

UNIVERSITY OF KWAZULU NATAL

**OPERATIONAL CHALLENGES FACED BY SMALLHOLDER FARMERS: A
CASE STUDY OF eThekweni DISTRICT**

By

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ABSTRACT

The aim of the study was to establish the impact of access to capital, access to markets, access to information and access to technology on viability of smallholder farming in eThekweni metropolitan on the market. An investigation was carried out, using a questionnaire administered to 100 smallholder farmers in eThekweni metropolitan. The questionnaire, which was the primary tool used to collect data, consisted of both closed and open ended questions. The investigation sought to establish if the above mentioned four factors affected smallholder farmers in eThekweni region. A list of smallholder farmers practising agroecology in eThekweni metropolitan was used as the population for this study. Total population size was 485 and sample size was 100. The data collected was summarised and analysed using Microsoft Excel software package. The sample was composed of 21% male and 79% female smallholder farmers. All respondents were of the African race. Statistical analysis revealed that access to funding, access to markets, access to information and access to technology not only influenced viability of smallholder farmers in eThekweni metropolitan, but that the farmers were not getting enough access to all four variables. 66% of the farmers had plots less than 0.5acres under cultivation. Another finding was that the farmers had basic tools to work with and required funding to acquire irrigation, water storage facilities, transport and tractors. As far as passing information to farmers is concerned, the farmers mostly preferred extension visits. It was recommended that well equipped agricultural resource centres be established in all agricultural hubs. The second recommendation was that the government employ an asset-based community development approach when funding smallholder farmers. Another recommendation was that farmers and other stakeholders be conscientised on the concept of sustainable farming.

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CHAPTER 1

1.1 Introduction

Smallholder farmers are perceived to be the key drivers of many African economies. As reported by DAFF (2012), apart from ensuring household food security, smallholder production can also be a source of livelihood amongst the rural poor. Landesa (2014) also claimed that smallholder farmers can be the driving force behind rural development which is equitable, sustainable and productive. Altieri *et al* (2012) recognise that small scale agricultural production is a contributor to national food security. Nwanze (2011) insists that smallholder farmers should be treated as entrepreneurs, as farming practised at whatever scale is a business. AgriSETA (2010) further added that land reform programmes were creating new opportunities for emerging black farmers in South Africa.

According to Fan *et al* (2013), worldwide, there are about 500 million farms which are run by smallholder farmers. FAO (2011) reported that small farms produce an estimated 80 percent of the developing world's food. Stats SA (2011) adds weight to the points above and reported that there are 2.9 million agricultural households in South Africa, of which the majority are smallholder farmers. WWF (2015) further reported that there are 2 million smallholder farmers in South Africa, a figure that tallies with the report from Stats SA.

Despite the seemingly positive outlook for smallholder farmers, in South Africa smallholder farmers are afflicted by various social ills which include poverty, hunger and poor remuneration (Mudhara, 2010). As revealed in the next chapter, several factors have been listed by scholars as hindrances which prevent smallholder farmers from capitalising on existing opportunities.

1.2 Motivation for the study

The South African agricultural sector is dualistic in nature, as an advanced commercial farming sector exists alongside a less developed communal farming sector. The communal farming sector makes up the bulk of smallholder farms (Mudhara, 2010). There are approximately 40 000 commercial farm entities producing about 95 per cent of the agricultural output in South Africa, and about 2

million smallholder farm entities producing the balance of agricultural output (WWF, 2015)

Godfray, Beddington, Crute, Haddad, Lawrence, Muir and Toulmin (2010), however suggested that although per capita food production capacity has increased 1.6-fold in Asia, China and Latin America, Africa's per capita food production has not changed much over the past 50 years. Godfray *et al* (2010) attribute this lack of progress to factors such as lack of technical knowledge and skills required to increase production, as well as finances. For that reason African governments and agricultural research institutes are concerned about food security in their respective countries. The South African government, like many other African governments, committed itself to the 2003 Maputo Declaration on Agriculture and food security in the continent. South Africa, through its Department of Agriculture and Forestry (DAFF), adopted a smallholder development programme as a short term strategic plan to increase food production and trade (Moeng, 2010).

The analysis above clearly shows that there is a disparity between South African smallholder farmers' actual output and potential output. This study therefore seeks to establish the causes of such incongruity from literature. The study focuses on factors affecting smallholder farmers in South Africa. Recommendations are prescribed in an effort to offset the challenges which are hindering smallholder farmers from attaining their maximum output.

1.3 Justification of the study

WWF (2015) claimed that there are 40 000 commercial farm entities producing about 95 per cent of the agricultural output in South Africa, and about 2 million smallholder farm entities producing the balance of agricultural output. This statement implies that the ratio of commercial farmers to smallholder farmers is 1:50. However, these two farmer categories' output ratio is 19:1. The smallholder farmers' output seems to suggest hidden operational challenges, hence the need to undertake this study. This study envisages benefits for policymakers and government at large, when planning the future of smallholder farmers in eThekweni.

1.4 Problem statement

Poulton, Dorward and Kydd (2010) suggested that growing demand for high value food commodities in South Africa is a source of opportunities for smallholder farmers to diversify into commodities which yield higher returns per unit of labour, land and capital. According to Chikazunga and Paradza (2012), the South African food markets generates over R200 billion annually, of which 15 per cent of the value comes from fresh produce.

Sadly, in South Africa, current total output from smallholder farmers is a far cry from potential output (DAFF, 2012). Chikazunga and Paradza (2012), also suggested that South Africa's impressive success on food self-sufficiency, and as a net food exporter acts as a mask which conceals the huge racial and ethnic inequalities which exist in the agricultural sector.

As noted by Chikazunga and Paradza (2012), the food markets in South Africa are dominated by four retail chains, namely Shoprite-Checkers, PicknPay, SPAR and Woolworths. As a result of lack of competition, these retailers demand low prices, and determine their own quality standards which farmers have to adhere to. Smallholder farmers are side-lined by the retail chains as they fail to meet the demands, as well as the high transaction costs involved in coordinating them (Chikazunga and Paradza, 2012). Faced with this market challenge, smallholder farmers end up selling their produce at their farm gates or roadside where their returns are low (DAFF, 2012).

As reported by DAFF (2012), the majority of smallholder farmers have low production capacity, which when coupled with poor quality, leads to output markets shunning their produce. The purpose of this study is twofold:

- (1) To identify the factors which aid the viability of a smallholder entity; and
- (2) To investigate the possible impact of the critical factors on overall performance of a smallholder entity.

1.5 Objectives

This study seeks to establish:

- accessibility of capital to small scale farmers in eThekweni district.
- accessibility of markets to small scale farmers in eThekweni district.
- accessibility of agricultural information to small scale farmers in eThekweni district.
- accessibility of farming technology to small scale farmers in eThekweni district.

1.6 Research questions

- To what extent are small scale farmers in eThekweni district accessing capital?
- To what extent are small scale farmers in eThekweni district accessing markets?
- To what extent are small scale farmers in eThekweni district accessing agricultural information?
- To what extent are small scale farmers in eThekweni district accessing farming technology?

1.7 Limitations of the study

- Costs, distance and time limited the number of participants in the survey. Some of the farmers are located in sparsely populated areas which are difficult to reach.
- The accuracy of the results from the survey is limited by the sample size, as the actual population size is not known (Stats SA, 2011).
- Meanings of words and phrases could have been lost in translation, as most responses were given in isiZulu, but reported in the English language.
- All participants belonged to the African race. Results from this study cannot be generalised for other races.

1.8 Delineation of the study

- The research only covered smallholder farmers from four areas falling under eThekweni district namely Mariannhill, Cliffdale, Hambanathi and Umbumbulu.
- The investigation was limited to small scale farmers who practised agro-ecology.

1.9 Structure of the study

Chapter 1: Introduction

This chapter introduced the topic under investigation, as well as the objectives of the study. A snap-shot of the methodology was also given.

Chapter 2: Literature Review

Literature review provides insight from work done by other researchers on the same subject. Literature survey in this study concentrates on the top four challenges faced by smallholder farmers as suggested by other researchers. Some case studies showing how other smallholder farmers in other third world countries overcame their challenges are also reviewed.

Chapter 3: Research Methodology

This chapter contains theoretical aspects of the methodology utilised in the research. Statistical methods employed are also outlined in this chapter, as well as the justification for chosen methodology.

Chapter 4: Presentation of Survey Results

In this chapter results of the survey done are presented and statistical analysis done on the same results. Results are discussed in this chapter.

Chapter 5: Discussion of findings

In this chapter, the results presented in chapter 4 are discussed. Statistical analysis is done to establish relationships.

Chapter 6: Recommendations

Once analysis and discussion of results is done, recommendations are given in chapter 6. Suggestions for further research are made in the same chapter.

1.10 Conclusion

This chapter has outlined the problem statement, and also attempted to justify the reason for the research. The objectives and limitations of the research were also outlined. The following chapter focuses on literature deemed to aid this study by increasing knowledge about the topic being investigated.

CHAPTER 2 - LITERATURE REVIEW

2.1 Introduction

Smallholder farming in developing countries is a force to reckon with as it is the main source of employment, income and food security in rural communities (Hazell, 2011). Ironically, smallholder farmers continue to be plagued by poverty and hunger. Globally there are nearly 500 million smallholder farmers (Hazell, 2011).

2.2 Definition of smallholder farmer

Nagayets (2005) defines a small scale farm on the basis of the magnitude of landholding or livestock kept on the farm. According to Nagayets (2005), a smallholder farm is 2 hectares and below in size. Berdegue and Fuentealba (2011), however, criticise the size-based definition as they claim that it does not show the farm's labour arrangement, efficiency and productivity.

Berdegue and Fuentealba (2011) describe smallholder agriculture as comprising farms which are operated by families and whose labour is mainly from these families. Berdegue and Fuentealba (2011) also add that smallholder farmers can be further divided into two subgroups. The first (and also coincidentally the larger subgroup) is referred to as "subsistence farmers." These farmers derive a large fraction of their household income from non-farm sources which include providing labour for non-farming activities, remittances, as well as social support services. The second subgroup is the commercial family farmers, who at times hire a handful of permanent labour to work on the farm. Berdegue and Fuentealba (2011) also highlight that although this subgroup is smaller in terms of number of farms, members of this category play a more important economic role. This study does not distinguish between subsistence farmers and commercial family farmers.

2.3 Characteristics of smallholder farmers

- Household objectives by and large dictate the resources which can be committed to an activity (Mudhara, 2010).
- Decisions on a smallholder farm are mostly to cater for the welfare of the family before profit is considered (Mudhara, 2010).

- Smallholder farmers are also generally characterised by limited education levels, limited access to information as well as limited management skills and time to run their farms efficiently (Mudhara, 2010).
- Simple and out-dated means of production are utilised, which leads to low yields (DAFF, 2012).
- Smallholder farmers can also be characterised by the size of their piece of land, distribution of resources towards production of food and cash crops, as well as livestock (DAFF, 2012).
- Allocation of time spent on farm activities as compared to non-farm activities is another factor that defines smallholder farming as an economic activity (DAFF, 2012).
- Distribution of external inputs, as well as household expenditure patterns can also be used to characterise smallholder farmers (DAFF, 2012).
- Households involved in smallholder farming activities generally have limited access to amenities such as clean water and electricity (Stats SA, 2013).
- Stats SA (2013) further characterize smallholder farmers as people who generally have limited schooling, income and whose ages by and large fall in 45 to 54 years category.

2.4 Stages of smallholder farming development

According to Harwood (1979), there are four stages of small farm development namely: primitive hunting-gathering, subsistence level crop and animal husbandry, early consumer and primary mechanisation

2.4.1 Primitive hunting gathering

According to Harwood (1979), farmers located in remote areas still practice this system. This is the most primitive stage, where food production is based on harvesting of natural resources. Harwood (1979) also warns that this practice can destroy the natural resource base when population pressure exceeds the ability of the environment to renew itself.

2.4.2 Subsistence level crop and animal husbandry

This practice is also common in remote areas. Under subsistence level crop and animal husbandry, the farmer directly consumes at least 90 percent of farm produce (Harwood, 1979)

2.4.3 Early consumer

Farmers who are at this stage of development market and sell between 10 and 30 percent of farm produce. The cash income is used to acquire goods and services required by the farm family, or reinvested into the farm. Harwood (1979), however highlights that the farmer will only reinvest cash into the farm when the following conditions are met:

- The farmer has set aside adequate and good quality food for his own family.
- He has confidence in his own technical, agricultural, and commercial skills
- His farming system is ready to respond to additional inputs
- He has the technology to turn inputs into increased production
- He has access to markets and to the cash economy.

2.4.4 Primary mechanisation

A farmer is said to have reached primary mechanisation when he or she rents or purchases a source of mechanical power. Harwood (1979) also claims that mechanisation and commercial farming go hand in hand. Machinery acquired by small farmers is usually used for transportation, primary tillage and irrigation under primary mechanisation. Secondary mechanisation, on the other hand entails mechanical cultivation, planting, harvesting and processing

2.5 Agricultural value chain structure

According to Trienekens (2011), the main purpose of a value chain is to add value of a product or service to be sold on a market. Trienekens (2011) further adds that development of value chains is hindered by constraints directly related to market

access and market orientation, available resources and physical infrastructure and institutions.

According to Parikh, Patel & Schwartzman (2007), there are four main players in an agricultural value chain namely, farmers, intermediaries, consumers and support organisations.

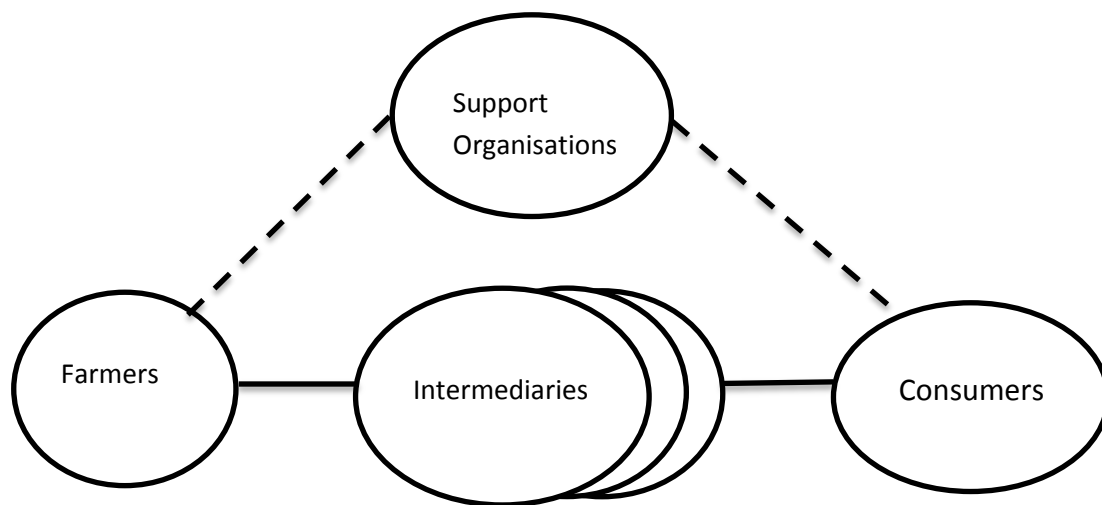


Figure 2.1 Agricultural value chain

Source: Parikh, T. S., Patel, N., & Schwartzman, Y. 2007. A survey of information systems reaching small producers in global agricultural value chains. *International Conference on Information and Communication Technologies and Development*, 2007. p4.

2.5.1 Intermediaries

According to Parikh *et al.* (2007), there are a number of intermediary agents which participate in the agricultural value chain. The main functions of these intermediaries include procurement, processing, transportation and distribution of produce. The key intermediaries, as outlined by Parikh *et al.* (2007) include importers and exporters, brokers and retailers.

2.5.1.1 Functions of each intermediary

- Exporters and importers use their expertise in international standards and regulations to facilitate global markets for certified produce in high volumes.

- Brokers exist to facilitate the sale of agricultural produce between farmers and large buyers.
- Retailers have over the years relied on specialised procurement channels to acquire agricultural produce.

2.5.2 Support organisations

Parikh *et al.* (2007) also suggest that supporting organisations are another form of intermediaries as they provide complimentary goods and services for the farmers. Supporting organisations comprise value addition agents, input providers, certifying agencies, extension agencies, Non-Governmental Organisations (NGOs), governments and financial service providers.

Functions of supporting organisations as suggested by Parikh *et al* include:

- Value addition agents increase the value of off-the-farm produce through processing.
- Input providers supply implements necessary for farming operations.
- Certifying agents exist to establish standards as well as to issue certification. Certifying agents also grant permission for certain products to trade under a specific brand name or label.
- Extension agencies pass on knowledge and advice to farmers in a bid to enhance their farming practice.
- NGOs are active in the organisation and education of farmers as well as creation of market opportunities for smallholder farmers.
- Governments provide the necessary legislation and support services as a way of promoting sustainable agricultural practices.
- Financial Services Providers help smallholder farmers to build assets, invest and mitigate risk through financial aid and advice.

2.6 Access to markets

The South African government liberalised the marketing environment when it introduced the Marketing of Agricultural Products Act of 1996 (Mudhara; 2010). Satgar (2011) argues that although liberalisation of the markets was meant to create equal opportunities for all players in the agricultural industry, this goal was

never realised. Monopolistic businesses which operated under the guise of farmers' cooperatives increased in structural power after markets were liberalised. Another development which resulted from liberalisation of markets was that farmers' cooperatives converted themselves into private and public companies. An example given by Satgar (2011) is the National Cooperative Dairies (NCD), which was founded in 1898. After liberation of the market, the NCD became more powerful when it formed joint ventures with companies like Danone and Fonterra.

Van Schalkwyk *et al.* (2012) also argue that in South Africa, market liberalisation was a major drawback for smallholder farmers as the inexperienced farmers found themselves competing for market share in an extremely competitive environment. According to Van Schalkwyk *et al.* (2012), smallholder farmers also found themselves incurring high transaction and transport costs to access markets after liberalisation of the market.

According to the Department of Agriculture, Forestry and Fisheries (2012), smallholder farmers lack reliable markets. As a result of this development, the farmers end up selling their produce at "give away prices" at their farm gates or local markets.

2.6.1 Change in consumer demand and preferences

Oluoch-Kosura (2010) suggests that the requirements, quality standards and safety rules required by both consumers and corporations pose the danger of acting as barriers to entry into coordinated market chains and alliances. Consumers have become health conscious over the years and, as a result, consumers now demand quality, value and consistency (Lenzen, Moran, Kanemoto, Foran, Lobefaro & Geschke, 2012). Consumers are now better informed and their preferences have shifted to health conscious food producers. From research, consumers in developed countries do not mind paying extra for products considered to be environmentally friendly, or supporting healthy working conditions (Lenzen *et al.*, 2012).

2.6.2 Changes in global agricultural economy

The ever-changing global agricultural economy has also been identified as a source of market challenges for smallholder farmers (Jayne, Mather and Mghenyi,

2010). Some of the changes which have occurred in the markets include market liberalisation both locally and internationally, innovations in ICT, improvements in transport and logistics as well as improvements in biotechnology (Prowse, 2012). Other changes which have occurred over the years include increased concentration within agricultural supply chains as well as increased emphasis on safety standards and traceability of agricultural products (Prowse, 2012).

2.6.3 Low negotiating power

According to Singh (2011), market prices do not reflect a true picture of costs and returns of all market participants. Market prices are determined by large supermarket operators who, in a bid to sell farm produce at a competitive price, end up suppressing farmers' prices. Other areas which make small scale farmers have limited power when negotiating contracts include threats of delisting suppliers who cannot meet supermarket price demands, just-in-time system which is meant to reduce inventory costs in supermarkets, tough contracts which punish farmers for failure to supply on time, as well late payments to farmers by the supermarket buyers (Singh, 2011).

According to IFAD (2012), the small percentage of smallholder farmers who manage to grow surplus food face serious challenges when trying to sell their produce. Smallholder farmers generally struggle to meet volumes demanded by the market; as a result, the farmers fail to derive the highest value for their products from such a market.

2.6.4 Collective action as a solution

Markelova and Mwangi (2010) suggest that a shift from focusing on internal to external economies of scale through networking or clustering or some other form of alliance could be a solution to the problem of access to markets for smallholder farmers. According to Markelova and Mwangi (2010) limitations of wealth, size of farm and bargaining power could be overcome when smallholder farmers come together. Other benefits of collective action, as outlined by Prowse (2012), include:

- Ease of acquiring new technology.
- Improved control over production process.
- Greater capacity for income generation.

- Reduced coordination costs.
- Economy of scale when it comes to procurement.

2.6.4.1 Contract farming as a solution

Abebe, Bijman, Kemp, Omta & Tsegaye (2013) suggest that the main motivation for farmers to participate in contract farming arrangements is what they stand to gain from the input market, as opposed to the output market. As a result of this development, firms which incorporate aspects like provision of seed, inputs and technical assistance in their contracts stand a better chance of attracting farmers than firms which do not (Abebe *et al*, 2013).

According to Prowse (2012), there are five possible models for contract farming, namely:

- The central model, in which the sponsor processes or packages and sells farm produce from several farmers.
- The nucleus estate model, under which the sponsor also manages a central estate, apart from centralised processing.
- The tripartite model, which involves statutory bodies, financial institutions and other private companies working with farmers.
- The informal model, which involves individual entrepreneurs or small companies who enforce informal contracts with farmers.
- The intermediary model, which involves sponsors formally subcontracting intermediaries who also have informal agreements with farmers.

Prowse (2012) also notes that the private sector is dominating contract farming in developing nations. Hellin, Lundy and Meijer (2009) outline that the benefits of farmer organisations when it comes to access to markets are more visible with vegetable farmers. This situation is due to the fact that vegetable farmers generally incur high transaction costs. Farmers who produce undifferentiated commodities do not realise the benefit of collective action as the transaction costs of such commodities are generally low. Kaganzi, Ferris, Barham, Abenakyo, Sanginga & Njuki (2009) argue that collective action, coupled with astute marketing strategies, can improve service provision efficiency of poor and loosely

organised smallholder farmers. Prowse (2012) also lists some of the demerits of such arrangements as follows:

- Farmers end up entirely dependent on farmer organisations to maintain market linkage, thereby stifling innovation to develop new markets.
- Collective action is insufficient to enhance market performance.
- Collective action cannot guarantee increased profit.
- Farmers can incur significant losses when they invest in developing structures for selling high value products through farmer organisations.

Barham and Chitemi (2009) however suggest that in order for collective action to work, the following prerequisites must be met first:

- A relatively small group size.
- Clearly defined boundaries.
- Interdependence among group members.
- Shared past successes.
- Shared values and norms.
- Leadership which is appropriate for the group.
- Low levels of poverty.

The table below summarises some of the benefits and problems presented by contract farming as described by Eaton and Shepherd (2001).

