.06

Source: Survey data (2015)

#### 5.4.1 Gross profit margin (GPM) analysis

Gross profit margins were further calculated for all the government funded small-scale broiler producers under study (see appendix 1 for the average gross profit margins). Table 5.6 shows the mean gross profit margins for uMkhanyakude, uThungulu and Zululand Districts in comparison to those of Rainbow Chickens. The results show that the

mean gross profit margin for all the districts was about 31% and the mean gross profit margin for Rainbow chickens was about 58%. Both Table 5.4 & 5.5 shows that both gross margin and gross profit margin for the government funded small-scale broiler projects are positive though their profit margin is less when compared to that of Rainbow chickens meaning that small-scale broiler producers need to put extra effort in production management, financial management and marketing strategies so that their broiler production can be more viable.

From the three selected districts, uThungulu was more profitable (with a GPM of about 54%) followed by Zululand (with a GPM of about 42%) and lastly uMkhanyakude (with a GPM of about 35%). uThungulu District performed better than Zululand and uMkhanyakude Districts because it has better formal markets than the other districts, better roads and water services when compared to Zululand and uMkhanyakude Districts.

Table 5.6 Comparison of the mean gross profit margin for government funded small-scale broiler producers versus those of Rainbow Chickens (R/ 100 broiler batch)

	<b>Government funded small-scale broiler producers</b>				<b>Rainbow Chickens</b>
	<b>uMkhanyakude</b>	<b>uThungulu</b>	<b>Zululand</b>	<b>All 3 Districts</b>	
Mean Gross Profit Margin	0.352	0.53.75446	0.416	0.310	0.577

## 5.6 Chapter summary

This chapter presented and discussed the descriptive analysis of the study. Small-scale broiler producers' demographics, their socio-economic characteristics and the gross margin and gross profit margin analysis are presented and discussed in the chapter. The results of the survey revealed that generally, production challenges included high input

costs and lack of abattoir/refrigeration infrastructure while marketing challenges included lack of own transport, limited sources of market information market and lack of access to formal markets. All these challenges are likely to affect the profitability of the small-scale broiler projects. Generally, the results of the survey suggest that the small-scale broiler producer demographics and socio-economic characteristics may have an influence on the viability of the small-scale broiler projects. In addition, gross margins and gross profit margins for the government funded small-scale broiler producers were computed. The gross profit margin analysis shows that the government funded small-scale broiler projects in Northern KZN region have a positive gross margin and gross profit margin indicating that they are profitable but less profitable when compared to a large scale broiler producer - Rainbow Chickens. The next chapter presents the empirical results of the study on the factors influencing the profitability of government funded small-scale broiler projects.



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# **CHAPTER 6**

## **EMPIRICAL RESULTS AND DISCUSSION**

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### **6.1 Introduction**

This chapter presents the empirical results of the study. A multiple regression model was employed to determine the factors influencing the profitability of government funded small-scale broiler projects that was formulated and explained in Chapter 4. Within the chapter, the independent (explanatory) variables are tested for their significance and conclusions are drawn based on the results. An in-depth explanation is provided for the statistically significant variables.

### **6.2 Factors affecting the profitability of government funded small-scale broiler projects (multiple regression analysis)**

A multi regression analysis was used to test for the factors that have an influence on the profitability of broiler production in the study areas. The dependent variable used in this study is the gross margin (GM). The method was adopted from Zulu (2011) regressed against independent variables that included the age of the small-scale broiler producer, gender of the small-scale broiler producer, years of schooling of the small-scale broiler producer, farm gate price, access to markets (yes/no), distance to market (km), access to market information (yes/no), access to own transport (yes/no), access to storage facilities (yes/no) and access to electricity.

### **6.3 Variables excluded from the model**

There are several variables that were targeted for inclusion in the model. However due to some variables being constants (access to own transport, access to markets and access to storage facilities); the variables were eventually excluded from the final model.

