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Analysis of Beef Farmers' Participation to Formal Markets in Ngaka Modiri Molema District in North West Province, South Africa

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Abstract

Aim of this study was to identify factors that influence smallholder beef farmers' participation to formal markets in Ngaka Modiri Molema District, North West Province, South Africa. The smallholder beef producers in the study area do not make use of output markets efficiently due to a number of factors thus marketing constraints that limit their involvement in formal markets; these factors are identified in this paper. Simple random sampling method was used to select 109 smallholder beef farmers in the district. A structured questionnaire was used to collect data from respondents. Data was analyzed with SPSS version 25 using frequency count percentages, mean values and standard deviations. A multinomial logistic regression model was adopted and ran on STATA version 12 to investigate constraints that influence smallholder farmers' participation to formal markets. Empirical results show that farmers' participation in formal markets is significantly influenced by age of farmers, contact with extension agents, access to market information, infrastructure, workshop participation, formal contractual agreements and training. This paper recommends that Government should (in collaboration with relevant stakeholders) design, implement and, improve existing initiatives to foster entry into formal markets by smallholder beef farmers.

Keywords: Smallholder Farmers, Beef Cattle, Formal Markets Access.

Introduction

Agriculture plays a crucial role in developing countries as it is a major source of income in rural households. Small scale farmers are often located in rural areas and they can be defined in diverse ways depending on perspective, nation and ecological zone and this explains interchangeable use of the term smallholder with small-scale, resource poor and peasant farmers. According to and smallholder farmers have cattle numbers that are significant and if they manage them well, they can contribute to the nutrition and food security at a household level and, add to the national economies. However, a number of authors expressed the concern over the limited contribution of livestock that the smallholder farmers own, especially cattle towards their household and economies of the nation [1-5].

These farmers often struggle to improve their standards of living because they lack access to formal markets and therefore end up selling their cattle to the buyer at whatever price dictates [6]. On the study on the "Analysis of cattle marketing channels used by small scale farmers in the Eastern Cape Province, South Africa" by [7]. The authors expressed that the change towards commercial production by the smallholder sectors is dictated by its entrance to the market. However, few factors such as low purchasing power, poor marketing infrastructure, and absence of marketing sizes of herds and high transactional costs influence efficiency of marketing livestock.

Farmers in the smallholder sector desire to sell their cattle through formal markets but lack sufficient cattle numbers to offset pre-slaughter transactional cost and satisfy the formal market demand, as indicated by [6-8]. In the opinion of, they also face challenges such as lack of slaughter facilities at reasonable distance, poor production and marketing management, poor condition of livestock, lack of information to be able to sell livestock in formal markets etc [9]. Furthermore, they often fail to produce beef that meet the quality standards required if formal markets, and lack stable and reliable markets to sustainably drive efficient cattle production [10, 11].

Moreover, the current system used by formal markets which favors young well-conditioned animals works as a disadvantage to smallholder farmers as they often market old and emaciated animals. As a result, they offer their cattle to informal markets which more often have low buying power; hence they get low prices for their livestock [12, 13]. Access to markets is an imperative requirement for small scale farmers thus having access to inputs is not of much benefit if they are unable to access profitable markets. In order to increase market participation by small-scale farmers, it is essential to identify variables that influence market access.

Literature Review

Market Access

Market access is multidimensional, conceptually based on physical access (such as roads and transportation expenses) and non-physical coordination costs (transaction costs, according to new institutional economics), which change idiosyncratically and regionally for different marketing channels and actors [14]. According to, market access refers to the methods by which people enter markets, including their nature, efficiency, and costs [15]. Market access can be related in the following ways: first, to information about product availability, attributes, and prices, including the frequency, quality, and cost of this information; second, to information about transaction counter-parties, as trustworthiness is critical if payment is not instantaneous or quality checking is costly; third, to the extent that suppliers can have confidence in market conduct; fourthly, to information on physical costs of reaching a market, which is a function of the quality of infrastructure and the transportation sector; and finally, to the actual price levels found in the markets in which individuals transact.

This is similar to definition, where market access is defined in three dimensions: physical access to markets (distances, costs, etc.); market structure (asymmetry of power relations between farmers, market intermediaries, and consumers); and the level of producers' human capital [16].

Available Market Channels

Marketing channels are chosen based on market availability, distance, and market size. Smallholder farmers find it difficult to decide which market channel to use that will offer the best prices and high profit [17]. The choice requires reliable market information such as, cattle prices, the right selling time, available market channel, cattle breed and age of cattle that will offer the highest return. Five main marking channels that smallholder farmers can use to sell their beef cattle and are discussed below. Firstly, Private sale. This is the shortest and simplest manner of marketing beef cattle for smallholder farmers is through private sales, where producers sell their beef cattle directly to buyers.

The consumers purchase beef cattle for different reasons which include, slaughter, investment and, socio-cultural function such as funerals, weddings, and customary and religious functions [18]. The market exists because of socio-cultural functions performed; as a result, smallholder farmers use this channel because they can set their own prices. Furthermore, the costs of marketing that farmers incur are low, therefore this marketing channel cheapest and simplest form of market outlet [8-20] . As observed by, farmers obtain high profit because there are no middlemen in this marketing channel [21, 22]. However, the demand is irregular since it is usually high during certain times of the year (festive and Easter season), and cattle that are sold are here are often old and emaciated [23].

