International Journal of Scientific Reports
Kajevhu C et al. Int J Sci Rep. 2023 Mar;9(3):56-61
http://www.sci-rep.com
pISSN 2454-2156 | eISSN 2454-2164
DOI: https://dx.doi.org/10.18203/issn.2454-2156.IntJSciRep20230375

Original Research Article

Determinants of small-scale goat production in Mushowani, Zimbabwe

Clapperton Kajevhu[1], Nyasha Mabika[2]*

[1]Department of Livestock, Wildlife and Fisheries, Great Zimbabwe University, Zimbabwe
[2]Department of Biological Sciences and Ecology, University of Zimbabwe, Zimbabwe

Received: 22 November 2022
Revised: 23 January 2023
Accepted: 02 February 2023

***Correspondence:**
Dr. Nyasha Mabika,
E-mail: nmabika09@gmail.com

ABSTRACT

Background: Goats are of economic importance to livelihoods of many rural communities in Zimbabwe. Unfortunately, very few farmers are into goat production. Therefore, this study was carried out in order to establish the factors that are affecting goat production in Mushowani, Zimbabwe.
Methods: A household survey, using a structured questionnaire was administered in October 2022. The Spearman correlation coefficients were used to test the associations between number of goats against farm size, gender, age, marital status, education, household size, formal training, diseases, income and extension services.
Results: Of the 52 respondents surveyed, 59.6% were males and more than half (51.9%) of the farmers attended secondary school, followed by tertiary education (36.6%). Most of the farmers (69.2%) had a herd size of less than 20. The main source of income in the area was the selling of crops. The majority (77%) of the farmers indicated that they planned to increase their goat herd. Goat production in Mushowani is constrained by diseases, feed, water, theft, heat stress, market, transport, veterinary services, insufficient funds, lack of extension services and lack of commercial breeds. Results showed that farm size, age of the farmer, education and extension visits were associated with herd size. Age, education and extension visits were significant at 5%, while farm size was significant at 1%.
Conclusions: The results of this study are anticipated to give an insight to the government, policy makers and non-governmental organizations (NGOs) that focus on improving goat production in rural communities.

Keywords: Livelihood, Mushowani, Goat production, Herd size, Zimbabwe

INTRODUCTION

Goats (*Capra hircus*) were the first animals to be domesticated by humans around 9,000 years ago.[1] Currently, there are over 200 different species of goats that produce a variety of products, including milk, meat, and fiber.[2] Globally, the production of goat meat is greater than the production of beef or pork.[3] In the last decade, large amounts of public and private funds have been invested in goats in Southern Africa (Zimbabwe, Zambia and Mozambique). The goal is to increase the number of goats and increase their productivity.[4] Improving goat production has been an on-going challenge at both academic, institutional, village, and individual farmer levels, and a major pathway is through breeding. Benefits from genetic improvement that add value to goat meat end-products could achieve sustainable development and reach a wider population of the poor and needy.[5]

Goats contribute significantly to the livelihoods of smallholder farmers in Zimbabwe.[6] Over 97% of the 4.7 million goats in Zimbabwe are found in the smallholder farming sector. Most of the smallholder farmers live in agro-ecological regions IV and V, which are characterized by poor rainfall, and only permits low cropping activities.[7] Livestock rearing, especially goat production, predominate in such arid and semi-arid regions.[8] There are five breeds of goats in Zimbabwe namely the; Mashona, Matebele, Boer, Saanen and Angora goats.[9]

Zimbabwe's livestock (particularly goats) production dropped significantly because of export problems caused by meat export safety regulations.[10] This led to a shortage of goat by-products such as goat meat, goat skin and goat milk on the market. The shortage of goat meat and their by-products have necessitated an increase in their price which is beyond the reach of the majority of the Zimbabweans who are also suffering from malnutrition, reduced household income and food insecurity. More so, village goats have generally been neglected by researchers, veterinarians and even by extension workers. Therefore, it is important to assess the factors that are affecting small scale goat production in Zimbabwe. The results of the study could possibly proffer solutions to solve the problem of low goat yields for small and large farmers so as to increase the level of family income and guarantee food security.