Table 2.1 Benefits and problems presented by contract farming

	BENEFITS	PROBLEMS
FARMER	<ul style="list-style-type: none"> • Provision of inputs and production services • Access to credits • Skills transfer • Guaranteed and fixed pricing structures • Access to reliable markets 	<ul style="list-style-type: none"> • Indebtedness and overreliance on advances • Unsuitable technology and crop incompatibility • Manipulation of quotas and quality specifications • Corruption • Domination by monopolies • Increased risk of market failure or production challenges <p>when growing new crops</p>
Sponsors	<ul style="list-style-type: none"> • Political acceptability • Overcoming land constraints • Production reliability and shared risk • Quality consistency • Promotion of farm inputs 	<ul style="list-style-type: none"> • Land availability constraints • Social and cultural constraints • Farmer discontent • Extra- contractual marketing • Input diversion

2.6.4.2 Cooperatives

According to the Department of Agriculture, Forestry and Fisheries (2012), agricultural cooperatives in South Africa were started by the Afrikaner nationalist movement. The movement developed three types of cooperatives, which are marketing, supply and processing. These cooperatives grew rapidly after the establishment of the Land Act in 1912 as they enjoyed the apartheid government support. From the 1940s, the same cooperatives also enjoyed subsidies under the Marketing Act of 1937. Although the Apartheid regime in South Africa established black cooperatives in rural areas, these cooperatives never enjoyed equal privileges as white cooperatives. As a result of these inequalities, black cooperatives could not develop as much as those of their white counterparts (DAFF, 2012).

The present South African government however signed into law in 2005 the Cooperatives Act (No 14 of 2005). This act is based on seven international principles (Derr, 2013). The seven international principles state that cooperatives should embody the following elements: voluntary and open membership, democracy, autonomy and independence, equitable and fair member participation, regard for the community, access to training and education, as well as cooperation among cooperatives (ICA, 2005).

According to DAFF (2012), there were 54 461 registered cooperatives in South Africa as of 31 January 2012. The Agricultural sector constituted about 47% of the total number of cooperatives in the country. Agricultural cooperatives are, however, facing challenges of a lack of demand for their produce, caused by failure to access lucrative domestic and international markets. The South African government is trying to redress this situation by introducing incentive schemes aimed at encouraging establishment of secondary marketing cooperatives. The secondary marketing cooperatives" mandate is to reduce marketing transactional costs (DAFF, 2012).

2.6.4.3 Benefits of cooperatives

Cooperatives can potentially offer a number of benefits to smallholder farmers which include increased access to markets, risk mitigation and access to capital which can be used to purchase value addition equipment (Fisher and Qaim, 2012). Lee *et al* (2011) also add that, through cooperatives, smallholder farmers can institute in-house quality control and lowered certification standards.

2.6.4.4 Problems associated with cooperatives

According to Rosairo *et al*, (2012), there are several problems associated with cooperatives which include free rider problem, horizon problem, portfolio problem, control problem and influence cost problem.

- Free-rider problems arise due to the fact that member benefits like residual claims or net profit are linked to patronage and not investment. This implies that new members get immediate access to all the assets of the cooperative.

- Horizon problems, on the other hand, arise because members are not allowed to trade their shares at market value. Members who leave the cooperative do not receive the benefits of their shares' capital gains.
- Portfolio problems arise due to the fact that members of a cooperative cannot diversify their individual investment portfolios as they may wish. This makes it impossible for cooperative managers to make investments which satisfy all members.
- Control problems arise due to divergence of interests.
- Lastly, influence problems occur when members' voting rights are based on democracy, as opposed to being proportional to the level of investment (Rosairo *et al*, 2012).

2.7 Access to capital

Baiyegunhi and Fraser (2014) highlights that some of the factors considered when lenders issue loans to smallholder farmers include household demographics, socio-economic and farm characteristics. According to Baiyegunhi and Fraser (2014), the age of a smallholder farmer, as well as educational level of a farmer applying for credit, are considered to be very important. Credit institutions prefer lending to farmers who fall within the economically active age group.

On the other hand, education gives insight into credit providers of productive opportunities available to the farmer as well as capacity to understand loan evaluation procedures. According to Baiyegunhi and Fraser (2014), in the Eastern Cape of South Africa, smallholder farmers have got an average 8 years of schooling. Smallholder farmers who can access loans generally have at least 10 years of education, while those who cannot access loans have got an average of 4 years of schooling.

Credit providers and insurance firms are not keen to deal with smallholder farmers because they pose covariant risk due to factors like adverse weather conditions, moral hazard and anti-selection. These factors force lending companies to be extra vigilant during monitoring of clients, and in the process incur higher transaction costs (Poulton *et al*, 2010).

Baiyegunhi and Fraser (2014) also argue that conducting many small credit transactions for smallholder farmers, like checking for credit worthiness, collateral verification and monitoring of loan repayments implies extra expenses which cannot be justified by the sum total borrowed by these smallholder farmers (Baiyegunhi and Fraser, 2014)

Van Schalkwyk *et al* (2012) suggest that although smallholder farmers in South Africa were given access to land, no title deeds were issued to these farmers for the pieces of land they are farming on. As a result, the smallholder farmers face difficulties when they apply for loans to invest on their farms due to lack of collateral.

2.7.1 Factors influencing likelihood of farmers accessing loans

According to Baiyegunhi and Fraser (2014), the main providers of credit are commercial banks. These commercial banks prefer clients who can offer collateral in the form of property, or clients with proof of employment in the form of a payslip. This condition has resulted in a large number of rural clientele being side-lined as the exercise of lending to such a clientele is considered to be costly, risky and cumbersome.

2.7.2 Government initiatives

According to a review conducted under the Belgian Technical Cooperation in 2006, there are a number of government initiatives which have been established to ease the above listed challenges faced by smallholder farmers (Umhlaba Rural Services, 2006). Chikazunga and Paradza (2012) reported that the South African government is facilitating a certification process called Global GAP certification as a market integration strategy to aid smallholder farmers. Global GAP encourages supplying produce to supermarkets or export markets. According to Umhlaba Rural Services (2006), state sponsored schemes have been focusing on closing the resource gap through infrastructure development and improving access to land and credit. Some of the programmes which have been implemented to date include:

- Land Redistribution for Agricultural Development (LRAD)
- Micro-Agricultural Financial Institution of South Africa (MAFISA)

- Comprehensive Agricultural Support Programme (CASP)
- The Industrial Development Corporation (IDC)
- Lima, Small Enterprise Development Agency SEDA
- Eastern Cape Development Corporation (ECDC)

Sikwela (2013) however argues that the above mentioned government initiatives have not been effective to date as intended due to institutional obstacles. Some of the obstacles include limited access to information and technical skills, as well as high marketing and transaction costs.

2.7.3 Private Sector Initiatives

As reported by Umhlaba Rural Services (2006), the private sector is channelling its efforts towards skills development, access to better markets, as well as coordination issues. Some of the private sector organisations which have over the years been involved with smallholder farmers include:

- Farm Africa
- Oxfam
- The Agricultural Sector Education and Training Authority (AgriSETA)

Many of these programmes have been described as poorly designed and coordinated. Some state programmes were also reported to have been underfunded (Umhlaba Rural Services, 2006).

2.8 Access to information

Siyao (2012) reported that there is a direct relationship between access to relevant and effective information and agricultural development. Masuki et al. (2010) also add that access to agricultural information can help small scale farmers to improve production capacity as well as to access better remunerative markets. IFAD (2012) reported that rural communities urgently need basic education on farming. Schools also need to start teaching agriculture in the context of sustainability, in order for learners' knowledge to be relevant and compatible with community development initiatives. IFAD (2012) further argues that, although smallholder farmers have passed on traditional and indigenous farming knowledge from generation to generation, this information is no longer adequate in this

technological day. For that reason, farmers need to combine traditional and indigenous farming knowledge with recent scientific approaches.

As noted by IFAD (2012) women, indigenous farmers and young people are by and large deprived of training and up to date information. Quisumbing and Pandolfelli (2010) report that when compared to their male counterparts, women generally have much less access to information through agricultural extension services due to the fact that women were not regarded as agricultural decision-makers.

2.8.1 Methods of disseminating information

2.8.1.1 Mobile phones

Aker (2011) suggests that there has been significant growth in mobile phone adaptation and usage during the past decade in less developed countries. This development can be attributed to low cost, ease of use and extensive geographic coverage of mobile phones. Wyche and Steinfield (2015) also add that the development of agricultural market information services (MIS) can help to harness the potential of mobile phones.

2.8.1.2 Radio, Television and Newspaper

According to Rasmussen et al. (2015) radio, television and newspapers have over the years been used as traditional media for transmitting agricultural information in sub-Saharan Africa. The media's effectiveness in transferring information to farmers may be hindered by language barriers as many national broadcasters use their official languages. Printed media can also be difficult to distribute to remote areas or expensive to print. Television and print media, however, have got an advantage over radio in that they also offer visual dissemination.

2.8.1.3 Agricultural extension services

Another method of passing information to smallholder farmers is through agricultural extension services (Aker, 2011). Musa, Aboki and Audu (2013) define agricultural extension as, "the entire set of organisations which support and facilitate people engaged in agricultural production to solve problems and obtain information, skills and technologies to improve their livelihoods and wellbeing.

According to Aker (2011), although there are many forms of agricultural extension models, the most common approaches are training and visit (T&V), Farmer Field schools and fee-for-service.

- **Training and Visit (T&V) extension model**

Under this model, specialists provide information as well as visit farmers in their respective areas. Normally the selected farmers or communities would have successfully adopted new technologies and also have got the ability to train others (Aker, 2011).

- **Fee-for-service extension model**

This model involves both public and private initiatives. These initiatives are normally funded by the public. In such programmes, farmer groups pool funds to hire the services of extension agents in order to acquire specific information and services (Aker, 2011).

- **Farmer field school (FFS) model**

According to Aker (2011), this model originated in Asia. The reason for this FFS approach was to control pests in rice fields in the Philippines and Indonesia. The approach was for farmers to attend weekly informal meetings in one farmer's field for 14 weeks. The farmers would teach themselves how to control pests. The farmers would also discuss their operations and agricultural interventions to be implemented on their own farms.

2.8.2 Information Communications Technology (ICT) in Agricultural Value Chains

Parikh *et al* 2007 suggests that there are four broad categories of information systems in agricultural value chains which can be used to aid smallholder farmers. The four types of information systems are market information systems, procurement and traceability information systems, extension and knowledge systems as well as inspection and certification systems.

2.8.2.1 Market information systems

Access to market information is critical for informed decision-making, as well as improving economic performance of smallholder farmers (Parikh *et al*, 2007). Web based programmes have been developed to enable farmers to access information about current market prices and latest agricultural practices. Smallholder farmers in India can access such information in information kiosks, information centres, post office electronic tickers, on mobile phones as well as voice recordings via a toll free number (Parikh *et al*, 2007).

Mwakaje (2010) suggests that limited access to market information also leads to a significant barrier to market access for poor smallholder farmers. Mwakaje (2010) further adds that lack of market information systems leads to high transaction costs and low market efficiency.

2.8.2.2 Procurement and Traceability

Transportation of agricultural produce is one of the main sources of transaction costs in farming (Parikh *et al*, 2007). The condition of road network system is also another factor which contributes to the surge in transaction costs. Parikh *et al* (2007) suggests establishing centralised points where farmers can drop off their produce and collect payments as a solution to this problem.

Kondo (2010) suggests that the need for traceability of agricultural products has been heightened by increased health awareness of consumers, as well as a response by producers to the need to provide quality and healthy agricultural products. Opara (2003) in Karlsen *et al* (2013) also suggests that in order to form an “integrated agricultural and food supply chain traceability system”, the following elements should be looked at: product traceability, process traceability, genetic traceability, input traceability, disease and pest traceability as well as measurement traceability. Barriers to development and implementation of an effective food traceability system usually arise from resource limitations, information limitations, standard limitations, capacity limitations and awareness limitations (Bosana and Gebresenbet, 2013).

2.8.2.3 Extension and knowledge systems

Aker (2011) suggests that ICT is increasingly being employed to help facilitate extension programmes. According to Aker (2011), mobile phones can facilitate technological adoption through ICT based extension services. Parikh *et al* (2007) also mention that several web based applications had been implemented to create networks where farmers and researchers could interact and exchange knowledge. Radio and video broadcasts are also powerful means of passing information to farmers in rural areas. Videos offer another advantage in that they enable sharing of complex information (Parikh *et al*, 2007).

2.8.2.4 Inspection and certification

According to Parikh *et al* (2007), effective maintenance of certification can only be achieved when there is periodic inspection on farmers" procedures to ensure that minimum requirements are met.

According to Padel *et al* (2010), certification systems can be split into four categories, depending on who creates the standards and who verifies them. The first category is first-party system in which an individual organisation develops and implements in-house standards on the product it sells. The second category is second party certification which is carried out by an association of organisations who adopt a set of standards and verification methods. The third category is third party certification, which is carried out by a body which is independent of the activity it certifies. Fourth party certification is carried out by an association of third party organisations that create the rules and verification method. Padel *et al* (2010) further add that, third party certification (TPC) is the most commonly practised. Parikh *et al* (2007) suggests that for smallholder farmers, cooperatives often establish internal control systems. Inspection and monitoring activities are also carried out by cooperatives as a safety measure to give advance warning for breach of standards and minimise risk of losing certification.


2.8.3 Information flow in Agricultural Value Chains

Parikh *et al* (2007) divides the flow of information in agricultural value chains into three categories namely link-to-link (L2L), peer-to-peer (P2P) and end-to-end

(E2E) as shown in the table below. Table 2.2 below shows a typical communication matrix in an agricultural value chain.

Table 2.2 communication matrix of agricultural value chain stakeholders

from \ to	Farmers	Intermediaries	Consumers	
Consumers	NONE	Market Information	Consumer Advocacy	Supported by government and NGOs
Intermediaries	Market Information	Market Information, Procurement & Traceability	Labeling & Marketing	
Farmers	Extension	Market Information, Procurement & Traceability	Inspection & Certification	Supported by government, NGOs and certifying agencies
	Supported by government, NGOs and universities			



E2E
P2P
L2L

Source: Parikh, T. S., Patel, N., & Schwartzman, Y. (2007, December). A survey of information systems reaching small producers in global agricultural value chains. *International conference on Information and Communication Technologies and Development*. p7.

2.8.3.1 Link-to-link (L2L)

L2L involves information flows which enable the sale, movement and distribution of produce. Business processes such as procurement distribution and retail involve L2L information flow.

2.8.3.2 Peer-to-peer (P2P)

In agriculture, there is a need for knowledge transfer between farmers. This need for knowledge transfer is more visible when it comes to organic farming, where information is not readily available (Parikh *et al*, 2007). Under P2P information

flow, farmers share information on successful farming practices, latest technologies, as well as disease and pest control methods (Parikh *et al*, 2007).

2.8.3.3 End-to-end (E2E)

Under E2E, information flows from producers to consumers. Producers communicate to consumers non-economic values of production. Direct communication between producers and consumers can be challenging in value chains with several intermediaries. In such a case, intermediaries themselves or third party certification may convey information to customers. This arrangement has, in some instances, led to customers questioning credibility of the information as values recorded about a product often do not match the actual values.

2.8.4 Digital Green Concept Case Study

The Digital Green (DG) concept is a research project which seeks to spread agricultural information to small and less privileged farmers in India using digital video technology (Gandhi *et al*, 2007). This DG approach utilises existing people-based agricultural extension systems with the aim of magnifying their effectiveness. Through this programme, farmers and experts are video recorded during discussions (Punchihewa and Wimalaratne, 2010). Gandhi *et al* (2007) argue that the use of homophily to minimise distance between teacher and learner, as well as the excitement of learners appearing “on TV,” encourages farmers to be more participative. A database is created and information gathered can be shared with other smallholder farmers.

Other advantages offered by the DG approach, as suggested by Gandhi *et al* (2007), include:

- Content production involves participation of actual farmers.
- Digital videos produced are locally generated, instilling a sense of ownership of the programme within farmers.
- Information can be disseminated in sequence, which makes the training of a community possible.
- Content and quality of information can be regulated so that only relevant information can be passed on to farmers.

2.8.5 Warana “Wired Village” Case Study

Warana village is located in the state of Maharashtra, India. In this village, locals adopted ICT to streamline sugar cane growing and harvesting operations (Kukreja and Chakrabarti, 2013). According to Sharma and Sherpa (2013), some of the objectives of the project were to:

- Avail educational, market and agricultural information to smallholder farmers in their native languages.
- create a database with profiles of individual farmers and their implements requirements.
- create a Geographical Information System for 70 villages.
- streamline operations of sugarcane growing and harvesting of the cane.

Warana “Wired Village” project was launched in 1998, and involved the National Informatics Centre (NIC), the Warana Education Department and the Maharashtra Government. The project was initially aimed at 70 villages around Warana Nagar. Fifty-four village information kiosks were set up to facilitate the sugar-cane production process in three phases. The first phase was yearly registration for plantation. The second phase was during issuing of harvesting permits, and the last stage was with payment information. Each kiosk had a personal computer (PC) with a printer, and the PCs had email and internet access. A single kiosk would serve farmers ranging from 30 to 100 per day (Sapovadia, 2010).

According to Sapovadia (2010), some of the benefits of the project included:

- Increased efficiency in terms of monetary gain to the farmer.
- Increased efficiency in terms of administrative time saved by farmers.
- Fertiliser stocks at mini-depots became smaller and better managed.
- Another benefit of the project was that young people became more aware of the internet, as they developed an interest in surfing on the internet in the kiosks.

Sapovadia (2010) highlighted that ICT could potentially help retain the local educated youths.

Lessons learnt from Warana “Wired Village” project, according to Sapovadia (2010) included:

- Assessing the information needs of the community before implementing a project.
- Involvement and feedback from locals is crucial during content and software development. By involving the community, it creates a sense of ownership in the people.
- It is crucial to make it easy for women and poor people to access information as they are generally marginalised. Information on government schemes would be more beneficial to marginalised people like women, the landless and labourers. Failure to access such information would mean that this group of people misses out on opportunities.
- For an ICT programme to work, grassroots operators should be empowered so that they can impart the community with knowledge and skills.

2.9 Access to Technology

According to Sikwela and Mushunje (2013), inadequate agricultural technology is one of the factors negatively affecting smallholder production requirements in rural South Africa. Buah, Nutsugah, Kanton, Atokple, Dogbe, Karikari and Ndiaye (2011) suggest that any new technology should be developed in such a way that it adapts to actual farm conditions for farmers to eagerly adopt it. Farmers also need proper communication on the advantages of new technology for ease of transfer.

Some of the methods suggested by Buah *et al* (2011) which can be used to promote the adoption of a new technology include:

- Training and workshops.
- On-site demonstrations designed in a way which encourages farmer participation.
- Seed fairs, where improved varieties are exhibited to farmers.
- Community outreach programmes.
- Yearly planning sessions.

2.9.1 Adoption of new seed varieties by smallholder farmers

According to IFAD (2012), although organisations like the International Centre for Agriculture Research in the Dry Areas (ICARDA) are always producing new and more productive seed varieties, smallholder farmers are not always keen to adopt these varieties. IFAD (2012) recommends incentivising farmers to encourage them to use improved varieties by way of enhanced market integration, access to funds as well as risk mitigation measures. Lack of proper collaboration between researchers and farmers is also another area which hinders the adoption rate of new seed varieties by smallholder farmers.

2.9.2 Secure storage

According to IFAD (2012), smallholder farmers generally do not have secure storage facilities for surplus produce. The lack of good roads and transport systems to transport farm produce to distant markets significantly hinders smallholder farmers from tangible economic progress. As reported by the IFAD (2012), lack of storage and transport infrastructure contributes to product rejects since freshness becomes compromised. Nearly one third of all food produced every year is lost as spoilages before and after harvest (IFAD, 2012). Smallholder farmers who do not have secure storage for their produce, sometimes find themselves selling their grain as soon as they harvest, only to repurchase the grain a few months down the line at an exorbitant price, leading to them falling into a cyclical poverty trap (IFAD, 2012).

2.10 Vertical Integration

According to Hovenkamp (2010), vertical integration is said to have occurred when an organisation performs a certain task for itself, which it could otherwise get from the market. Huang (2011) suggests that smallholder farmers should engage in vertical integration, for them to earn meaningful returns in their farming activities. As reported by Chikazunga and Paradza (2012), the South African government has been aiding farmers by building pack houses as well as helping in acquisition of formal market certification. Chikazunga and Paradza (2012) however suggest that the SA government should take a step further by:

- Engaging smallholder farmers in training focused on financial management and developing viable business models
- Investing financially in cooperatives and mentoring them until they are going concerns
- Developing alternative fresh produce markets as a way of helping smallholder farmers.

2.11 Productivity growth

Jorgenson *et al* (2014) defined productivity growth as the ratio of change in output to change in input. Productivity growth can be measured in two ways, namely technical efficiency and technological progress (Asekenye *et al*, 2013).

According to NEPAD (2013), agricultural growth in Africa is currently being achieved by employing larger labour force and cultivating more land. As reported by NEPAD (2013), these two strategies have neither led to improved yields nor improvements in production techniques. Larson *et al* (2014) however claims that the key to productivity growth for African smallholder farmers lies with them adopting technologies which will boost their yields.

Alene (2010) however has a different opinion to Mulenge *et al* (2006), as he claims that agricultural productivity in Africa increased after the mid-1980s. Alene (2010) attributes this productivity growth to trade policy reforms as well as improved conditions.

2.11.1 Technical efficiency (TE)

Technical Efficiency may be defined as “the ability and willingness of a production unit to obtain the maximum possible output with a specified endowment of inputs, given the surrounding technology and environmental conditions” (Shanmugan and Venkararamani, 2006). TE can be used as a measure of the effectiveness of management in exploiting the benefits of a given technology (Asekenye, Bravo-Ureta, Mukherjee, Okoko, Okello, Kidula & Puppala, 2013). In agriculture, TE can be measured as the difference between maximum output and actual output of a plot or farm (Asekenye *et al*, 2013). Some of the factors affecting technical efficiency are farm size, specialisation of a farm, price liberalisation, reform and institutional development as well as the income gap between rural and urban

areas (Bojnec, Ferto, Jambor & Toth, 2014). According to Bojnec *et al* (2014), the living standards of agricultural practitioners in rural areas can be improved when agricultural technical efficiency is also increased.

2.11.2 Technical progress (TP)

Technical progress can be defined as the increase in the production function as a result of adoption of improved practices (Asekenye *et al*, 2013). Asekenye *et al* (2013) also claim that TP in agriculture plays a vital role in enhancing economic growth, developing agricultural production and increasing availability of agricultural products on the market. Coxhead and Warr (1995) suggest that productivity gains are the main sources of agricultural growth in Asia.