Secondly, cattle farmers can sell their livestock through auction markets. Auctions are places of business that are established were cattle are brought together at regular times and sold by public bidding to the buyer who offer the highest price per head. They are public markets open to everyone both the seller and the buyer (butchers, farmers and speculators etc.). These markets operate all year round but the cattle number that is sold tends to be higher in certain times of the year (summer months, late winter and early spring). Additionally, the auctioneer is authorized to a commission from the sale preceding and is paid by the seller or buyer. Likewise, success of the auctions depends on the type and numbers of animals, and buyers' participation. Also, agricultural companies and corporations are involved in cattle marketing as agents or brokers. Agents bring sellers and buyers in touch on a commission basis, and the sellers are then paid by the agent after a few days. These agents include speculators who purchase cattle directly from the farmers or auctions, take ownership and sell at a profit. Farmers do not incur market costs when selling their stock to speculators. Speculators however incur transport cost but they enjoy the advantage of not being charged for commission. Prices are agreed upon through negotiations, and smallholder famers often find speculators being dishonest and not treating them good. Farmers complain that they trick and convince them to sell their stock when famers are in need of cash [12-27].

Thirdly, farmers who raise cattle extensively have the option of selling them directly to feedlots. Beef cattle feedlots are intense finishing operations in which cattle are confined to pens or yards and given a high-energy, balanced diet (usually high-maize or grain-based) for 90 to 300 days to rapidly increase weight, enhance meat quality, and reach market slaughter weight [28]. Currently in South Africa there are 60 commercial feedlots registered in South African Feedlot Association (SAFA), and cattle are marketed throughout the year as well in feedlots. Out of 2.4 million slaughtered cattle annually in abattoirs, 70-80% of the slaughtered stock comes from feedlots [29-33]. These markets usually buy weaner calves that have a mass of 230 kg from extensive cattle farmers, add 105 kg carcass mass through intensive feeding of about 100 days, and slaughter the animal at 215 kg carcass weight. Cattle prices are determined by weight of the head, sex, breed, grade and condition [34]. Fourthly, Beef cattle can be sold through abattoirs. Since meat industry was deregulated in South Africa there has been a rapid growth in the number of abattoirs that are registered [35]. At abattoirs an agent brings the buyer and the seller in touch.

This marketing channel ais not popular and are used the least

within the smallholder sector, because they are located far away from farmers, payments are made after a few days after slaughtering of animals, animals are usually condemned because of health status, prices are based on carcass quality not physical appearance of the animal, and it is not economically to sell one or two animals as costs of transportation will be high. Abattoirs pay according to age, weight and grade of animals. The grading system does not consider the breed or feeding practices. These channels tend to sell natural beef at higher prices compared to genetically modified beef, and as a result they get higher returns at the expense of farmers [36, 37].

Lastly, another alternative for smallholder farmers to market cattle is to sell them through butchers. In the views of and, the marketing channel is mostly used by smallholder farmers who are not able to market beef cattle efficiently and gain profits through the formal markets [18-38]. Also, butchers enhance marketability of beef cattle by acting as a buyer in their own right and by acting as a buyer at auctions. Similarly, smallholder farmers are satisfied with sales to butchers because they obtain good prices and have a strong bargaining power in determining their price. In addition, out of the five marketing channels explained above, smallholder farmers usually prefer to sell their cattle through public auction that are organized by reliable auctioneer agent. The main reason for this, is because auctions are accessible at the right time, the pay reasonable prices that are related to the market, farmers can sell stock in bulk, they can build socio and economic relationship, and if farmers are not satisfied with the price, they can decide to return back their cattle without any penalty, except transport costs [23-37] .

Research Methodology

The study's population consisted of smallholder farmers rearing beef cattle. A simple random probability sample of farmers in Ngaka Modiri Molema District Municipality (North West Province) was used. The sampling approach involved selecting 109 farmers and conducting interviews with them using standardized questions. To examine data, the study used descriptive statistics as well as an econometric model (Multinomial Logistic Model). Descriptive statistics (SPSS version 25) were used to assess farmers' characteristics and formal market limitations (mean values and percentages). These proved effective for studying household characteristics as well as the relationship between factors. Data was used to create frequency tables, which were then presented in tables, pie charts, and bar graphs. To investigate the socioeconomic determinants influencing farmers' participation in formal markets, a multinomial logistic regression model was used (following [17] and run on STATA version 12. Formal market involvement was described as a function of numerous socioeconomic criteria such as the farmer's age, reasons for maintaining cattle, experience in years, market channels used by the farmer, and so on.

In this study smallholder beef farmers are faced with two choices; informal and formal market participation. It is assumed that these decisions are made on the basis of the options which maximize their utility. As such, the utility maximizing function can be given as:

$$\text{Max } U = U(Ck, Rfk, Rik; Hu) \quad (1)$$

Where; Max U denotes the maximum utility that can be obtained from agricultural production

Ck represents the consumption of raised cattle by the farmers

Rfk represents revenue gained from formal market participation

Rik represents revenue gained from informal market participation

Hu represents a set of market constraints shifting the utility function.

According to the utility maximizing function, farmers make decisions about producing, consuming, and marketing their animals. As a result, if the costs of using a certain channel outweigh the advantages, farmers will be discouraged from using it and will instead choose the alternative that maximizes their utility. In the utility function, the amount of good k consumed or sold must not exceed the amount created. However, it is difficult to assess utility directly, so it is assumed that farmers make participation choices based on the option that maximizes their benefit. Thus, decisions to participate in formal or informal markets reflect the optimal path for utility maximization. Using the stated premise, logistic regression was used to relate the decision to participate in formal and informal markets and the factors that influence these choices.

A typical logistic regression model which was used is of the form:

$$\text{Logit (Pi)} = \ln (Pi / 1 - Pi) = \alpha + \beta 1X1 + \ldots + \beta nXn \quad (2)$$

Where; ln (Pi / 1 – Pi) = logit for market participation choices

Pi = not participating in formal markets

1-Pi = participating in formal markets

X represents covariates

In this study formal market participation was taken as dependent variable. This type of variable was measured using a number of farmers' that offer their cattle to formal markets. Variable explanation and hypothesis are given below (Table 3.1).

