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Operational challenges faced by smallholder farmers: a case of Ethekwini Metropolitan in South Africa

Abstract

The study is aimed at establishing the impact of access to capital, access to markets, access to information and access to technology on competitiveness of smallholder farmers on the market in Ethekwini Metropolitan in South Africa. A questionnaire is used as a research instrument. A total of 100 participants was sampled from a population of 485 smallholder farmers in Ethekwini Metropolitan. From the sample, 21% were male and 79% were female. All respondents were all from the African race. The study reveals that access to funding, access to markets, access to information and access to technology not only influenced viability of the smallholder farmers in Ethekwini Metropolitan, but also that the smallholder farmers were not getting enough access to all four stated variables. Of the 100 farmers, 66% of the smallholder farmers had plots with less than 0.5 acres under cultivation. Another finding was that even though the farmers had basic tools to work with, they 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. The study recommends that well equipped agricultural resource centres be established in all the agricultural hubs. It is also recommended that the government employs an asset based community development approach when funding smallholder farmers and that the smallholder farmers and other stakeholders be conscientized on the concept of sustainable farming.

Keywords: capital, market, information, technology.

JEL Classification: Q12.

Introduction

Smallholder farmers are believed 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 claims that smallholder farmers can be the driving force behind rural development which is equitable, sustainable and productive. Altieri et al. (2012) claim that small scale agricultural production is a contributor to national food security. Nwanze (2011) claims that smallholder farmers should be treated as entrepreneurs, as farming practised at whatever scale is a business. AgriSETA (2010) further added that land reform programs 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) reports that small farms produce an estimated 80 percents of the developing world's food. Stats SA (2011) reports that there are 2.9 million agricultural households in South Africa, of which the majority are smallholder farmers. WWF (2015) further reports that there are 2 million smallholder farmers in South Africa.

Despite this, smallholder farming in developing countries is a force to reckon with, as it is the main source of employment, income, food security, as well as a source of 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).

1. Literature review

1.1. Definition of a smallholder farmer. Nagayets (2005) defined a small scale farm on the basis of 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, criticized the size based definition, as they claim that it does not show the farm's labor arrangement, efficiency and productivity.

Berdegue and Fuentealba (2011) described smallholder agriculture as comprising of farms which are operated by farm families and whose labor is mainly from these families. Berdegue and Fuentealba (2011) also added 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 labor for non-farming activities, remittances, as well as social support services. The second subgroup is the commercial family farmers, which, at times, hire a handful of permanent labor to work on the farm. Berdegue and Fuentealba (2011) also highlighted that,

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although this subgroup is smaller in number of farms, members of this category play a more important economic role. This study will not distinguish between subsistence farmers and commercial family farmers.

1.2. 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, characterized 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 outdated means of production is utilized, which leads to low yields (DAFF, 2012).
- ◆ Smallholder farmers can also be characterized 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 (DAFF, 2012).
- ◆ Distribution of external inputs, as well as household expenditure patterns, can also be used to characterize 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 falls in 45 to 54 years category.

Positive outlook for smallholder farmers, in South Africa, the same farmers are afflicted by various social ills which include poverty, hunger and poor remuneration (Mudhara, 2010). As will be revealed in the next chapter, several factors have been listed by scholars as hindrances which have prevented smallholder farmers from capitalizing on existing opportunities.

1.3. Access to capital. Baiyegunhi and Fraser (2014) highlighted 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 to 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 sum total borrowed by these smallholders (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 the same farmers for the pieces of land they are farming. As a result, the smallholder farmers face difficulties when they apply for loans to invest on their farms due to lack of collateral.

1.4. Access to markets. The South African government liberalized the marketing environment when it introduced the Marketing of Agricultural Products Act of 1996 (Mudhara, 2010). Satgar (2011) argues that, although liberalization of the markets was meant to create equal opportunities for all players in the agricultural industry, this goal was never realized. Monopolistic businesses which operated under the guise of farmers' cooperatives increased in structural power after markets were liberalized. Another development which resulted from liberalization 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 liberalization 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 liberalization 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 liberalization 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.

1.5. 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 added 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 day and age. 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) reported that, when compared to their male counterparts, women, generally, had much less access to information through agricultural extension services, due to the fact that women were not regarded as agricultural decision makers.