METHODS

Study area

Shamva district is in the province of Mashonaland Central, Zimbabwe (Figure 1). It is located about 90 km north-east of Harare (Zimbabwe's capital city). The district consists of 30 wards and Mushowani is a rural settlement located in ward 5, comprising of 23 villages surrounded by few commercial farmers. Mushowani is classified within the agro-ecological region 2b, which specializes in both livestock and crop production. Mixed farming is the main economic activity in the area and maize is the major agronomic crop. However quite a number of the youths in this area are into gold panning.

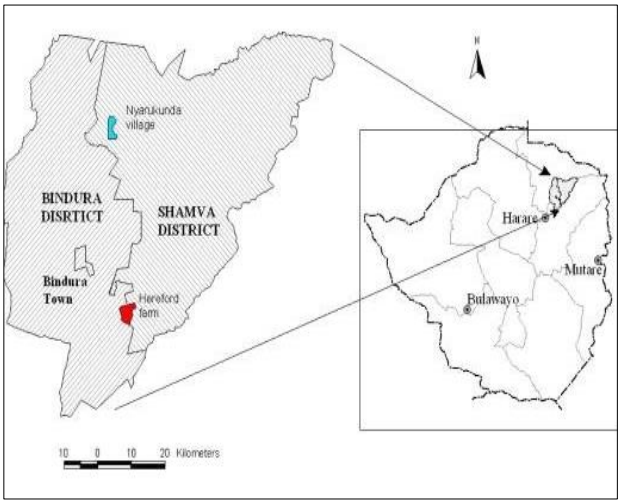

Figure 1: Location of the study area.

Sampling and sample size

The study population comprised of households' heads who were into goat farming. In instances where the heads of households were not available, their spouses or other family member represented the household head and filled in the structured questionnaire. A sample of 52 households (5% of the population) was selected at random in October 2021 using random number tables and a map of district household.[11] The farmers were grouped into three strata basing on the number of goats: less than 20 goats, 20-40 goats, and above 40 goats.

Data analysis

Collected data were subjected to descriptive statistics, presented in the form of tables. The Spearman correlation coefficients were used to test the associations between number of goats against farm size, gender, age, marital status, education, household size, formal training, diseases, income and extension services.

RESULTS

Demographic characteristics of the study population

Fifty-two respondents took part in the survey and most (59.6%) of the respondents were males (Table 1).

The majority (73.1%) of the goat farmers were married, while 11.5% and 3.8% were single and divorced respectively. More than half (51.9%) of the farmers attended secondary school, followed by tertiary education (36.6%). A small proportion (1.9%) attended primary education only, while 9.6% never attended school. Most (67.3%) households' sizes were in the 1-5 range, while 1.9 % households had families greater than 10. Farming was the major (48.1%) occupation and 10% of respondents were not employed, while 28.8% of the farmers were employed.

Income sources

The main source of income was selling crop produce followed by small business and mining (Figure 2).

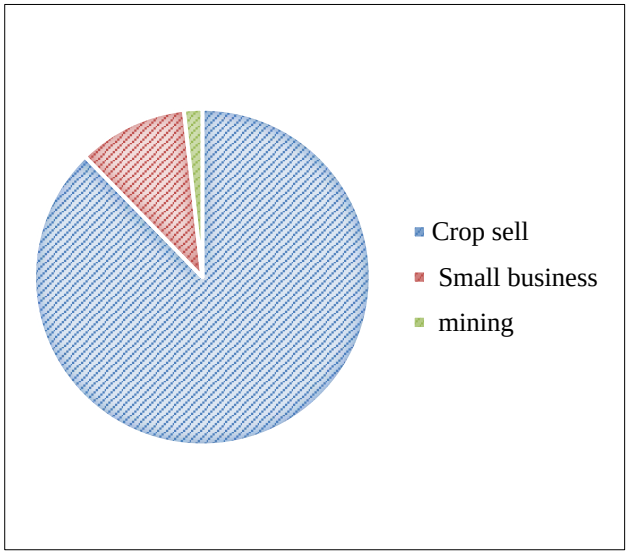

Figure 2: Sources of income for goat farmers in Mushowani.

Table 1: Demographic characteristics of the study population.