Table 3.1: Variables Included in the Model

Variable label	Variable name	Coding of variable	Expected relationship
Gnder	Gender	Dummy variable (1 = male; 2 = female)	±
Ethn	Ethnicity	Dummy variable (1 = black; 2 = other)	±
Cntwtes	Contact with extension service	Dummy variable (1 = yes; 2 = no)	+
Formember	Farmers organizational membership	Dummy variable (1 = yes; 2 = no)	+

Wrkssttend	Workshop attendance	Dummy variable (1 = yes; 2 = no)	+
Formlca	Formal contractual agreement	Dummy variable (1 = yes; 2 = no)	+
Typptrans	Type of transport used to move animals	Dummy variable (1 = own; 2 = hired)	±
Mainfo	Access to market information	Dummy variable (1 = yes; 2 = no)	+
Smllhz	Small herd size	Dummy variable (1 = yes; 2 = no)	+
hightransc	High transactional costs	Dummy variable (1 = yes; 2 = no)	+
Markinfr	Access to market infrastructure	Dummy variable (1 = yes; 2 = no)	+

Results and Discussion

The findings on Table 4.1 indicate that majority of the farmers were male (71%) while (29%) were females. Most people still believe that agriculture is suitable for men, and this approves study which states that generally livestock are owned by men, even when they are not on daily supervision of the animals [39]. Also, 68% of the respondents were over 40 years of age and 32% were aged between 18 and 39 years. This might be because farming is often dominated by older people as compared to young ones who would rather seek for employment in urban areas. Young people lack motivation towards farming as a major occupation, as observed [40]. Additionally, majority of the respondents had no formal education (34%), whereas 25% completed their secondary school, 23% went to tertiary level of education and 18% were primary school leavers. These results show that many of smallholder beef farmers do not have solid education with most of them having no formal education, which could limit their adaptation to new beef farming agricultural activities. This is a worrisome factor if any progressive development of rural beef farming agriculture is to be supported in the rural areas like Ngaka Modiri Molema District.

On Table 4.1, the results reveal that 60% of the farmers had between 6 and 10 years of experience in beef production, while 35% had more than 10 years and only 5% had less than 5 years of experience. Usually, older people tend to have more experience as compared to young ones, and those with more experience are most likely to participate in formal markets or otherwise. Similarly, some of them might not feel the need to be involved in these markets and become skeptical for change that may arise from selling their animals to these markets if they were not use them before, and rather prefer to stick to their own ways of doing things.

However, 63% of the respondents had contact with extension services and only 37% had no contact. It can be concluded that most of the farmers in the study area are aware of the challenges associated with formal marketing, because they have contact with extension services, and through participation in agricultural activities and demonstrations disseminated by extension agents they can improve their marketing skills, and offer their cattle to formal markets. Support this assertion on their study on factors affecting marketing of vegetables among small-scale farmers in Mahikeng in North West province, South Africa [41]. Their results indicate that agricultural production and productivity increases as a result of the knowledge, information and demonstrations from the extension officers. This is corroborated by in India and Indonesia [42, 43].

Furthermore, about 56% of the respondents said that they keep farm records while 44% did not keep farm records, as indicated on Table 4.1. Record keeping is very critical for informed managerial decisions regarding planning for development. Since some of these farmers do not keep farm records, this might be one of the reasons why they do not qualify to get credit from financial service providers, because these institutions usually require financial records of the farm etc. in order to provide financial services to the farmer, and to be certain that the loan will be paid back. This is sustained by and [44, 45]. On the study on "Farm accounting record keeping and its impact on the profitability of farm business" in Nigeria, found that small business enterprises should embrace proper accounting record keeping practices in order to be successful and for effective financial performance [46].

Moreover, one reason for not keeping farm records might be because most of the farmers had no formal education. Likewise, 76% of smallholder farmers had between 6 and 40 cattle numbers, 17% had over 40 cattle numbers and 6% had less than 6 of cattle numbers. The result shows that most of beef farmers have significant herd size, and farmers with large herd sizes have greater probability of selling their cattle to formal markets such auctions and abattoirs. Lastly, majority of smallholder farmers (71%) had no formal contractual agreement with any agribusiness outlet, whereas only 29% had formal contractual agreement. This is worrisome when we look at the figures of those who do not have any formal contractual agreement with agribusiness outlets. According to, a guaranteed or contract farming is one of the formal agreements that can promote market access to the smallholder farmers [47]. This is supported by on the study "Contract farming, contract design and smallholder livelihoods" in Ghana [48].

Table 4.1: Basic Characteristics of Beef Farmers Interviewed (n = 109)

Variables	Description	Frequency	Percentage of respondents
Gender	Male	77	71
	Female	32	29

Age in years	18–39	35	32
	>40	74	68
Educational level	No formal education	37	34
	Primary school	20	18
	Secondary school	27	25
	Tertiary	25	23
Farming experience in years	1–5	6	5
	6–10	65	60
	>10	38	35
Contact with extension service	Yes	69	63
	No	40	37
Keeping farm records	Yes	61	56
	No	48	44
Farm herd size (in numbers)	40 cattle	19	17
Formal contractual agreement with any agribusiness outlet	Yes	32	29
	No	77	71

The outcomes on Table 4.2 indicates that 61% of smallholder beef cattle farmers in Ngaka Modiri Molema market their animal through informal markets with (46%) of them selling cattle through private sales, while 39% of beef producers market their cattle to formal markets with 20% of them selling cattle through auctions. Farmers pointed out that auctions were easily accessible and reliable in which farmers could market their animal through formal markets. This may be due to drought that led to more cattle dying, adding to the fact that the study area has low rainfall rates [49-51]. Therefore, farmers are more skeptical to own large number of herds. Whereas, it is often required of a farmer to have large number of cattle to be able to offer them to market channels (formal market) such as abattoirs, and to avoid high transactional costs by offering them in large numbers instead of selling few at a time because some farmers in the study area are located in remote areas far from abattoirs.

