



Case Study

Economic analysis of nomadic pastoral livestock family enterprises in Somalia, Case study of Guriel District in Galmudug State of Somalia

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Abstract

The aim of this study was to determine the socio-economic characteristics and investigate the economic contribution of pastoral livestock family enterprises in Guriel district of Galgadud region in Somalia. The main materials of the study are data obtained through using questionnaires from 50 nomadic livestock farms in Guriel district in the production period of 2020. The Random sampling method was used as the sampling method. According to the results of the study, labor costs take the first place with 41.5% among the cost elements that make up the cost of enterprises, followed by the food and non-food household consumption costs (29.5%), water costs (%12,1), amortization (%10,0), veterinary-service costs (%4,2), transport costs (%1,5) and marketing costs (%1,2). On the other hand, it has been determined that %33,8 of the revenue is obtained from the inventory value increase, %30,1 from the goat sales, 16,7% from the sheep sales %7,0 from the camel milk, %6,0 from the kids sales revenue, %3,0 from the camel sales and 3,4 from the value of milk consumed at home. The annual net profit of the nomadic livestock enterprises in this study area was 159 USD.

Keywords: Economic Analysis, Guriel district, Nomadic livestock, Somalia.

Introduction

The livestock sector in Somalia has a strategic importance in the national economy as it is a source of livelihood for a large part of the country's population. The sector contributes about 40% to the Gross Domestic Production in Somalia having more than 40 million of livestock population and exported more than 5 million live animals of camels, cattle, sheep and goats in 2014, the highest number ever exported in a single year¹. The livestock sector is the most important part of Somali rural economic activities. Animal production plays important socio-economic roles to the welfare of rural households, such as a source of food, income and employment in Somalia and the industry has a direct impact on the economic growth of the country². The predominant form of the economic livelihood in Somalia is pastoral livestock production³.

Livestock activities in Somalia are an important element in the sustainability of the household's consumption of animal food and have economic importance. More than half of the population living in rural areas is directly or indirectly involved in livestock production⁴. The livestock sector dominates the economy, creating about 60% of Somalia's job opportunities and providing about 80% of foreign currency earnings⁵. It is reported that the livestock sector provides the biggest contribution to Somalia's GDP, livelihoods and economic growth⁶. Both small-ruminant and large ruminant nomadic livestock rearing farmers are common in Somalia. Animal husbandry activity in Somalia is mainly carried out by pastoral

families living in rural areas in small-scale enterprises⁷. Modern livestock enterprises and breeding farms do not exist throughout the country. Drought and diseases are the main challenges of Somali pastoral livestock production⁸. Prolonged and sequential droughts have been major threats to the local economy particularly to the livestock sector and to rural livelihoods in Somalia⁹. Although Somalia has an important potential in terms of animal production and the wide range of rangeland that is suitable for animal production, it is seen that the productivity of local animal breeds are low¹⁰.

This study is aimed at performing socio-economic analysis of pastoral livestock family enterprises, investigating the contribution of animal production to the pastoral family economy and also to determining the structural characteristics of nomadic livestock enterprises in Guriel district of Galgadud region in Somalia. The result of this study is expected to contribute to the limited available knowledge in Somalia's livestock sector.

Materials and methods

The study was conducted in Guriel district of Galmudug State of Somalia. Guriel is one of the districts in Galmudug State where livestock most intensely is reared. The economy of the district is largely related to animal production. The largest animal market in the region is located in this district. Guriel is the economic and commercial center of the Galgadud region of

Somalia. The population of Güriel district is estimated to be around 300 thousand.

The main material of the study was the primary data obtained through questionnaires from the nomadic livestock farms in the Gurriel district. The data of the study were obtained between January-May 2021, covering the 2020 production period. In this study, in addition to primary survey data, reports of FAO, World Bank, other international institutions, scientific studies and articles made in Somalia were used as secondary data.