## **6.4 Model Fit**

The unadjusted multiple R-Square for this data is 0.850 and the adjusted multiple R-Square is 0.832. This suggests the model accounts for about 83% of the total variability. The assumption in running the multiple regression models was that errors in regression are independent. This assumption was met by computing the Durbin-Watson statistic. The Durbin-Watson statistic is computed to test for serial correlation (whether adjacent error terms are mutually correlated). The Durbin-Watson for this data is 1.504. A Durbin-Watson statistic that is around 2 (between 1 and 3) is normally acceptable. In addition, the variance inflation factors (VIF) were used to inspect the level of multicollinearity between the independent variables. The variance inflation factor (VIF) quantifies how much the variance is inflated. A VIF of 1 suggests that there is no correlation among the  $k^{\text{th}}$  predictor and the remaining predictor variables, and hence the variance of  $b_k$  is not inflated at all. The general rule of thumb is that VIFs above 4 warrant further analysis, while VIFs above 10 are indicators of serious multicollinearity. The classification accuracy in this data indicated multicollinearity was not a problem and thus the correctness of the model.

## **6.5 Results of the multiple regression analysis on factors affecting the profitability of government funded small-scale broiler projects**

Table 6.1 presents the empirical results of multiple regression analysis used to determine the factors affecting the profitability of government funded small-scale broiler projects. Results show that factors that significantly influenced profitability of government funded small-scale broiler projects included gender, farm gate price, access to market information and access to extension services.

Table 6.1: Factors influencing the profitability of government funded small-scale broiler projects in Northern KZN

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	VIF
	$\beta$	Std. Error	$\beta$			
Constant	-320.484	143.637		-2.231	0.029	-
Age	21.551	19.257	0.058	1.119	0.267	1.213
Gender	1.176*	0.642	0.101	1.832	0.071	1.360
Educational level	15.469	11.044	0.075	1.401	0.166	1.263
Farm gate price	27.218***	1.699	0.951	16.016	0.000	1.572
Distance to market	-5.142	6.291	-0.046	-0.817	0.417	1.420
Access to market information	-40.745*	23.426	-0.095	-1.739	0.087	1.321
Access to electricity	-1.603	27.490	-0.003	-0.058	0.954	1.297
Access to extension	68.865**	25.296	0.140	2.722	0.008	1.179
Number of observations	75					
R-square (Adjusted R-Square)	0.850 (0.832)					
Durbin Watson	1.504					

\*\*\* Significant at 1% \*\* Significance at 5%, \* Significance at 10%

The variable gender is statistically significant at 10% significance level ( $p=0.071$ ) and positively related to the gross margin. The model predicts that the "effect" of being a male small-scale broiler producer (male coded with 1) is about 1.2% greater than being a female small-scale broiler producer (female coded with 0) on gross margin. The results suggest that male small-scale broiler producers are more profitable than female small-scale broiler producers. This is in contrast with other studies for example Bagamba *et al.* (1998) and Manona (2005) who postulated that women in small businesses are more likely to be profitable than men. However on the other hand these findings are supported by Hilmi *et al.* (2011) that man are more profitable than women. Some reasons for men to be more profitable than women in most rural areas could be that although most

businesses such as poultry are considered a women business; women have little or no access to for example to resources, infrastructure, land and credit and as a result they tend to have less economic benefits of such activities.

The variable farm gate price is statistically significant at 1% significance level ( $p=0.000$ ); and positively related to the gross margin. The model predicts that a one (1) unit increase in farm gate price is associated with a 27.218 unit increase in the gross margin. That is an increase in the farm gate price would result in an increase the gross margin. This is in agreement with the prior expectation. This is true because generally a price increase would result to increased revenue and thus increased gross margin. These findings are in agreement with those of Zulu (2011) who also found that the farm gate price is positively associated with the gross margin.

The variable access to market information is statistically significant at 10% significance level ( $p=0.087$ ) and negatively related with the gross margin. The regression model suggests an improvement in access to market information (coded with 1) would result in a decrease in the gross margin by about 41%. This is in disagreement with the prior expectation and in contrast with many studies for example a study by Chetroiu and Lurchevici (2012) who indicated that access to market information is positively related to gross margins. These findings could be explainable by descriptive results that revealed that the total allocable costs by the small-scale broiler producers were higher than those of a large scale broiler producer (Rainbow chicken). This in turn translates to lower GMs realized by small-scale broiler producers also given the fact that they do not perform value adding to their products. This therefore suggests that acquiring more market information and intelligence through pathways such as the internet a and other means and/or sources other than government extension services already available, may be costly to small-scale broiler producers who are already burdened by producing at higher costs.