Table 4.2: Marketing Channels used by Smallholder Farmers.

Market channel	Frequency	Percentage
Speculators	17	16
Private sales	50	46
Butchers	7	6
Open market	1	1
Abattoirs	12	11
Auctions	22	20
Feedlots	0	0
Main market channels		
Formal	42	39
Informal	67	61
Total	109	100

The finding on figure 4.1 shows that 84% of the participants reported that inappropriate carcass classification system at abattoirs was one of their constraints towards access to formal market. Supports this result on their study on determinants and opportunities of commercial marketing of beef cattle raised on natural pastures in South Africa [1]. Their results revealed that classification system used to price beef carcasses in abattoirs (formal market) favors well-conditioned young animals. Whereas, most of smallholder farmers keep their cattle longer because they consider to market cattle only near the end of the animal's life when its capacity to provide other roles (e.g., draught power for ploughing etc.) becomes weakened [52, 53].

Hence the existing carcass classification system should be revised to accommodate consumers that prefer beef from older animals. Carcass classification system involves ranking of carcass according to describing qualities (lean yield for example) of the carcass that are useful to those involved in their utilization/trade. This system also consists of carcass grading that includes placing different values on the carcass for pricing purpose depending

on the market and requirements of traders [35-54] . Also, 70% of the respondents reported that they had no marketing skills. This is concerning because market skills influence production and market decision, the number and type of cattle that they keep as well as the market channel they choose to sell their animals.

Likewise, 68% of the farmers said they were lacking stable and reliable markets. They specified that there were few numbers of formal markets available in their area. However, smallholder beef farmers choose which marketing channels they wish to sell their cattle to, and this depends on which market is available, existing market pricing, the distance to the market, and the degree of relationships created from previous transactions, among other factors [1]. Most the farmers prefer to market their cattle through informal markets since the buyer just come and buy from the kraal and farmers do not incur transport costs. As indicated (Figure 4.1), the results show that 63% of the respondents said that they were lacking market infrastructure. and detailed that the most important physical infrastructural weaknesses for the livestock marketing system relates to transport and holding facilities. A well-organized transport system is important to effective agricultural marketing [12-55].

It is in this context that mentioned that, if transport services are not frequent, of poor quality or expensive, farmers won't be timeous and will be exposed to price risk. also pointed out that the level of sophistication of a transport system can improve the mobility of the user and the accessibility of market opportunities. In revelation to this, many communities complain of insufficient access to traders mainly due to traders that are unwilling to make trips because of high transaction costs they incur due to poor physical infrastructure such as roads and loading facilities, as well as distance to reach farmers [56, 57]. Besides, 60% of the farmers had no access to credit assistance. This may be mainly because they do not keep farm records, and they do not have any guaranteed formal market that they sell their animals to in order to generate sufficient income to be able to pay back loans. If farmers get access to credit, they are likely to invest in cattle production, hence producers are likely to produce breeds that are required in formal markets and can therefore be paid reasonable prices for their animals [58-60].

In the same way, 59% of the respondents stated that they experienced high transactional costs. In the opinion of, transaction cost affects the market participation and/ or a choice of a marketing channel [61]. Transactional costs include grade uncertainty, risk of not selling, time spent at the auction etc. which affect the choice of a marketing channel [23]. Thus, it may be inferred from this study that farmers select less expensive market channels, and that participation is often influenced by transportation, market channel search, and education. In addition, 57% of the participants were lacking support service. In the study area, some of the farmers were located in remote areas far away from civilization. This might be one of the reasons why they lack sufficient support services and why other even had no contact with extension services. The participants (56%) specified that formal markets were far away from their location and they had low market-offtake rates. As a result, they are avoiding high transportation costs since most of the farmers use hired transport to move their animals to the markets. Additionally, lack of market infrastructure such as good quality roads also affects their participation to formal. In terms of low market-offtake rates, marketing in smallholder farmers differs, some farmers sell to formal markets and others do not. This might be due to small numbers of cattle that farmers own (refer to Figure 4.1).

The results also indicate that 53% of the farmers reported that they had small herd sizes (figure 4.1). Those with large numbers of cattle are more likely to participate in formal markets relative to those with small beef cattle numbers. Also, 48% of the farmers specified they had animals of poor body condition which are usually less favored at formal markets. Meat classification system at abattoirs grade animals in terms of specific traits or qualities, and one of them include body conformation of an animal. Therefore, smallholder farmers with animals with poor body conditions refrain from selling to this market channel because their animals are usually not favored and receive lesser prices for their cattle as a result. Correspondingly to feedlots which frequently favor exotic breeds of cattle that mature faster as compared to indigenous breeds that are generally kept by smallholder farmers [62, 63]. Into the bargain, in auctions buyers often want animals that are in good condition with excellent body conformation for reproduction and slaughtering [27]. To conclude, 31% of the farmers reported they were lacking market information. The lack of information on formal markets results in high transactional costs which prevents farmers from using the channel [64].