Coxhead and Warr (1995) further suggest that TP can be split into two forms, which are land quality improvement through irrigation and introduction of new technologies. The new technologies are in chemical and biological form, especially modern crop varieties. Coxhead and Warr (1995) also further argue that the two forms of TP are interdependent. An example given by Coxhead and Warr (1995) is how the yield advantage of modern crop varieties over old varieties can only be realised when irrigation is adequate. NEPAD (2013) however reports that a very small portion of land is under irrigation in Africa, despite abundant water resources. The effects of TP cannot be analysed in isolation as critical factors such as the policy setting in which they take place also have an influence on outcome (Coxhead and Warr, 1995).

2.12 Sustainability in small-scale farming

According to Bernues *et al* (2011), farming is sustainable when it satisfies social, economic, political and environmental demands. The goal of sustainability in agriculture is using ecosystem resources and services for present day needs in such a way that this does not deprive future generations of the privilege of meeting their own needs (Lee *et al*, 2011). Some of the principles of sustainability as outlined by Lee *et al* (2011) include:

- Complying with national laws and regulations,
- Good agricultural practices and techniques,
- Practising agriculture in a manner which protects the environment,

- Looking after the welfare of employees and local community, and
- Continuous improvement of management practices.

DFID (2004) also adds that agricultural sustainability does not go against technology advancement, but rather supports technology which improves productivity without causing harm to the environment. DFID (2004) also describe two levels of agricultural sustainability, namely “light green” and “dark green” levels. “Light green” approach covers agricultural practices which cause no harm to the environment or humans. On the other hand, “dark green” approach covers agricultural practices which build natural and social assets simultaneously with increasing food production. Aubrey *et al* 2012, also suggest that sustainability in agriculture can be viewed in terms of farm sustainability and territorial sustainability. According to Aubrey *et al* (2012), farm sustainability focuses on whether or not the means of production on a farm are economically justifiable, socially acceptable and resources used are renewable. Territorial sustainability, on the other hand, focuses on how much agricultural practices in a territory contribute towards the sustainable development of that territory.

2.13 Fair Trade

According to Raynolds (2012), the fair trade initiative was begun by concerned people in developed economies to help uplift economic and social development of organised smallholder farmers and wage employees in the South through trade. Raynolds (2012) suggests that although fair trade was initially designed for the upliftment of peasant coffee farmers, the concept now includes 20 different agricultural commodities.

Fair trade, as defined by WFTO (2014), is “a trading partnership based on dialogue, transparency and respect that seeks greater equity in international trade. It contributes to sustainable development by offering better trading conditions to, and securing the rights of, marginalised producers and workers - especially in the South.” Fair trade organisations have teamed up with consumers to campaign for changes in conventional international trade rules and practice. Other functions of fair trade organisations are to raise awareness of the need for fair trade, as well as to support producers in their quest to be paid the true value of their goods sold on the market (WFTO, 2014).

According to the WFTO (2014), fair trade standards stipulate the following conditions for traders:

- To pay a price that covers the cost of sustainable production.
- To pay an additional sum which enables producers to invest in development.
- To sign contracts that enable producers to make long term plans and engage in sustainable production practices.
- To aid producers by partially paying them in advance, when asked.

According to Fair Trade Foundation (2011), Fair trade farmers have higher income than their counterparts who are outside the system. As a result of this development, Fair trade farmers are less vulnerable to poverty. Fair Trade Foundation (2011) also suggests that the benefits of Fair trade sales may be offset by membership costs, if smallholder farmers produce small quantities.

According to Cramer *et al* (2014), many papers and journal articles have been published over the past few years, regarding perceived benefits of fair trade on smallholder coffee farmers in developing economies. However, very few journals show empirical evidence from field surveys of the actual benefits of fair trade, especially on farm workers.

2.14 Conclusion

This chapter extensively covered literature concerning small scale farming. The chapter began by defining a smallholder farmer, as well as outlining the characteristics of a smallholder farmer. Aspects like agricultural value chains and challenges faced by smallholder farmers were also covered. Two case studies were included in the chapter, which showed how other smallholder farmers in India overcame their challenges. The chapter ended by touching on two other parameters which are important in agriculture. These parameters are productivity growth and sustainability growth. The next chapter shows how the research was designed and conducted.

CHAPTER THREE

Research Methodology

3.1 Introduction

This chapter clearly outlines the purpose of the study, the research strategy, location, as well as a report of the extent of researcher control and manipulation of the research. Other aspects covered in this research include collection, measurement and analysis of data.

3.2 Purpose of the study

Literature suggests access to markets, information, technology and capital are the major factors influencing the success of smallholder farmers (Mudhara, 2010). A survey was conducted on smallholder farmers in eThekweni Metropolitan, KwaZulu-Natal, to establish how smallholder farmers in eThekweni access these resources. The research was narrowed down to four hubs which fall under eThekweni Metropolitan, namely Hambanathi, Mariannhill, Cliffdale and Umbumbulu.

3.3 Nature of study

The approach employed in this research is descriptive in nature. The research was meant to determine if smallholder farmers in eThekweni Metropolitan perceived the four major challenges listed in literature as affecting their operations, as well as competitiveness on the market. In order to achieve the objectives of the study, a mixed methods approach was employed to collect data from smallholder farmers whose responses were based on their experiences. During the study, there was minimum researcher interference.

3.4 Sampling techniques

Sekeran and Bougie (2013) suggest that in instances where it is impossible to collect data from the whole population, a researcher can use a sample. Studying a sample, as opposed to an entire population can yield more reliable results as fatigue and data collection errors are minimised. Other reasons why researchers

also use samples in their studies are time, costs and other human resources constraints (Sekeran and Bougie, 2013).

According to Sekeran and Bougie (2013), there are six factors to consider when deciding on the size of a sample. These factors are:

- Objectives of the research,
- The required level of precision,
- The tolerable risk in predicting the required level of precision,
- Variability in the population,
- Cost and time constraints which may exist, and
- Population size in certain instances.

A representative sample of the population was selected using systematic sampling technique, which falls under probability sampling. The study was limited to smallholder farmers growing vegetables in the Mariannhill, Umbumbulu, Clifffdale and Hambanathi agrihubs of eThekweni Municipality. The total population of smallholder farmers, as given by Edamame Development Programme, was 585 farmers. The population of active farmers was composed of 456 females and 129 males (Partner Farmer Register, 2015). A sample size of 100 farmers was selected using systematic sampling technique, where every sixth name on the register was selected. Although the statistical tables suggest a larger sample to minimise errors and bias during the research, time and resources were the main hindering factors from using a larger sample. The respondents selected are farmers who were registered by Partner Farmer, a not-for-profit organisation which works with farmers. The respondents also practice agro-ecology in eThekweni district.

3.5 Research Method

This research took the form of a descriptive study. According to Sekeran and Bougie (2013), some of the potential benefits of descriptive studies are:

- They help the researcher to understand the characteristics of persons, events or situations.

- They help the researcher to think in a systematic way about aspects in a given situation.
- They enable the researcher to formulate ideas for further research.
- They help in decision-making processes.

As outlined by Sekeran and Bougie (2013), descriptive research can be either qualitative or quantitative in nature.

Quantitative research is a type of research where data collected are in the form of numbers (Punch, 2013). Sekeran and Bougie (2013) also suggest that quantitative data include variables like satisfaction ratings, sales figures, production figures, as well as demographic data. Quantitative data are normally gathered through structured questions.

Qualitative research, on the other hand, is a type of research where data are in the form of words. Data are generated from broad answers to questions asked in an interview or open ended questions in a questionnaire. Qualitative data may also be generated from secondary data or through observation (Sekeran and Bougie, 2013).

Creswell (2013) however suggests a third type of research called mixed method research. According to Creswell (2013), this type of research involves collecting qualitative and quantitative data. The rationale behind this type of research is that, fusing both types of research approaches gives the researcher better understanding of a research problem, than when a single approach is used.

3.6 Questionnaire Design

Data was collected by means of a personally administered questionnaire. The questionnaire was designed and developed in two languages, namely English and isiZulu. The isiZulu version of the questionnaire was meant to cater for participants who were not proficient in the English language. The questionnaire employed both open ended and closed questions. In designing of the questionnaire, care was taken to ensure that the alternatives are mutually exclusive and collectively

exhaustive, as suggested by Sekaran and Bougie (2013). Other factors which were taken into consideration were:

The questionnaire comprised five parts which covered participant's personal information, funding of farming projects, marketing, access to information and access to technology. Section one of the questionnaire was meant to gather data which could be used to describe the sample characteristics, as well as to establish if there were any noticeable trends among demographics. The reason for section two of the questionnaire was to establish funding of smallholder farming activities in eThekweni Metropolitan. Aspects like the ease of accessing and repayment of loans were also investigated.

Section three of the questionnaire covered the marketing of agricultural produce. Participants were asked to give their opinions on ease of access to markets, their negotiating power at the market as well as method of selling agricultural produce. Section four of the questionnaire had to do with the ease of smallholder farmers accessing vital information needed for the smooth running of their operations. Section five of the questionnaire sought to establish smallholder farmers' exposure to the latest technology and their view of what technology they would need to simplify farming operations.

The questionnaire was designed in a simplified manner such that participants could complete the document in fifteen minutes. The questionnaire employed an itemised rating scale format. According to Sekaran and Bougie (2013), the itemised rating scale format gives advantages of flexibility to use as many points in the scale deemed necessary, as well as flexibility in nomenclature of the anchors.

3.7 Research instrument administration

Potential participants were first informed about the reason for administering the questionnaire. The participants were also assured that privacy and confidentiality of responses would be maintained. Participants were also informed that they could only answer the questionnaire on a voluntary basis, and that they could pull out before completion of the questionnaire, without any negative consequences on their part. These assurances were made so that participants gave true responses

to the questions asked, hence also ensuring validity and reliability of data collected. Any questions which participants had were answered prior to commencement of the interview. Participants were then issued with a separate informed consent form, which they were required to complete.

Questionnaires were issued to participants in their respective areas, completed in the same instance and collected immediately after completion. All 100 questionnaires issued were completed by the respondents.

3.8 Ethical considerations during research

In any academic research ethical issues must be considered prior to commencement of the research. Several issues were considered during questionnaire design and collection of data. As required by the University of KwaZulu Natal, a copy of the questionnaire as well as research proposal was submitted to the University's ethics committee for approval. The ethics committee requested for the questionnaire to be translated into isiZulu, for the convenience of participants who were not conversant with the English language. Permission to proceed with the investigation was granted by the ethics committee after a copy of the translated version of the questionnaire was submitted.

During questionnaire design, care was taken to ensure that:

- Intrusive information was not asked for.
- Questions which violate participants' self-esteem or lead to shame, embarrassment, regret, or social stigmatisation were not asked.
- No misrepresentation in written form of the nature of the study was made.

During interviews, ethical issues which were observed include:

- No confidential information was asked without prior consent of participants.
- An atmosphere where respondents could answer the questions out of their own free will and without fear of being victimised was created.
- Participants were not exposed to questions which are considered to be stressful or upsetting.
- Procedures which may have unpleasant or harmful side effects were also avoided.

- Participants were not exposed to any situations which may be deemed to be physically or mentally harmful.

After interviews were conducted

- Information given by respondents was treated with strict confidentiality. Questionnaires were locked up in a safe and secure storage facility at the University premises.

Prior to conducting each interview, the interviewer took time to explain to each potential respondent that the research was for academic purposes only and that there was no monetary reward for participating in the study. Potential participants were also informed that their participation should be on a voluntary basis, and that they could pull out of the exercise at any time without any negative consequences on them. The participants were also informed that information supplied by them would be treated with strict confidentiality. After the participants agreed to be interviewed, they were asked to sign an informed consent form, as evidence that they gave the researcher permission to interview them.

3.9 Pilot testing

Sekaran and Bougie (2013) recommend that pretesting and validation of a questionnaire be done before questionnaires are handed out to the rest of the participants. This exercise is meant to help the researcher to identify and correct any errors in their research instrument. In this research, a small number of 5 respondents were identified from the population and interviewed to test for the following:

- That questions were clear to the participants
- Comprehensibility of the questionnaire
- The length of time it would take to complete the questionnaire.

After pretesting, it was established that the questions were adequately clear and the questionnaire was comprehensible. It was also established that it took an average of 15 minutes to complete the questions.

3.10 Measurement and analysis of data

For this study, the questionnaire was the only tool for collecting primary data from the farmers. The questionnaire was developed by the researcher. Each question in the questionnaire was meant to establish if variables identified in literature to be affecting smallholder farmers' operational efficiencies also affect farmers in eThekweni. Data collected from the farmers was summarised and analysed using Microsoft Excel 2010.

Demographic information collected from the farmers was presented in the form of frequency distribution of age, gender, and marital status. For the rest of the questionnaire, the results were presented in the form of descriptive statistics. Graphs and cross tabulations were used to present the data.

A reliability test was performed on the data using Cronbach's alpha test. Sekaran and Bougie (2013) claim that, reliabilities less than 0.6 are considered to be poor, while those between 0.7 and 0.8 are considered to be acceptable. Reliabilities above 0.8 are considered to be good.

3.11 Summary

This chapter outlined the nature and purpose of the study. Sampling technique employed in this study was outlined and stratified random sampling was identified to be the best technique for this research. The research instrument employed in this study was reported to be a questionnaire, which utilised an itemised rating scale format. A brief description of how the questionnaire was designed, pilot tested and administered was also given. Ethical issues which were considered during designing of questionnaire, during questionnaire administration and after data collection were also outlined. Lastly the chapter also summarised how the data was measured and analysed. The next chapter presents data collected and subsequent analysis.

CHAPTER 4

PRESENTATION OF RESULTS

4.1 Introduction

In this chapter, data collected from respondents by means of questionnaires is presented. Data collected was first summarised using Microsoft Excel 2010, and presented in the form of graphs and tables. Correlation calculations were also performed to establish any relationships between variables.

4.2 Reliability statistics

The Cronbach's alpha score was used to measure reliability of the research instrument for this study. For more insight on the test, readers may see Cronbach (1951) or Miller (1995) for alpha scores. Table 4.1 below shows Cronbach's alpha scores for the questionnaire used.

Table 4.1: Cronbach alpha scores

Questionnaire Segment	Parameter	No. of Items	Cronbach's Alpha Coefficient
Section Two	Project funding	8	0.764
Section Three	Marketing of farm produce	10	0.818
Section 4	Access to information	7	0.754
Section 5	Access to technology	5	0.846
Overall Score		30	0.796

The overall reliability score was 0.796 indicating that the research instrument was reliable. The individual reliability scores for each section were also higher than the minimum required score of 0.7, hence reaffirming that the research instrument was reliable.

4.3 Demographics

This section presents demographic information of the participants. All the participants were of the African race, hence race will not be considered as a factor or significant construct in this study.

4.3.1 Gender distribution

Both males and females participated in the survey. Figure 4.1 below shows gender distribution of the participants.

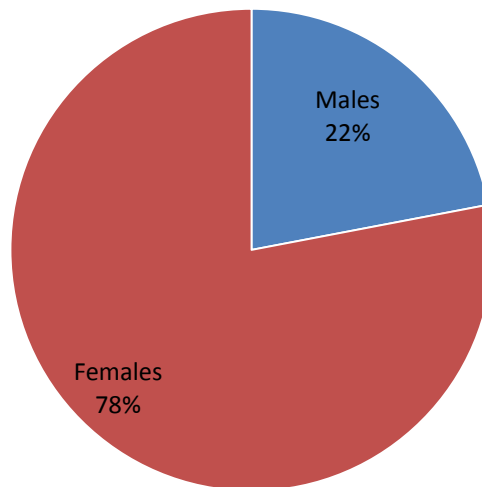


Figure 4.1 Gender distribution of participants

As shown in Figure 4.1 above, 78% of the participants were female and 22% were male. The high ratio of females to males who participated in the survey seems to suggest that there are more females than males involved in agroecology in eThekweni district.

4.3.2 Marital status

Figure 4.2 below shows a summary of marital status of the farmers who participated in the survey.

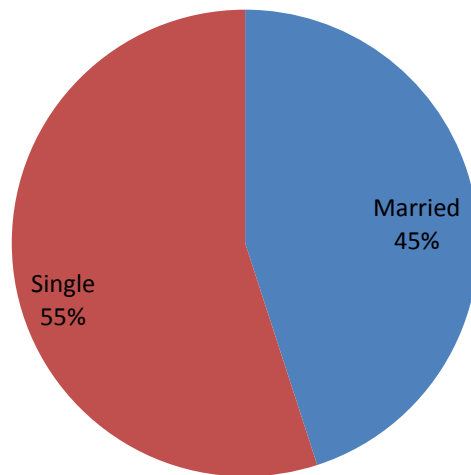


Figure 4.2 Marital status of participants

From Figure 4.2 above, it can be seen that 55% of participants were not married and 45% of the participants were married. Whereas the distribution here reveals some aspect of the status of respondents, it does not reveal the number of children in each of the units. Literature suggests that smallholder farmers often rely on the labour force of family members in order to allay production costs (Mudhara, 2010).

4.3.3 Age distribution

Age of the participants was classified into four groups namely 16 to 30 years, 31 to 45 years, 46 to 60 years and 61 years and above. Figure 4.3 below shows the age distribution of the participants.

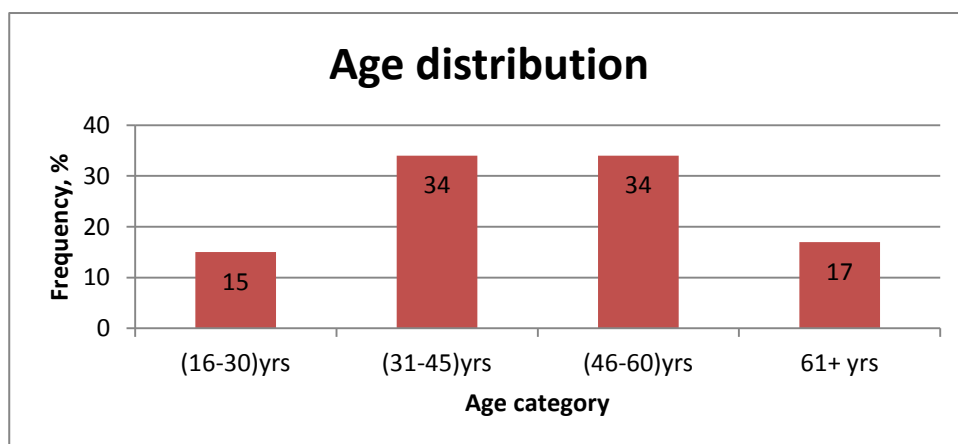


Figure 4.3 Age distribution of participants

The ages of the participants was normally distributed, with 68% of the participants falling between 31 and 60 years. 17 % of the participants was 61 years and above, while those who fell in the 16 to 30 years age group constituted 15% of the participants. It is critical to observe that 68% are between 31 and 60 years, which is also confirmed by the literature that most smallholder farmers are spread in these age groups (STATS SA, 2013).

4.3.4 Plot size distribution

The plot sizes which were denoted in acres, were measurements of the pieces of land under cultivation. This measurement helps one to understand the smallholder farmer's capacity to produce crops. Figure 4.4 below shows distribution of the plot sizes.

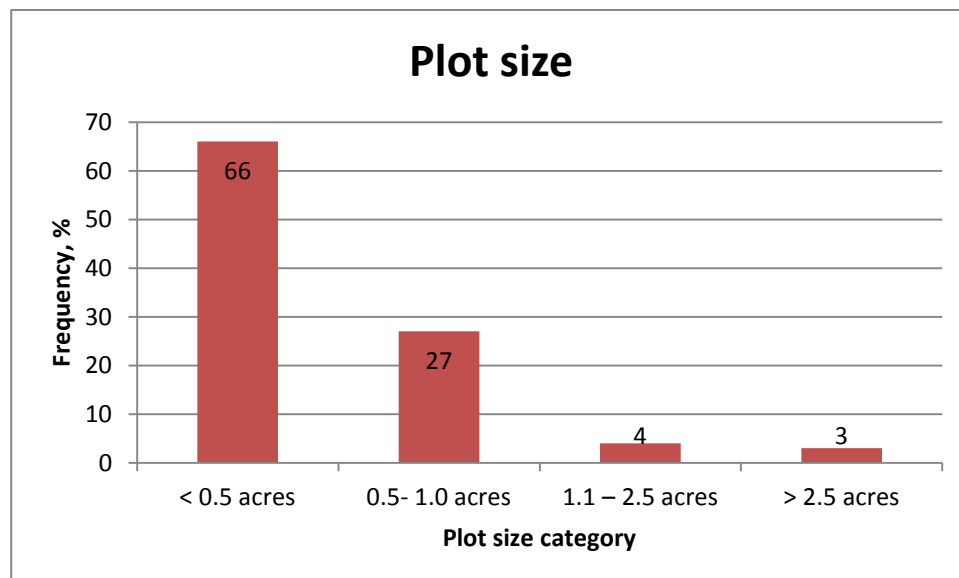


Figure 4.4 Plot size distribution

From Figure 4.4 above, it can be seen that 66% of the farmers have cultivated plots of land measuring less than half of an acre in area. 27% of the farmers had between 0.5 and 1.0 acre in size under cultivation. 4 % of the farmers had between 1.1 and 2.5 acres under cultivation and only 3 % had over 2.5 acres under cultivation.

4.4 Access to funding

In this section the researcher investigated issues surrounding funding of smallholder farmers.

4.4.1 Financing of farming venture

Participants were asked how they financed their farming business. The responses were summarised and presented as shown in Figure 4.5 below.

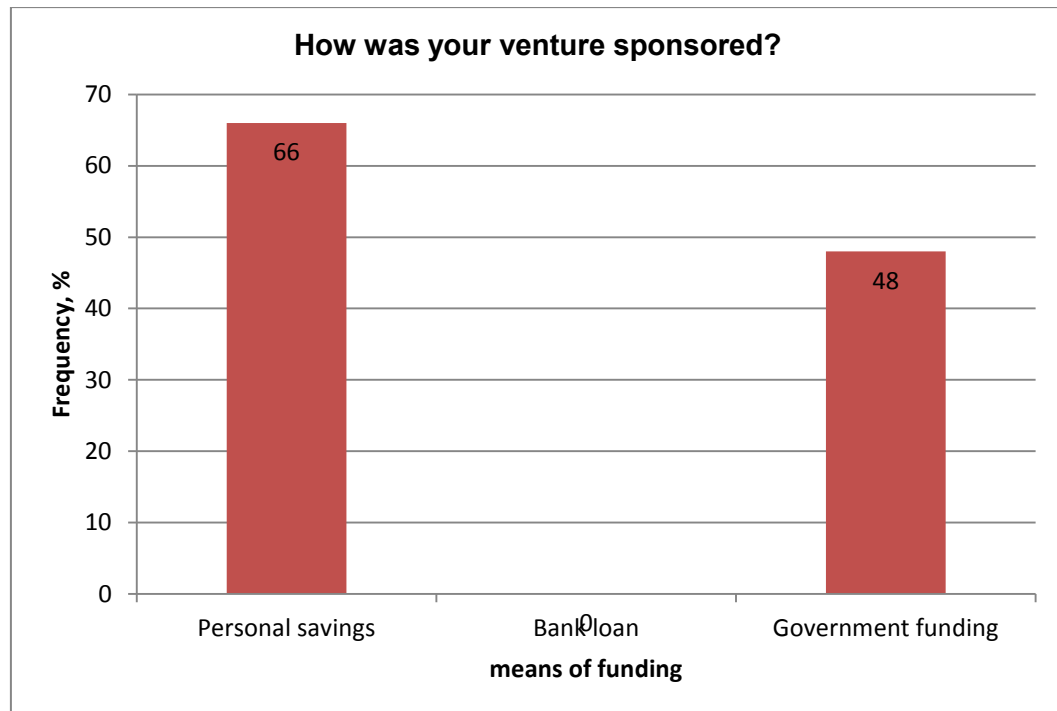


Figure 4.5 financing of farming ventures

From Figure 4.5 above, 66% of the farmers reported that they financed their farming businesses from their personal savings, while 48% revealed that they received government funding. 14% of the farmers also reported that they partly funded their businesses from personal savings and partly from government funding.