Variable	Percentage (%) N=52
Household head	
Male	59.6
Female	40.4
Age (in years)	
<20	1.9
21-30	17.3
31-40	13.5
41-50	40.4
>50	26.9
Marital status	
Single	11.5
Married	73.1
Widowed	11.5
Divorced	3.8
Educational level	
Never attended school	9.6
Primary education	1.9
Secondary education	51.9
Tertiary education	36.6
Household size	
1-5	67.3
6-10	30.8
>10	1.9
Major occupation	
Farming	48.1
Employed	28.8
Self employed	13.5
Not employed	9.6

Table 2: Stock information in Mushowani, Shamva district.

Variable	Percentage
Parent stock breed	
Mashona	94
Boer	6
Age parent stock (months)	
>8	31
9-12	52
13-18	10
<18	7
Source of breeding stock	
Small trader	13
Large trader	0
Store merchant	2
Friend and neighbor	52
Family and relatives	27
Cooperatives	0
Research extension	2
Non–governmental organization	2
Government	2

Stock profile of goat farmers

Two types of goat breeds were recorded; the Mashona (94%) and Boer breeds (6%) (Table 2). The majority (52%) of the parent stocks were between 9-12 months, followed by the stock less than 8 months (31%). Ten percent of the stocks were between 13-18 months. Parental stock greater than 18 months were the least preferred stock. Most goat farmers (52%) acquired their breeding stock from their friends and neighbors. The second source of breeding stock was from the family and relatives (27%) followed by small trader (13%). Few farmers acquired their stocks from store merchants, research extension, government and non-governmental organizations. No stocks were acquired from large traders and cooperatives.

Table 3: Goat production in Mushowani, Shamva district.

Variable	Percentage (%)
What is the no. of goat units?	
<20	69.2
20-40	23.1
>40	7.7
What is the main reason for keeping goats?	
Family consumption	38
Security	0
Source of income	62
Prestigious reason	0
Are there any prevalent diseases in the area?	
Yes	38
No	42
Not sure	20
If yes, indicate the disease/s	
Are there any extension visits?	
Yes	65
No	33
Not sure	2
Do you plan to increase the herd size?	
Yes	77
No	13
Not sure	10
If yes or no state reason	
Management system	
Permanent confinement	0
Partial confinement	69.2
Free range	30.8

Goat production

Most (69.2%) farmers had goat herds of less than 20, while 23.1% of the farmers had goat herds in the 20-40 range (Table 3). Very few farmers (7.7%) had a goat herd size of more than 40. The majority (62%) of the farmers kept goats for income purposes. Thirty-eight percent of the farmers indicated that goat diseases were prevalent in the area. Twenty percent of the farmers indicated that they were not sure of any goat diseases in the area. Most (65%)

farmers agreed that there were extension visits in the area and the majority (77%) of the farmers indicated that they planned to increase their goat herd. Most (69.2%) farmers practiced partial confinement management system and 30.8% practiced free range management. No permanent confinement was reported.

Constraints faced by goat farmers

Eleven factors were cited as the constraints faced by farmers in goat production in the area. These were; diseases, feed, water, theft, heat stress, market, transport, veterinary services, insufficient funds, lack of extension services and lack of commercial breeds (Figure 3).

According to the graph; diseases, feed, theft and lack of commercial breeds were the major constraints affecting goat farmers in Mushowani. This was followed by market, veterinary services, heat stress, insufficient funds and lack of extension services. Water shortage and transport were cited as minor challenges affecting goat farmers.

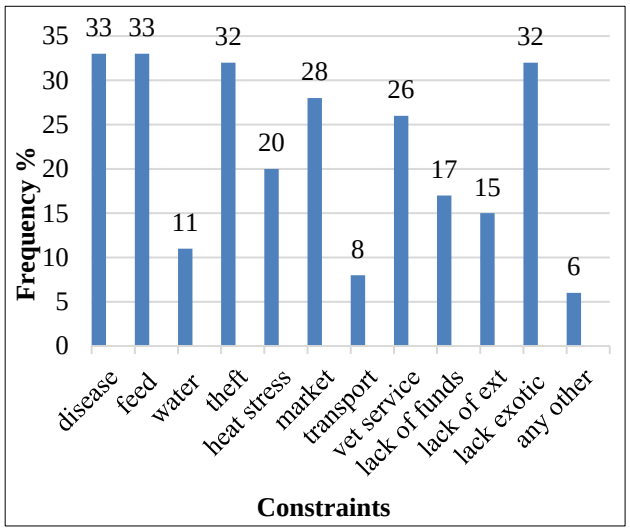

Figure 3: Constraints faced by goat farmers in Mushowani.