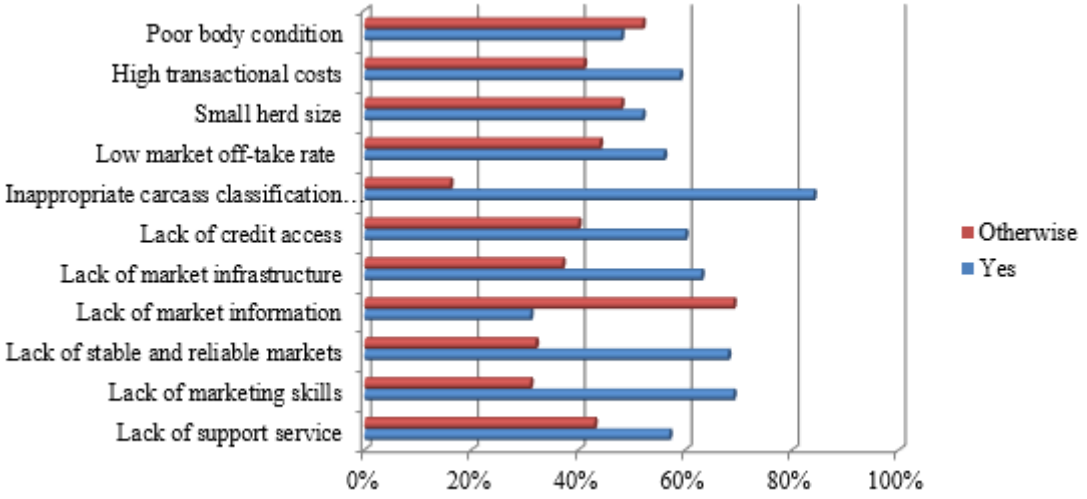


Figure 4.1: Smallholder Farmers' Constraints to Sell Their Animals to Formal Market

On Figure 4.2 the findings reveal that most of the participants (61%) said that they want to sell and are willing to participate in formal market provided that their market position is improved through provisions of institutional support that will address the limitations that they are faced with in accessing formal markets, such as the provision of good quality roads, credit institutions, and also if formal market channel standards could be reviewed in order to cater for smallholder beef farmers etc. Farmers also pointed out that some of their consumers prefer beef from older animals, so it might be of assistance if carcass classification systems at abattoirs are revised to cater for consumers who prefer beef from older animals. On the other hand, only 38.5% of the farmers said they were not ready to participate in formal markets. Some of them said it was because they were comfortable with the market channel that they were currently using, while others mentioned that they are not willing to sell in formal markets because of some of the market limitations already described above.

One of the reasons is that feedlots reject pure and indigenous cattle because they often fail to meet feedlot initiation specifications for age, weight, fatness and frame score whereas indigenous breeds are found in numbers in smallholder sector [62-65]. In addition, according to, older people and farmers with low education sell their cattle to neighbors, relative and private sales, while young educated farmers use private sales, auctions, abattoirs, local butchers and speculators [7-35]. This is farmers do not experience any transactional cost for selling to speculators and neighbors or relatives because transactions take place at their place.

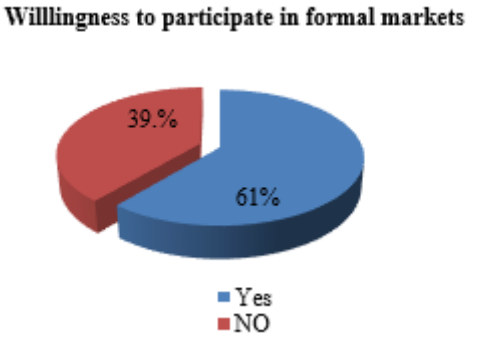


Figure 4.2: Smallholder Farmers' Willingness to Participate in Formal Markets

The outcomes on Table 4.3 indicate a positive sign and significant relationship between smallholder beef farmers' contact with extension services and their participation to formal markets with a significant value at ($\beta = 0.158$; $P<0.10$). This relationship implies that farmers are more likely to sell their animals to formal markets, as they get contact with extension services, as observed in the Western Cape province [66]. However, occupation has a negative correlation but yet significant relationship with formal market participation at ($\beta = -0.053$; $P<0.10$). The negative correlation between the two might be because some of the farmers were found to be part-time farmers, employed and unemployed, and others were pensioners.

Furthermore, age had a positive correlation with participation in formal markets with significant value at (β = 0.0795; P<0.10). Age normally has a significant relationship with experience. Older people typically have more farming experience than young ones, and farming experience tend to increase market participation to formal markets, as indicated on the study of "A Typology of the Level of Market Participation among Smallholder Farmers in South Africa: Limpopo and Mpumalanga Provinces" by [67]. On the contrary, formal contractual agreement had a negative correlation but significant at the value (β = -0.190; P<0.10) with formal market participation. This means that households might increase participation in formal markets with the availability of contractual agreements. The negative sign is because most of the sampled farmers had no formal contractual agreement with any agribusiness outlet.

Furthermore, farmers' workshop attendance had a positive sign and significant relationship with formal market participation. The significant value at (β=0.262; P<0.001), which means that those who attend agricultural workshops are more likely to market cattle to formal markets. supports this proclamation [7-66]. Additionally, farmers who were not attending workshops indicated that they needed a particular training in order to learn more about cattle practices. The findings revealed a positive sign and a significant (β =0.046; P< 0.05) relationship between training needed by participants and their participation to sell cattle to formal markets. If more farmers could get sufficient training of cattle practices, they will be likely to participate in formal markets. On the other hand, market information access had negative correlation and significant (β = -0.451; P< 0.001) relationship with formal market participation.

The negative correlation is because farmers said that they were lacking access to formal market information. The less access farmers get of market information, the less likely they are to participate in formal markets [68]. Likewise, market infrastructure showed a negative correlation and significant (β = -0.155; P< 0.05) relationship with formal market participation. The negative correlation is because smallholder farmers lacked adequate marketing infrastructure. This is because they are located in remote areas where there is lack of developments such as good quality roads etc., and this often leads to them not choosing to sell cattle in formal markets.