4.4.2 Application for bank loans

This question was meant to establish the proportion of farmers who had applied for a bank loan as opposed to those farmers who never applied for a bank loan. The results are summarised in Figure 4.6 below.

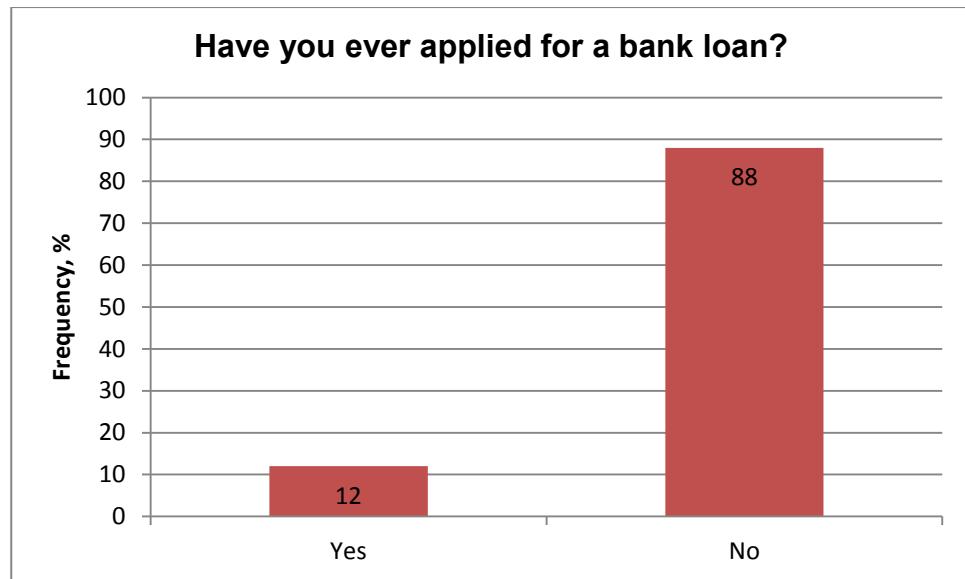


Figure 4.6 bank loan applications

From Figure 4.6 above, it can be seen that only 12 % of the farmers had ever applied for a bank loan.

4.4.3 Ease of acquiring a bank loan

The next question was meant to establish farmers' perspectives of the ease of acquiring a bank loan. Figure 4.7 below shows a summary of farmers' responses to the question.

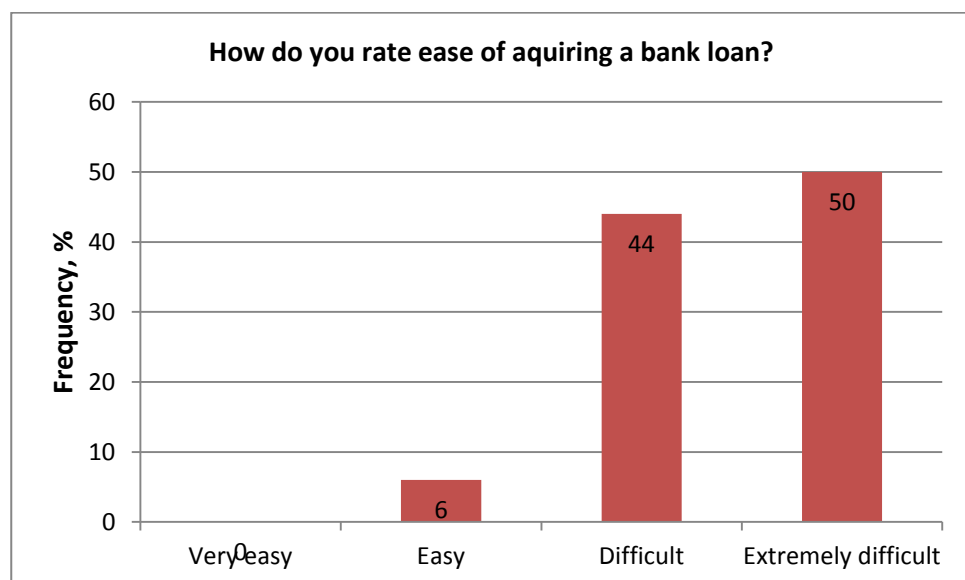


Figure 4.7 Ease of acquiring a bank loan

From Figure 4.7 above, it can be established that no farmer claimed that it was very easy to acquire a bank loan, and only 6% claimed that it was easy to acquire a bank loan. 44% of the farmers interviewed claimed that it was difficult to get a loan from the bank, while 50% of the farmers reported that it was extremely difficult to acquire a loan from the bank. A total of 94% of the farmers interviewed claimed that it was difficult for them to acquire a bank loan. This perception could be the reason why only 12% of the farmers had ever applied for a bank loan.

4.4.4 Bank loan repayment

The next question sought to establish the farmers' perceptions of bank loan repayment conditions. The results were summarised as shown in Figure 4.8 below.

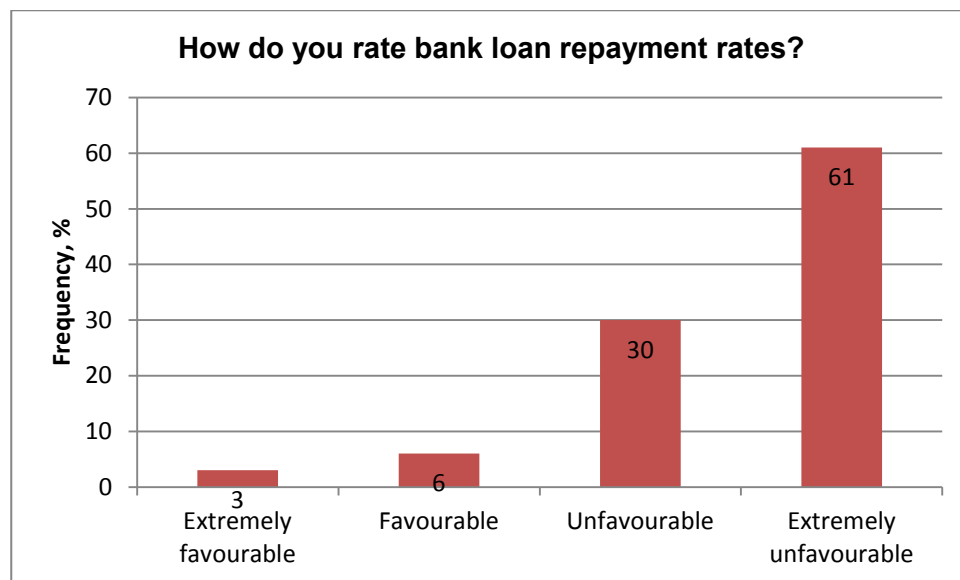


Figure 4.8 Bank loan repayment conditions

It can be established from Figure 4.8 above that 61% of the farmers reported that bank loan repayment conditions were extremely unfavourable, while 30% reported that the repayment conditions were unfavourable. 6% of the farmers however reported that the conditions were favourable and 3% claimed that bank loan repayment conditions were extremely favourable. 91% of the farmers who participated in the survey claimed that bank loan repayment conditions were not favourable to them.

4.4.5 Application for government loan (grant)

The next question sought to establish the percentage of farmers who had applied for government loan. It should be noted that although recipients do not pay back the money issued by government to sponsor their farming projects, there are certain conditions which the farmers have to meet prior to and after receiving the grant. For that reason, government grants were loosely referred to as government loans in this research. The farmers' responses were summarised as shown in Figure 4.9 below.

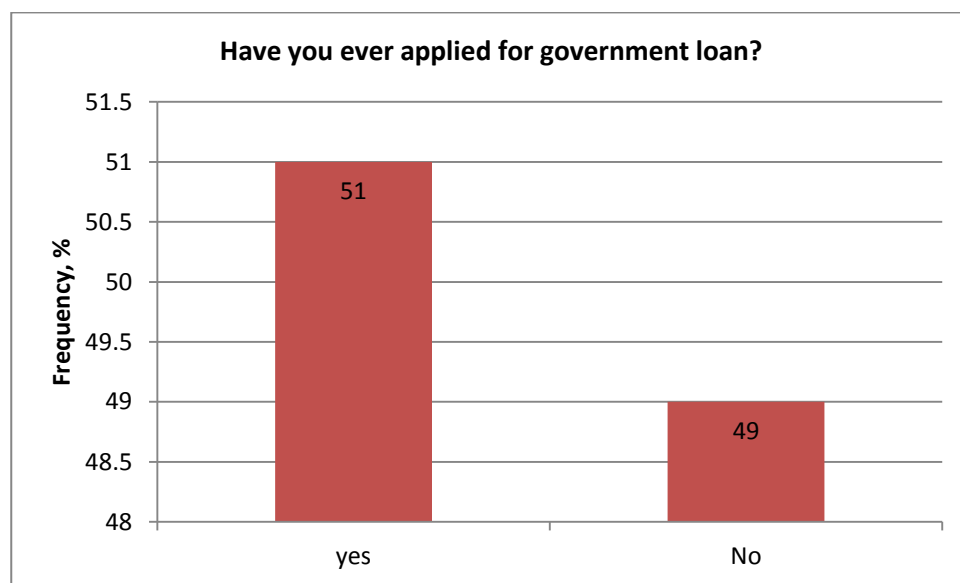


Figure 4.9 Government loan applications

From the survey, 51% of the farmers applied for government loans while 49% never attempted to apply for government loans.

4.4.6 Ease of acquiring a government loan

This question was meant to establish farmers' perceptions of acquiring a government loan. Figure 4.10 below shows the farmers' responses.

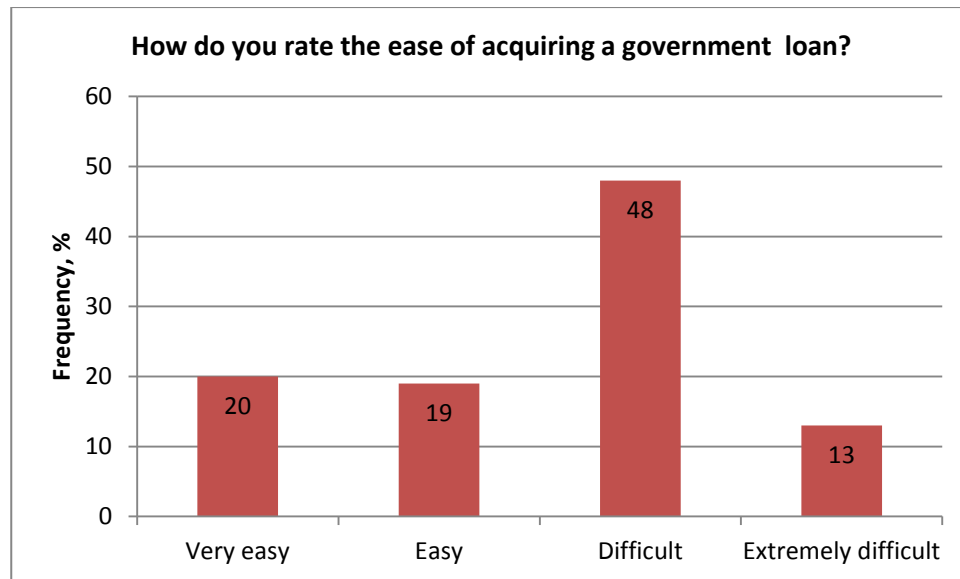


Figure 4.10 Acquisition of government loans

From Figure 4.10 above, it is clear that 48% of the farmers claimed that it was difficult to acquire a government loan, and a further 13% reported that it was extremely difficult. In total 61% of the farmers perceived acquisition of government loans to vary from being difficult to extremely difficult to acquire. 19% of the farmers, however, claimed that it was easy to acquire a government loan, while 20% claimed that it was very easy to get a loan from the government.

4.4.7 Government loan repayment rates

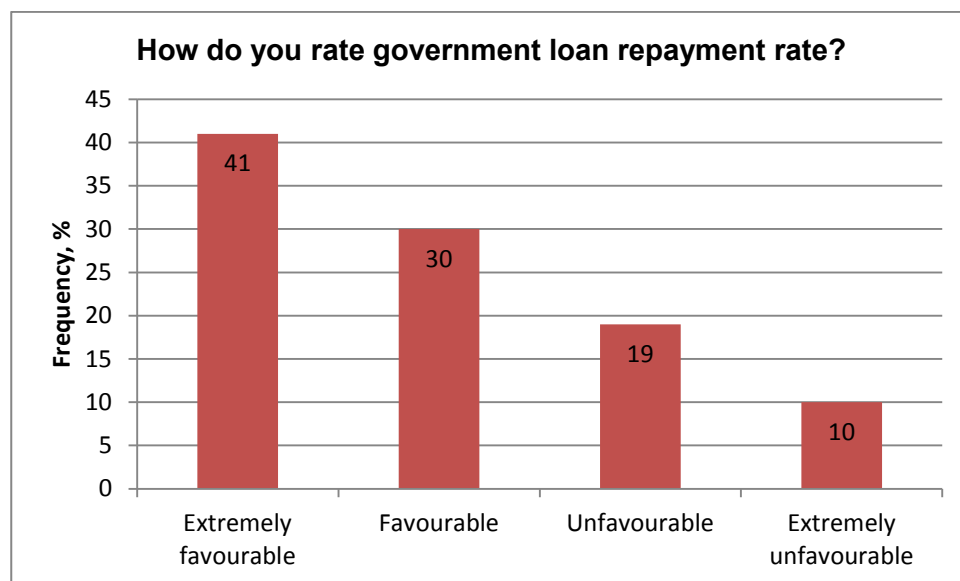


Figure 4.11 Respondents' perceptions of government loan repayment conditions
From the data collected, it was established that 41% of the farmers were of the

opinion that repayment conditions were extremely favourable. A further 30% also claimed that the repayment conditions were favourable. This brings to 71% of the farmers who were of the opinion that government repayment conditions were favourable. 19% of the farmers, however, were of the opinion that repayment rates were unfavourable, and a further 10% thought the conditions were extremely unfavourable.

4.4.8 General comments concerning funding

The farmers were also asked to give general comments on funding of smallholder farmers in order to capture any other important issues which might exist. The table below gives a summary of comments given by the farmers. The responses were captured and summarised in Table 4.2 below.

Table 4.2 General comments on funding of smallholder farmers

Comment	Frequency (%)
Government funding is difficult to acquire	16%
More government funding required	53%
Government to relax conditions for funding of individuals to the same level of conditions for cooperatives.	9%
It takes too long for government funds to be released	6%
Farmers could not access information with regards funding	4%
Government funding is best suited for smallholder farmers	3%
Government funding is critical for farmers' success	5%
Thanks to government	3%
No comments	1%
TOTAL	100%

It is important to note that 53% of the respondents commented that more government funding was required. 16% of the respondents commented that government funding was difficult to acquire. A further 9% of the respondents commented that government should revise downwards the preliminary requirements to be met by individuals who applied for funding to the same level of requirements from cooperatives.

4.5 Access to markets

This section investigated smallholder farmers' ease of accessing markets

4.5.1 Selling of farm produce

This question was meant to establish where farmers mostly sold their produce. The results are presented in Figure 4.12 below.

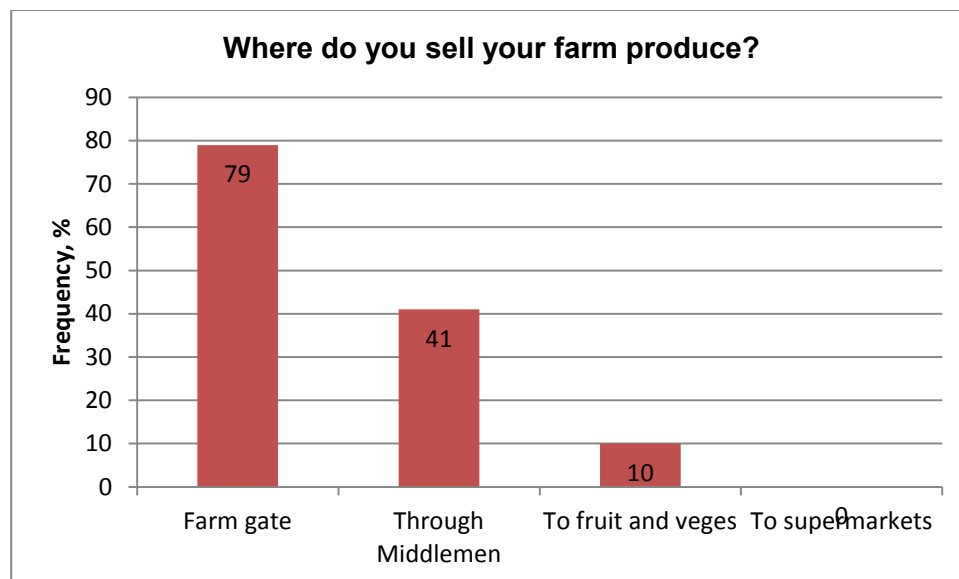


Figure 4.12 market channels used to sell farm produce

It can be established from Figure 4.12 above that 79% of the farmers sold their produce at the farm gate, or just around their smallholdings. 41% also claimed to sell through middlemen, while another 10% sold to fruit and vegetable markets. No farmer claimed to be selling their produce to established chain supermarkets. Only 28% of the farmers claimed to sell their produce through one channel, and 72% of the farmers used more than one channel to sell their produce.

4.5.2 Reasons for using current market channel to sell produce

The following question was meant to establish why farmers used the above mentioned channels for selling their produce. The results are presented in Figure 4.13 below.

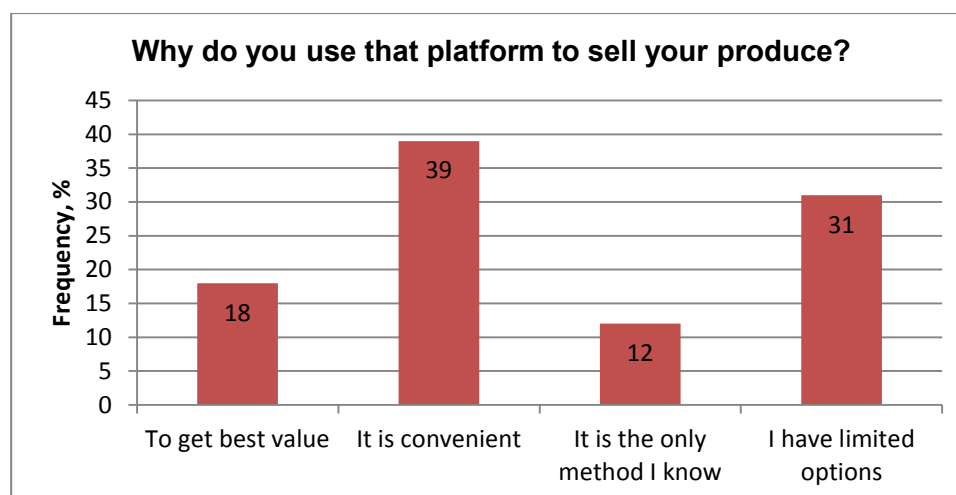


Figure 4.13 Reasons for using specified market channels to sell produce

From Figure 4.13 above, it can be seen that 39% of the respondents admitted that they were using those particular market channels for convenience. 31% commented that they had limited options. Only 18% of the participants commented that they used their specific market channel to get best value. 12% of participants confessed ignorance of other channels and alternatives through which they could sell their produce, apart from the ones they were using.

4.5.3 Value generated when produce is sold on the market

The researcher wanted to establish if farmers thought that they were getting best value for their produce sold on the market. The responses are presented as follows:



Figure 4.14 farmer perception of value obtained from markets

Figure 4.14 below shows that 30% of the participants were not sure if they were getting best value for their produce. A further 24% of the respondents commented that they did not know if they were receiving best value for their produce on the market. Another 22% of the respondents admitted that they were not getting best value for goods sold on the market. Only 24% of participants admitted that they received best value.

4.5.4 Ease of reaching market

Participants were asked about accessibility of markets. Data was summarised and presented in graphical form as shown in Figure 4.15 below:

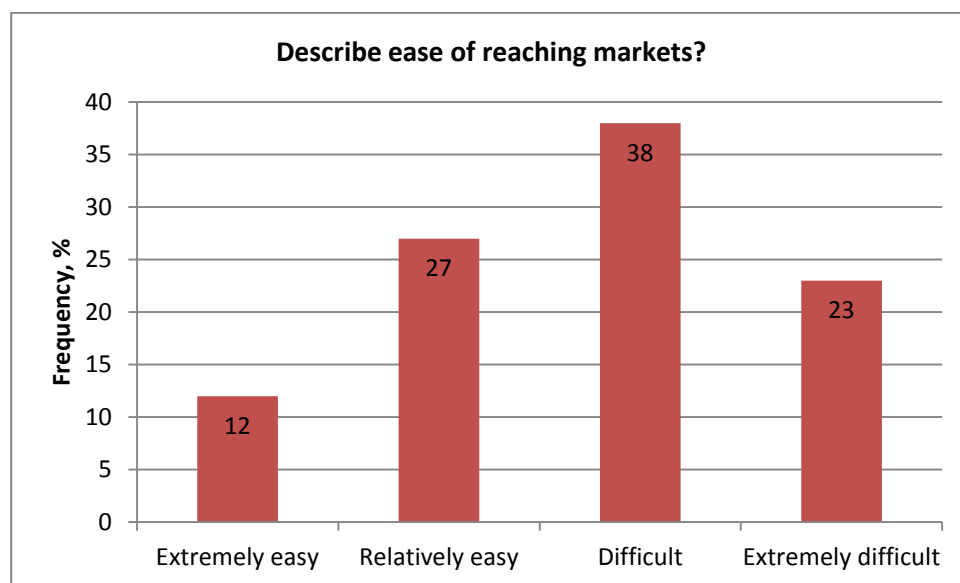


Figure 4.15 Accessibility of markets

From Figure 4.15 it can be established that 38% of the participants claimed that markets were difficult to access. A further 23% also commented that markets were extremely difficult to access. A total of 61% of respondents were of the opinion that markets were either difficult or extremely difficult to access. 39% of participants claimed that markets were easy to access.