Method: Identification of nomadic livestock farms to be sampled: Random sampling method was used in the study to ensure the accuracy of the data collected from the nomadic livestock pastoralists and to provide an adequate representation of the different segments of the population. The sample is a collection of units that are chosen according to certain properties from the population, which is a collection of units with the same characteristics, and that can represent the selected population¹¹. Initially, the number of enterprises engaged in nomadic livestock activities in the district of the study was determined with the help of the local administration.

For the study, a random village was selected using the sampling method. Approximately 100 families that carry out nomadic livestock activities in the selected village formed the main framework of the study. As all of these 100 family enterprises which are the main framework of the study couldn't be worked on because of the limitation of time and cost so the researcher decided to work on a certain sample size in inclusion in the study and the data was obtained in the form of remote information collection. The sample size was calculated as 50 with a 90% confidence interval and 10% margin of error, and the sample size of the enterprises were selected randomly on the nomadic basis. Nomadic livestock enterprises with 50 or more animals were included in the sample, as they are suitable for the purpose of the study and to keep the accuracy of the data to be obtained. The following formula was used to determine the sample size¹².

$$n = \frac{N}{1+N(e)^2} = \frac{100}{(1+100 \times 0.10)^2} = 50 \text{ Pastrolists}$$

Here; n = sample size, N = Number of Nomadic Family Enterprises, e2 = denotes the level of precision.

Cost calculation of nomadic livestock enterprises: Within the scope of the study, statistical software Microsoft Excel (Microsoft Office Professional Plus 2010) and Statistical Packages for the Social Sciences (SPSS) were used in computer environment for the purpose of evaluating the data obtained through the questionnaire¹³.

Costs and revenue components of nomadic livestock enterprises (USD \$): Various cost elements were noted during the calculation of the cost incurred on livestock production in the study area. However cost items that were pointed out

included; Veterinary-health costs, Labor costs, Water costs, Shipping costs, Household consumption expenses, Marketing costs and Living asset depreciation (animal depreciation).

Cost and revenue elements that make up the cost determined in nomadic livestock enterprises are evaluated on the revenue-cost analysis table shown in Table-1.

Table-1: Cost and revenue elements of pastoral livestock enterprises.

I. Costs of Enterprises	Amount
1. Veterinary-health (USD \$)	
2. Labor costs (USD \$)	
3. Water costs (USD \$)	
4. Shipping costs (USD \$)	
6. Household consumption expenses (USD \$)	
7. Marketing costs(USD \$)	
8. Live asset depreciation (USD \$)	
II. Revenue of Enterprises (USD \$)	
1. Milk and Animal Sales (USD \$)	
2. Value of Milk Consumed at Home (USD \$)	
3. Inventory Value Increase (USD \$)	
A. Total cost	
B. Total Revenue	
C. Net Profit-Loss (B-A)	

Inventory value change: In the inventory change calculated in the enterprise, if there is a decrease in the inventory, it is written in the cost expenses, if positive (+) is obtained; evaluated as revenue, which is an increase in the inventory value. The formula used for this purpose is given below¹⁴.

Inventory value change: (year-end animal value + value of animal sold + value of animal slaughtered - (value of animal at beginning of year + value of animal purchased).

Living asset depreciation: Animals that lose weight and value due to being used in breeding (milk and brood yield) in the production process (dairy cows, lactating camels, milked sheep and goats, and male animals used for breeding) constitute living stock animals to depreciation in livestock enterprises.

Living asset depreciation is calculated by using the formula given below.

$$\text{Annual living asset depreciation} = (\text{Breeding Value} - \text{value at slaughter}) / \text{Economic Life of Animal}$$

Kolmogorov-Smirnov and Shapiro-Wilk tests were used to test whether the normality assumption of the variables was met. Accordingly, parametric and non-parametric statistical tests were used according to the nature of the variables, whether there is a statistical difference between the livestock enterprise groups in terms of the variables examined.

Results and discussion

In this study, the results of the survey conducted with the nomadic livestock enterprises in the district of Guriel were analyzed and the findings were evaluated.