Table 4.3: Multinomial Logistic Regression Results

Variables	Beta (β)	P-value
Contact with Extension service	0.158	0.087*
Number of cattle	-0.001	0.702
Occupation	-0.053	0.089*
Age	0.0795	0.064*
Formal contractual agreement	-0.19	0.088*
Workshop participation	0.262	0.001* **
Needed training	0.046	0.047 **
Poor body condition	-0.0245	0.707
High transaction costs	-0.0889	0.287
Lack of market information	-0.451	0.000* **
Small herd size	0.13	0.179
Lack of market infrastructure	-0.155	0.035 **
R-squared	0.632	
F statistic p-value	0	

Note (*, **, ***, denotes 10%, 5%, 1% significant levels, respectively)

Conclusion

Smallholder beef farmers have cattle numbers that are significant and if managed well they can contribute to nutrition and food security at household level, and add to the national economies. However, the economic and production environment in which they are supposed to produce are getting harder every day. The production costs rise in a way that they tend to exceed the rise in income, which in turn have a negative impact on profitability. The problem is further enriched by the fact that most farmers use single marketing channels (informal markets). This paper investigated factors that influence these farmers' decisions to sell their animals to informal markets and identified market constraints that limit their participation to formal markets. Simple random sampling method was used to select 109 smallholder beef farmers in the study area. A structured questionnaire was used to collect data from respondents. Data was analyzed with SPSS version 25. A multinomial logistic regression model was adopted and ran on STATA version 12 to investigate constraints that influence smallholder farmers' participation to formal markets.

The results of the study indicated that majority of the farmers

use informal markets to market their cattle. They mainly use auctions as a formal marketing channel and are mostly familiar with informal marketing channels. The respondents' reasons for not participating in formal markets were high transactional costs, lack of marketing skills, lack of market infrastructure etc. The farmers do not attend cattle farming workshops, do not have contractual business agreement and do not have regular customers. Furthermore, distance also plays a major role in the ability to access formal markets. Farmers may not be involved in variety of formal marketing channels because of their dissatisfaction with conditions of the roads that link them to these markets.

Correspondingly, most farmers point out that they had access to market information. Nevertheless, they indicated some of the constraints that influence their participation to formal markets, and they often do not meet formal market quality standards and requirements. However, the variables that are likely to shift smallholder beef cattle farmers to participate in formal cattle markets include farmers contact with extension services, occupation, age, workshop attendance by farmers, specific training needed by the farmers to learn about cattle practices, market information and market infrastructure. Without the significant variables, it will be difficult for smallholder cattle farmers in the study area to participate in formal cattle markets. Therefore, in order to encourage smallholder beef farmers to enter formal markets, this paper suggests that the government design, implement, and enhance current programs in cooperation with pertinent stakeholders.

References

Marandure, T., Mapiye, C., Makombe, G., Nengovhela, B., Strydom, P., Muchenje, V. & Dzama, K. 2016. Beef traders' and consumers' perceptions on the development of a natural pasture-fed beef brand by smallholder cattle producers in South Africa. African Journal of Range & Forage Science, 33, 207-214.

Mottet, A., Teillard, F., Boettcher, P., De'besi, G. Besbes, B. 2018. Domestic herbivores and food security: current contribution, trends and challenges for a sustainable development. Animal, 12, s188-s198.

Mapiye, O. 2017. Towards a management database to improve the sustainability of cattle production and its contribution to food security: A case of emerging beef farmers in Limpopo Province, South Africa. Stellenbosch: Stellenbosch University.

Ashley, K., Harrison, H., Chan, P. H., Sothoeun, S., Young, J. R., Windsor, P. A. & Bush, R. D. 2018. Livestock and livelihoods of smallholder cattle-owning households in Cambodia: the contribution of on-farm and off-farm activities to income and food security. Tropical animal health and production, 50, 1747-1761.

Mdiya, L., Shiba, W., Mdoda, L. Van Niekerk, J. 2025. Assessing the role of smallholder livestock farmers on rural household food security: experiences from Raymond Mhlaba local municipality, eastern Cape Province, South Africa. South African Journal of Agricultural Extension, 53, 96-110.

Gwiriri, L. C., Bennett, J., Mapiye, C., Marandure, T. Burbi, S. 2019. Constraints to the sustainability of a 'systematised'approach to livestock marketing amongst smallholder cattle producers in South Africa. International Journal of Agricultural Sustainability, 17, 189-204.

Musemwa, L., Chagwiza, C., Sikuka, W., Fraser, G., Chimonyo, M. & Mzileni, N. 2007. Analysis of cattle marketing channels used by small scale farmers in the Eastern Cape Province, South Africa. Livestock Research for Rural Development, 19, 131.

Dlamini, S. I. Huang, W.-C. 2019. A double hurdle estimation of sales decisions by smallholder beef cattle farmers in Eswatini. Sustainability, 11, 5185.

Coetzee, L., Montshwe, B. Jooste, A. 2005. The marketing of livestock on communal lands in the Eastern Cape Province: contraints, challenges and implications for the extension services. South African Journal of Agricultural Extension, 34, 81-103.

Nkadimeng, M., Van Marle-Köster, E., Nengovhela, N. B. Makgahlela, M. L. 2022. Understanding beef cattle production practices and associated factors constraining performance: A survey of smallholder farmers in South Africa. Journal of Agriculture and Rural Development in the Tropics and Subtropics (JARTS), 123, 131-145.

Mumba, C., Kasanga, B., Mwamba, C. T., Sichilima, T., Siankwilimba, E., Sitali, D. C., Munkombwe, J., Banda, R. & Muma, J. B. 2024. An in-depth analysis of factors influencing small-scale cattle farmers' participation in livestock markets in Western Province of Zambia: navigating challenges and barriers. Frontiers in Veterinary Science, 11, 1397000.

Mbatha, C. 2021. Livestock production and marketing for small emerging farmers in South Africa and Kenya: comparative lessons. South African journal of agricultural extension, 49, 141-161.