4.5.5 Transportation of produce

The next question was aimed at establishing how farm produce was transported to the markets. The results are shown Figure 4.16 below.

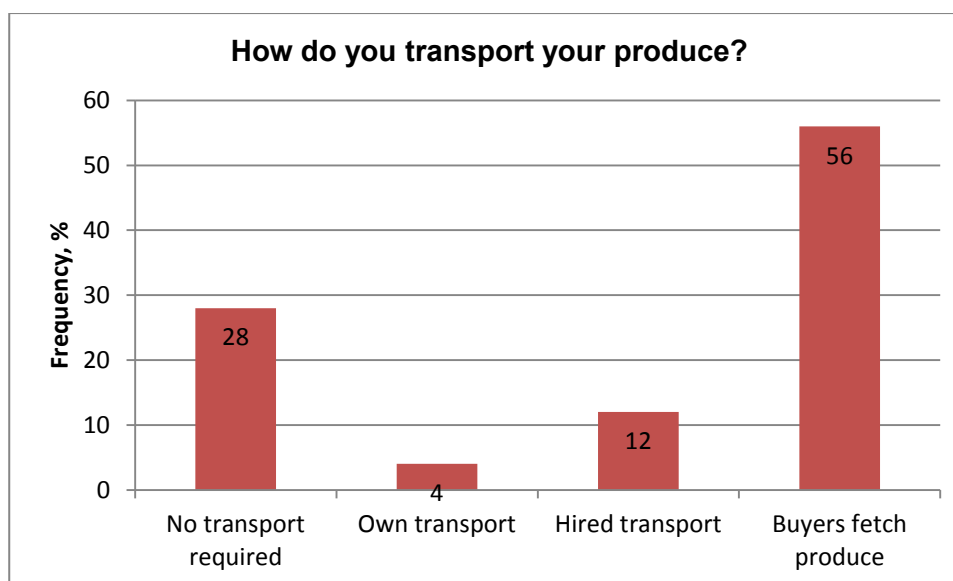


Figure 4.16 transportation of farm produce

An analysis of Figure 4.16 shows that 56% of the participants indicated that buyers fetched their produce from the smallholdings. 28% commented that their produce did not need transportation. Only 12% of the farmers indicated that they used hired transport to ferry their produce to outlying markets. 4% of the farmers used their own transport.

4.5.6 Accessibility of farms

The reason for the next question was to establish accessibility of farms. The results were summarised and presented in Figure 4.17 below.

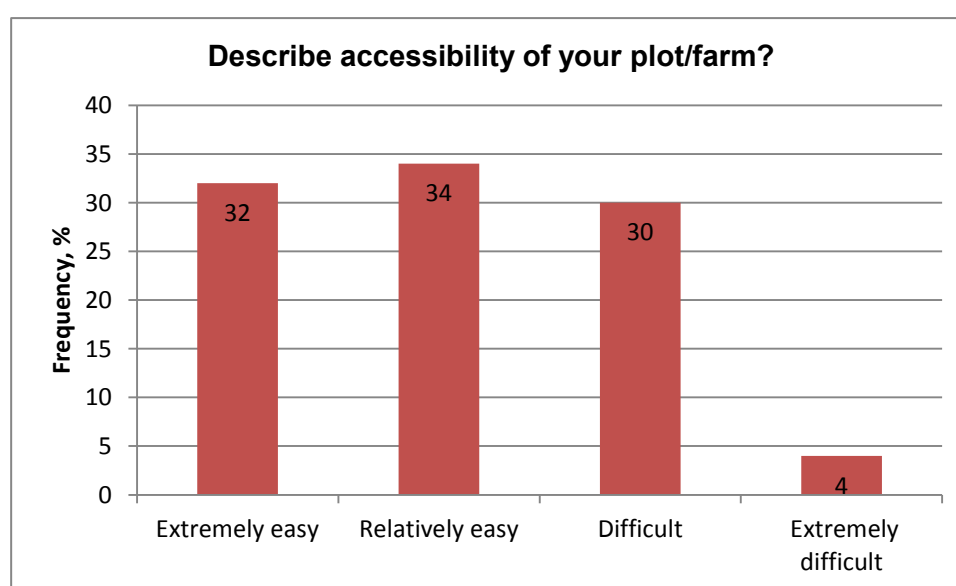


Figure 4.17 Accessibility of farms

It can be established from Figure 4.17 above that, 32% of participants reported that their farms were extremely easy to reach. 34% reported that their farms were relatively easy to access. In total 66% of participants reported that their farms were easy to access. Only 34% of participants reported that their farms were difficult or extremely difficult to access by potential customers.

4.5.7 Transport costs

The reason for the next question was to establish how farmers viewed their transport costs. The farmers' views on the matter are presented in Figure 4.18 below:

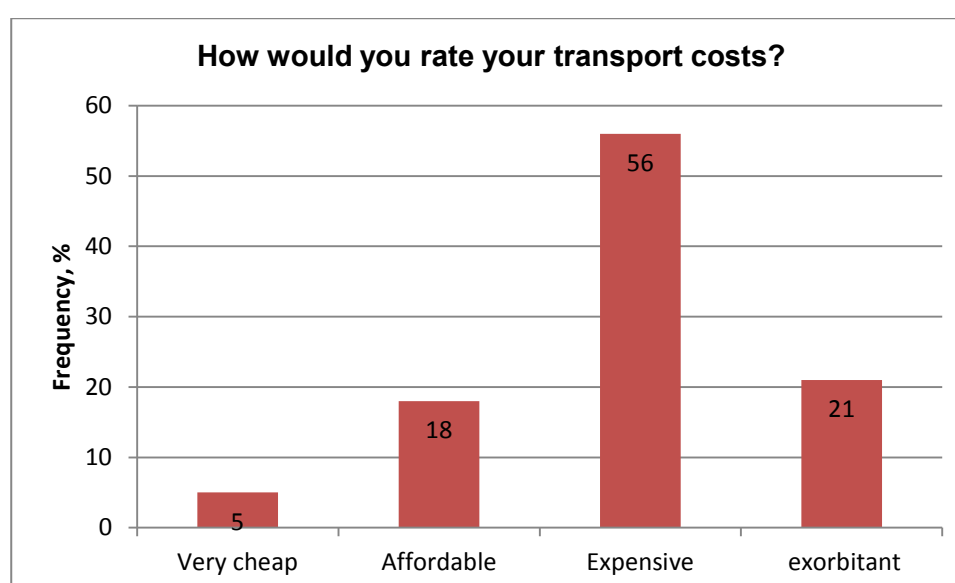


Figure 4.18 farm produce transport costs

From Figure 4.18 above, it can be established that 56% of respondents thought their transport costs were expensive. Another 21% commented that transport costs were exorbitant. A total of 77% of the farmers therefore suggested that transport costs varied from being expensive to exorbitant. This has a significant impact on the profit margins of the smallholder farm

4.5.8 Negotiating power in the marketplace

The farmers were also asked about their negotiating power and their responses were summarised and presented in Figure 4.19 below.

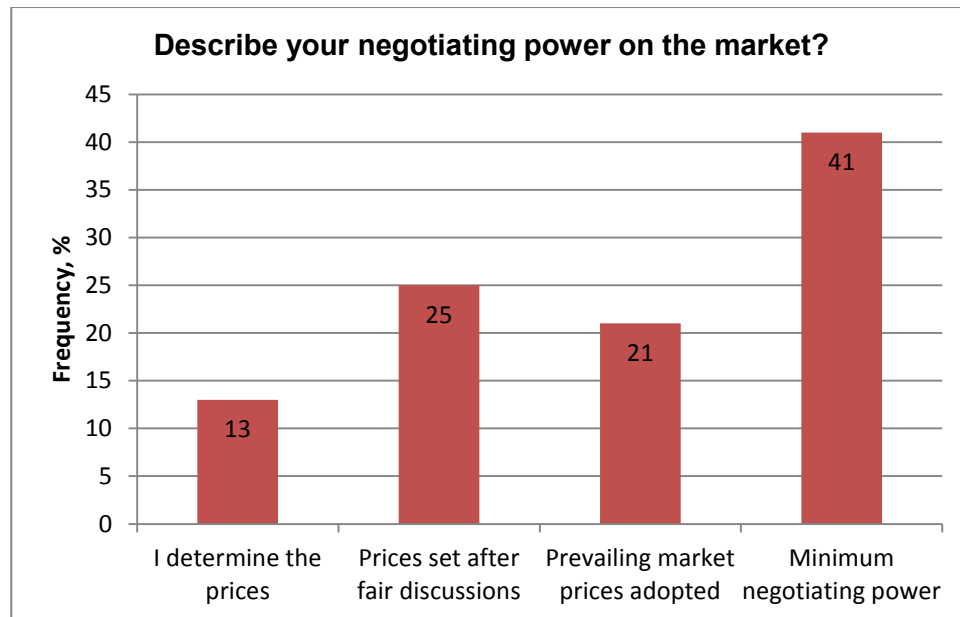


Figure 4.19 Farmer negotiating power in the market

An analysis of Figure 4.19 reveals that 41% of the participants had minimum negotiating power in the marketplace, while 21% revealed that they used prevailing market prices. Another 25% commented that prices were set after discussion with the buyers. Only 13% of the farmers claimed that they set their own prices.

4.5.9 Preferred market with highest returns

The participants were also asked which market they thought they would get the highest returns for produce sold. The participants' responses are shown in Figure 4.20 below:

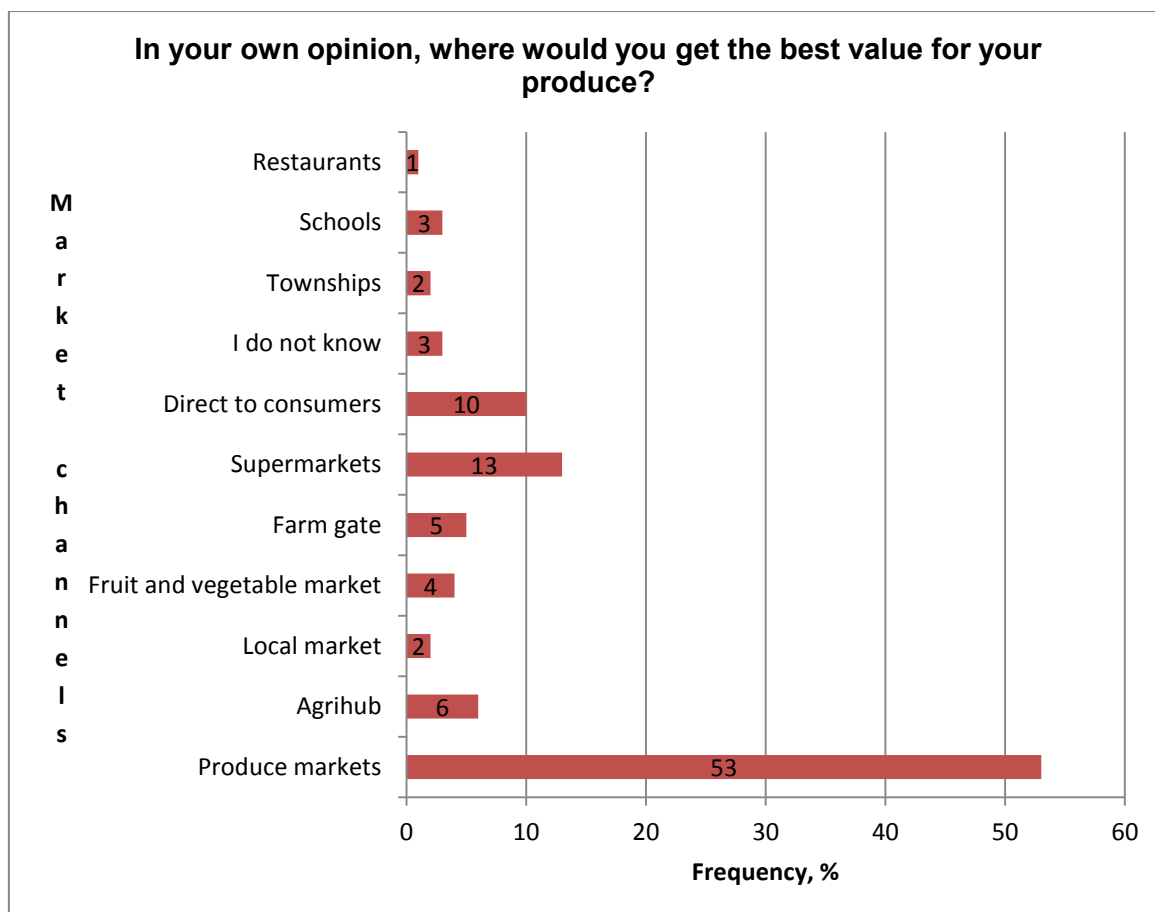


Figure 4.20: Perceived markets with highest returns

As can be seen from Figure 4.20 above, 53% of the farmers were of the opinion that they would receive the highest value for produce if this was sold at fresh produce markets. Only 13% of the farmers suggested supermarkets to be the best channel. Another 10% of the farmers were of the opinion that they would get the highest returns when they sold their produce direct to consumers. The last 24% of the farmers thought that they would get highest value when they sold to places like restaurants, schools, townships and farm gates. 3% of the farmers did not know which places to sell their produce in order to get the highest value.

4.5.10 Hindrances which prevent farmers from selling to preferred markets

The farmers were also asked what was hindering them from selling their produce to the above suggested markets, in order to receive the highest value. The responses are presented below:

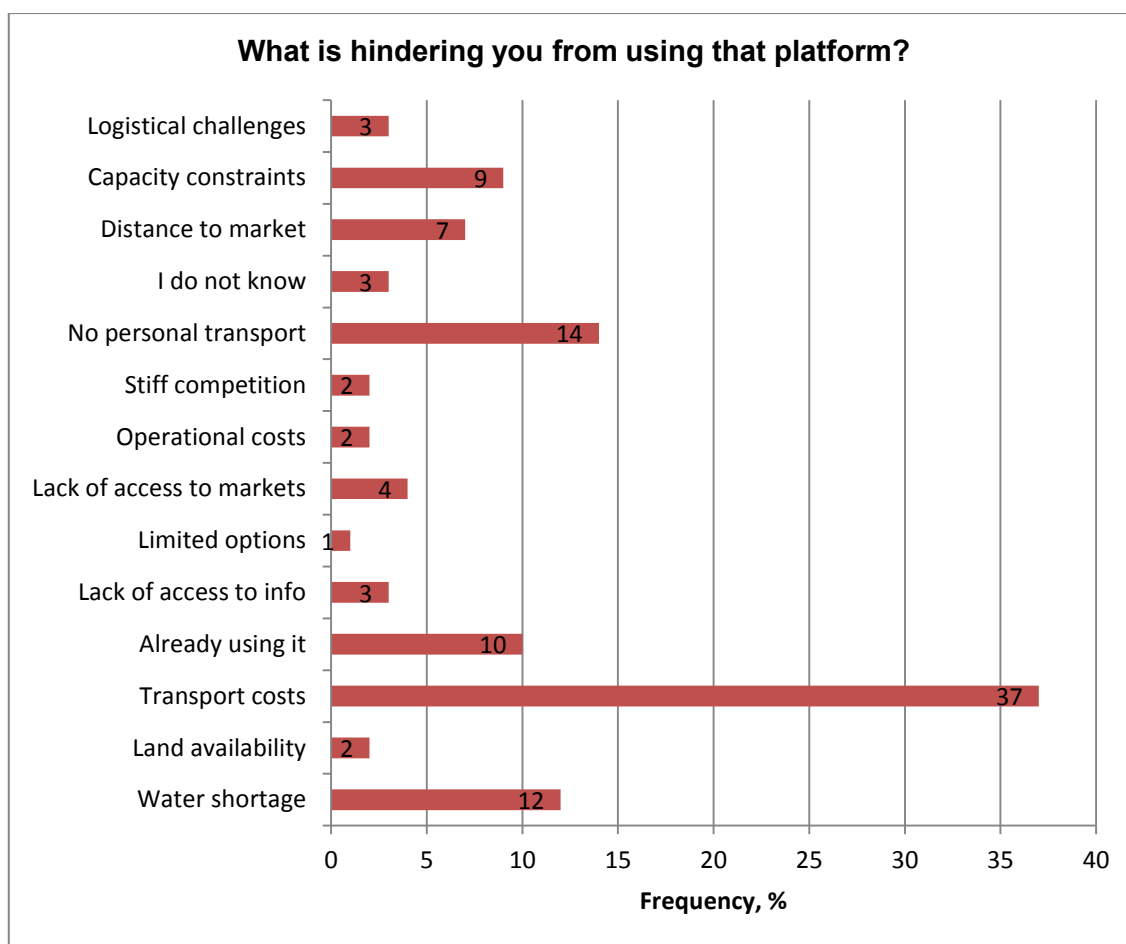


Figure 4.21: Hindering factors preventing farmers from selling to preferred markets

According to the results shown in Figure 4.21 above, a total of 14 factors were cited as the reasons why the farmers were not selling to their preferred markets. Transport costs had the highest frequency of 37%. Another 14 % of the farmers cited lack of personal transport. Water shortage was cited by 12% of the respondents. Water shortage limited the farmers" capacity. 10% of the farmers claimed to be already using the preferred channel to sell their produce.

4.6 Access to information

This section investigated smallholder farmer accessibility to critical agricultural information.

4.6.1 Farmer access to information regarding latest farming developments and innovations

The farmers also commented how they received information on latest

developments and innovations, and the results were as shown in Figure 4.22 below:

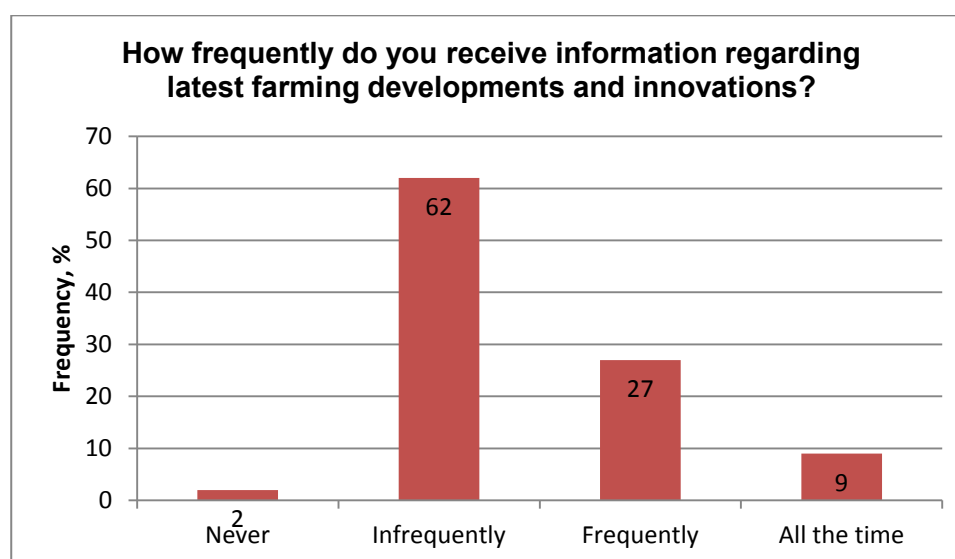


Figure 4.22: Access to information on latest farming developments and innovations

A total of 62% of the farmers revealed that they received information infrequently and 27% received information frequently. 9% of the participants claimed to receive critical agricultural information all the time, while 2% claimed not to receive information at all.

4.6.2 Farmers' methods of accessing information updates

Figure 4.23 above shows the distribution of farmers, according to how they receive information updates.

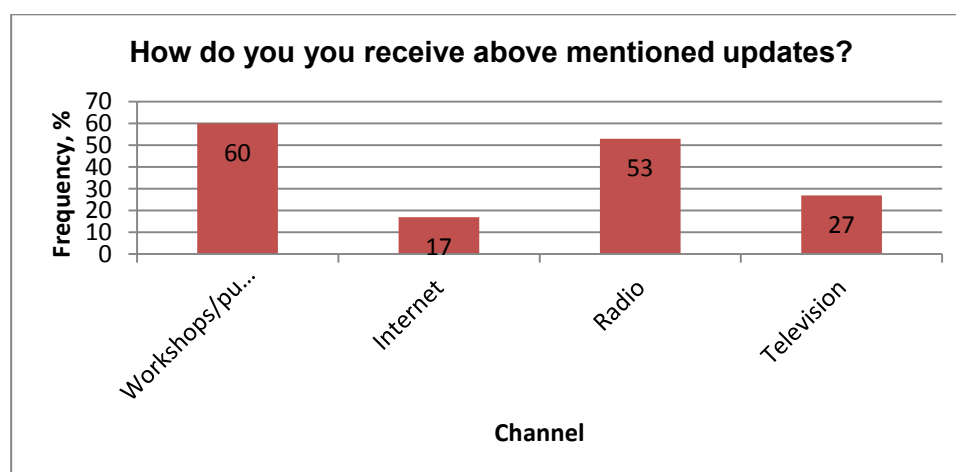


Figure 4.23 Channels used by farmers to receive information updates

Figure 4.23 above shows that 60% of the respondents claimed to receive information through workshops and publications. 53% of the respondents also claimed to receive information through the radio. Only 17% claimed to be using the internet to access information and 27% to be using television to access farming updates.

4.6.3 Access to information on prevailing market prices

The farmers were also asked about their access to information on market prices, and their responses were as shown in Figure 4.24 below.

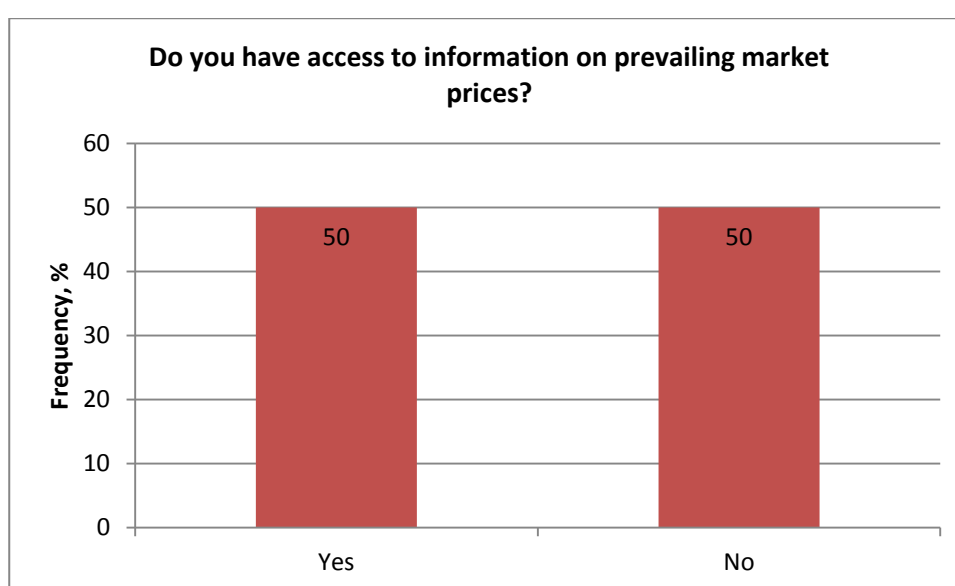


Figure 4.24 Farmers' access to information on prevailing market prices

50% of the farmers claimed to receive information on prevailing market prices, and the other 50% claimed not to receive the information.