Socio-economic characteristics of nomadic livestock enterprises: Age of livestock owners, educational status, household size, the main economic activity of nomadic livestock enterprise owners, costs and revenue variables were considered and examined in the survey. Age, education level, number of household members and the main economic activity are presented in Figure-1, 2, 3 and 4.

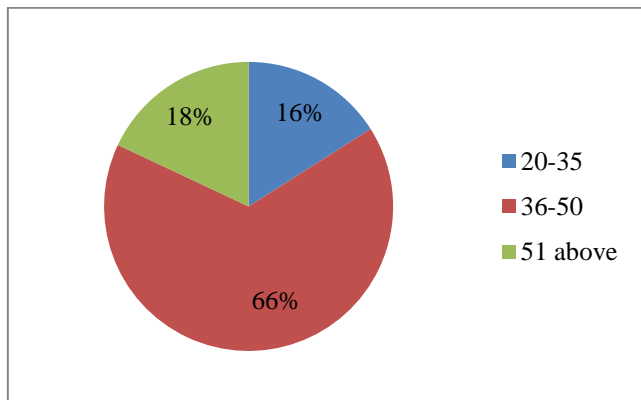


Figure-1: Age of Respondents.

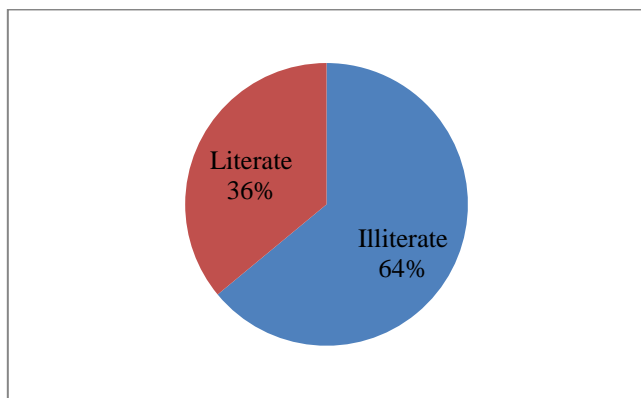


Figure-2: Level of Education.

According to Figure-1, most respondents (66%) were aged from 36-50 years while 16% of the respondents are between 20-35 years. On the other hand 18% of the respondents are 51 and above years. The average age of the owners of the nomadic livestock enterprises included in the study is 43.96, and when these data are evaluated, it is seen that the majority of the livestock owners are middle-aged and above. Figure-2 shows the education level of the nomadic livestock owners in the surveyed area is 64% illiterate, while the rate of literate is 36%.

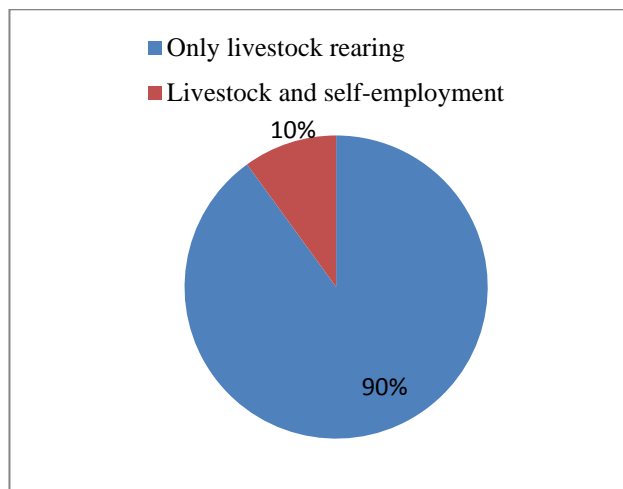


Figure-3: Main Economic Activity.