Mugumaarhahama, Y., Ayagirwe, R. B. B., Mutwedu, V. B., Cirezi, N. C., Wasso, D. S., Azine, P. C. & Karume, K. 2021. Characterization of smallholder cattle production systems in South-Kivu province, eastern Democratic Republic of Congo. Pastoralism, 11, 4.

Chamberlin, J. Jayne, T. S. 2011. Unpacking the meaning of "market access".

Killick, T., Kydd, J. Poulton, C. 2000. Agricultural liberalization, commercialization and the market access problem in the rural poor and the wider economy: The problem of market access. International Fund for Agricultural Development, Rome, 3001-3012.

Page, S. 2003. Towards a global programme on market access: opportunities and options. Report for IFAD, Overseas Development Institute.

Munyati, V., Mudhara, M. Sikhulumile, S. 2025. Determinants of the market channel choice by smallholder maize farmers in Zimbabwe: A case of the Mazowe District. South African Journal of Agricultural Extension, 53, 100-118.

Ndoro, J., Mudhara, M., Chimonyo, M. Hitayezu, P. 2015. Farmers' Choice of Cattle Marketing Channels in Rural South Africa: A Transaction Cost Economics Perspective.

Thomas, B., Togarepi, C. Simasiku, A. 2014. Analysis of the

determinants of the sustainability of cattle marketing systems in Zambezi Region of north-eastern communal area of Namibia. International Journal of Livestock Production, 5, 129-136.
Coleman, A. 2018. Grass-fed beef: the trend that favours communal farmers. Farmer's Weekly, 2018, 30-31.
Dewi, N. M. A. K., Syahlani, S. P. Haryadi, F. T. 2021. The choice of information sources and marketing channel of Bali cattle farmers in Bali Province. Open Agriculture, 6, 413-425.
Jobirov, F., Yuejie, Z. Kibona, C. A. 2022. Evaluating profitability of beef cattle farming and its determinants among smallholder beef cattle farmers in the Baljovan District of Khatlon region, Tajikistan. Plos one, 17, e0274391.
Nkhori, P. A. 2004. The impact of transaction costs on the choice of cattle markets in Mahalapye district, Botswana, University of Pretoria (South Africa).
Suon, S., Hol, D., Siek, S., Mclean, M. Copeman, B. 2006. Seasonal differences in the incidence of infection with Fasciola gigantica in Cambodian cattle. Tropical animal health and production, 38, 23-28.
Berry, T. 2010. Channel marketing moves goods from producers to consumers. Agricultural review paper, 13, 23-24.
Rickard, S. 2019. Livestock Auction Markets: An Economic and Social Contribution Much Greater Than the Value of Livestock Traded. Carlisle: Livestock Auctioneers Association.
Mothupi, F. 2025. Livestock Markets in Rural Eastern Cape: Challenges and Opportunities for Cattle Sellers and Buyers at MNP Mobile Auctions. South African Journal of Agricultural Extension, 53, 22-43.
Miranda-De La Lama, G., Villarroel, M. María, G. A. 2014. Livestock transport from the perspective of the pre-slaughter logistic chain: a review. Meat Science, 98, 9-20.
Gulati, A. Fan, S. 2007. The dragon and the elephant: Agricultural and rural reforms in China and India, Johns Hopkins University Press.
Gollin, D. Rogerson, R. 2009. The greatest of all improvements: Roads, agriculture, and economic development in Africa. Department of Economics, Williams College, mimeo.
Strydom, P. E., Frylinck, L., Van Heerden, S., Hope-Jones, M., Moholisa, E., Sehoole, O., Hugo, A., Liebenberg, B. & Webb, E. 2015. Sources of variation in quality of South African beef: Case studies in relation to the red meat classification system. South African Journal of Animal Science, 45, 289-301.
Forestry, D. O. A. Fisheries 2017. A profile of the South African beef market value chain. Department of Agriculture, Land Reform and Rural Development (DALRRD ….
Lombard, W. Maré, F. 2022. The role of feedlots in South Africa's red meat economy. Stockfarm, 12, 13-15.
Togarepi, C., Thomas, B. Kankono, M. 2016. Cattle marketing constraints and opportunities in north-central communal areas of Namibia, Ohangwena Region. Livestock Research for Rural Development, 28, 2016.
Soji, Z., Chikwanda, D., Chikwanda, A. T., Jaja, I. F., Mushonga, B. & Muchenje, V. 2015. Relevance of the formal red meat classification system to the South African informal livestock sector. South African Journal of Animal Science, 45, 263-277.
Anríquez, G. Stamoulis, K. G. 2007. Rural Development and Poverty Reduction: Is Agriculture Still Key? eJADE: electronic Journal of Agricultural and Development Economics, 4, 5-46.
Burke, W. J. 2009. Triple hurdle model of smallholder production and market participation in Kenya's dairy sector, Michigan State University.
Kherallah, M., Minot, N., Kachule, R., Soule, B. G., Berry, P., Gabre-Madhin, E. Z., Fafchamps, M. & Khan, Z. 2001. Impact of agricultural market reforms on smallholder farmers in Benin and Malawi, Volume 2.
Sikhweni, N. Hassan, R. 2014. Determinants of herd size among small-scale cattle farmers: The case of selected villages at the Mhinga Traditional Authority in Limpopo, South Africa. Agrekon, 53, 106-122.
Rigg, J., Phongsiri, M., Promphakping, B., Salamanca, A. Sripun, M. 2020. Who will tend the farm? Interrogating the ageing Asian farmer. The Journal of Peasant Studies, 47, 306-325.
Matsane, S. Oyekale, A. 2014. Factors affecting marketing of vegetables among small-scale farmers in Mahikeng Local Municipality, North West Province, South Africa. Mediterranean journal of social sciences, 5, 390-397.
Kaur, K. Kaur, P. 2018. Agricultural extension approaches to enhance the knowledge of farmers. International Journal of Current Microbiology and Applied Sciences, 7, 2367-2376.
Firmanto, A., Ngarawula, B. Wahyudi, C. 2023. Actor relationship model in empowering local farmers community base sustainable development to increase productivity: Study of social interaction between field extension officers and farmers in Rubaru District, Sumenep Regency. International Journal of Research in Social Science and Humanities (IJRSS) ISSN: 2582-6220, DOI: 10.47505/IJRSS, 4, 27-49.
Wagacha, W. P. Odini, C. 2020. Access to and use of Information on Credit Facilities by Farmers in Kiambu County. Saudi J. Humanit. Soc. Sci, 5, 366-374.
Wulandari, E., Karyani, T., Ernah Alamsyah, R. T. P. 2023. What makes farmers record farm financial transactions? Empirical evidence from potato farmers in Indonesia. International Journal of Financial Studies, 11, 19.
Bolaji, S. A. 2023. Farm accounting record keeping and its impact on the profitability of farm business. International Journal of Social Sciences and Management Review, 6, 272-298.
Jari, B. Fraser, G. 2009. An analysis of institutional and technical factors influencing agricultural marketing amongst smallholder farmers in the Kat River Valley, Eastern Cape Province, South Africa. African journal of agricultural research, 4, 1129-1137.
Ruml, A., Ragasa, C. Qaim, M. 2022. Contract farming, contract design and smallholder livelihoods. Australian Journal of Agricultural and Resource Economics, 66, 24-43.
Botai, C. M., Botai, J. O., Dlamini, L. C., Zwane, N. S. Phaduli, E. 2016. Characteristics of droughts in South Africa: A case study of free state and North West provinces. Water, 8, 439.