The variable access to extension services is statistically significant at 5% significance level ( $p=0.008$ ) and positively related to the gross margin. The model predicts that access

to extension (coded with 1) would result in an increase in gross margin by about 69%. The results show that an improvement in the access to extension services greatly result in an increase the gross margin. This is in agreement with the prior expectation. These findings are supported by Chetroiu and Lurchevici (2012) who indicated that access to extension is positively related to gross margins. Extension is likely to play a positive role on small-scale broiler production through improved broiler management and broiler marketing aspects.

## **6.6 Chapter Summary**

This chapter presented and discussed the results of the empirical analysis on factors influencing the profitability of government funded small-scale broiler projects in Northern KZN. Results indicate that gender, farm gate price, access to extension services have a positive and significant effect to gross margin whereas access to market information showed a negative and significant effect to gross margin in the study areas. The next chapter presents the overall summary, conclusions and recommendations of the study.

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# **CHAPTER 7**

## **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

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### **7.1 Introduction**

This chapter presents a summary of the research findings and draws conclusions and put forward recommendations for the government funded small-scale broiler projects.

### **7.2 Summary**

The main aim of the study was to assess the economic viability (profitability) of the government funded small-scale broiler projects in Northern KwaZulu-Natal. A probability sampling procedure was employed to sample 75 small-scale broilers producers under the KZN North region. Simple random sampling procedure was used. The advantage for using a random sample is the absence of both systematic and sampling bias (Bless & Smith, 2000). Not all government funded small-scale broiler producers in the study areas were selected for the study; but a sample was drawn. For the sample to best represent the total population, a complete sampling frame was employed. A complete sampling frame was obtained from the KZN Department of Agriculture. In total there are about 134 small-scale broiler projects that have been funded by the KZN Department of Agriculture. A total of 75 small-scale broiler projects (25 broiler projects in each district – uMkhanyakude, uThungulu and Zululand) were investigated. Under this broad objective, the specific objectives were:

- 1) Firstly, to determine production challenges faced by government funded broiler projects in Northern KZN. The study found that the challenges constraining government funded small-scale broiler projects in Northern KwaZulu-Natal included the high input costs especially for feed, electricity and vaccines. In addition, the small-scale broiler producers also lacked production and management skills.

2) Secondly, to analyse the marketing channels used by the government funded small-scale broiler projects in Northern KZN. The study found that there were no formal markets used by the small-scale broiler producers to sell their broiler produce; as most formal markets prefer slaughtered broilers. In the case of these small-scale broiler producers, they do not have the slaughtering and storing facilities; and thus this negatively impacted on them in terms of accessing formal markets and as a result they marketed their produce to informal markets which include pension points, farm gate, selling to the vendors and to the nearby households.

3) Thirdly, to determine the marketing challenges faced by government funded small-scale broiler projects in Northern KZN. Customers generally prefer the slaughtered and packed broiler carcass than live broilers. The result of the study where else indicated that the small-scale broiler producers in the study areas do not have the necessary facilities for slaughtering and packaging. Other marketing challenges included lack of access to formal markets, unavailability of proper processing and storage facilities, long distances to the market and lack of own transport that resulted in the use of expensive hired transport to collect inputs and to deliver the broiler product to the market and were the main market challenges.

4) Fourthly, to determine the viability of government funded small-scale broiler projects in Northern KZN. The study found that the gross margins and gross profit margins of government funded small-scale broiler projects are positive and are thus viable. However, when compared to a large scale producer like Rainbow chicken, the government funded small-scale broiler projects were less profitable. The findings suggest there is still a need for small-scale broiler producers to improve their management and marketing skills and lower feed and accumulation costs through bulk purchasing.

5) Lastly, to determine the factors influencing profitability of government funded small-scale broiler projects in Northern KZN. The study found that gender, farm gate price, access to market information and extension services were significant factors influencing the profitability of government funded small-scale broiler

projects in the study areas. Gender, farm gate price and access to extension services were found to be positively related to gross margin whereas access to market information was surprisingly found to be negatively related to gross margin.