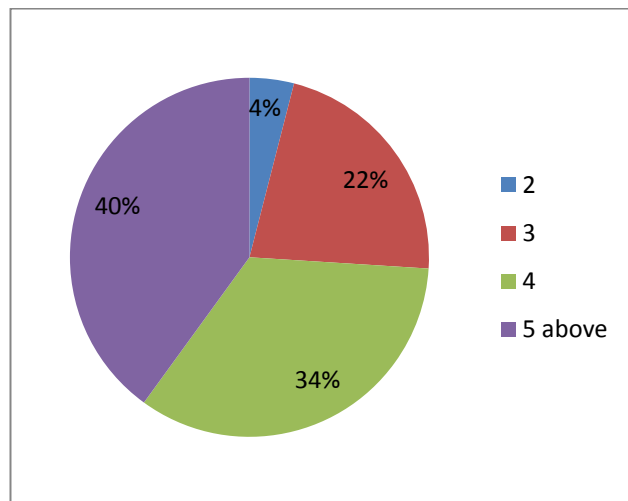


Figure-4: Household Members.

According to Figure-3, the main economic activity of the livestock owners is only animal rearing at the rate of 90%. In addition, it has been determined that 10% of the nomadic livestock owners are engaged in self-employment activities while their main economic activity being in livestock rearing. On the other hand, the figure 4 shows that the number of household's members with 2, 3, 4, 5 or more in the nomadic livestock enterprises was determined as 4.0%, 22.0%, 34.0% and 40.0%, respectively.

Findings related to the production costs in nomadic livestock enterprises: In the economic analysis, the cost and their ratios in the total expenses were calculated according to the livestock rearing enterprise groups. In nomadic livestock enterprises, the cost elements of camel-small ruminant rearing farms and only small ruminant farm groups for 2020 are presented in Table-2. These calculations are based on annually.

When Table-2 is examined, it is understood that labor expenses take the first place among the production costs in nomadic livestock enterprises in Somalia. Labor costs are followed by household consumption expenses with an average of 29.5%. It has been determined that water costs in the examined enterprises have an average of 12.1%. It has been determined that the rate of living asset depreciation in the total production costs is 10.0%, veterinary health costs are 4.2%, transportation costs are 1.5% and marketing expenses are 1.2%.

The ratio of labor costs in livestock rearing groups was calculated as 37.0% in camel and small ruminant farms, and 43.3% in small ruminant farms. When we look at the family

livestock enterprise groups, the water costs and the living asset depreciation expense ratio were found to be higher in the camel and small ruminant farm group than the other. In the study, labor costs and household consumption costs were found to be higher in small ruminant breeding enterprises. When evaluated in terms of camel-goat and sheep and small ruminant breeding groups, there is no statistical difference between the groups in terms of labor, marketing, transportation, veterinary health and household consumption costs ($p > 0.05$). In addition, the difference between the groups in terms of water and living asset depreciation costs was found to be statistically significant ($p < 0.05$).

Findings regarding the revenue of nomadic livestock enterprise: In the economic analysis table prepared for the nomadic livestock enterprises included in the study, the revenue components and their share in the total revenue were classified and calculated as both camel-small ruminant breeding enterprises and only small ruminant breeding enterprises. Revenue calculations are based on annually. The obtained findings are presented in Table-3.

Table-2: Cost Elements and Proportional Distribution of Enterprises to Groups.

Production Costs	Groups						
	Large-small ruminant Rearing Enterprises (12)		Only small ruminant Rearing Enterprises (38)		Total (50)		P
	Amount \$	%	Amount \$	%	Amount \$	%	
Labor Costs	1683±221,5	37,0	1472±72,0	43,3	1522±76,0	41,5	0,597
Food Expenses	1141±105,4	25,0	1062±53,1	31,3	1081±47,3	29,5	0,480
Water Costs	754±84,0	16,6	348±18,6	10,3	446±40,4	12,1	0,000*
Animal Depreciation	659±73,6	14,5	275±20,1	8,1	367±32,7	10,0	0,000*
Veterinary costs	207±19,3	4,6	140±10,9	4,1	156±10,2	4,2	0,718
Shipping Costs	53±12,4	1,2	57±7,8	1,7	56±6,5	1,5	0,852
Marketing Costs	50±8,6	1,1	43±4,6	1,2	45±4,1	1,2	0,410
Total	4547	100	3397	100	3673	100	

Significant (* $p < 0,05$). Insignificant (- $p > 0,05$).

