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Chapter
Factors Affecting Household Goat Farmers’ Market Participation and the Extent of Commercialization
Zamokwakhe Maureen Ntshangase, Tafa Sanelise, Bethwell Moyo, Sikwela Misery and Johan Van Niekerk

Abstract

This paper assessed the factors influencing farmers’ choice to participate in selling goats and the extent of goat commercialization in Zululand district of Kwa-Zulu Natal Province in South Africa. Data were collected through questionnaires administered to 175 selected goat farmers in five local municipalities within Zululand district. A Probit model was used to estimate the factors affecting farmers’ choice to commercialize while Tobit regression model was used to analyze the factors affecting the extent of commercialization. The Probit results show that the factors that positively and significantly affect farmers’ choice to commercialize are gender, education level, quantity of goats, and type of marketing channel. The Tobit results revealed that factors that have a positive significant effect on commercialization are gender, level of education, experience in goat farming, and time of the year. The paper recommends that government support programs should be promoted to achieve high goat production and establishment of formal marketing goat sector to promote commercialization. Furthermore, information about goat nutritional attributes must be effectively shared with the society to change the negative stigma towards goats thus increasing the demand for goat and goat products, thus increasing farmers’ market participation and promoting commercialization.

Keywords: goats, market participation, commercialization, sustainability

1. Introduction

Goat farming in South Africa (and other parts of Africa) has been the most extensive agricultural sector since the beginning of the 19th century. It is believed that goat population grows along with the human population. One of the reasons for a growing population of goat farming in Africa is that it is a farming sector that does not require intensive investment. For that reason, most South African farmers see goat farming as one of the strategies to curb food insecurity, for it is in high demand in the informal market.

However, the surprising thing is that goat farming is regarded as a poor man’s trade. It is characterized by informality, lack of industry determination, value addition, and modern distribution channels. Very few farmers sell their goats through abattoirs, because most producers rely on consumers who are driven by cultural and traditional beliefs.
This chapter presents the factors affecting goat farmers’ market participation and the extent of commercialization. The chapter is set out as follows; the next section defines the problem, followed by the methodology. After that, the discussion of results are presented, followed by the conclusion.

2. Definition of problem

There are very few large scale commercial goat farmers in Africa, and most of them are found in South Africa [1]. In South Africa, a large number of indigenous goats are owned by small-scale farmers found mainly in communal areas [2]. The white commercial farmers mainly rear Boer and Angora goats [3]. The goat resource in South Africa, which is mainly owned by non-commercial farmers and mostly of indigenous breeds is large enough to ensure a consistent supply of product to the market.

Goats significantly contribute to the country’s goat population as it is approximately 63% [4]. Goat commercial farming is predominant in the Eastern Cape, followed by Limpopo then Kwa-Zulu Natal (KZN) Provinces of South Africa. Eastern Cape has more goats in South Africa accounting for 38% of the total flock followed by Limpopo with 18% and KwaZulu–Natal with 13% [5]. However, there is a potential to develop goat production in KZN as according to [6], more than 50% of cattle, 19% of sheep, and 74% of goats are on communal lands in the KZN province.

It is noteworthy that, goat marketing remains very low and informal in South Africa and this is exacerbated by low participation of goat farmers in formal markets [7]. One of the contributing factors to low market participation is that most goat farmers are mostly in rural areas where goats depend on the natural forage under extensive conditions throughout the year without nutritional supplements during the winter dry season. In general, smallholder farmers’ productivity is low due to factors such as lack of information, lack of market access, and poor access to support services [8–10].

These factors are challenges in the improvement of smallholder production and thus smallholder producers are finding difficulties in commercializing their production. The major challenge to commercialization is how smallholders can penetrate and participate in markets [11]. Sharma et al. [12] also found out that participation in the commercialization process has been difficult for smallholder farmers because of inappropriate policies, insufficient access to technology, institutional obstacles, weak infrastructure, and unfortunate links to markets. In the past 18 years, the South African government implemented several policies and programmes and increased the agricultural sector’s budget by supporting emerging farmers [13–15]. However, very little is known about smallholder goat farmers or goat production in general. The resistant nature of goats to disease and internal parasites, its adaptability to harsh conditions, less production cost, and easy increase of production because of the high possibility of twining makes goats more sustainable livestock to produce by smallholders thus demanding a commercial approach from farmers.