1.6. Access to technology. According to Sikwela and Mushunje (2013), inadequate agricultural technology is one of the factors negatively affecting production requirements in rural South Africa. Buah (2011) suggests that a 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 a new technology for ease of transfer. Some of the methods suggested by Buah (2011), which can be used to promote the adoption of a new technology, include:

- ◆ Training and workshops.

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

1.7. 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 et al. (2010), however, suggest that, although per capita food production capacity has increased by at least 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 like 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. In South Africa, the government also committed itself to the 2003 Maputo Declaration on Agriculture and to food security in the continent. South Africa, through its Department of Agriculture and Forestry (DAFF), adopted a smallholder development program 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 will, then, focus on factors affecting smallholder farmers in South Africa. Recommendations will also be prescribed in an effort to offset the challenges which are hindering smallholder farmers from attaining their maximum output.

2. Research methodology

From literature review, there are four main parameters which scholars seem to suggest as the main factors which determine whether a smallholder farmer will succeed or not. These parameters are access to capital, access to information, access to technology and access to markets.

2.1. Objectives. The study was aimed at exploring the effects of access to: capital, markets, information, technology.

2.2. Questionnaire design. A questionnaire was used as a research instrument and was available 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. During 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). The questionnaire was divided into five sections as follows:

- Section one: Demographic data of the participants.
- Section two: issues surrounding funding of smallholder farmers.
- Section three: Accessibility of markets.
- Section four: Access to information.
- Section five: Access to technology.

The questionnaire had 30 questions in total, excluding section one.

2.3. Selection of participants. A total of 100 participants were selected using stratified random sampling from a population of 485 smallholder farmers. The study was narrowed down to four hubs which fall under EtheKwini Metropolitan, namely, Hambanathi, Mariannahill, Cliffdale and Umbumbulu.

2.4. Ethical considerations during research. Ethical approval was granted by University of KwaZulu-Natal ethics committee for this study.

2.5. Pilot testing. A small number of 5 participants was identified from the population outside the 100 participants targeted for the main study. This exercise was done to identify and correct any errors in the research instrument. Pilot testing was done to determine:

- ◆ if questions were clear to the participants;
- ◆ comprehensibility of the questionnaire; and
- ◆ the time it would take to complete the questionnaire.

The necessary adjustments were done to improve the questionnaire.

2.6. Administration of questionnaire. Questionnaires were personally 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. Presentation of results

3.1. Introduction. In this Section, data collected from respondents by means of questionnaires are presented in the form of graphs and tables. Correla-

tion analysis was used to establish relationships between the variables of interest.

3.1.1. Reliability of research instrument. The Chronbach’s alpha score was used to measure reliability of the research instrument for this study. For more insight on the test, readers may see Chronbach (1951) or Bonett (2010). The Table below shows Cronbach’s Alpha scores for the questionnaire used.

Table 1. Cronbach’s Alpha scores

		No. of items	Cronbach's Alpha coefficient
Section two	Project funding	8	0.764
Section three	Marketing of farm produce	10	0.819
Section four	Access to information	7	0.754
Section five	Access to technology	5	0.846
	Overall	30	0.794

The overall reliability score was 0.794 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.

3.2. Demographics. This Section presents demographic information of the participants. All the participants were of the African race, hence, effect of race will not be considered in this study.

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

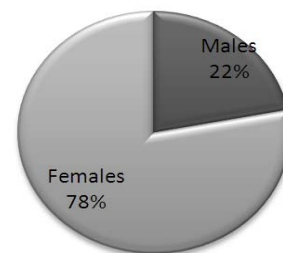


Fig. 1. Gender distribution of participants

As shown in Figure 1 above, 78% of the participants were female and 22% were male.

3.2.2. Marital status.

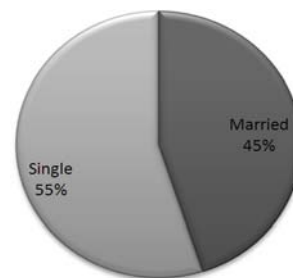


Fig. 2. Marital status of participants

From the above Figure, it can be seen that 55% of participants were not married and 45% of the participants were married.

3.2.3. 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 3 below shows the age distribution of the participants.