Table 4: Spearman correlation results.

Number of goats	Sig. (2-tailed)	Correlation coefficient
Farm size	0.002	-0.206**
Gender	0.142	0.305
Age	0.028	0.087*
Marital status	0.541	0.541
Education	0.017	0.123*
Household size	0.385	-0.105
Formal training	0.458	-0.256
Diseases	0.067	-0.055
Income	0.701	0.052
Extension visits	0.035	0.156*

Factors affecting goat production

Of the 10 variables investigated, four were found to have an effect on goat production in the area. These four factors were; farm size, age of the farmer, education and extension visits. Age, education and extension visits were significant at 5%, while farm size was significant at 1% (Table 4).

DISCUSSION

The majority (59.6%) of goat farmers in Mushowani were males. This observation agrees with a similar study in Eastern Cape, South Africa, where 68% of the goat farmers were males.[12]

The economic status of this community is best illustrated by the fact that most of those interviewed indicated that their main source of household income was mainly from selling crop produce followed by small business and mining. From the results it is clear that very few young farmers (17.3%) are into goat farming. This can be attributed to mining activities in the area where most of the youths prefer. It can also be assumed that the younger household heads are more likely to offer their labour and to take part-time jobs in the neighbouring Shamva town than to be engaged in goat farming.

Two breeds, the indigenous Mashona (94%) and the exotic Boer were observed in the study. Unavailability of feeds, drugs as well as poor management system are some of the factors which result in most farmers keeping Mashona breeds since their management system is not much complicated.[8] However, the Boer breed has more economic benefits because it produces meat of high quality, hardy and adaptable, resistance to diseases, high fertility and kidding percentage.[13] Of note was that most (52%) goat farmers acquired their breeding stock from their friends and neighbours. It is therefore of concern as to why the majority of these farmers do not acquire their breeding stock from store merchants, research extension, government and non-governmental organizations as these are presumed to offer quality breeds. Follow-up research is recommended so as to establish why farmers are not acquiring their stock from these reputable sources. Despite the hardiness of the Zimbabwean Mashona, their mortalities are very high in communal areas.[14] Flock mortalities have been reported to be in excess of 50% with kids being the vulnerable group.[15] Additionally, lack of proper health care, infectious diseases and nutritional inadequacies can also result in high mortalities.[16]

The herd size of the majority (69.2%) of the goat farmers was less than 20. These goats were raised under partial confinement. No permanent confinement was reported. Though most farmers agreed that they were supported by extension officers in their goat farming business, it is still worrisome why most of them have small herd sizes. However, one of the reasons noted was that most of the areas were not accessible during the rainy season.

Diseases, feed, theft and lack of commercial breeds were the major constraints cited as affecting goat farmers in Mushowani. The problem of diseases, as observed in this study also confirms the findings elsewhere where it was reported that animal disease constitutes a major constraint to livestock production and the safe utilization of animal products worldwide.[7] For small scale farmers, the impact of livestock disease on lives and livelihoods is particularly severe. An outbreak of disease can mean the difference between sufficient food stocks, and food insecurity and between having a secure income to the loss of key household assets.[7] The presence of diseases also makes it difficult for the poor to participate in local and even the national livestock economy.[17] Lack of commercial breed was also another constraint cited by the goat farmers. This is evident from the results as the majority of the breeds are the indigenous Mashona type. It is therefore important to assist farmers in acquiring commercial breeds in order to improve their goat farming enterprise.