According to [16], smallholder commercialization is part of an agricultural transformation process in which individual farms shift from a highly smallholder-oriented production towards more specialized production targeting markets for their input procurement and output supply. According to [17] agricultural commercialization is the basis of economic development and integration of farm household into rural economy and society as an integral part of the process. Furthermore, [18] also assert that the transition from subsistence to commercial agriculture represents a key ingredient for low-income countries’ economic development.
Therefore achieving goat commercialization will enhance the welfare as well as economic development for smallholder farmers. Notable, commercialization as an agricultural transformation will therefore have a substantial impact on agricultural production, food security, poverty alleviation, and economic contribution to the smallholder farmer at a household and a national level.

Goats are predominantly sold live for cultural and religious ceremonies and traditionally goats have served as a means of ready cash and a reserve against economic and agricultural production hardship [19]. However, the evolution in the meat industry and consumer health requirements are slowly creating an entrance for goats in the formal market since goat meat is now available in some retail stores in Eastern Cape, Gauteng, and in very few outlets in KZN [4]. Most goat products are exported to countries like Asia where they are mostly used and are in high demand than in local use [20, 21]. Despite the exporting marketing opportunities, smallholder farmers still have no access to these markets because of various production and marketing constraints they face. Producing for the formal market requires production resources such as land, water, on farm and off-farm infrastructure, labour force, capital, and good management skills [15, 22]. Poor access to these resources by household farmers affects how they may benefit from opportunities in agricultural markets hence lack of resources also hinders the commercial approach in goat production and marketing.

Globally, livestock production systems are undergoing rapid changes in response to population growth, urbanization, and increasing incomes [23]. The demand for livestock is largely influenced by socio-economic factors such as human health concerns, constantly changing socio-cultural values and rapidly increasing population. As such the increasing demand for the animal products is expected to improve the income and livelihood of smallholder farmers who account for the bulk of production in developing countries [23, 24]. However, most of the increasing livestock production is taking place outside the smallholder sector, which is the same trend with goat production. Goat meat matches consumer preferences for low-fat meat and consumer concerns on health [20, 21]. Therefore goats have the potential for being a diverse reservoir for future use if commercialization is achieved.

The problem investigated in this study relate to the farmers’ choice to participate in goat selling and goat commercialization. Commercialization means a change from a subsistence type of production to a market-oriented to profit maximization [25]. Therefore, commercialization can transform smallholder goat farmers by shifting production practices from current consumption-oriented towards market-oriented thus achieving economic development through income growth. The question which can be asked is whether the household farmers do participate in marketing goats, the level of participation, and which market do they use to sell goats. Therefore, this chapter aim at identifying the factors affecting farmers’ choice to participate in the marketing of goats and determine the extent of goat commercialization in the study area.

3. Methodology

3.1 Description of the study area

This study was conducted in Zululand district municipality, (ZDM) which is situated in the northeastern part of KZN. Zululand District Municipality is the biggest district in the province, making up 16% of its geographical area. The ZDM covers 14810km² and consisting of 803576 population size in total and 102982 people of the entire population are unemployed hence the level of poverty in the
area is very high amounting to 33.02% [26]. Approximately half of the area is under traditional authorities’ jurisdiction while the remainder is divided between commercially owned farmers and conservation areas [26]. The ZDM district municipality comprises five local municipalities: Ulundi, Abaqulusi, Edumbe, Nongoma, and Pongola.

3.2 Sampling and data collection

The target population of the study was the household goat farmers in Zululand district in KZN province. Purposive sampling was performed in this study. One hundred and seventy-five goat farmers were randomly selected from the five local municipalities with 35 goat farmers from each municipality. Structured questionnaires were used to collect data through face-to-face interviews with goat farmers in the Zululand district. As household farmers did not have records, this study counted on farmer’s recall for information.