### **7.3 Conclusion**

In conclusion, the study found that unavailability of formal markets and high input costs are the major constraints faced by the government funded small-scale broiler producers in Northern KZN. It was found that small-scale broiler projects relied on the local informal market which buys live chicken. Even though the government funded small-scale broiler projects were found to be profitable, they were not as much viable as the large scale broiler producer like Rainbow chicken due to some of these constraining factors. The government funded small-scale broiler producers are failing to penetrate the formal market because of the lack of value addition and their distance away from markets. The main requirement for participating in a formal market is to supply slaughtered chicken. These projects are not able to meet this requirement because they do not have formal facilities to slaughter birds. It is very difficult to run a sustainable broiler project that produces only live-birds if there is no market to take them all at a particular time.

### **7.4 Recommendations**

Profitable broiler production requires a high degree of efficiency. After going through the assessment, the following recommendations are made:

#### **7.4.1 Strategies for improving skill of women in broiler production.**

The study generally found that there were more females than males in the study areas. Interestingly the empirical results predict that males have a greater economic viability than females. However many studies show mixed feelings on this aspect. Bagamba *et al.* (1998) noted that women are more responsible than men when it comes to paper work such as keeping proper records, doing accountant work and other calculating work. It may not be accurate to generalize that small-scale male broiler producers are profitable than female small-scale broiler producers. Since in many cases women are actively involved in the small-scale broiler projects particularly in rural areas (Martin, Frands. and Robyn



2011). The study recommends empowering women producers with necessary resources and improving their access to markets. Again the study recommends encouraging men to be involved in small business enterprises such as small-scale broiler production rather than migrating to mining areas or urban areas in search of employment.

#### **7.4.2 Improving farm gate prices**

At present, the farm gate price of a broiler in the Northern Region is around R70 per broiler. According to Martin *et al* (2011) and other industry watchers, the production cost of broiler production is around R50 per broiler. The small-scale broiler producers pass those costs to the consumers. The broiler industry hopes that this new initiative will help in arresting the failing farm gate prices of broilers. It is important that the products, the market channels and the markets are properly organized. It is very difficult to run a sustainable broiler project that produces only live-birds if there is no market to take them all at a particular time. It is therefore recommended that the products of the broiler projects should be diversified so as to allow broilers to be ready for the market at six weeks of age. The broiler project should have organized market channels and market to take some of the live birds slaughtered at six weeks of age. Broiler projects are struggling to market their chickens. They are only depending on the local informal market which buys live birds. These projects cannot penetrate the formal market which buys slaughtered chickens. It is therefore recommended that a poultry abattoir is established to give broiler projects an opportunity to penetrate the formal market. It is however not clear if the abattoir will be able to compete in terms of price and quality with large brands such as Rainbow Chickens. There is a belief that large brands brine their chickens. This makes their products look good in the eyes of the customers. This will pose a challenge to the abattoir. Therefore, it is recommended that the abattoir should target government institutions such as government hospitals, prisons, and education departments for a reliable market. Municipalities can play a major role in establishing and controlling those broiler abattoirs and also attracting local government departments, retailers, international markets and others.

### **7.4.3 Strategies for improving access to information**

Most of the projects that are successful have individuals who have certain skills that are relevant to the operations of the broiler projects. The essential skills such as record keeping, financial management, business management and broiler production technical skills are crucial to the success of the projects. Trainings will be more beneficial if people who get trained are either the committee members or members who are able to influence and train the whole group or labourers. It is imperative that the project members should receive skills training that cover all the relevant aspects of the project as indicated above. Market information is important for a project to be sustainable. Government extension services have to play an important role in disseminating market information. The study suggest that small-scale broiler producers should use other sources of information and not to rely on one source of market information which is the extension services but to use other sources such as media, internet, newspapers and neighbours. For optimum production, it is important that input suppliers deliver on time and deliver quality products at a reasonable cost. The following essential inputs such as chicks, feed, wood shavings are being sold at high prices. This situation affects the production process thus the final product of the project. The pricing system also gets affected as the produced birds would not compete with other producers in areas next to urban areas. The farmers in these areas are able to produce at low prices and sell cheaper than most of the rural areas. The study found that the major production challenge that the projects are facing is the high input costs. To minimise inputs costs, farmers may be encouraged to buy inputs collectively and in bulk.