4.6.4 Farmers' level of awareness of organisations helping them with information and training

This question was aimed at establishing farmers' level of awareness of organisations helping them with information and training. Figure 4.25 below shows the results.



Figure 4.25 Level of awareness of organisations helping farmers with information and training.

58% of the farmers claimed to be aware of organisations which exist to help them, and 42% confessed ignorance of such organisations.

4.6.5 Training in agriculture

The farmers were also asked what type of agricultural training they had received, and their responses are shown in Figure 4.26 below.



Figure 4.26 Agricultural training received by farmers

From Figure 4.26 above, it can be seen that 60% of the farmers claimed to have received training in the form of short courses and workshops. 60% of the respondents also received agricultural know-how through informal exchange of knowledge. 16% of the respondents claimed to have never received any training. 1% of the respondents claimed to have received extensive training.

4.6.6 Agricultural extension officers' services

Participants were also asked how frequently they received agricultural extension services, and their responses were summarised as shown in Figure 4.27 below:

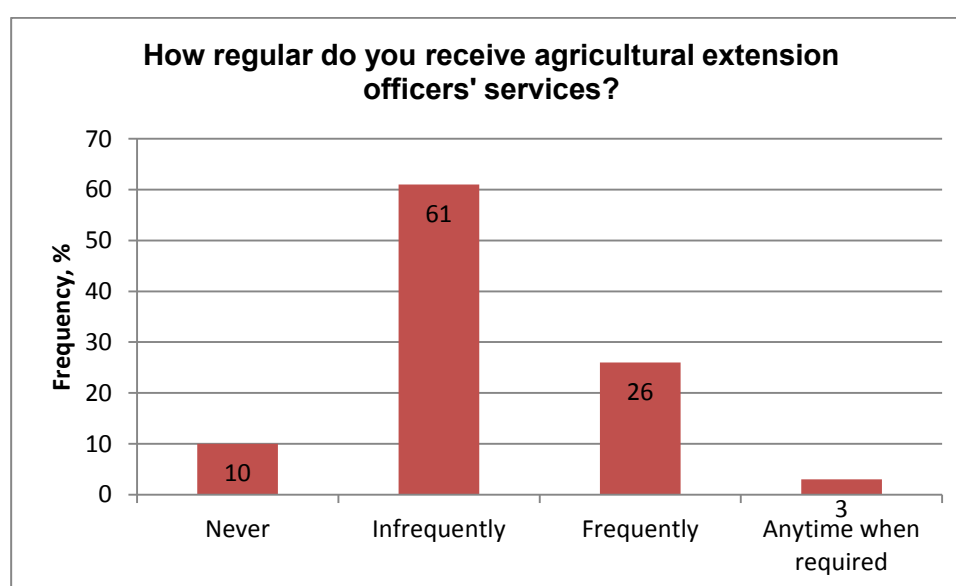


Figure 4.27 Frequency of receiving agricultural extension services

61% of the respondents claimed to receive extension services infrequently, and another 26% claimed to receive information frequently. 10% claimed that they never received extension services. The last 3% claimed to receive extension services as and when they required them.

4.6.7 Best means of passing information to farmers

This question was asked to establish the best way of passing information to the farmers. The farmers' responses are illustrated in Figure 4.28 below:

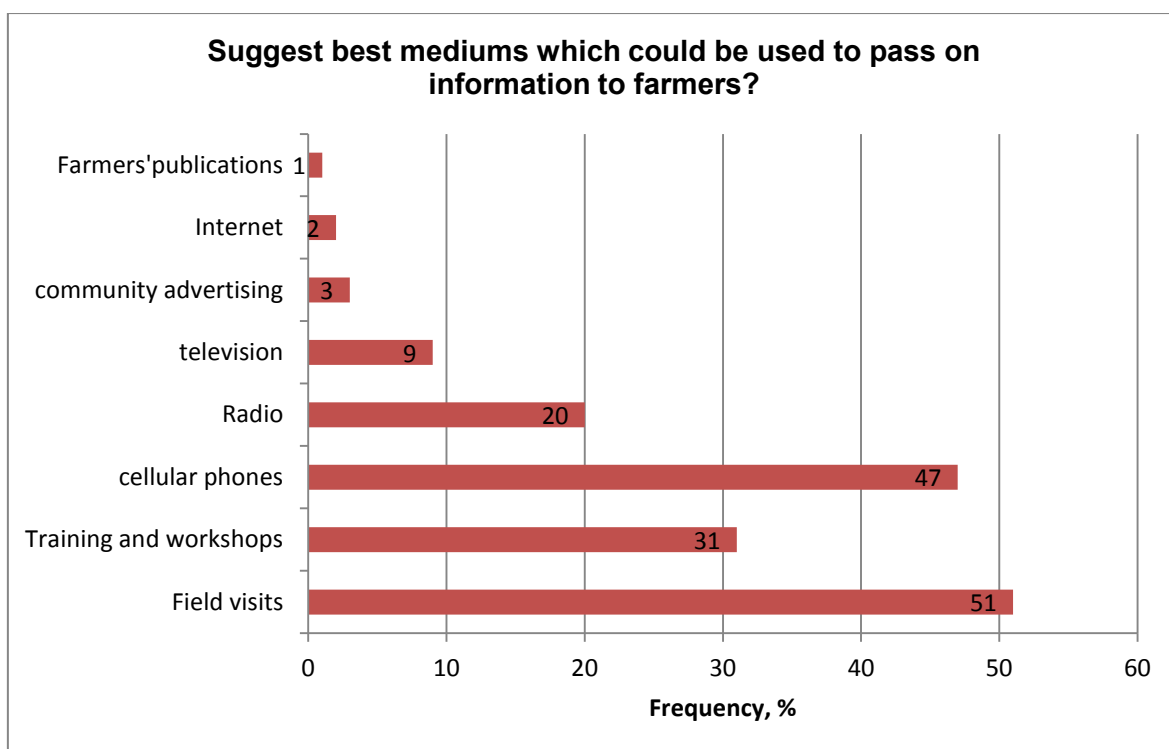


Figure 4.28 Modes of communication

51% of the farmers suggested field visits were the best means of passing information to the farmers. 47% of the farmers also suggested cellphones, which was followed by training and workshops and radio which were suggested by 31% and 20% of the farmers respectively.

4.7 Access to technology

In this section the investigator sought to establish the farmers' ease of acquiring technology.

4.7.1 Farmer perception of access to farming technology

Figure 4.29 below summarises the farmers' perception of their access to technology.

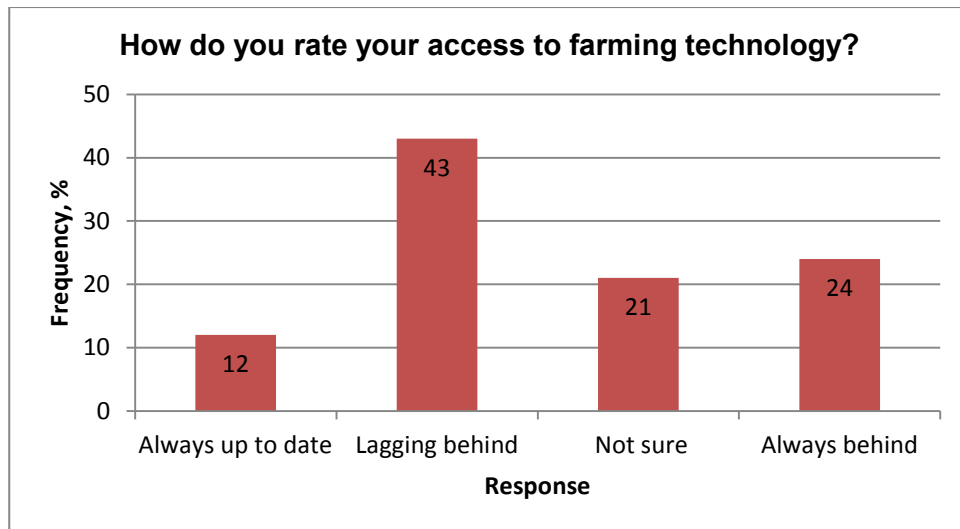


Figure 4.29 participants' perception of their access to farming technology

43% of the participants were of the view that they were lagging behind in technology access. 24% of the respondents were of the view that they were always behind when it came to technology access. 21% of the farmers were not sure of their status, and 12% were of the view that they were always up to date.

4.7.2 Comparison of smallholder farmers' access to farming technology with commercial farmers' access

The farmers were also asked how they perceived their access to farming technology when compared to commercial farmers' access to technology. The responses are as shown in Figure 4.30 below.

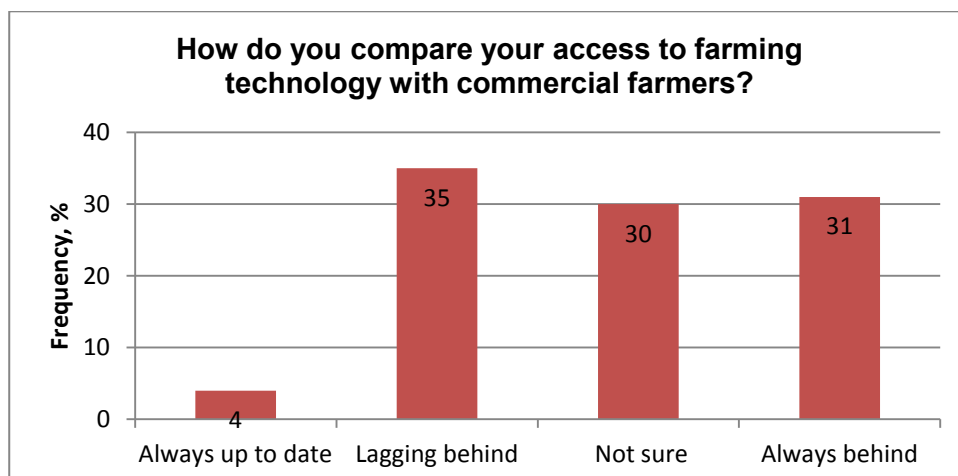


Figure 4.30 Comparison of smallholder and commercial farmers' access to technology

35% of the respondents claimed that they were lagging behind in access to farming technology when compared to commercial farmers. 31% were of the opinion that they were always behind. In total, 66% of the respondents agreed that they were behind in accessing technology. 30% of the respondents were not sure of their status in as far as access to technology is concerned. Only 4% of the respondents claimed to be always up to date with the latest developments in farming technology.

4.7.3 Farming equipment available to smallholder farmers:

The farming equipment being investigated was categorised into six sections namely soil testing, land preparation, irrigation, harvesting, storage and transport equipment.

4.7.3.1 Soil testing equipment

Table 4.3: Soil testing equipment available to smallholder farmers

Description	Frequency
Soil testing kit	0
Laboratory	0

Table 4.3 above shows that none of the farmers claimed to have access to a soil testing kit or laboratory where their soil samples could be tested.

4.7.3.2 Land preparation

A summary of the land preparation equipment available to the respondents is shown in Figure 4.31 below.

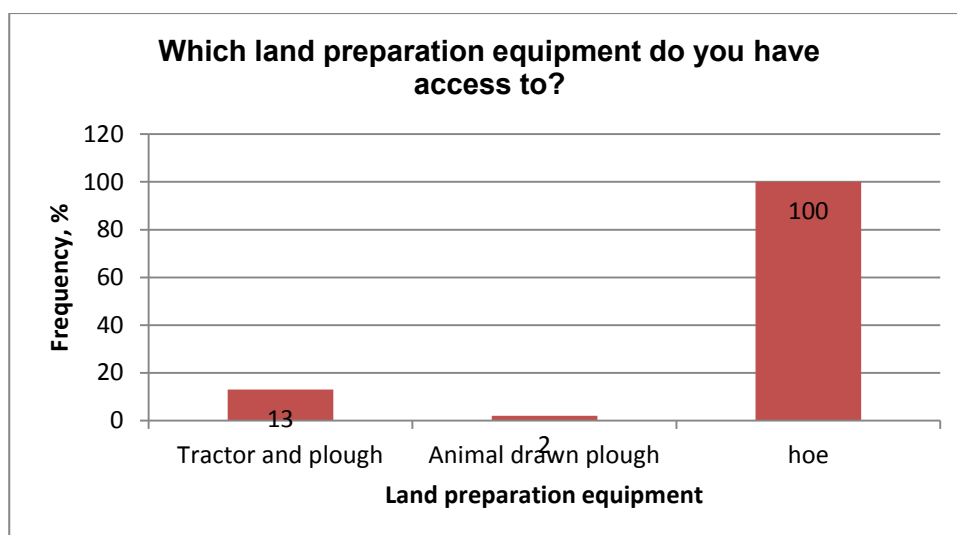


Figure 4.31 Land preparation equipment available to the farmers

100% of the farmers claimed to have hoes for tilling the ground. 13% of the respondents claimed to have access to a tractor and 2% access to an animal drawn plough. This suggests that smallholder farmers had the most basic and rudimentary land preparation equipment at their disposal.

4.7.3.3 Irrigation

The respondents were also asked about their irrigation methods. The results are shown in Figure 4.32 below.

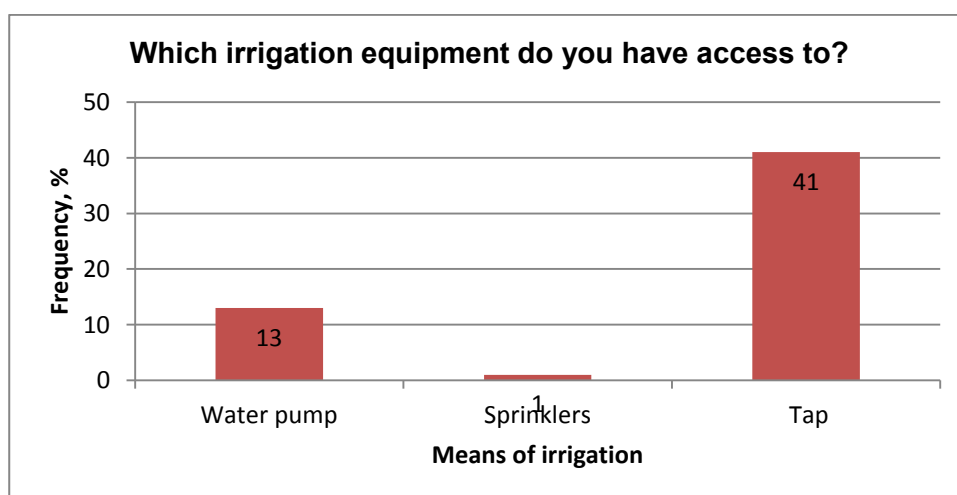


Figure 4.32 Irrigation methods used by farmers

41% claimed to have access to tap water for irrigation. 13% had access to a water pump. Only 1% used sprinklers for irrigating their crops.

4.6.3.4 Harvesting

The farmers were also asked about which harvesting equipment were available for use. The responses to this question were summarised and shown in Figure 4.33 below.

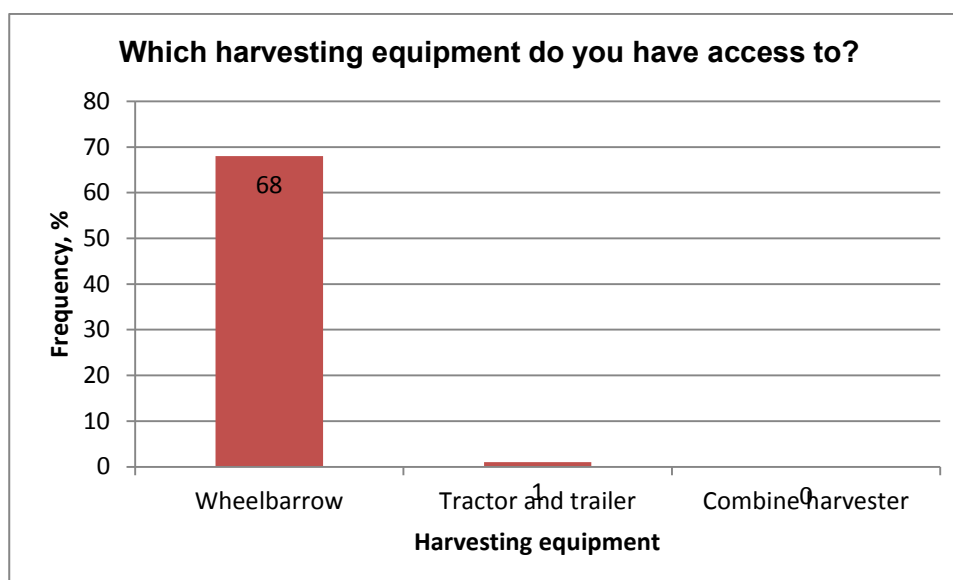


Figure 4.33 harvesting equipment available to the farmers

68% of the farmers had access to a wheelbarrow for harvesting. Only 1% of the respondents had access to a tractor and trailer for harvesting. None of the 100 smallholder farmers claimed to have access to a combine harvester.

4.7.3.5 Storage

Table 4.4 Storage facilities available to smallholder farmers

Description	Frequency
Cold room	0
Processing house	0
Warehouse/storeroom	0

None of the farmers claimed to have access to a cold-room, processing house or warehouse.

4.7.3.6 Transport

Table 4.5 transport modes used by farmers

Description	Frequency
Trucks	0
Train	0
Aeroplane	0

None of the respondents claimed to have access to trucks, train or aeroplane for transporting their produce to the market.

4.7.4 Role played by access to technology in farming

The farmers were also asked about their perception of the role played by technology as a determining factor of whether or not a smallholder farmer will succeed in their business venture. The responses were summarised and presented in Figure 4.34 below.

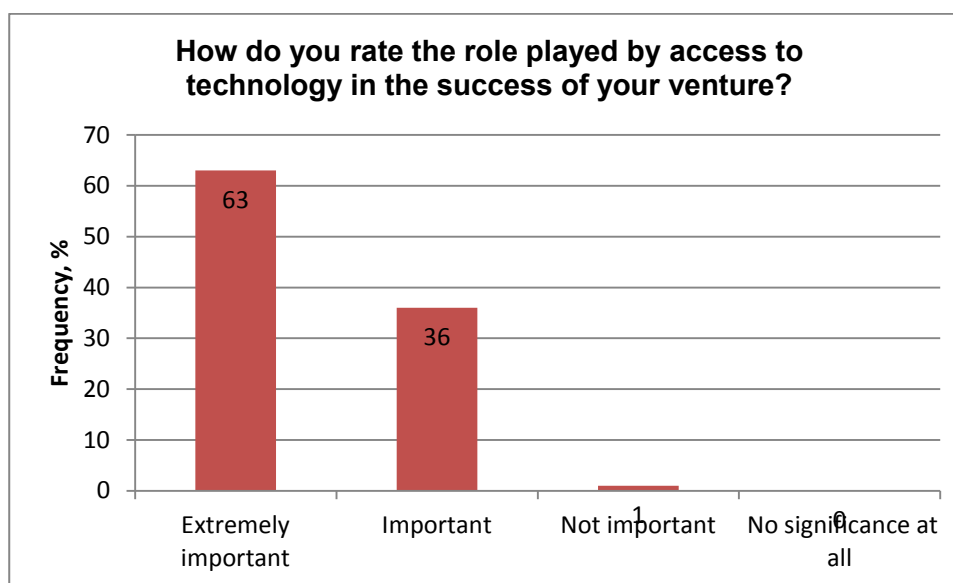


Figure 4.34 farmer perception of role played by technology in farming

63% of the respondents were of the opinion that technology played an extremely important role in determining the success of a smallholder enterprise. 36% of the respondents also claimed that technology was important. In total 99% claimed that technology played an important role in farming. Only 1% claimed that technology was not important in agriculture

4.7.5 Technology required for improvement of smallholder farmers operations

Figure 4.35 below shows a summary of equipment required by farmers to enhance their operations.

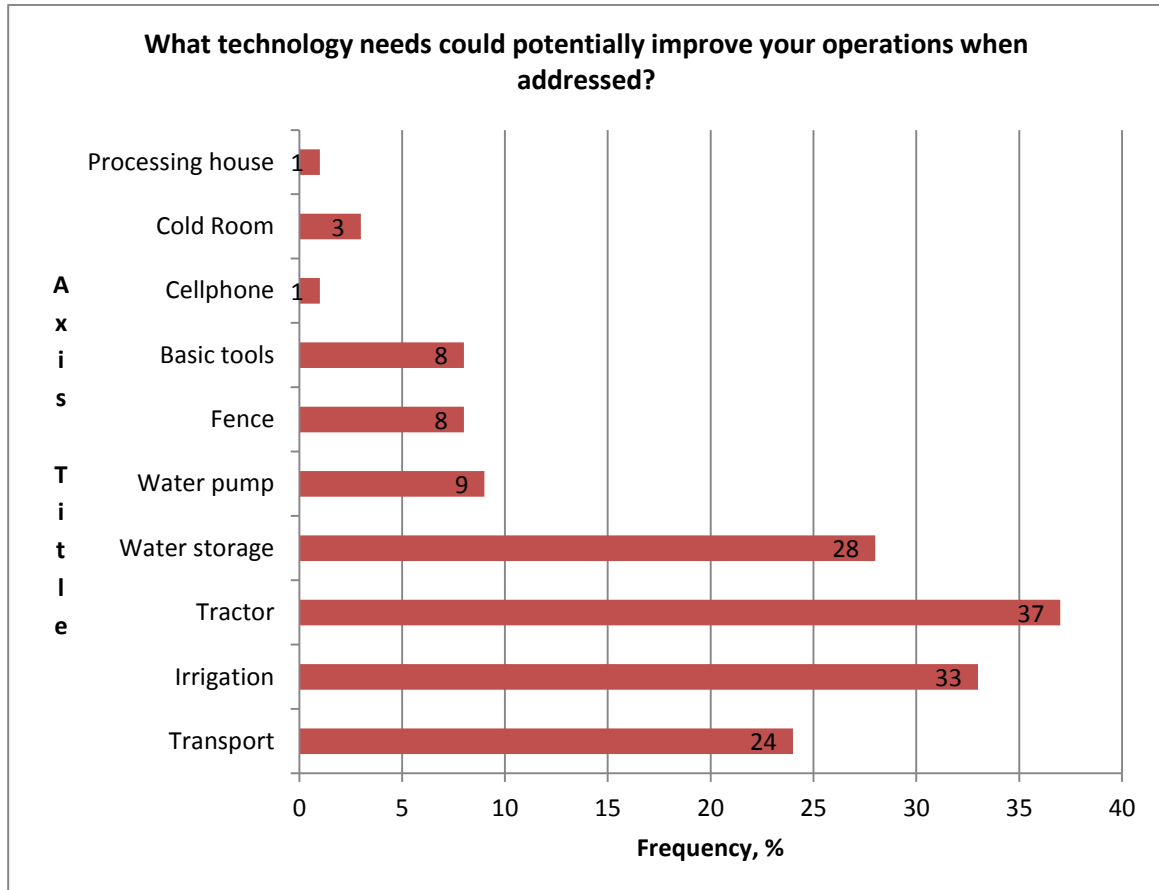


Figure 4.35 Technology required to enhance smallholder farmer operations

37% of the farmers claimed that tractors would improve their operations, while 33% claimed that they needed an irrigation scheme to improve their operations. 28% of the responses claimed water storage facilities would improve their operations, while 24% mentioned transport.