3.3 Data analysis

Frequency and econometric analyses were done to analyze the data. Percentages were used to analyze the demographics of farmers. This study’s socio-economic characteristics include gender, age, race, marital status, level of education, and employment status.

A Probit model was used to estimate the factors affecting the choice of commercialization. [27] asserted that when the Probit model is used to analyze the farmers’ decision to participate in the output market, it has to be estimated as follows:

$$Y_i = \beta_0 + \beta_1 \text{Age} + \beta_2 \text{Gender} + \beta_3 \text{Race} + \beta_4 \text{Marital status} + \beta_5 \text{Education} + \beta_6 \text{N.Livestock} + \beta_7 \text{Market channel} + \beta_8 \text{Farm ass.} + \beta_9 \text{Det.price} + e_i$$ (1)

Where:

Yi is dependent variable, which is the choice to participate or not. It can take 1 if the farmer participate in commercialization and 2 if otherwise.

In order to analyze the factors affecting the extent of commercialization, Tobit regression model was used. This Tobit model was developed by Tobin in 1958. Tobit was chosen because it uses censored dependent variable as the information is available for certain respondents. Some studies have used the Heckman model to fulfill the same objective; however, Heckman is not efficient compared to the maximum likelihood of the Tobit Model. Tobit Model specification is as follows:

$$Y_i = \beta_0 + \beta_1 \text{Age} + \beta_2 \text{Gender} + \beta_3 \text{Race} + \beta_4 \text{Marital status} + \beta_5 \text{Education} + \beta_6 \text{N.Livestock} + \beta_7 \text{Market channel} + \beta_8 \text{Farm ass.} + \beta_9 \text{Det.price} + u_i$$ (2)

Where Yi presents the number of traded goats.

4. Results and discussion

4.1 Introduction

This section presents the results first and foremost. The objective was to assess the factors affecting household goat farmers’ market participation and the extent of commercialization. The first sub-section presents the socio-economic profile of the
goat farmers in the study area. The second section provides the empirical results, where tobit and marginal effect results are discussed.

4.2 Goat farmers’ socio-economic profile

The significant of demographic information in academic research cannot be overemphasized. The socio-economic factors exert pressure on the decision making behaviour of a household. This study’s socio-economic factors are gender, age, marital status, level of education, race, experience, and membership status in the farmers’ association (see Table 1).

The Zululand population is predominantly black/African. For that reason, most respondents in the study area were Africans (98%), while the remaining 2% was made up of white respondents (see Table 1). Majority of African farmers were

<table>
<thead>
<tr>
<th>Variable</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>75%</td>
</tr>
<tr>
<td>Female</td>
<td>25%</td>
</tr>
<tr>
<td>Age group</td>
<td></td>
</tr>
<tr>
<td>16–20</td>
<td>2.4%</td>
</tr>
<tr>
<td>21–25</td>
<td>6.5%</td>
</tr>
<tr>
<td>26–30</td>
<td>5.9%</td>
</tr>
<tr>
<td>31–35</td>
<td>7.6%</td>
</tr>
<tr>
<td>36–40</td>
<td>7.1%</td>
</tr>
<tr>
<td>41–50</td>
<td>18.8%</td>
</tr>
<tr>
<td>51–60</td>
<td>28.8%</td>
</tr>
<tr>
<td>61 and older</td>
<td>22.9%</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>38%</td>
</tr>
<tr>
<td>Married</td>
<td>59%</td>
</tr>
<tr>
<td>Widowed</td>
<td>3%</td>
</tr>
<tr>
<td>Level of education</td>
<td></td>
</tr>
<tr>
<td>Never been to school</td>
<td>19.4%</td>
</tr>
<tr>
<td>Grade R to 8</td>
<td>33.5%</td>
</tr>
<tr>
<td>Grade 9 to 11</td>
<td>22.4%</td>
</tr>
<tr>
<td>Matriculated</td>
<td>18.2%</td>
</tr>
<tr>
<td>Tertiary education</td>
<td>5.9%</td>
</tr>
<tr>
<td>Race</td>
<td></td>
</tr>
<tr>
<td>African</td>
<td>98%</td>
</tr>
<tr>
<td>White</td>
<td>2%</td>
</tr>
<tr>
<td>Number of years farming</td>
<td></td>
</tr>
<tr>
<td>Less than five years</td>
<td>17.6%</td>
</tr>
<tr>
<td>Five to ten years</td>
<td>25.3%</td>
</tr>
<tr>
<td>10 to 20 years</td>
<td>24.1%</td>
</tr>
<tr>
<td>More than 20 years</td>
<td>32.4%</td>
</tr>
<tr>
<td>Membership to an association</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>12%</td>
</tr>
<tr>
<td>No</td>
<td>88%</td>
</tr>
</tbody>
</table>

Source: Author’s computation (2021).