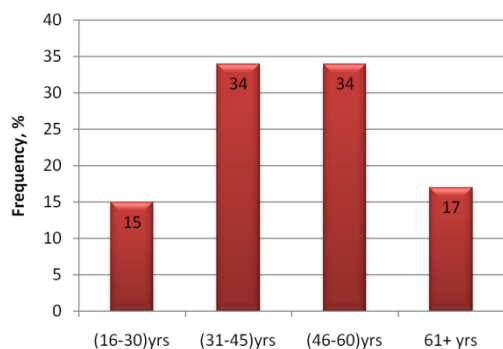


Fig. 3. Age distribution of participants

The age of the participants was normally distributed, with 78% 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.

3.2.4. Plot size distribution. The plot size which was denoted in acres, was measurement of the pieces of land under cultivation. This measurement helps one to understand the smallholder farmer’s capacity to produce crops. Figure 4 below shows distribution of the plot size.

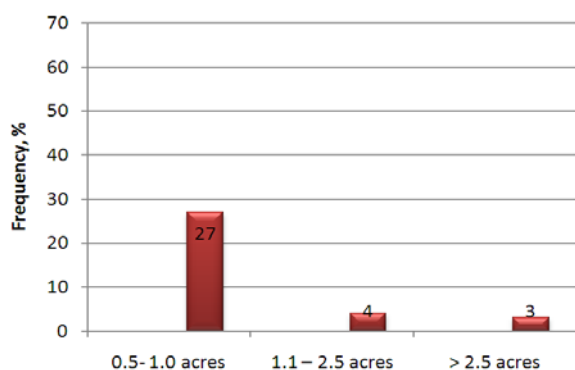


Fig. 4. Plot size distribution

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

3.3. Access to funding. In this Section, we present issues surrounding funding of smallholder farmers.

3.3.1. Financing of farming venture. The participants’ responses on how they financed their farming business were summarized and presented as shown in Figure 5.

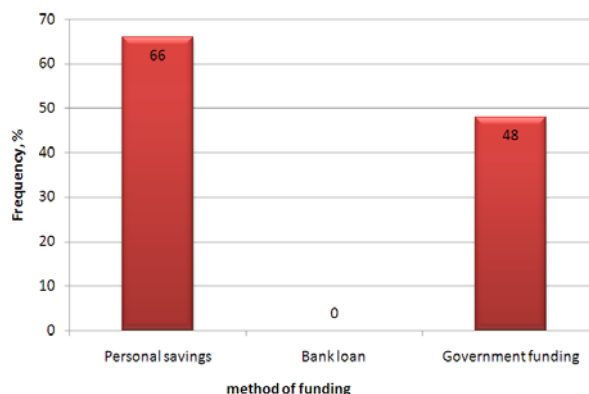


Fig. 5. Financing of farming ventures

About 66% of the farmers reported that they financed their farming businesses from their personal savings, while 48% revealed that they relied on government funding. About 14% of the farmers relied on both their personal savings and government funding.

3.4. Access to markets. This Section investigated smallholder farmers’ ease of accessing markets.

3.4.1. Selling of farm produce. This Section presents results on how farmers mostly sold their produce. The results are presented in the Figure 6 below.

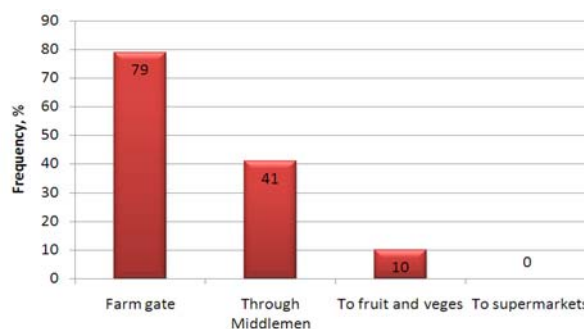


Fig. 6. Market channels used to sell farm produce

From the Figure 6, it is worthwhile to note that 79% of the farmers sold their produce at the farm gate. About 41% also claimed to sell through middlemen, while another 10% also sold to fruit and vegetable markets. No farmer claimed to be selling their produce to supermarkets. Only 28% of the farmers claimed to be selling their produce through one channel, and 72% of the farmers sold their produce through more than one channels.

3.4.2. *Transportation of produce.* Data on how farm produce was transported to markets are presented in Figure 7.