Table-3: Revenue Distribution of Examined Nomadic Livestock Enterprises by Groups.

Revenues	Groups						
	Large-small ruminant Rearing Enterprises (12)		Only Small ruminant Rearing Enterprises (38)		Total (50)		P
	Amount \$	%	Amount \$	%	Amount \$	%	
Inventory Value Increase	996±223,7	20,4	1390±80,4	39,7	1295±83,6	33,8	0,007*
Goat Sales Revenue	1242±132,0	25,5	1127±58,6	32,2	1155±54,4	30,1	0,203
Sheep Sales Revenue	530.4±46,8	10,9	673±38,5	19,2	639±31,9	16,7	0,258
Camel Milk Revenue	1126.3±182,7	23,1	0	0	270±80,7	7,0	
Kids-lambs Sales Revenue	358±56,4	7,3	190±13,4	5,4	230±19,5	6,0	0,001*
Camel Sales Revenue	475.8±190,2	9,8	0	0	114±52,8	3,0	
Value of Milk Consumed at Home	148±22,4	3,0	123±9,1	3,5	129±8,8	3,4	0,21
Total	4877	100	3503	100	3832	100	

Significant (*p<0,05). Insignificant (- p>0,05).

When Table-3 is examined, 33.8% of the nomadic livestock enterprise revenue in Guricel district is from the inventory value increase, 30.1% from the goat sales, 16.7% from the sheep sales, 7.0% from the camel milk, 6.0 was calculated from the kids-lambs sales revenue, 3.0% from the camel sales and the value of the products consumed at home as 3.4%. As a result of the production activities of the nomadic livestock enterprises in the study area, it is seen that the inventory value increase takes the biggest share of 33.8% in the total revenue of the enterprises.

Goat sales revenues; It was determined that the average was 25.5% in the camel-goat and sheep breeding farm group and 32.2% in only small ruminant farms. When examined in terms of nomadic livestock rearing family enterprise groups, goat sales and sheep sales revenue ratios were found to be higher only in the small ruminant farm group than the other.

When evaluated in terms of livestock breeding groups, there is no statistical difference between the enterprise groups in terms of goat sales, sheep sales and milk value consumed at home in nomadic livestock enterprises (p>0.05). In addition, the difference between nomadic livestock breeding family groups in terms of inventory value increase and kids-lambs sales revenue were found to be statistically significant (p<0.05).

Findings regarding the economic activity of nomadic livestock farms: In the nomadic livestock enterprises included

in the scope of the study, the annual average profit findings according to the enterprise groups are presented in Table-4.

Table-4: Annual Average Profit and Loss Status Per Family Enterprise as by Groups.

Enterprise groups	Camel-Goat and sheep livestock breeding farms n=12	Only goat and sheep breeding farms n=38	Total
Number of family livestock enterprises	12	38	50
Profit (USD\$)	328	106	159

When Table-4 is examined, it is seen that the annual profit of nomadic livestock enterprises within the scope of the study does not show significant differences between the groups, and the profitability level is in favor of the group that raises camel and small ruminant animals. It has been calculated that an average of 328 USD annual profit was obtained in the camel-goat and sheep farming group, and an average of 106 USD was obtained in only small ruminant breeding farm groups. As an overall distract family livestock breeding family farms, the average profit was determined as 159 USD. In addition, while 28 enterprises were making profits in the examined enterprises, 22 enterprises had a loss.

Discussion: In this section findings of the study were discussed and compared with previous studies on the subject. In the majority of the nomadic pastoral livestock enterprises included in the research, goat and sheep rearing is carried out while some of the enterprises have small ruminants (goat and sheep) together with camel. None of the enterprises in the research area that carried out cattle rearing.

Evaluation of economic activity findings of nomadic livestock farms: Livestock in Somalia is very important for the national economy as well as for the region and particularly the district where this study was conducted. Pastoral livestock activity is the main economic activity for the residents in the study area. Nomadic livestock activity in Somalia is carried out at a higher rate than any other region in Africa and is the engine of the rural economy¹⁵.