Table 1. Socio-economic factors.
producing for subsistence purposes, while the white farmers were solely producing for commercial purposes.

It is important to note that in most African settings, male gender usually likes to keep livestock compared to females. Females predominantly look after crop production. Hence the results presented in Table 1 reveal that Zululand farmers are made up of 75% male, and 25% females. The findings reveal that goat farming is dominated by males than females in the study area. Furthermore, the greater number of male respondents could also be attributed to the cultural ideology that males are the heads of the families and therefore own livestock and are often the ones answering questions in the survey despite the possibility of a wife being the owner of the goats in the household farm.

This study also reveals that older farmers are dominating goat farming when compared to the younger generation. 53% of respondents were between the ages 50 to 61, while the 31 to 40 age category comprised 33% and 13.5% were in the category of 18 to 25 years. Generally, young people are more likely to migrate in search of non-agricultural jobs whilst older people remain at home and do agricultural activities. Furthermore, the author assumes that youth with higher educational qualifications are always hesitant to engage in agriculture as a primary means of livelihood unless commercially available. In addition, climate change and the rapid increasing population demand for the transfer of food production activities and knowledge to young and literate society members. However, the limited participation of youth in goat farming is a concern for sustainable goat productivity and commercialization considering the level of chronic illnesses threatening the aging farmers and the high rate of youth unemployment.

Though education impacts farming, it is clear in this study that household farmers take it for granted, particularly with goat production as an average number of respondents without formal education participate in goat farming. Most (33.5%) of the respondents of goat farmers in the study area attended primary school, followed by secondary education with 22%, while 18% of the study population had matric and only 6% had tertiary education. 19% of the study population did not have formal education. These findings further confirm that most South African smallholder farmers have limited education and the lack of awareness among rural farmers can be attributed to the high level of illiteracy.

Regarding employment, less than 10% of the respondent were employed, the majority (64%) are getting state grants and not employed, followed by 26% who are unemployed. From these findings, it is clear that unemployment is one of the challenges facing rural goat farmers.

Marital status affects decision making in any household. In most cases, married farmers usually have children to take care of, which affects their decision because they have to invest in their families’ future. This is why most goat farmers in Zululand are 59% of the Zululand married farmers, while 38% single, followed by those who are widowed (3%). Membership in a farmers’ organization is essential for every farmer’s development. A farmers’ organization is vital because it is where challenges facing farmers are mostly discussed. Results presented in Table 1 show that most farmers in Zululand are not members of an organization.

4.3 Factors affecting the goat farmers’ choice to commercialize

Table 2 shows the factors affecting goat farmers’ choice to commercialize in the KZN area. These factors range from gender, age, marital status education level, market channels among others.

Gender plays a crucial role in the decision of whether to produce for commercial purposes or subsistence. This is because of the distribution of economic roles within
a household. For example, roles that require physical strength are given to men while those that do not, are given to a females. The results revealed a significant relationship between gender and the decision to commercialize at $p < 0.05$ (see Table 2). African cultural norms that perpetuate the perception that livestock ownership is a responsibility of men also contribute to this finding. Therefore livestock gender ownership greatly influence goat commercialization.

Furthermore, the results revealed that education level significantly affects commercialization choice at 5%, positively. The influence of education in adopting new technologies by farmers is generally prominent [28]. On the same note, [29] argued that education is one of the most significant demographic characteristics for decision-making among farmers, for it directly improves knowledge capacity, the ability to understand and instantly make sense of information. The higher the level of education the more the chances of adopting new technology [30]. In this case, it is clear that the high literacy level can strengthen or enhance goat production because literate communities are more likely to take risks and thus more inclined to commercialize and quickly adopt new technologies.