4.8 Conclusion

This chapter has provided summarised results of responses given by respondents as they were asked in the questionnaire. Brief descriptions and comments were given for general trends and outstanding statistics observed as well. The next chapter discusses the research findings and offers possible explanations for any trends observed.

CHAPTER 5

DISCUSSION OF FINDINGS AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the research findings which answer the critical questions posed in chapter 1. Results presented in chapter 4 are also discussed in this chapter. Discussion of results is done in the same sequence as they were asked in the questionnaire.

5.2 Demographics

The ratio of female to male participants was 3.5:1. This ratio suggests that there are more women practising agro ecology in eThekweni metropolitan. In line with the above finding, Tibesigwa and Visser (2015) report that rural and urban small scale agriculture in Sub-Saharan Africa is dominated by women. Doss (2014), claims that 79% of women in developing nations are involved in agriculture as their primary activity. Rodriguez, Kulpavaropas, Annamalai, Wright and Evans (2015) also claim that an average of 63% of rural workers in developing countries are women.

The ratio of single participants to married participants was 1.22:1. From this ratio, one cannot deduce any trend as the proportions are almost equal.

Looking at the age distribution, when plotted on a graph it is clear that the distribution forms a normal curve as can be observed from Figure 4.3. Knowledge of age distribution is important, as it allows one to understand the proportion of the ageing workers in relation to the whole population of the economically active participants. It is however worth noting that only 15% of the participants were in the 16-30 years age group. According to White (2012), young Africans are increasingly shunning careers in agriculture. White (2012) further adds that young Africans do not find careers in agriculture attractive due to de-skilling of rural

youth, government neglect of small scale agriculture and the challenge of access to productive agricultural land.

Statistics SA (2011) defines the economically active population to be between 15 and 65 years of age. Individuals beyond 65 years are categorised as the ageing. From Figure 4.3, one can deduce that the ageing formed close to 17% of the participants. Ideally one would expect more people in the 16 to 30 years category participating in farming activities than those above 61 years of age in order to bolster agricultural production in eThekweni.

As for plot or farm size distribution, the fact that 66% of the participants had less than half an acre to cultivate, and 93% of the participants had at most 1 acre to cultivate suggests that smallholder farmers have got capacity constraints and challenges. Individual farmers cannot capitalise on economies of scale and economies of scope strategies due to the sizes of their plots. Aliber and Cousins (2013), suggest that smallholder farmers are still confined to the ex-Bantustans, hence have got limited capacity to produce as they have small and largely non arable pieces of land. Masters, Djurfeldt, De Haan, Hazell, Jayne, Jirstrom and Reardon (2013) also suggest that African farms sizes will continue to become smaller and more labour intensive in the future.

5.3 Objective 1

The first objective was to establish the impact of funding on smallholder farmer's viability. A series of eight questions were asked which centred on funding. From the questions asked it was established that:

None of the respondents funded their ventures through bank loans. This falls in line with suggestions from literature, which highlighted that it is difficult for small scale farmers to acquire loans as they normally do not have the required collateral or payslip to prove ability to repay the loans (Fukudze and Machethe, 2015). As reported by Chisasa and Makina (2012), small scale farmers in South Africa receive the lowest amount of credit from commercial banks. Chisasa and Makina (2012) further state that despite the smallholder farmers' potential to increase output, lending institutions are unwilling to commit themselves to finance these

farmers to levels where their output improves. Fukudze and Machethe (2015) also suggest that poorly defined land rights are making lending institutions reluctant to issue loans to smallholder farmers.

As can be seen from Figure 4.6, the farmers also seem to be abstaining from even attempting to apply for bank loans. 88% of the respondents claimed to have never applied for a bank loan. From Figure 4.7, it can be seen that 94% of the respondents viewed acquisition of bank loans as being difficult to extremely difficult. When it comes to repayment of bank loans, Figure 4.8 revealed that 91% of the respondents viewed repayment rates as being extremely unfavourable.

As for government loans, Figure 4.9 shows that 51% of the participants admitted that they had applied for government loans. Figure 4.10 also shows that 61% of the respondents claimed that government loans were either difficult or extremely difficult to acquire. Figure 4.11 however revealed that 71% of the respondents viewed the repayment conditions to be either favourable or extremely favourable. An explanation for farmers viewing government loans or grants as favourable is that the farmers do not pay back the money to government. The grants come with conditions, which the farmers have to meet prior to the disbursement of government funding. Individual farmers also viewed acquiring a government grant as being difficult to acquire as government generally prefers to sponsor cooperatives as opposed to individuals.

From Figure 4.5, it can be seen that 66% of the farmers claimed to have funded their business ventures from personal savings and 48% also disclosed that they received funding from the government. Table 4.2 also revealed that 53% of the respondents needed more government funding for their projects to run smoothly.

From results in Figure 4.7 and Figure 4.10 it can be deduced that smallholder farmers face funding challenges. The farmers require more funding, but find it difficult to acquire loans or funding. According to Aliber and Hall (2012), although budgetary allocations to smallholder farmers have increased significantly since the birth of South Africa's democracy, the distribution and use of the resources have

only benefited a few farmers. Lack of access to funding has a negative impact on the economic viability of smallholder farmers in eThekweni.

5.4 Objective 2

The second objective was to determine the impact of access to markets on smallholder farmers' viability. A series of ten questions were asked, in a bid to get a solution for objective 2.

It can be established from Figure 4.12 that, 79% of the respondents indicated that they sold their produce at the farm gate, while 41% of the respondents revealed that they sold their produce through middlemen. On being asked why they used those channels to sell their produce, their answers were as summarised in Figure 4.13. Eighteen per cent of the respondents cited high returns on investment as the major motivating factor. The rest of the respondents cited reasons like ignorance of alternative channels, as well as limited options. Siddik, Kabiraj, Shanmugan and Kahota (2015) claim that lack of access to information on prices and market hindered smallholder farmers from exploring better prices and markets.

Figure 4.14 also shows that only 24% of the respondents claimed to be receiving the best value for their produce. From the description above, it can be concluded that the farmers were generally not getting the best value for their produce as only 24% claimed to be getting the best value. Limited options and ignorance of market information were also factors which led to the farmers not getting the best value for their produce. Fischer and Qaim (2012) cite high transaction costs as one of the main hindrances to market participation.

From Figure 4.15, it can be concluded that 61% of the farmers found it difficult to reach the markets. The figure 61% was arrived at after adding the 38% who said that it was difficult to reach the markets and the 23% who said it was extremely difficult to reach the markets. From figure 4.18, it can be concluded that 77% of the respondents viewed transport costs as being either expensive or exorbitant. Figure 4.19 reveals that 41% of the farmers had minimum negotiating power on the market, and only 13% claimed to be the ones determining their own selling prices. The fact that 61% of the farmers suggested that it was difficult to reach the

markets, 77% of the farmers viewed transport costs as expensive, and 41% had minimum negotiating power on the market, could form part of the reason why 79% of the farmers sold at their farm gate. Matsane and Oyekale (2014) suggest that small quantities, poor quality and lack of contract marketing as other reasons why smallholder farmers end up selling their produce at their farmgates. Figure 4.16 reveals that 56% of the farmers had buyers fetching their own goods. This situation can lead to a situation where middlemen have got more negotiating power over farmers and end up taking advantage of the farmers (Fanadzo ,2012). From Figure 4.12, it can be seen that 41% of the farmers sell their produce partly through middlemen who create convenience for the farmers.

Figure 4.15 and Figure 4.18 prove that smallholder farmers in eThekweni Metropolitan have got limited access to markets and are not getting the best value for their produce. This phenomenon has got a negative impact on viability of the farmers

5.5 Objective 3

The third objective was to determine the impact of access to information on smallholder farmers" viability. A series of seven questions were asked in a bid to investigate the effect of access to information on farmers in eThekweni.

Figure 4.22 revealed that 62% of the respondents infrequently received information pertaining to latest farming developments and innovations. Only 36% of the respondents revealed that they received information frequently or all the time. This scenario suggests that farmers in eThekweni Metropolitan generally are not up to date with new developments in farming. As an example, if an outbreak of pests occurs, the farmers would probably be late to respond in mitigation and resolution of the problem. This poses a viability problem for the farmers. Ortmann and King (2007) suggest that smallholder farmers in South Africa generally have limited access to vital farming information.

An investigation on popularity of methods of disseminating agricultural information revealed that 60% of the respondents received information through workshops. Gilmore and Chasomeris (2015) also claim that 60% of smallholder farmers in

Umbumbulu received information through training and workshops. A further 53 % of the respondents claimed to receive information through the radio, as shown in Figure 4.23. Kaberia (2003) suggests that radio and television are the most effective means of passing information to the farmers. Workshops, however, are not frequently held and radios are too general in their discussions, which may not address individual smallholder farmer problems. These two channels' capacities to help farmers are therefore limited.

A further 50% of the respondents however revealed that they did not have access to information concerning prevailing market prices as shown in Figure 4.23. Ortmann and King (2007) also suggest that smallholder farmers in South Africa by and large do not receive adequate market information. On checking if participants were aware of organisations which helped farmers with information and training, 58% of the farmers revealed that they were not aware of such organisations as seen in figure 5.24. With regards training, 60% of the farmers revealed that they received training in agriculture through short courses and workshops and another 60 % through informal sharing of information as shown in Figure 4.25. A further 61% of the farmers revealed that they received agricultural extension services infrequently, and a further 10% revealed that they never receive extension services as can be seen in figure 4.26. Gilmore and Chasomeris (2015) suggest that the ratio of extension officers to farmers in Umbumbulu is far below the standard stipulated by the South African Department of Agriculture.

Lack of knowledge of market prices and organisations which supply such information can work against the farmers, as middlemen take advantage of the farmers. Knowledge of market prices could help farmers to plan on sequencing and combination of crops during planting in order to get best value from this investment.

Figure 4.22 and figure 4.27 show that smallholder farmers in eThekweni are not accessing the right and sufficient information which is necessary for them to run their business ventures profitably.

5.6 Objective 4

The fourth objective was to determine the impact of access to farming technology on smallholder farmers' viability. A series of five questions were asked in a bid to establish how access to technology was affecting smallholder farmers in eThekweni.

Figure 4.28 revealed that 43% of the respondents indicated that their access to technology was lagging behind and a further 24% revealed that their access to technology was always behind. Only 12% of the farmers were of the opinion that their access to technology was always up to date. Technology can potentially aid farmer productivity by increasing their efficiency and effectiveness, saving on labour costs, improving quality of produce, minimising losses which normally come through breakages and spoilages. Watako, Mundia and Odhiambo (2013) cite lack of access to technology inputs as a major constraint for smallholder farmers' output. The fact that only 12% of the farmers perceived themselves to be keeping abreast with latest farming technology suggests that smallholder farmers in eThekweni are registering low technical efficiency and technical progress values on their farms.

When asked about how their access to technology compared with that of commercial farmers, only 4% of the farmers were of the opinion that they were always up to date or at par. 66% of the respondents suggested that they were behind commercial farmers level of access to technology. 30% of the respondents were not sure, as can be seen from figure 4.29. Mudhara (2010) suggest that the commercial farming sector in South Africa is resource-rich, but the smallholder farmers generally have poor resources and employ outdated technologies as means of production.

From question 28 in the questionnaire, which asked the farmers to indicate which farming equipment they had access to, the following results were obtained: none of the farmers claimed to have access to soil testing equipment, storage facilities, or trucks to transport produce. Only 13% of the farmers had access to tractors for tilling the land. As far as irrigation is concerned, 41% of the farmers had access to tap water and 13% had access to a water pump. Only 1% of the farmers used sprinklers to irrigate, as can be seen in Figure 4.31. For harvesting of farm

produce, 68% of the farmers revealed that they had access to a wheelbarrow, and only 1% had access to a tractor with trailer, as can be seen in Figure 4.32.

All these factors show that the farmers had basic simple tools for farming like hoes, and were far behind when it comes to access to technology. The farmers however revealed, as shown in Figure 4.33, that access to technology played a vital role in the successful running of a farming enterprise. Some of the pieces of equipment which the participants were in lack of included tractors, irrigation, water storage facilities and transport, as shown in Figure 4.34. From Figure 4.84, one can deduce that technology also plays a pivotal role in successfully running farming enterprises in eThekweni. The smallholder farmers in eThekweni were however lagging behind on technology, and this was also negatively affecting their viability.

5.7 Correlation analysis

In this section the Pearson's Product Moment Correlation Coefficient was used to analyse the correlation of some factors in this study. The factors which were considered are age of participants, access to funding, access to markets, access to information and access to technology.

5.7.1 Correlation between age and funding

Table 5.1 Age versus funding

		Age of participants	Funding
Age of participants	Pearson Correlation	1	0.532
	Sig. (2-tailed)		0.034
Funding	Pearson Correlation	0.532	1
	Sig. (2-tailed)	0.034	
	N	100	100

** . Correlation is significant at the 0.01 level (2-tailed).

The analysis showed that there was a positive correlation between age of participants and government funding (Pearson correlation coefficient $r = 0.532$). It means that the older you are the more likely you are to get government funding.

The mature people seem to be more trusted by those administering government funding than the young farmers. Another possible explanation could be that the elderly people have been practising agriculture for much longer, hence they apparently have acquired more knowledge and experience over the years. This knowledge and experience can potentially aid the elderly to develop solid project proposals which are appealing to those in charge of funding.

5.7.2 Correlation between age and access to markets

Table 5.2: Age versus Access to markets

		Age of participants	Access to markets
Age of participants	Pearson Correlation	1	0.014
	Sig. (2-tailed)		0.002
Access to markets	Pearson Correlation	0.014	1
	Sig. (2-tailed)	0.002	
	N	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis showed that there was no correlation between age of participants and access to markets (Pearson correlation coefficient $r = 0.014$). Age of the participants did not determine access to the markets.

5.7.3 Correlation between age and access to information

Table 5.3: Age versus Access to information

		Age of participants	Access to information
Age of participants	Pearson Correlation	1	0.248
	Sig. (2-tailed)		0.027
Access to information	Pearson Correlation	0.0248	1
	Sig. (2-tailed)	0.027	
	N	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis showed that there was a weak correlation between age of participants and access to information (Pearson correlation coefficient $r = 0.248$). Age did determine to a little extent the accessibility of information. One would expect a strong correlation, with access to information decreasing with increase in age, as the younger generation has got more exposure to the internet and information gathered from schools. Poverty can, however, limit the young people's access to information, especially in the rural areas.

5.7.4 Correlation between age and access to technology

Table 5.4: Age versus Access to Technology

		Age of participants	Access to technology
Age of participants	Pearson Correlation	1	0.613
	Sig. (2-tailed)		0.098
Access to technology	Pearson Correlation	0.613	1
	Sig. (2-tailed)	0.098	
	N	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis showed that there was positive correlation between age of participants and access to technology (Pearson correlation coefficient $r = 0.613$). Age can determine the access to technology of the participants. The older one gets the more access to technology. A person gathers better means to earn wealth with time, as well as the fact that the elderly would have had enough time to save money to buy the technology.

5.8 Conclusion

In this chapter, discussion of results presented in chapter 4 was done. Some calculations were made which revealed correlations. The next chapter will round up the research by summarising the findings and making recommendations in a bid to ensure viability of small scale farming businesses.

CHAPTER 6

RECOMMENDATIONS AND CONCLUSION

6.1 Introduction

In this chapter key findings are listed and elaborated. Recommendations are subsequently made as a way of offsetting the challenges which smallholder farmers face. The chapter also outlines the limitations of the study as well as recommends areas of further study in the future.

6.2 Key findings

The following findings were established from this research:

6.2.1 Funding

Funding is a major determinant of whether a smallholder farmer succeeds or not. It was established that smallholder farmers in eThekwinini were underfunded and this threatened their viability. The survey also revealed that farmers required funding mostly for the following four critical items: tractor, irrigation, water storage and transport.

It was also discovered that the majority of farmers financed their ventures through personal savings and government funding. None of the respondents received bank loans to finance their farming projects due to the fact that banks required collateral in the form of property or at least a payslip before they can issue a loan.

Smallholder farmers viewed government funding as relatively easier to acquire and pay back (meet conditions), when compared with commercial bank loans. For that reason, only 12% of the farmers ever attempted to apply for a bank loan and 51% of the farmers applied for government funding.

6.2.2 Markets

Smallholder farmers generally found it difficult to reach markets mainly due to transport costs. Distance to the markets also escalated the transport costs for the

farmers. As a result of these developments most smallholder farmers were forced to sell their produce at their farm gates and through middlemen.

Another factor which made it difficult for the farmers to sell their produce at the fresh produce markets was production capacity constraints. Almost 66% of the farmers interviewed had less than half an acre of land under cultivation, while 93% of the farmers had less than 1 acre under cultivation. Clearly, the size of the land possessed by the farmers has a bearing on the volumes they could sell on the market. Transporting small volumes to the market leads to higher transport costs per unit transported to the market.

Farm accessibility did not seem to be an issue for smallholder farmers in eThekweni, as 66% of the farmers mentioned that it was relatively easy to access their plots.

6.2.3 Information

Although publications and workshops, radio and television proved to be the most frequently used media for disseminating information to the farmers, the same farmers claimed that they infrequently received agriculturally relevant information. The farmers also claimed that they were not receiving enough information about market diversity and dynamics. This claim could be due to the fact that not all farmers get the opportunity to receive publications, considering the fact that some of them live in isolated areas which are far from the city. On the other hand, workshops with agricultural extension workers are not conducted regularly in eThekweni. This implies that farmers who mainly depend on workshops for information also receive information infrequently

Agricultural extension visits was the most preferred mode of passing information to the farmers. During extension visits, farmers have got an opportunity to ask direct questions concerning personal challenges, as well as to receive immediate and relevant answers.

6.2.4 Technology

Another finding is that smallholder farmers lag behind on access to technology when compared to their counterparts in commercial farms. This development could be due to the fact that smallholder farmers have got limited access to funding.

Smallholder farmers in eThekweni perceived technology as an important factor which determines the success of a farming venture. The farmers generally had access to the most basic technology which consisted of a hoe, wheelbarrow and tape water.

With such tools the farmers' capacity was extremely limited.

6.3 Recommendations

In light of the research findings outlined above, the following recommendations have been proposed:

1. It is clear that funding is a major issue for smallholder farmers. Although government has over the years been actively involved in funding smallholder farmers through cooperatives, a new perspective should be taken for future funding projects. Nel (2015) suggests an asset-based community development (ABCD) approach, as opposed to the traditional needs-based approach which has been employed by government and donors over the past years.

According to Wu and Pearce (2014), the ABCD approach is aimed at uncovering and utilising the strengths within communities. Wu and Pearce (2014) further argue that the ABCD approach is more sustainable than the traditional needs based approach which focuses on the needs, problems and deficiencies of low income communities. According to Beaulieu (2002), there are three underlying principles of the ABCD approach. The first principle is identification and mobilising of existing assets. The second principle is that the ABCD approach is internally focused, hence starts with agenda-building and problem-solving capacities of local residents. The

ABCD approach also encourages relationship building amongst local residents, as well as with local institutions.

A comparison of the ABCD approach with the traditional needs based approach reveals that the needs based approach focuses on community deficiencies, while the ABCD approach focuses on effectiveness, capacities and assets of a community (Beaulieu, 2002). According to Beaulieu (2002), the needs based approach results in fragmentation of responses to the local needs, while the ABCD approach builds independence amongst locals. The third difference is that the needs based approach encourages the community to be consumers of services, while the ABCD approach encourages individuals in communities to utilise their talents. Lastly, the needs based approach does not encourage community members to decide how to address local concerns, while the ABCD approach encourages autonomy (Beaulieu, 2002). In summary, the ABCD approach emphasises on development of the community, as opposed to development in the community (Beaulieu, 2002)

2. According to the findings of the survey, an average smallholder farmer cultivates less than half an acre. This situation makes it economically challenging for smallholder farmers to participate competitively in produce markets and supermarkets. The volumes sold on the market cannot justify the exorbitant transport costs incurred. As a way of overcoming this challenge, government could help by establishing agricultural resource centres where farmers send their produce. A consolidated truck load can then be made up at the resource centre and the fresh produce transported to the city markets for economically meaningful returns. This approach reduces transport costs per individual farmer. Sending produce to the nearest resource centre enables farmers whose farms are difficult to access to also sell their produce to city markets. Edamame Development Programme, through its sister company Partner Farmer, have already established four resource centres in the four agricultural hubs under investigation. Similar resource centres can be established in other areas as future projects.

3. Borrowing the Warana Wired concept and Digital green concepts from India, the resource centres mentioned above can be further developed into information sharing platforms. The agricultural hubs can potentially be equipped with televisions and digital video disc (DVD) players where farmers could potentially gather and watch videos containing latest farming techniques. This approach is a practical and cheap way of passing information to farmers.

Extension officers could also conduct their workshops at the resource centres. This approach reduces costs and increases effectiveness on the part of extension officers who are already overstretched. The agricultural resource centres can also have demonstration plots where extension officers can conduct practical sessions and trials with farmers during workshops and training sessions.

4. Farmers producing crops classified under the fast-moving-consumable-goods (FMCG) category can also benefit from the agricultural resource centres if they are equipped with processing houses and cold rooms. Processing houses and cold rooms help make farming more sustainable. Processing houses help to add value to the crops hence enabling the farmers to earn better returns from their crops. On the other hand, cold rooms reduce the pressure on farmers to sell farm produce like vegetables at give-away prices, as well as to reduce spoilages.

Baiphethi and Jacobs (2009) also cite how JFPM board is working with local municipalities such as the Vhembe District Municipality to establish grading and packhouse facilities. Baiphethi and Jacobs (2009) argue that these „satellite“ facilities offered several benefits which include reduction of transport costs. The second benefit offered by the facilities is reduction of spoilages, as the facilities are equipped with cold storage facilities. Smallholder farmers can also derive better returns for the produce, as their facilities enable them to deliver better quality produce to JFPM (Baiphethi and Jacobs, 2009).