The results of the study indicated that the major factors affecting goat production in Mushowani were farm size, age of the household, education and extension visits. Though farm size had a weaker negative correlation, it is well known that as the size of the farm gets bigger the goat herd size also grows and vice versa.[18] Currently, most large-scale farmers do not take goat farming serious that is why goat farming is most common in small holder farmers. Our results also demonstrate that age has a bearing on goat production in Mushowani. This observation was also reported in Benin.[19] Household head age tends to be of importance in agricultural productivity as indicated by the level of experience that a person attains as they grow old in their day to day rearing of goats.[20] The study also noted that only 17.3% of the youths (21-30 years) were into goat farming and this, possibly implies that the enterprise is missing out on a more active group, who would enhance productivity and commercialisation.[21]

More than half (51.9%) of goat farmers had received schooling up to secondary level and farming was their major occupation. This high literacy level is strength in enhancing goat production because literate communities are more likely to adopt and practice new technologies, which may enhance commercialization of enterprises.[22]

Furthermore, a literate community is able to read and understand some of the requirements of goat farming.[23] A small proportion (9.6%) of the farmers did not attend school and due to such kind of instructive contrasts, consistency is uncommon in appropriation of modern innovations and generation strategies in such a community. Thus, the levels of understanding by these agriculturists would probably be different in terms of administrative abilities. However, the literacy level from studies elsewhere were very low. For example, 60% of goat farmers received schooling for five years or less in Eastern Cape, South Africa.[24] Similar results were also reported in Nigeria.[25]

Extension services were also considered as a challenge to goat production by farmers in Mushowani. This observation also confirms to a similar study in Ethiopia.[26] One of the reasons cited in the current study was that the frequency of visits by extension service officers from ministry of agriculture is quite poor. During the wet season, goats are affected by a number of diseases and the unavailability of extension officers during that time greatly affects goat production.[27] Additionally, extension services also play an important role in improving the information flow from farmers to scientists. During the study extension officers indicated that the tropical challenges being encountered by goat farmers include lack of information on goat production systems, prophylactic health programs for small ruminants as well as market linkages.

Limitations

The results of this study present the determinants of goat production in Shamva district. Therefore, readers should not generalize them since the results represent just one of the districts in Zimbabwe.

CONCLUSION

Goat production provides a number of economic benefits which can improve on the livelihoods of communities. Regular cash income from selling of goats was the most important reason for keeping goats, followed by family consumption. The results of this study indicated that farm size, age of the household, education and extension visits were the major factors affecting goat production in Mushowani. It is therefore important for all stakeholders to work together so as to mitigate against the aforesaid constraints so as to improve goat production in Mushowani.

ACKNOWLEDGEMENTS

The authors would like to thank the extension officers in Shamva District who assisted in data collection.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Kumar S. Commercial Goat Farming in India: An Emerging Agri-Business Opportunity. Agricultural Econom Res Rev. 2007;20:503-20.
2. Coffey L, Hale M, Well A. Goats: Sustainable Production Overview. Livestock Production Guide. National Sustainable Agriculture Information Service. 2004. Available at: www.attra.ncat.org. Accessed on 12 December 2022.
3. Musara JP, Chimvuramahwe J, Munyati V, Chivheya R, Mwadzingeni L. Why not commercial goat production? exploring rural communities' preference