Serumaga-Zake, E. 2020. The impact of rainfall variability on subsistence farmers in the North West Province, South Africa. Doctoral dissertation, North-West University (South Africa).

Letsoalo, N. L., Samuels, I. M., Tjelele, J. T., Pule, H. T., Cupido, C. F. & Engelbrecht, A. 2025. Rangeland conditions and grazing capacities on livestock farms during and after drought in three biomes in South Africa. Land, 14, 1836

Rufino, M. C., Herrero, M., Van wijk, M., Hemerik, L., De Ridder, N. & Giller, K. E. 2009. Lifetime productivity of dairy cows in smallholder farming systems of the Central highlands of Kenya. Animal, 3, 1044-1056.

Muteyo, E. Gift, C. 2025. Production objectives of smallholder farmers: Implications on beef value chain in livestock development programmes.

Webb, E. C. 2015. Description of carcass classification goals and the current situation in South Africa. South African Journal of Animal Science, 45, 229-233

Sehar, M. Oyekale, A. S. 2022. Effect of livestock farmers' access to formal markets on marketing inefficiency in Mpumalanga province, South Africa. African Journal of Science, Technology, Innovation and Development, 14, 225-233.

Montshwe, B. D. 2006. Factors affecting participation in mainstream cattle markets by small-scale cattle farmers in South Africa.

Thormeyer, T. 1989. Socio-economic criteria for the assessment of smallholder Agricultural schemes in South African homelands. University of Natal.

Shiimi, T., Taljaard, P. R. Jordaan, H. 2012. Transaction costs and cattle farmers' choice of marketing channel in North-Central Namibia. Agrekon, 51, 42-58.

Kibona, C. A. Yuejie, Z. 2021. Factors that influence market participation among traditional beef cattle farmers in the Meatu District of Simiyu Region, Tanzania. PLoS One, 16, e0248576.

Mkhize, R. S., Mokolopi, G., Chipfupa, U. Loki, O. 2026. Determinants of market choices among beef cattle farmers in uMgungundlovu District of Kwa-Zulu Natal, South Africa. Agriculture, 16, 414.

Hung, P. Q. Khai, H. V. 2020. Transaction cost, price risk perspective and marketing channel decision of small-scale chili farmers in Tra Vinh Province, Vietnam. Asian Journal of Agriculture and Rural Development, 10, 68-80.

Raffrenato, E., Hoffman, L., Chingala, G., Mapiye, C. Dzama, K. 2017. Towards a regional beef carcass classification system for Southern Africa. South African Journal of Animal Science, 47, 408-423.

Slayi, M. Rapiya, M. 2025. Adaptive foraging strategies of indigenous and exotic cattle breeds in semi-arid communal rangelands: implications for bush encroachment and climate resilience. Pastoralism: Research, Policy and Practice, 15, 15124.

Negi, D. S., Birthal, P. S., Roy, D. Khan, M. T. 2018. Farmers' choice of market channels and producer prices in India: Role of transportation and communication networks. Food Policy, 81, 106-121.

Mapiye, O., Chikwanha, O. C., Makombe, G., Dzama, K. Mapiye, C. 2020. Livelihood, food and nutrition security in Southern Africa: what role do indigenous cattle genetic resources play? Diversity, 12, 74.

Cheteni, P. Mokhele, X. 2019. Small-scale livestock farmers' participation in markets: evidence from the land reform beneficiaries in the Central Karoo, Western Cape, South Africa. South African Journal of Agricultural Extension, 47, 118-136.

Hlatshwayo, S. I., Ngidi, M., Ojo, T., Modi, A. T., Mabhaudhi, T. & Slotow, R. 2021. A typology of the level of market participation among smallholder farmers in South Africa: Limpopo and Mpumalanga Provinces. Sustainability, 13, 7699.

Agholor, A. I., Ogujiuba, K. K. Shongwe, N. I. 2023. Determinants of small farmers access to agricultural markets in South Africa. Agricultural Science and Technology.

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