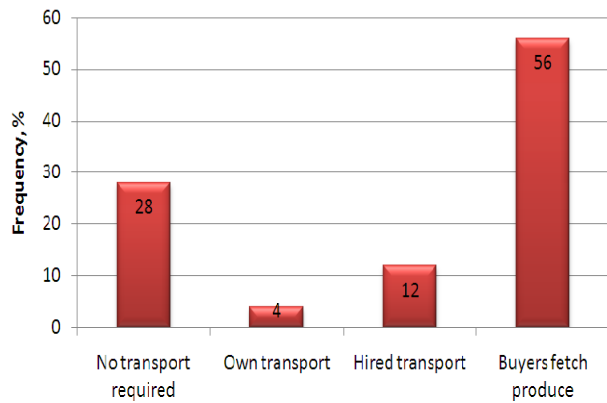


Fig. 7. Transportation of farm produce

About 56% of the participants indicated that buyers fetched their produce. About 28% commented that their produce did not need transportation. Only 12% of the farmers indicated that they used hired means to transport their produce. 4% of the farmers used their own transport.

3.4.3. *Transport costs.* Data on how farmers viewed their transport costs are presented in Figure 8.

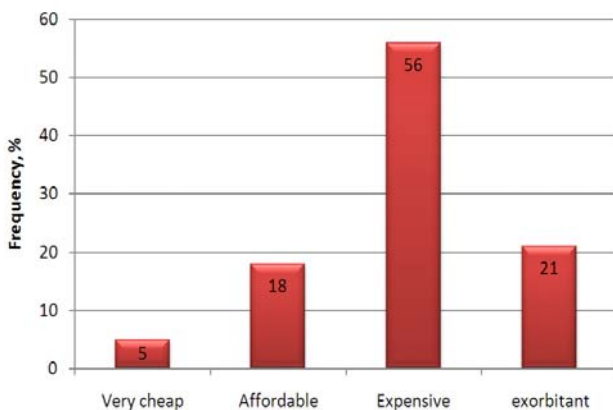


Fig. 8. Farm produce transport costs

From the above Figure, it can be seen 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 suggested that transport costs varied from being expensive to exorbitant.

3.5. Access to information. This Section investigated smallholder farmer accessibility of agricultural information.

3.5.1. *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 presented as shown in Figure 9 below.

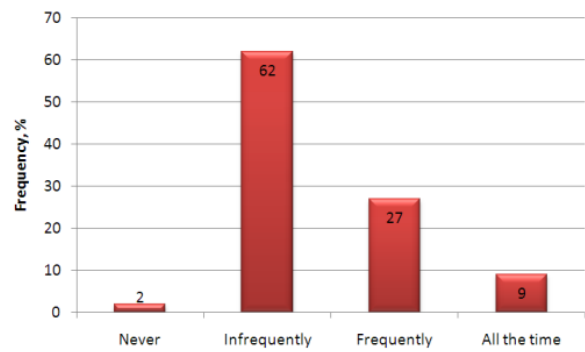


Fig. 9. Access to information on latest farming developments and innovations

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

3.5.2. *Farmers' method of accessing information updates.* Figure 10 below shows the distribution of farmers, according to how they receive information updates.

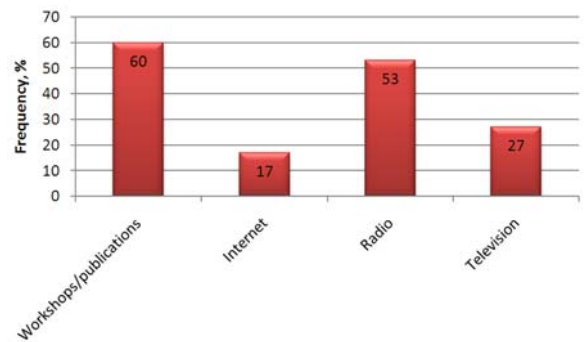


Fig. 10. Channels used by farmers to receive information updates

About 60% of the respondents claimed to receive information through workshops and publications. About 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.

3.5.3. *Access to information on prevailing market prices*

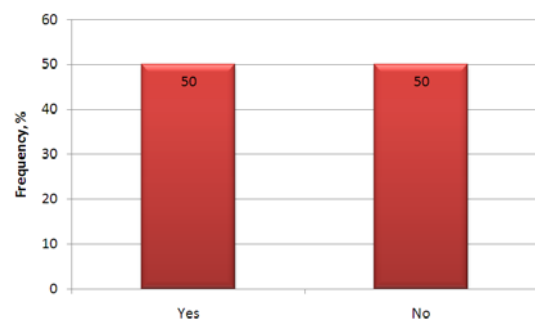


Fig. 11. Farmers' access to information on prevailing market prices

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

3.5.4. *Farmers' level of awareness of organizations helping them with information and training.* Data on establishing farmers' level of awareness of organizations helping them with information and training are presented in Figure 12.