### **7.4.4 Strategies for improving access to extension services**

Market information is important for a project to be sustainable. Government extension services have to play an important role in disseminating market information. Extension services are the main source of information for the small-scale broiler producers. Extension services must be equipped with recent information because small-scale broiler producers are relying on them. Extension services are the source of information that most

small-scale broiler producers are dependent on. The improvement on extension service can improve the profitability of small-scale broiler producers.

### **7.5 Suggestions for future research**

The study assessed the viability of government funded small-scale broiler producers in the Northern KZN. The study found that these projects are economically viable, however, the socio-economic impact it has on the small-scale broiler producers was not investigated. Future research can focus on the socio-economic impact of the government funded small-scale broiler producers and the broader community at large.

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## Appendix

### Appendix 1: Gross margin and gross profit margins (income and cost budget)

#### Appendix 1.1: Average income and cost budget for uMkhanyakude

ESTIMATED INCOME	UNIT	PRICE/UNIT (R)	QUANTITY PER BATCH	VALUE PER BATCH (R)
<b>Gross Income</b>				
Sale of Live Birds	Each	45.00	96.00	4,320.00
<b>Total Gross Income (A)</b>				<b>4,320.00</b>

ESTIMATED COSTS	UNIT	PRICE/UNIT (R)	QUANTITY PER BATCH	COST PER BATCH (R)
<b>Less: Allocable Costs</b>				
Day-old chickens	Each	4.40	100.00	440.00
Feed:				
Starter Crumbles	50kg	177.30	2.00	354.60
Grower Pellets	50kg	166.35	3.00	499.05
Finisher Pellets	50Kg	156.55	4.00	626.20
Vaccinations:				
Newcastle Disease 1	1000 doses	34.40	0.20	6.88
Newcastle Disease 2	1000 doses	28.75	0.20	5.75
Gumboro	1000 doses	62.40	0.20	12.48
House sanitation	Batch	84.35	0.20	16.87
Transport:				400.00
Day-old chickens	Batch	173.00	0.20	34.60
Shavings	km	3.46	100.00	346.00
Contingencies	2.00%			54.85
<b>Total Allocable Costs (B)</b>				<b>2,797.28</b>

<b>GROSS MARGIN (A-B)</b>	<b>1,522.72</b>
<b>Gross profit margin</b>	<b>0.35</b>

## Appendix 1.2: Average income and cost budget for uThungulu

ESTIMATED INCOME	UNIT	PRICE/UNIT (R)	QUANTITY PER BATCH	VALUE PER BATCH (R)
<b>Gross Income</b>				
Sale of Live Birds	Each	45.00	96.00	4,320.00
<b>Total Gross Income (A)</b>				<b>4,320.00</b>

ESTIMATED COSTS	UNIT	PRICE/UNIT (R)	QUANTITY PER BATCH	COST PER BATCH (R)
<b>Less: Allocable Costs</b>				
Day-old chickens	Each	4.40	100.00	440.00
Feed:				
Starter Crumbles	50kg	177.30	2.00	354.60
Grower Pellets	50kg	166.35	3.00	499.05
Finisher Pellets	50Kg	156.55	4.00	626.20
Vaccinations:				
Newcastle Disease 1	1000 doses	34.40	0.20	6.88
Newcastle Disease 2	1000 doses	28.75	0.20	5.75
Gumboro	1000 doses	62.40	0.20	12.48
House sanitation	Batch	84.35	0.20	16.87
Transport:				
Day-old chickens	Batch	173.00	0.20	34.60
Shavings	km	3.46	100.00	346.00
Contingencies	2.00%			46.85
<b>Total Allocable Costs (B)</b>				<b>2,389.28</b>

<b>GROSS MARGIN (A-B)</b>	<b>1,930.72</b>
<b>Gross profit margin</b>	<b>0.45</b>

### Appendix 1.3: Average income and cost budget for Zululand

ESTIMATED INCOME	UNIT	PRICE/UNIT (R)	QUANTITY PER BATCH	VALUE PER BATCH (R)
<b>Gross Income</b>				
Sale of Live Birds	Each	45.00	96.00	4,320.00
<b>Total Gross Income (A)</b>				<b>4,320.00</b>