This study’s findings further reveal that the number of goats owned by the household was observed to be an important factor influencing the commercialization of goat for meat production with a statistical significance of $P < 0.001$. Households with large herds sold significantly more goats on average than those with medium and small herds. Such households presented a significant source of goats for the market and they could, therefore, be a target group for commercialization. These findings are in line with [31]’s arguments who noted that the insufficient number of goats amongst farmers with small herds restrict sale.
The results also revealed a significant relationship ($P < 0.05$) between the market channel type and commercialization choice. Thus, large numbers of goats are sold through informal markets directly to the available consumer by the household farmer thus allowing the farmer to retain 100% of the selling price in the absence of a formal market. The large use of the informal market for goat sales in this study is not uncommon. There is nevertheless an enormous potential for the sale of goat meat as an additional source of income on farms. According to [24] despite the economic importance of goats, particularly in the sustenance of household food security in rural areas of developing countries, marketing of goats and chevon is not as formalized as that of other livestock.

4.4 Factors affecting the extent of goat commercialization

Tobit results are presented in Table 3, with marginal effect. Tobit results presented in Table 3 above indicate that gender was statistically significant at 10% with a positive influence on the extent of commercialization amongst the farmers. This positive relationship between gender and the extent of commercialization is inconclusive since any of the gender can commercialize. The marginal effect presents that gender affects the level of commercialization by about 9%. Age was also found to affect the level of commercialization at 10% positively. These results imply that an increase in age of a farmer has a high probability of increasing the extent of commercialization by 23.8% (presented by marginal effect). Many studies have concluded that age signifies the level of experience of a farmer. Moreover, farmers with more experience tend to participate in the market.

Levels of education significantly affect the extent of commercialization at 5%. The positive coefficient shows that the more educated a farmer becomes, the higher probability of commercializing their goat production. The results are in line with [24] who stated that educated farmers are more likely to participate in marketing their products. This is because educated farmers are more likely to know the available marketing channels. Similarly, [32] attest that illiteracy affects one's ability to

<table>
<thead>
<tr>
<th>Sell goats</th>
<th>Coef.</th>
<th>Std. Err.</th>
<th>T</th>
<th>P &gt;</th>
<th>dy/dx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>.0928731*</td>
<td>.0506815</td>
<td>1.83</td>
<td>0.071</td>
<td>.0928731</td>
</tr>
<tr>
<td>Age</td>
<td>.0238155*</td>
<td>.0136858</td>
<td>1.74</td>
<td>0.086</td>
<td>.0238155</td>
</tr>
<tr>
<td>Education</td>
<td>.0428948**</td>
<td>.0215988</td>
<td>1.99</td>
<td>0.051</td>
<td>.0428948</td>
</tr>
<tr>
<td>If yes number</td>
<td>.0098008</td>
<td>.0225234</td>
<td>0.44</td>
<td>0.665</td>
<td>.0098008</td>
</tr>
<tr>
<td>Duration farming</td>
<td>−.0088377</td>
<td>.0192465</td>
<td>−0.46</td>
<td>0.647</td>
<td>−.0088377</td>
</tr>
<tr>
<td>Transport to market</td>
<td>−.0115561</td>
<td>.0224159</td>
<td>−0.52</td>
<td>0.608</td>
<td>−.0115561</td>
</tr>
<tr>
<td>Time of year</td>
<td>−.0321768*</td>
<td>.0190296</td>
<td>−1.69</td>
<td>0.095</td>
<td>−.0321768</td>
</tr>
<tr>
<td>Constant</td>
<td>.7903371</td>
<td>.1592653</td>
<td>4.96</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

LR chi2(7) = 11.47
Prob > chi2 = 0.1195
Pseudo R2 = −0.3077
Log likelihood = 24.364345

Note: *** = 1% significance level, ** = 5% and * = 10% significance level.
Source: Author’s computation (2021).