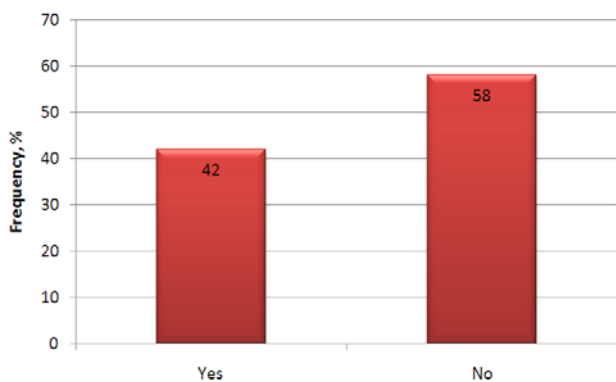


Fig. 12. Level of awareness of organizations helping farmers with information and training

About 58% of the farmers claimed to be aware of organizations helping them, and 42% confessed ignorance of such organizations.

3.5.5. *Agricultural extension officers' services.* Data on how frequently farmers received agricultural extension services were presented as shown in Figure 13.

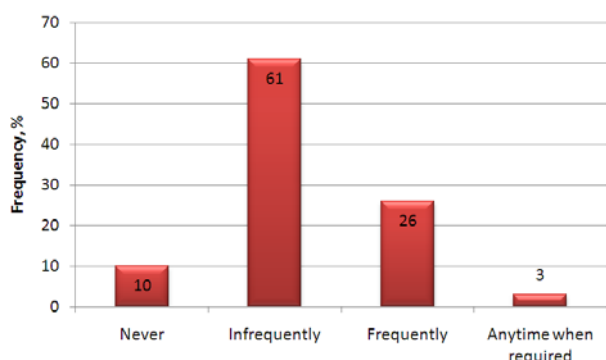


Fig. 13. Frequency of receiving agricultural extension services

About 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.

3.6. **Access to technology.** In this Section we establish the farmers' ease of acquiring technology.

3.6.1. *Farmer perception of access to farming technology.* Figure 14 below summarizes the farmers' perception of their access to technology.

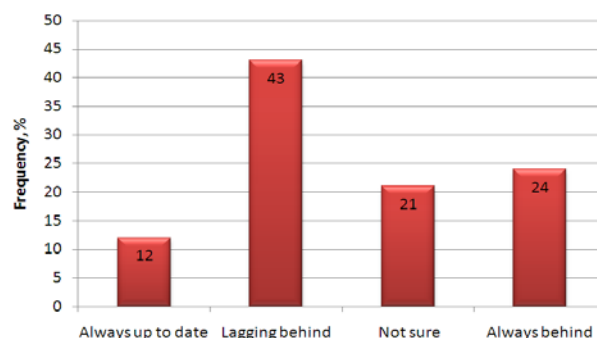


Fig. 14. Participants' perception of their access to farming technology

About 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.

3.6.2. *Comparison of smallholder farmers' access to farming technology with commercial farmers' access.*

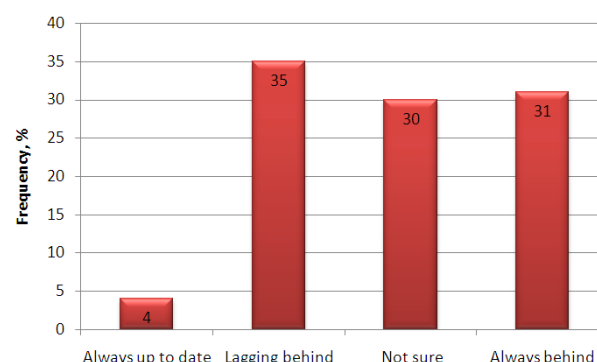


Fig. 15. Comparison of smallholder and commercial farmers' access to technology

About 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 access to 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 farming technology.