for livestock enterprises. case of Matsai communal area, Zimbabwe. J Agr Res Dev. 2013;3(3):26-34.
4. Mataveia GA, Visser C, Sitoe A. Smallholder Goat Production in Southern Africa: A Review. 2021. Available at: http://dx.doi.org/10.5772/intechopen.97792. Accessed on 12 December 2022.
5. Shrestha JNB, Fahmy MH. Breeding goats for meat production: a review 1. Genetic resources, management and breed evaluation. Small Ruminant Res. 2005;58:93-106.
6. Chamboko T, Ziteya T, Muzanhindo and Hanyani-Mlambo BT. Socio-economic factors influencing goat milk production in the smallholder areas of Zimbabwe: A case study of Bulilima East District. Livestock Research for Rural Development. 2014;26(7).
7. Chikura S. An assessment of the role of goats in a smallholder crop-livestock production system of Zimbabwe: A case study of Wedza communal area. Animal Science Department, Faculty of Agriculture, University of Zimbabwe. M. Phil. Thesis. 2009;112.
8. Masunda B. Studies on reproductive activity in indigenous cows under traditional management in the communal areas of Zimbabwe: A case study of Sanyati communal area. Animal Science Department, University of Zimbabwe, Harare, Zimbabwe. M. Phil. Thesis. 2011.
9. Kusina NT. Goat productivity in smallholder farming areas of Zimbabwe. Paper presented at the BVSc/BADC/ITM Workshop on Health, Production and Management of small ruminants. 2000;8:16-8.
10. FAO and UNEP. The future of our land. Facing the challenge. Guidelines for integrated planning for sustainable planning of land resources. Food and Agriculture Organization of the United Nations (FAO), United Nations Environment Programme (UNEP), Rome, Italy. 2016.
11. Singh AS, Masuku MB. Sampling Techniques & Determination of Sample Size in Applied Statistics Research: An Overview. Int J Econom Commerce Management. 2014;2(11):1-22.
12. Mahanjana AM, Cronje PB. Factors affecting goat production in a communal farming system in the Eastern Cape region of South Africa. South Afr J Animal Sci. 2000;30(2):149-54.
13. Das S, Mohanty GP, Das D, Mishra SR, Palai TK, Sardar KK. Boer, an improved and fast-growing goat-A Review. Livestock Line. 2012.
14. Ben ST, Smith R. A review of goat production in Zimbabwe. J Zimbabwe Soc Animal Prod. 2008;4:111-8.
15. Pandey VS, Ndao M, Kumar V. Seasonal Prevalence of Gastro internal Parasites in Communal Land Goats of from the High Veld of Zimbabwe. Veterinary Parasitol. 2004;51(3-4):241-8.
16. Kusina NT, Kahiya C, Mukaratirwa S, Chikura S, Sibanda S. Seasonal patterns in parasitic infection in Zimbabwean communal lands. Zimbabwe Veterinary J. 2009;30(2):41-54.
17. Perry B, Grace D. The impacts of livestock diseases and their control on growth and development processes that are pro-poor. Philos Trans R Soc Lond B Biol Sci. 2009;364(1530):2643-55.
18. Feder G. The relation between farm size and farm productivity: the role of family labor, supervision and credit constraints. J Development Economics. 1985;55:297-313.
19. Dossa LH, Rischkowsky B, Regina Birner R, Wolln C. Socio-economic determinants of keeping goats and sheep by rural people in southern Benin. Agriculture and Human Values. 2008;25:581-92.
20. Unay-Gailhard I, Bojnec Š. Gender and the environmental concerns of young farmers: Do young women farmers make a difference on family farms? J Rural Studies. 2021;88:71-82.
21. Nampanzira DK, Kabasa JD, Nalule SA, Nakalembe I, Tabuti JR. Characterization of the goat feeding system among rural small holder farmers in the semi-arid regions of Uganda. Springerplus. 2015;4:188.
22. Homann S, van Rooyen A, Moyo T, Nengomasha Z. Goat production and marketing: Baseline information for semi-arid Zimbabwe. Matopos Research Station, Bulawayo, Zimbabwe. International Crops Research Institute for the Semi-Arid Tropics. 2007;84.
23. Gundu M. The effect of literacy on access to and utilization of agricultural information for household food security at Chirau communal lands in Zimbabwe. MSc Project. University of South Africa. 2009.
24. Bembridge TJ. A systems approach to the study of agricultural problems in Transkei. Ph.D. dissertation, University of Stellenbosch, Stellenbosch, South Africa. 1984.
25. Okunlola JO. 2000. Socio-economic constraint in sheep and goat production in Ekiti and State. M.Sc Thesis, University of Ibadan, Ibadan, Nigeria. 2000.
26. Nyamangara ME. Feeding behaviour, chemical composition of diet selected and feed intake in indigenous goats raised on natural vegetation. M. Phil Thesis. Animal Science Department. Faculty of Agriculture, University of Zimbabwe. 2001;125.
27. Ndlovu C, Mayimele R, Wutete O and Ndudzo A. Breeding of goats: An indigenous approach to enhancing opportunities for smallholder farmers in Inyathi, Zimbabwe. Int J Livestock Prod. 2020;11(3):91-101.

Cite this article as: Kajevhu C, Mabika N. Determinants of small-scale goat production in Mushowani, Zimbabwe. Int J Sci Rep 2023;9(3):56-61.