When we look at the education level of the nomadic livestock owners in Guricel district, it was determined that 36% of the educational status was literate, while in another study 60% and 57.2% of them were literate in Puntland and Somaliland regions, respectively¹⁶. According to a study conducted in the Somali region located on border of Somalia and Ethiopia, the rate of illiterate was 78.2%¹⁷. This is due to a lack of education services and facilities in the rural areas of the country where pastoral livestock activity is carried out. The average age of enterprise owners in this study is 43.96 while the average age of livestock owners in Qardho district is similarly reported as 4.9¹⁸. When the age of data are evaluated, it is seen that the majority of pastoral livestock owners in the research area are middle-aged and above.

Within the scope of the study, labor costs took the first place with a rate of 41.5% among the total production expenses in 2020. Food household consumption expenditures followed labor costs with an average of 29.5%. Water costs were determined as 12.1% on average. The ratio of living fixtures depreciation in total production costs is 10%, veterinary service costs are 4.2%, transport costs are 1.5%, and marketing costs are 1.2%. In a study conducted in Kenya, it has been reported that among the production costs, services take the first place with a rate of 29.3%. Water costs were followed by 21.6% of service costs, and labor costs were reported as 15.4%. It has been reported that pesticide costs are 12.3% in total production expenses, veterinary health costs are 10.8%, concentrate feed costs are 9.3%, transportation costs are 1% and marketing costs are 0.3%¹⁸. According to the study conducted in Guriel, the marketing and transportation costs among the total production expenses had the smallest share while very similar results were obtained with this study conducted in Kenya. The main reason for this can be said that the nomads do not have a permanent residence and settlement and they constantly change places between the dry and rainy seasons. Therefore, shipping and marketing costs have the smallest share in production costs.

Within the scope of the research, it has been determined that the largest share of the nomadic livestock enterprises in the revenue obtained from production activities in 2020, with a rate of 33.8%, is the revenue from the inventory value increase. Inventory value increase revenues were followed by goat sales revenues with an average of 30.1%, and sheep sales revenues were found to be 16.7% on average. In a study conducted in Ethiopia, especially in the Somali region, in terms of revenue elements it was reported that there are animals and animal product sales, firewood, supports and charcoal. It has been revealed that within the total revenue, firewood has 35.2%, supports 29.7%, charcoal 19.7% and animal and animal product sales 15.4%. It has been reported that while firewood revenue has the largest share in total revenue, animal and animal product revenue has the smallest share¹⁸. In the pastoral livestock production revenue obtained is quite low as the production is not effective. Pastoral households in the study area depend on largely on the livestock activity as a source of income and there is no additional income rather than the income from livestock activities.

Conclusion

Within the scope of the study, it has been concluded that the education level of the nomads engaged in animal husbandry activity in the district is very low; therefore increasing the educational opportunities in the district particularly in the rural areas will be the key in solving all the problems. In order to increase the welfare level of the people in the countryside, to improve animal production, to develop the economy of the district and the country, education services in the countryside should be increased and accordingly the schooling rate should be increased as well.

As the production is based on traditional and pastoral system, transformation of production system is inevitable. These are the starting points of transforming from traditional production to rational production and replacing the traditional mode of production with modern production techniques. Technical education and knowledge in animal production, higher education and trained manpower are important in scientific animal production. Furthermore, according to the results of the study, it has been determined that the annual profit obtained in animal husbandry is insufficient for the growth of the enterprise. For this reason, it is necessary to take steps that can bring international opportunities to the country in order to provide the financial support and increase the profits in animal husbandry.

Low productivity of indigenous breeds of animals is reared throughout the country, and pastures are used entirely for feeding animals. The milk and meat yield of these animals is low. For this reason, to increase animal production in terms of quality and quantity, animal breeds with high milk and meat yield should be imported and breeding studies should be expanded in the country. Essential infrastructure and facilities

should be built for livestock to be a profitable investment field in Somalia. Effective and new paths should be sought to transform animal production into market-oriented production rather than subsistence.

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