3.6.3. *Technology required for improvement of smallholder farmers operations.*

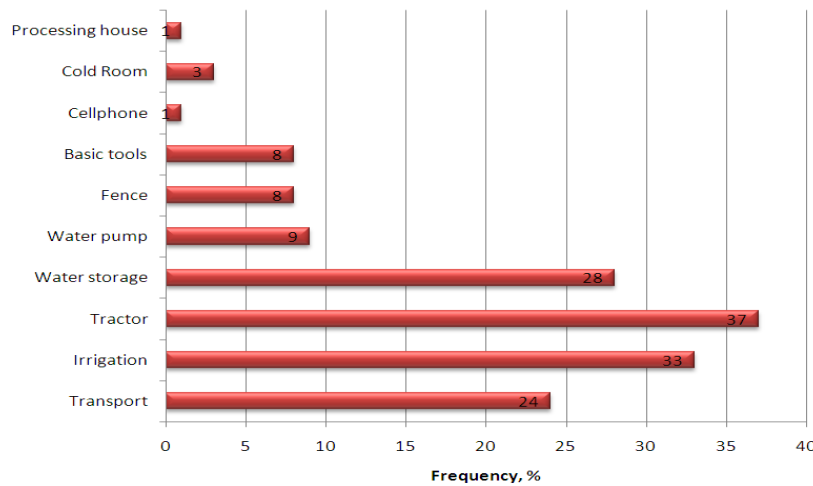


Fig. 16. Technology required to enhance smallholder farmer operations

About 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.

3.6.4. Role played by access to technology in farming

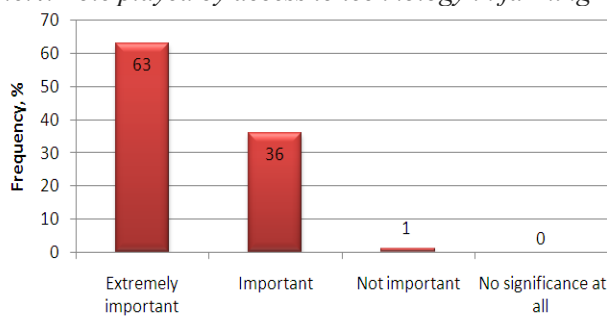


Fig. 17. Farmer perception of role played by technology in farming

3.7. Correlation analysis. In this Section, the Pearson’s product moment correlation coefficient was used to analyze 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.

3.7.1. Correlation between age and funding

Table 2. Age versus funding

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

Notes: **. 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’s 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 giving government funding than the young farmers. Another possible explanation could be that the elderly people have been practising agriculture for much longer, hence, acquired more knowledge and experience over the years. These knowledge and experience can potentially aid the elderly to develop solid project proposals which are appealing to those in charge of funding.

3.7.2. Correlation between age and access to markets.

Table 3. Age versus access to markets

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

Notes: **. 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’s correlation coefficient $r = 0.014$). Age did not determine the access to the markets of the participants.

3.7.3. Correlation between age and access to information.

Table 4. Age versus access to information

		Age of participants	Access to information
Age of participants	Pearson's correlation	1	0.248
	Sig. (2-tailed)		0.027

Access to information	Pearson's correlation	0.0248	1
	Sig. (2-tailed)	0.027	
	N	100	100

Notes: **. 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's 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.

3.7.4. Correlation between age and access to technology.

Table 5. Age versus access to technology

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

Notes: **. 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's 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.

4. Discussion of findings, conclusions and recommendations

4.1. Introduction. In this Section, key findings are listed and elaborated. Recommendations which are based on literature are made as a way of offsetting the challenges which smallholder farmers are facing. The Section also outlines the limitations of the study, as well recommends further areas of study in the future.

4.2. Key findings. The following findings were established from this research:

4.2.1. Funding.

- ◆ Funding is a major determinant of whether a smallholder farmer will be successful or not,

and smallholder farmers were underfunded, which was threatening their viability.

- ◆ The majority of farmers financed their ventures through personal savings and government funding.
- ◆ The survey also revealed that farmers required funding mostly for the following four critical items, namely, a tractor, irrigation, water storage and transport.
- ◆ Smallholder farmers viewed government funding as relatively easier to acquire and pay back (meet conditions), when compared with commercial bank loans.