ESTIMATED COSTS	UNIT	PRICE/UNIT (R)	QUANTITY PER BATCH	COST PER BATCH (R)
<b>Less: Allocable Costs</b>				
Day-old chickens	Each	4.40	100.00	440.00
Feed:				
Starter Crumbles	50kg	177.30	2.00	354.60
Grower Pellets	50kg	166.35	3.00	499.05
Finisher Pellets	50Kg	156.55	4.00	626.20
Vaccinations:				
Newcastle Disease 1	1000 doses	34.40	0.20	6.88
Newcastle Disease 2	1000 doses	28.75	0.20	5.75
Gumboro	1000 doses	62.40	0.20	12.48
House sanitation	Batch	84.35	0.20	16.87
Transport:				
Day-old chickens	Batch	173.00	0.20	34.60
Shavings	km	3.46	100.00	346.00
Gas for brooder	48kg	650.00	0.20	130.00
Contingencies	2.00%			49.45
<b>Total Allocable Costs (B)</b>				<b>2,521.88</b>

<b>GROSS MARGIN (A-B)</b>	<b>1,798.12</b>
<b>Gross profit margin</b>	<b>0.42</b>

**Appendix 1.4: Average income and cost budget for all three districts  
(uMkhanyakude, uThungulu and Zululand)**

**ENTERPRISE: 100 Broiler Birds**

ITEM	UNIT	PRICE/UNIT	QUANTITY PER BATCH	VALUE PER BATCH	VALUE PER ANNUM
<b>Gross Income</b>					
Sale of Live Bird	Each	65.00	96.00	6 240.00	36 192.00
<b>Total Gross Income</b>				<b>6 240.00</b>	<b>36 192.00</b>
Day-old chickens	Each	6.50	100.00	650.00	3 770.00
Feed:					
Starter Crumbles	50Kg	330.00	2.00	660.00	3 828.00
Grower Pellets	50Kg	315.00	2.00	630.00	3 654.00
Finisher Pellets	50Kg	288.00	6.00	1 728.00	10 022.40
Vaccination:					
Newcastle Disease 1	1000 doses	34.40	0.20	6.88	39.90
Newcastle Disease 2	1000 doses	28.75	0.20	5.75	33.35
Gumboro	1000 doses	62.40	0.20	12.48	72.38
House Sanitation	Batch	84.35	0.20	16.87	97.85
Transportation:					
Day-old chickens	Batch	173.00	0.20	34.60	200.68
Shaving	Km	3.46	100.00	346.00	2 006.80
Gas for brooder	48 Kg	650.00	0.20	130.00	754.00
Contingencies	2.00%			84.41	489.59
<b>Total Allocable Cost</b>				<b>4 304.99</b>	<b>24 968.95</b>
<b>Gross Margin</b>				<b>1 935.01</b>	<b>11 223.05</b>
<b>Gross Profit Margin (GPM)</b>				<b>0.31</b>	<b>0.31</b>

### Appendix 1.5: Average income and cost budget for Rainbow Chicken

ESTIMATED INCOME	UNIT	PRICE/UNIT (R)	QUANTITY PER BATCH	VALUE PER BATCH (R)	VALUE PER ANNUM (R)
<b>Gross Income</b>					
Sale of Frozen Chicken	Each	55.00	100	5 500.00	14,699.00
<b>Total Gross Income (A)</b>				<b>5 500.00</b>	<b>17,706.00</b>
ESTIMATED COSTS	UNIT	PRICE/UNIT (R)	QUANTITY PER BATCH	COST PER BATCH (R)	COST PER ANNUM (R)
<b>Less: Allocable Costs</b>					
Day-old chickens	Each	4.85	100.00	485.00	2,813.00
Feed:					
Starter Crumbles	50kg	177.30	2.00	354.60	2,056.68
Grower Pellets	50kg	166.35	3.00	499.05	2,894.49
Finisher Pellets	50Kg	156.55	4.00	626.20	3,631.96
Vaccinations:					
Newcastle Disease 1	1000 doses	34.40	0.20	6.88	39.90
Newcastle Disease 2	1000 doses	28.75	0.20	5.75	33.35
Gumboro	1000 doses	62.40	0.20	12.48	72.38
House sanitation	Batch	84.35	0.10	8.44	48.92
Transport:					
Day-old chickens	km	3.50	3.80	13.30	77.14
Shavings	km	3.46	3.80	13.15	76.26
Gas for brooder	48kg	650.00	0.20	130.00	754.00
Contingencies	2.00%			43.10	249.96
<b>Total Allocable Costs (B)</b>				<b>2 197.95</b>	<b>12,748.05</b>
<b>Gross Margin (A-B)</b>				<b>3 302.05</b>	<b>4,957.90</b>
<b>Gross Profit Margin (GPM)</b>				<b>0.58</b>	<b>0.28</b>