Table 3.
Tobit results and marginal effects.
access important agricultural market information (such as price updates) and fair marketing commitments. Illiteracy does not involve the inability to read and write only, but also inability to interpret agricultural market information. It is acknowledged that farmers with basic education are more likely to adopt new production technology and this impacts the number of goats produced and consequently market participation. Pienaar and Traub [33] indicate that most of the farmers in South Africa have 5 years of education (an equivalent of grade 5). The modern production technologies needed to increase agricultural production tend to be composite for the illiterate farmers, who are, therefore, less likely to adopt them. Therefore, the level of education has major implications for agriculture production since it is going through a series of innovations and development demanding a better-educated farmer. In addition, education influences the ability of farmers to adopt new marketing information and technology.

The time of the year presented in Table 3 above signifies the season. It is significant at 10% but has a negative influence on the extent of commercialization of goat. The results are in agreement with the fact that goat meat is usually in high demand during traditional ceremonies. These traditional ceremonies usually take place during the holidays of April, June, and December. For that reason, most farmers do not sell their goats when they are not in demand. Domestic consumption of fresh goat meat for only traditional and religious ceremonies is the primary challenge for goat farmers as they are unable to sell throughout the year.

5. Conclusion and recommendation

Socio-economic factors have an impact on both farmers’ choice and the extent of commercialization in the study. The study reveals that older farmers with experience are the ones likely to participate in the market. Educated farmers are also highly likely to participate in the market because they can access and be able to interpret marketing information. Age and level of education affect the number of goats owned and market participation. Level of education and experience enables the farmer to effectively manage goats thus achieving high productivity, as it is also easy for educated farmers to adopt new technologies that will improve production. Therefore there is a great positive relationship between productivity and market participation which consequently influences commercialization. It is noted in the study that the farmers use the informal market to sell their goats live and socio-economic issues largely influence the marketing as goats are sold in certain specific months which is the period where certain cultural, tradition or religious ceremonies are performed. There are no formal markets for goats and goat products, this is an issue as farmers depend on the available informal market which is not structured thus farmers in the study area have no choice to whom they sell their goats to.

The study reveals that a skilled and educated goat farmer participates in the market. Therefore, government programs that will train and skill goat farmers must be established to increase productivity and market participation. Market information is an important aspect of agricultural development as it enhances market performance and knowledge of market actors. Furthermore, training programs are important for adopting production and marketing technologies, thus enhancing rural goat farmers’ productivity. Through the training programs, effective goat marketing strategies could be developed to inform consumers about attributes of goats to address the sociocultural stigma attached to goat and allow goat products to be accepted as an alternative protein source and this will allow goat sales to be throughout the year consequently achieving sustainable commercialization of goats. The goat product potential that is somehow overshadowed by cattle, sheep, and pig
products will be illuminated by establishing formal markets. Training programs will also assist farmers in understanding the demand, price trend, and dynamics in consumer preferences. The study further reveals a positive relationship between market participation and productivity, therefore it appears that the quantity of goats is among the leading significant drivers thus efforts to increase production abilities are very important to promote commercialization of household farmers.

This study recommends that a pathway be created to support household goat farmers so that viable conditions to shift from subsistence farming to market-oriented farming are established. Government support for goat farmers will be imperative in this regard. The study also recommends establishing formal market structures where goat farmers can sell their goats and goat produce to promote market participation and, consequently, increase food security and poverty alleviation for rural farmers. Government support in establishing the formal market for goats will be of high importance as in return revenue could be collected from farmers thus contributing to the country's economy. The increasing evolution in consumer preferences and health consciousness is important for diffusion innovation and exploitation of new markets for goat products thus achieving commercialization. Climate change makes goat husbandry the main feasible economic and productive activity in mountain areas of South Africa, where the climatic and soil conditions hinder the sustainability of other livestock-rearing activities. Goats can effectively provide environmental and socio-economic services sustainable if well managed and also if there is a structured market for goats. It is noteworthy that the economic value of goats can be realized through commercial production and marketing of goat as well as through value-adding to goat products. There is therefore a need to explore vast marketing opportunities both local and international and at the same time improving goat production towards a commercial approach so as to ensure reliable supply and sustainability of these new markets.

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Conflicts of interest

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