4.2.2. Markets.

- ◆ Due to transport constraints and distance to markets, most smallholder farmers were forced to sell their produce at their farm gates and through middlemen.
- ◆ Farm accessibility did not seem to be an issue for smallholder farmers in Ethekewini.
- ◆ Smallholder farmers, generally, found it difficult to reach markets.
- ◆ The bulk of smallholder farmers had a capacity challenge, as they had, at most, 1 acre of land under cultivation. This constraint hindered them from selling their produce in the market, as transport costs offset the gains from selling their produce in the city markets.

4.2.3. 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 agricultural information.
- ◆ Agricultural extension visits were the most preferred mode of passing information to the farmers.
- ◆ Farmers were also not getting enough market information.

4.2.4. Technology.

- ◆ Smallholder farmers were lagging behind on access to technology, when compared to their counterparts in commercial farms.
- ◆ Smallholder farmers in Ethekewini 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.
- ◆ The farmers had basic tools for farming like hoes and wheelbarrows. With such tools the farmers capacity was extremely limited.

4.3. Recommendations. In light of the research findings outlined above, as well as findings from literature review, 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 interventions based on poverty analysis. According to Nel (2015), the ABCD approach comes handy when trying to establish the strong attributes of a vulnerable community during planning and implementation of sustainable community development programs. The ABCD approach seeks to make the livelihood of community members more sustainable by strengthening their assets. Development interventions, however, focus on areas where community members lack (Nel, 2015). Another advantage of the ABCD approach is that, in the long run, the burden on the government is lessened as farmers become more self reliant (Nel, 2015).
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 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, farmers can take advantage of the potential power of collective action. Farmers can establish their own agricultural hubs where they can send their produce. A consolidated truck load can, then, be made up at the hub and transported to the city markets where produce will be sold. This approach reduces transport costs per individual farmer. Sending produce to the nearest hub enables farmers whose farms are difficult to access to also sell their produce to city markets.
3. Borrowing the Warana Wired concept and Digital green concepts from India, the agricultural hubs mentioned above can be further developed into resource centres where information can be shared. 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 hubs can also have demonstration plots where extension officers can conduct practicals and trials with farmers during workshops and training sessions.
4. Farmers producing crops classified under the fast-moving-consumable-goods (FMCG) class can also benefit from agricultural hubs, if these hubs are equipped with processing houses and cold rooms. Processing houses and cold rooms can help to 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.
5. To solve the tractor shortage problem, government can intervene by allocating a tractor per resource center. The tractor fleet would be managed and maintained by Ethekwini municipality's agriculture department. The same approach can also be implemented with other technology demands which might be needed. The community resource centre could act as the bridge which will enable farmers to access technology.
6. As for irrigation and fencing challenges, Ethekwini 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 subsidized seedlings for planting and pumping water from rivers into farmers' reservoirs. The local municipality can also take another step by implementing rain water harvesting projects during establishment of new garden, as well as with the existing ones.
7. The local municipality can also aid the farmers by supplying them with the tonnes of grass and leaves which are cut from roadsides to make their own compost. Alternatively, the municipality can make compost and sell to the farmers at a subsidized rate.
8. 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 will, in turn, empower other farmers in their communities. This development will relieve the extension officers from the pressure they are under. A resident team leader can also help a community to have readily available source of knowledge.

9. The survey also showed that very few youths, in the 16 to 30 years band, are participating in agricultural projects. An incentivized nationwide campaign needs to be implemented aimed at luring the youths into farming.

5.4. Limitations of the study

- ◆ As with many research undertakings, a comprehensive sample of the whole population was limited. Firstly, there is no formal list of smallholder farmers practising agroecology in KZN, save for the one supplied by a Non-Governmental Organization (NGO) called Edamame Development Program (EDP). Access to smallholder farmers was also through EDP, which is based at Mariannhill Monastery farm in Pine-town. EDP has got four agrihubs in Ethekewini Metropolitan, namely, Mariannhill, Cliffdale, Umbumbulu and Hambanati. The survey was, therefore, limited to those four agrihubs.
- ◆ Costs, distance and time also 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 generalized for other races.

Recommendations for future studies

This study was limited to four areas namely, Cliff-

dale, Mariannhill, Hambanathi and Umbumbulu. There are, however, many more areas falling within the Ethekewini 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 seem 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 study the factors which could attract more young people into agriculture.
- ◆ 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.

Conclusions

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 were conducted on farmers by means of a questionnaire. Data were collected, analyzed and discussed. Recommendations were, then, given.

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