**Appendix 2: Questionnaire**

**UNIVERSITY OF ZULULAND**  
**FACULTY OF SCIENCE AND AGRICULTURE**



**VIABILITY OF GOVERNMENT FUNDED SMALL-SCALE BROILER  
PROJECTS IN NORTHERN KWAZULU-NATAL**

**QUESTIONNAIRE FOR SMALL SCALE FARMERS WITH BROILER PROJECTS IN  
NORTHERN KWA-ZULU NATAL**

All information provided will be treated as **STRICTLY CONFIDENTIAL**

Questionnaire number

Name of Interviewer

Local Municipality

District Municipality

**A.HOUSEHOLD DEMOGRAPHIC INFORMATION**

2. Household composition

	<b>Sex</b> 1.- Male 2.- Female	<b>Age</b>	<b>Marital status</b> 1- Single 2- Married 3- Divorced 4- Widow	<b>Education level</b> 1-No formal Education 2-Primary 3- Secondary 4-Tertiary 5-Others	<b>Years spent at school</b>	<b>Occupation category</b> 1Retired 2- Unemployed 3- Farmer 4- Employee 5- Self employed 6- School/ pre-school	Specify Occupation type	Years of employment
Head								
Spouse								
Children								

How do you rate the farming knowledge? *(Please tick correct option)*

<b>Employees knowledge</b>	Poor		Average		Good	
<b>How knowledge was acquired?</b>	Experience		Education		Training	

Is there any project member with any of the following skills?

<b>SKILL</b>	<b>Yes</b>	<b>No</b>	<b>If yes, where was it obtained?</b>
Animal production			
Financial management			
Record Keeping			
Marketing			
OTHER (Please <i>Specify</i> ) .....			

What specific training is needed?

<b>SKILL</b>	<b>Yes</b>	<b>No</b>	<b>Reason why you think it is important</b>
Animal production			
Financial management			
Record keeping			
Marketing			
OTHER (Please <i>Specify</i> ) .....			

## **PRODUCTION COSTS**

What is the maximum capacity of production per year? (e.g. 500 broiler birds).....



What is the current production capacity per year? (e.g. 300 broiler birds).....

Who are your input suppliers & how far are they from your location?

ITEM	SUPPLIERS NAME	DISTANCE
Day-old Chicks		
Feed		
Vaccine		
Medication		
Other .....		

What is the total production cost per year? **Batch of ..... broiler birds**

ITEM	UNIT	COST/UNIT (R)
Feed		
Starter		
Pellets		
Finisher		
Vaccine		
Newcastle Disease1		
Newcastle Disease2		
Gumboro		
Medication		

Other ( <i>Please Specify</i> )		
Storage/Refrigeration (if they do slaughtering)		
Labour		
Packaging		
Marketing costs		
<b>TOTAL COSTS</b>		

## **MARKETS**

What quantity of goods is marketed over what time period? (e.g. 500 chickens every seven weeks)

.....

.....

.....

.....

Do they sometimes have unsold produce? Yes                      No

Approximately how much of unsold produce?

.....