5. To solve the tractor shortage problem, government can intervene by allocating a tractor per resource centre. The tractor fleet would be managed and maintained by eThekweni municipality's agriculture department. The same approach can also be implemented with other technology needs which might arise. The community resource centre could act as the bridge which would enable farmers to access technology.
6. As for irrigation and fencing challenges, eThekweni municipality has been proactive by establishing communal gardens where several farmers are accommodated in one garden. This model is cheaper to maintain as fewer gardens are managed. The local municipality has been providing subsidised seedlings for planting and pumping water from rivers into farmers' reservoirs.

Baiphethi and Jacobs (2009) suggest that local authorities like municipalities can help the farmers to enhance their average crop yield per hectare by issuing tailor-made, improved input packages like seed and fertilisers. Baiphethi and Jacobs (2009) also suggest that in Southern Africa, smallholder farmers access only 10% of their seeds from the formal markets, and the rest from informal markets. Baiphethi and Jacobs (2009) also urge local authorities to further develop informal markets, in order to improve the farmers' access to inputs. eThekweni municipality can also adopt this strategy to enhance farmer access to inputs

The local municipality can also take another step of encouraging sustainable farming through responsible use of natural resources. Implementation of rain water harvesting projects during establishment of new garden as well as with the existing ones is one such approach to sustainable farming. The local municipality can also aid the farmers by supplying them with the tonnes of grass and leaves cut from roadsides to make their own compost. Alternatively, the municipality can make compost and sell to the farmers at a subsidised rate.

7. The survey revealed that the farmers are not getting enough visits and information from agricultural extension officers. Terblanche (2013) suggests

that there is a critical shortage of extension officers in South Africa, hence their inability to meet all farmers' needs. As a way of bridging this gap, team leaders could be identified from each community and trained extensively in latest agricultural practises. These same leaders would in turn empower other farmers in their communities. This development relieves the extension officers from the pressure they are under. A resident team leader can act as a readily available source of knowledge.

Baiphethi and Jacobs (2009) highlight how the Johannesburg Fresh Produce Market (JFPM) board is making an effort to integrate smallholder farmers into their formal system by conducting targeted extension officer training programs. The extension officers in turn pass on necessary information like prices, packaging, delivery times, quality, storage and market agents to the farmers. As mentioned by Baiphethi and Jacobs (2009), JFPM also conducts open days, during which smallholder farmers and informal traders are afforded an opportunity to their facilities and interact with JFPM officials. The purpose of the open day functions is for the farmers and informal traders to better understand how the market works, as well as to explore how they can benefit from the market. In a similar fashion, Durban Produce Market can also conduct open days and train extension officers to help small scale farmers attain better access to market information.

8. The survey also showed that very few youths, in the 16 to 30 years band are participating in agricultural projects. Sinyolo, Mudhara, and Wale (2014) suggest that the younger generation are shunning agriculture as a means of livelihood to seek opportunities in other industries because it pays less when compared with other industries. An incentivised nationwide campaign should to be implemented aimed at luring the youths into farming. Special funding for the youth should be allocated by government as well. Parikh *et al* (2007), also suggest incorporating more IT based applications in agriculture, as a way of luring the youths into agriculture. In South Africa, introducing IT at the resource centres can also aid in attracting the youths to take up agriculture as a profession. The issue of land ownership also

needs to be addressed as this will enable the youths to borrow from commercial banks.

6.4 Recommendations for future studies

This study was limited to four areas namely Cliffdale, Mariannhill, Hambanathi and Umbumbulu. There are, however, many more areas falling within the eThekweni metropolitan where further investigations could be carried out to establish if the same challenges apply to them. Other possible areas for future studies include:

- A comparison of male to female farmers to find out if the problems affecting both sexes are the same.
- Although the age distribution of smallholder farmers displayed a normal distribution curve for all four hubs, data collected seems to suggest that a small percentage of people below 30 years of age are participating in agricultural practises. An investigation can be carried out to investigate the factors which could attract more young people into agriculture
- Coincidentally, all the participants in this survey belonged to the African race. The research could be extended to other races and comparisons made to establish if the same challenges are faced across races.

6.5 Conclusion

The purpose of the study was to establish the impact of four operational parameters on viability of smallholder farmers' businesses. The four parameters under investigation were access to capital, access to markets, access to information and access to technology. A literature review was conducted which centred on the four parameters. The research method was chosen and interviews conducted on farmers by means of a questionnaire. Data was collected, analysed and discussed. Key findings from the study revealed that all four parameters under investigation have got an effect on the competitiveness of smallholder farmers in eThekweni district. The study also revealed that the smallholder farmers did not have enough access to funding, markets, agricultural information and farming technology. Some correlations analysis was also done, and it was discovered that there were positive correlations between age and funding, as well as age and

access to farming technology. There was however a weak correlation between age and access to information. No correlation was found between age and access to markets.

Several recommendations were also given which included government adopting an asset based community development (ABCD) approach. It was also recommended that agricultural resource centres be established. These centres would be equipped with processing and storage facilities, training facilities, as well as other necessary communal pieces of equipment like tractors. Other recommendations included training of resident team leaders, involvement of Durban Fresh Produce Market Board in smallholder farmer development programs, interventions to lure the youths into farming and adoption of sustainable farming techniques like rain water harvesting.

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Informed Consent Letter 3C

**UNIVERSITY OF KWAZULU-NATAL
GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP**

Dear Respondent,

MBA Research Project
Researcher: Mr. Joel Mutero (0738156136)
Supervisor: Dr Elias Munapo (031260 8943)
Research Office: Ms. P Ximba 031-2603587

I am, JOEL MUTERO, an MBA student, at the Graduate School of Business and Leadership, of the University of Kwa-Zulu Natal. You are invited to participate in a research project entitled Operational challenges faced by smallholder farmers in eThekweni region.

The aim of this study is to:

- Determine the challenges being faced by smallholder farmers in eThekweni, and hence threatening operational viability.
- Establish and recommend strategies which will enable smallholder farmers to viably run their businesses.

Four operational parameters will be investigated namely: **access to capital, access to technology, access to markets and access to information.**

Through your participation I hope to understand how the above mentioned factors affect sustainability of smallholder farming, as well as to establish strategies to ensure smooth running of such operations.

Please note that your participation in this research should be voluntary and you may withdraw from participating in the questionnaire any time you wish, without any negative consequences. Your response will be kept strictly confidential, and a summary of the results will be mailed to you after the data is analysed. This research is purely for academic purposes, as such no rewards will be handed to participants. Thank you very much for your time and cooperation.

If you have any questions or concerns about completing the questionnaire or about participating in this study, you may contact me or my supervisor on the above mentioned contacts.

The survey should take you about 15 minutes to complete. I hope you will take the time to complete this survey.

Sincerely

Investigator's signature_____

Date_____

Please mark with an X your answer in spaces provided

SECTION ONE: PARTICIPANT'S PERSONAL INFORMATION

Gender Male ☐ Female ☐

Age (years)

18-30	<input type="checkbox"/>	31-45	<input type="checkbox"/>	46-60	<input type="checkbox"/>	61+	<input type="checkbox"/>
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Marital Status:

Married	<input type="checkbox"/>	Single	<input type="checkbox"/>
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Number of shareholders in project

Gender distribution of shareholders: Males ☐ Females ☐

Size of plot utilised for growing crops:acres/hectares

Plot Number:

District name

SECTION TWO: PROJECT FUNDING

1. How is/was your venture financed?

Personal savings	<input type="checkbox"/>	Bank Loan	<input type="checkbox"/>	Government funding	<input type="checkbox"/>
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Other (please specify).....

2. Have you ever applied for a bank loan?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
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3. If answer to question 2 is yes, how would you rate the ease of acquiring a loan?

Very easy	<input type="checkbox"/>	Easy	<input type="checkbox"/>	Difficult	<input type="checkbox"/>	Extremely difficult	<input type="checkbox"/>
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4. If answer to question 2 is yes, how would you rate bank loan repayment rates?

Extremely favourable	<input type="checkbox"/>	Favourable	<input type="checkbox"/>	Unfavourable	<input type="checkbox"/>	Extremely unfavourable	<input type="checkbox"/>
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5. Have you ever applied for government funding?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
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6. If answer to question 5 is yes, how would you rate the ease of acquiring a loan?

Very easy	<input type="checkbox"/>	Easy	<input type="checkbox"/>	Difficult	<input type="checkbox"/>	Extremely difficult	<input type="checkbox"/>
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7. If answer to question 5 is yes, how would you rate government loan repayment rates?

Extremely favourable	<input type="checkbox"/>	Favourable	<input type="checkbox"/>	Unfavourable	<input type="checkbox"/>	Extremely unfavourable	<input type="checkbox"/>
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8. Please write any comments with regard to funding of smallholder farming projects.

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SECTION THREE: ABOUT MARKETING OF FARM PRODUCE

9. Where do you sell your farm produce?

To locals		Through Middlemen		To Fruit and Vegetable market		To supermarkets	
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Other (please specify).....

10. Why do you use that platform to sell your produce?

To get best value		It is convenient		It is the only Method I know		I have limited options	
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11. Are you getting best value for your produce?

Yes		Maybe		I do not know		Certainly not	
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12. Describe ease of reaching market

Extremely easy		Relatively easy		Difficult		Extremely difficult	
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13. How do you transport your produce?

No transport required		Own transport		Hired transport		Buyers fetch produce	
-----------------------	--	---------------	--	-----------------	--	----------------------	--

14. Describe accessibility of your plot/farm?

Extremely easy		Relatively easy		Difficult		Extremely difficult	
----------------	--	-----------------	--	-----------	--	---------------------	--

15. How would you rate your transport costs?

Very Cheap		Affordable		Expensive		Very exorbitant	
------------	--	------------	--	-----------	--	-----------------	--

16. Describe your negotiating power in the marketplace when selling your produce?

I determine The prices		Prices set after fair discussions		Prevailing Market prices adopted		Minimum negotiating power	
------------------------	--	-----------------------------------	--	----------------------------------	--	---------------------------	--

17. In your opinion where will you get best value for your produce?

.....

18. What is hindering you from using the above mentioned best platform to sell your farm produce?

.....

SECTION FOUR: ACCESS TO INFORMATION

19. Do you receive any information regarding latest farming developments and innovations?

Never		infrequently		frequently		All the time	
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20. How do you receive above mentioned updates?

Farmers Publications		Internet		Radio		TV		Other (specify)	
----------------------	--	----------	--	-------	--	----	--	-----------------	--

21. Do you have access to information on prevailing market prices of farm produce?

Yes		No	
-----	--	----	--

22. Are you aware of any organisations which are helping farmers with information and training?

Yes		No	
-----	--	----	--

23. Have you received any training in agriculture?

None		Informal sharing of information		Short Courses/Workshops		Comprehensive Training	
------	--	---------------------------------	--	-------------------------	--	------------------------	--

24. How regular do you receive agricultural extension officers' services?

Never		infrequently		frequently		Anytime when required	
-------	--	--------------	--	------------	--	-----------------------	--

25. Suggest other mediums which could be used to pass on information to farmers?

.....

SECTION FIVE: ACCESS TO TECHNOLOGY

26. How would you rate your access to farming technology?

Always up to date		Lagging behind		Not sure		Always behind	
-------------------	--	----------------	--	----------	--	---------------	--

27. How would you compare your access to farming technology with commercial farmers?

Always up to date		Lagging behind		Not sure		Always behind	
-------------------	--	----------------	--	----------	--	---------------	--

28. Please tick pieces of farming equipment you have access to:

Soil Testing	Land preparation	Irrigation	Harvesting	Storage	Transport
Soil testing kit	Tractor & plough	Water pump	Wheelbarrow	Cold room	Trucks
Laboratory	Animal drawn plough	Sprinklers	Tractor & trailer	Processing house	Train
		Sprayers	Combine harvester	Warehouse/store room	Airplane

29. How would you rate the role played by access to information in the success of your venture?

Extremely important		Important		Not important		No significance at all	
---------------------	--	-----------	--	---------------	--	------------------------	--

30. What technology needs, which when met could potentially improve your operations?

.....

END OF QUESTIONNAIRE - THANK YOU FOR PARTICIPATING.

Informed Consent Letter 3C

**INYUVESI YAKWAZULU-NATALI
GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP**

Ilotshelwe oyingxenywe yocwaningo,

MBA Research Project

Umcwaningi: Mr. Joel Mutero (0738156136)

Owengamele ucwaningo: Dr Elias Munapo (031260 8943)

Ihofisi lezokucwaninga: Ms P Ximba 031-2603587

Igama ngingu Joel Mutero, ngenza umcwaningo lweMBA esikhungweni sezemfundo zamabhizinisi nezobuholi eUKZN. Uyamenywa ukuba ubambe iqhaza kuphenyo oluhlelelwe maqondana ezibhekene nabalimi abasafufusayo besigceme sase Thekwini.

INHLOSO YOCWANINGO UKUTHI:

- Ukuxazulula izinselelo zabalimi base Thekwini ababhekene nazo.
- Ukusungula kuphinde kuphakanyiswe imibono yokulekelela abalimi abafufusayo ukuba babe nenqubekela phambili ebhizinisi.

Kuzohlaziywa amaphuzu amane enza kubenzima ukuqhuba ibhizinisi: **izinto ongathembela kuzo, ulwazi olujulile lwezobuxhakaxhaka, ukungena kulo, ukuthola ulwazi oluqavile.**

Ngokungenelela kwakho ngifisa ukuba uthole ulwazi lokuthi lamaphuzu abekiwe ngenhla abaphazamisa kanjani abalimi abasafufusa, nokuthi imiphi imibono engasiza kuth konke kuqhubeke kahle.

Ngcela wazi ukuthi ukungenela kwakho kulolucwaningo kuzoba okungakhokhelwa, ngokungenelela kwakho kulolucwaningo akuphoqiwe ungayeka noma nini ukuba yingxenywe yalo ngale kwemibandela. Impendulo zakho zizogcinwa ziyimfihlo, nemiphumela yakho izothunyelwa kuwe nge email ngemva kokuhlaziywa. Lolucwaningo lumsulwa lwenzelwe ukufundisa, ngalokho akunamkomelo ozotholwa abangenelele. Ngiyabonga kakhulu ngesikathi sakho nokubambisana.

Uma unemibuzo noma unenkinga ngokugcwalisa ifomu noma ngokungenelela kulolucwaningo, ungaxhumana name noma umphathi wami ezinombolweni ezingenhla.

Lelifomu lizothatha imizuzu emihlanu nje ukuligcwalisa, Ngiyethemba uzozinika ithutshana uligcwalise.

Ozithobayo

Umcwaningi signature _____ Usuku _____

Ileli fomu liya kumphenduli

FAKA UPHAWU X KWIMPENDULO YAKHO

ISAKHULO 1: IMININGWANE YONGENELELAYO

Ubulili Ndoda Sifazane

Iminyaka yobudala

18-30	<input type="text"/>	31-45	<input type="text"/>	46-60	<input type="text"/>	61+	<input type="text"/>
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Isimo sokushada

Ngishadile	<input type="text"/>	Angishadanga	<input type="text"/>
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Bangaki obambiselenabo kwiproject

Bawubuphi ubulili obambisenenabo : Ndoda Sifazane

Ubukhulu bensimi otshale kuyo:acres/hectares

Inombolo yensimu

Isigceme

ISAKHULO 2: INKOKHELE YEPROJECT

- Yayiqalwe ndlelani iproject ngokwezimali?

Imali ozongelelayona	<input type="text"/>	Imali mboleke ebanki	<input type="text"/>	Uxhaso lika hulumeni	<input type="text"/>
----------------------	----------------------	----------------------	----------------------	----------------------	----------------------

Noma olunye uhlobo (please specify).....
- Wake wazama ukuboleka ebhange?

Yebo	<input type="text"/>	Cha	<input type="text"/>
------	----------------------	-----	----------------------
- Uma impendulo yombuzo (2) kungu Yebo, ungakudaza ngengunjani kubalula kokukhokha emali mboleko?

Kulula kakhulu	<input type="text"/>	Kulula	<input type="text"/>	Kunzima	<input type="text"/>	Kunzima kakhulu	<input type="text"/>
----------------	----------------------	--------	----------------------	---------	----------------------	-----------------	----------------------
- Uma impendulo yombuzo (2) kungu yebo, ungakubeka ngaliphi izinga indlela ibange elikhokisa ngayo?

Encomeka kakhulu	<input type="text"/>	Ekahle	<input type="text"/>	Engancomeki	<input type="text"/>	Engancomeki kakhulu	<input type="text"/>
------------------	----------------------	--------	----------------------	-------------	----------------------	---------------------	----------------------
- Wake wazama ukuthola uxhaso luka hulumeni?

Yebo	<input type="text"/>	Cha	<input type="text"/>
------	----------------------	-----	----------------------
- Uma impendulo yombuzo (5) kungu Yebo ungayichaza ngaluphi uhlobo lemboleko?

Ilula kakhulu	<input type="text"/>	Ilula	<input type="text"/>	Inzima	<input type="text"/>	Inzima kakhulu	<input type="text"/>
---------------	----------------------	-------	----------------------	--------	----------------------	----------------	----------------------
- Uma impendulo yombuzo (5) kungu yebo, ungayicheza kanjani indlela yokukhokela uhulumeni?

Encomeka kakhulu	<input type="text"/>	Iyancomeka	<input type="text"/>	Ayincomeki	<input type="text"/>	Ayincomeki nhlobo	<input type="text"/>
------------------	----------------------	------------	----------------------	------------	----------------------	-------------------	----------------------
- Sicela ubhale imibono onayo ngokuxhaswa kwabalimi abafufusayo

ngezimali.....

ISAHLUKO 3: IZINDLELA ZOKUDAYISA IZIVUNO

9. Uzidayisaphi izivuno zako?

Emphakathini		Ngokubambisana nomunye		Emakethe Yezitshalo		Ezimakethe ezinkulu	
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Okuhlukile kuloku.....

10. Kungani usebenzisa leyondlela yokudayisa?

Ukuthola umvuzo oncono		Iyona ndlela ekusebenzelayo		Iyona kuphela indlela engiyaziyo		Anginayo enye Indlela	
------------------------	--	-----------------------------	--	----------------------------------	--	-----------------------	--

11. Uthola umvuzo omuhle ngezitshalo zakho?

Yebo		Mhlawumbe		Angazi		Cha	
------	--	-----------	--	--------	--	-----	--

12. Kulula kangakanani ukuthola abathengi?

Kulula kakhulu		Kulula		Kunzima		Kunzima kakhulu	
----------------	--	--------	--	---------	--	-----------------	--

13. Uzithutha kanjani izitshalo zako?

Azidingi kuthuthwa		Ngesithuthi sami		Ngesithuthi esiqashwe		Umthengi uyazilandela	
--------------------	--	------------------	--	-----------------------	--	-----------------------	--

14. Hlaziya indlela yokungena emasimini akho?

Ilula kakhulu		Ilula		Kunzima		Kunzima kakhulu	
---------------	--	-------	--	---------	--	-----------------	--

15. Ungawachaza kanjani amanani okuthutha?

ushibhile		akahle		ayadula		Adula kakulu	
-----------	--	--------	--	---------	--	--------------	--

16. Chaza amandla onawo ekudayisa umkhiqizo wakho?

Ngiyawahlela amanani		Amanani ngiyawahlela emva kokubonisana		Ngisebenzisa amanani akhona emakethe		Ngenza amanani ngokuxoxisana ngokusemandleni	
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17. Ngobono wakho ikuphi la ungathola khona umvuzo oncono ngomkhiqizo wakho?

.....

18. Yini eyenza kubenzima ukusebenza kulendawo?

.....

ISAHLUKO 4: UKUTHOLA ULWAZI

19. Uyalithola ulwazi oluphathelele nokukhula kanye nemubono emisha ngezobulimi?

cha		Uluthola nje		uluthola njalo		Zikhathi zonke	
-----	--	--------------	--	----------------	--	----------------	--

20. Uluthola kanjani loluwazi?

Ngokulalela /ufunde ngezolimi		Ngobu chwep heshe		ngomsa kazo		umab onak ude		Ngezinye izindlela	
-------------------------------	--	-------------------	--	-------------	--	---------------	--	--------------------	--

21. Uyakhona ukuthola ulwazi ngamananiemikhiqizo ezimakethe?

Yebo		Cha	
------	--	-----	--

22. Unalo ulwazi ngezigu ezisiza abalimi ngolwazi nangoqeqesho?

Yebo		Cha	
------	--	-----	--

23. Ukewaqeqeshelwa ubulimi?

cha		Ulwazi onalo ngokucoshacsha		Wenze izifundo ezimfishane		Uqeqeshwe ngokuqavile	
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24. Uyaluthola uxhaso lwabezolimi?

cha		Uluthola nje		Uluthola njalo		Noma nini mawuludinga	
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25. Yazisa ngezindlela obona kuncono zisetshenziswe ukudlulisela ulwazi kubalimi?

ISIHLUKO SESIHLANU: UKUFINYELELA EBUNYONICWENI

26. Unolwazi olungakanani ngokusetshenziswa ngobunyonicwani ngabalimi

Nginolwazi olwanele		Ngisalele ngemumva		Anginaso isiqiniseko		Ngisalele ngemumva	
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27. Ungaziqathanisa kangakanani nabalimi esebenesikhathi eside kulomkhathabala abalima ngokwakha inzuzo?

Ngingaziqathanisa ngokwanele		Ngisalele ngemumva		Anginaso isiqiniseko		Ngisalele ngemumva	
------------------------------	--	--------------------	--	----------------------	--	--------------------	--

28. Uyacelwa ukuba wenze umaka/ ukhombise lawo mathuluzi okulima ovamise okuwasebenzisa nofinyelela kalula kuwo

Awokuhlola umhlabathi	Awokulungisa umhlaba/ indawo	Awokuchelela	Awokuvuna	Yilawo okubekwa izitshalo emunva kokuvuna	izithuthi
Izinsiza zokusiza kuhlolwe umhlabathi	Ugandaganda /igeja	Umshini wokudonsa amanzi uwalethe ezitshalweni	Ibhala	Izibandisi	Amaloli
Labhoratori	Izinkomo noma izimbongolo	Okokucelela	Ugandaganda odonsa itrayila	Indlu yokosebenzela okushitsha impahla	Isitimela
		Okokubulala izinambuzane	Umshini omkhulu wokuvuna		Ibhanoyi

29. Ungachaza uthini ngendima edlalwa ukufinyelela ebunyonicwani empumelelweni yebhizinisini lakho?

Kubaluleke kakhulu		Kubalulekile		Akubalulekile		Nakunamehluko omkhulu	
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30. Yibuphi ubunyonicwani obudingekayo obungasimamisa ibhizinisi lakho...nobungenza ibhizinisi lakho lenze kancono

SIYABONGA UKUBA YINGXENYE YOHLELO.