What happens to the unsold produce? (*Please tick correct option*)

Eat (family and friends)	Sell at low Prices	Keep and sell later	Process it	Other

When do you start looking for buyers? (*Please tick correct option*)

Before production		Two weeks before broilers reach maturity		Once broilers are ready for marketing	
-------------------	--	--	--	---------------------------------------	--

Where do you sell most of your produce to? *(Please Tick as appropriate)*

PLACE	Tick	Reason
Farm gate		
Around the village		
Pension Pay points		
Nearest town		
Other <i>(Please Specify)</i> .....		

Who are your current customers? *(Please tick correct appropriate)*

Friends/ neighbours	hawkers	teachers	pensioners	Government institutions	Spaza shops	Abattoirs	Other

Do you have any contractual agreements (formal or informal)? (Give Details)

.....

.....

.....

Do you have regular customers, who always buy from you? YES  NO

If yes, who are these customers?

.....  
.....  
.....  
.....

Are there other possible markets?

.....  
.....  
.....  
.....

Before selling your produce what value adding activities do you perform?

ACTIVITY	TICK	PLEASE GIVE DETAILS
Slaughtering		
Other ( <i>Please Specify</i> ) .....		

What are the possible value adding activities?

.....  
.....  
.....

How is your produce moved to the marketing points? (*Please Tick as appropriate*)

	TYPE OF TRANSPORT				Distance to Market	Cost of a single trip to market (R)
	Truck	Bakkie	Bus	Other (Specify)		
Own transport						
Hired vehicle						
Public transport						
Buyers transport						
Other ( <i>Please Specify</i> ) .....						

What problem do you experience in moving your produce? (*Please tick as appropriate*)

Small size of transport	Lack of transport	High transport cost	Other (Specify)

**MARKET INFORMATION**

What or who are your sources of information?

.....

.....

.....

How do you want the information to be delivered? *(Please tick as appropriate)*

<b>INFORMATION MEDIUM</b>	<b>Tick</b>
Post	
Telephone	
Cell phone SMS	
Internet	
Extension officers	
Tribal meeting	
Farmer groups	
Other <i>(Please Specify)</i> .....	

The main challenges faced in running the project? *(Please tick as appropriate)*

<b>CHALLENGES</b>	<b>Minor Challenge</b>	<b>Major Challenge</b>
The search for information		
Lack of support by the government		
Access to extension services		
Frequency of extension visits if minor above		
Financial		
Access to credit		

Access to electricity		
Problems associated with crime		
Road infrastructure		
Other (please specify)		

How much do you sell your broilers for?.....

List what you consider to be the major problems you face in marketing your goods.....  
 .....  
 .....

Suggest ways in which such problems can be addressed.....  
 .....  
 .....

**Thank you for participating in this survey, your information is much appreciated.**

## Appendix 3: Ethical clearance certificate

**UNIVERSITY OF ZULULAND  
RESEARCH ETHICS COMMITTEE**  
(Reg No: UZREC 171110-030)



### RESEARCH & INNOVATION

Website: <http://www.unizulu.ac.za>  
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### ETHICAL CLEARANCE CERTIFICATE

Certificate Number	UZREC 171110-030 PGM 2015/211					
Project Title	Viability of government funded small-scale broiler projects in Northern KwaZulu Natal					
Principal Researcher/ Investigator	STC Mdletshe					
Supervisor and Co- supervisor	Dr M Sibanda		Prof A Obi			
Department	Agriculture					
Nature of Project	Honours/4 <sup>th</sup> Year		Master's	x	Doctoral	Departmental

The University of Zululand's Research Ethics Committee (UZREC) hereby gives ethical approval in respect of the undertakings contained in the above-mentioned project proposal and the documents listed on page 2 of this Certificate.

**Special conditions:**

- (1) The Principal Researcher must report to the UZREC in the prescribed format, where applicable, annually and at the end of the project, in respect of ethical compliance.
- (2) Documents marked "To be submitted" (see page 2) must be presented for ethical clearance before any data collection can commence.

The Researcher may therefore commence with the research as from the date of this Certificate, using the reference number indicated above, but may not conduct any data collection using research instruments that are yet to be approved.

Please note that the UZREC must be informed immediately of

- Any material change in the conditions or undertakings mentioned in the documents that were presented to the UZREC
- Any material breaches of ethical undertakings or events that impact upon the ethical conduct of the research