

Assessment of the Production System, Major Constraints and Opportunities of Sheep Production in Doyogena Woreda, Kembata Tambaro Zone, Southern Ethiopia

Feleke Assefa¹ Teshale Tigistu² Abebech Lambebo²

1. Department of Animal and Range Sciences, College of Agriculture, Wolaita Sodo University, Wolaita, Ethiopia, P.O.Box 138

2. Doyogena Woreda Agricultural Office, Kembata Tambaro Zone, Southern Ethiopia

Abstract

The study was conducted to identify the production system, major challenges and opportunities of sheep production in Doyogena woreda, Kembata Tambaro Zone. Both primary data through structured questionnaire and secondary data from different relevant offices, published and unpublished sources were gathered using 120 statistically selected respondents. To enrich the primary data, field observations and group discussions were also made. The result of the study indicated that 83.3% of the respondents kept their sheep under extensive system followed 16.7% who practice semi-intensive system of management. The main reason for keeping sheep by majority of the farmers (80.8%) is as a source of money to supplement family income. As indicated by the respondents, the average flock size of the study was 4 heads. Multiple birth(twinning) is very common in the flock. Natural pasture was the main feed resource during the rainy season whereas natural pasture, crop residue and improved forage are the dry season feeds. Keeping sheep in the main house with family is very common in the study area (100%) with no separate housing system. Short of capital, land scarcity, feed shortage and untimely credit access were the major constraints that hinder sheep productivity in the study area. The available opportunities of sheep production in the study area were feasible weather condition followed by availability of adapting local sheep breed, market access and government intervention according to their order of importance.

Keywords: Challenges, Doyogena woreda, Opportunities, Priority index and Sheep production

1. INTRODUCTION

Livestock in Ethiopia is an important and integral component of agriculture, which is the pillar of the economy. Sheep and goats are among the major economically important livestock in Ethiopia, playing an important role in the livelihood of resource-poor farmers. They provide their owners with a vast range of products and services such as meat, milk, skin, hair, and manure for cash, security, gifts, religious rituals and as a means of saving and investment. Similarly, the country's huge and diverse sheep populations and genetic diversity is a requisite for the present and future livelihoods of a large number of poor farmers (Gizaw *et al.*, 2007). Sheep are an important part of the livestock sector and their socio economic importance is widely recognized. Ethiopia has a sheep population of 25.5 million estimated by that are distributed from arid to high land, areas of the country (CSA, 2013).

The short generation interval, ability to give multiple births and their small size make sheep adaptable to smallholder mixed crop-livestock production systems where they contribute up to 22-63 % to the net cash income (FAO, 2004). The small size of sheep and goats has distinct economic, managerial, and biological advantages. Low individual values mean a small initial investment and correspondingly small risk of loss by individual deaths. They occupy little housing space, lower feed requirements, and supply both meat and milk in quantities suitable for immediate family consumption, which is important in view of lack of means of preservation (Ibrahim, 1989). For similar reasons, Dinksew and Girma (2000) reported that sheep production is becoming a viable alternative for urban production as a means to fulfill parts of home consumption and income needs during severe shortage of cash.

The productivity of sheep as in case of most of the ruminants is markedly low due to several genetic and environmental factors besides the institutional, environmental and infrastructure constraints (Markos 2006; Kosgey *et al* 2007). Therefore, improvements in small ruminant's productivity which is low in Ethiopia (EARO 2001) can be achieved through identification of production constraints and introduction of new technologies or by refining existing practices in the system. Assessment of sheep production constraints are pre requisites to bring improvement in sheep productivity. In the study area, the sheep production system, its major constraints and opportunities were not studied adequately and hence, assessment of the sheep production constraints in the district was necessary in order to achieve improvements in sheep productivity. Therefore, this study was conducted to collect information on the production system, main constraints and opportunities of sheep production in the study area.

2. MATERIALS AND METHODS

2.1. Description of the Study Area

This study was conducted in Doyogena woreda of Kembata Tambaro Zone, Southern Ethiopia. The woreda is located 171 km in south west of Hawassa, the capital city of the region of SNNP and 258 km south of Addis Ababa. According to the information obtained from the woreda finance and Economic development office (DOFED, 2006), the total population is about 93,265, out of which, 48,788 are males and the remaining are females. The woreda is divided into 17 kebeles for administrative purpose. Among these 17 kebeles, 13 of them are rural and 4 of them are urban kebeles. The woreda is bounded by Angacha woreda in eastern direction, Hadiya Zone in North West direction, Kachabira woreda and partially Hadiya Zone in Northern direction.

The altitude ranges from 1900-2800 meter above sea level with the agro-ecological condition of 70% highland, and 30% of mid altitude. The average temperature ranges from 10^oc -16^oc, and the rain fall ranges from 1200 mm to 1600 mm (DOFED, 2006). In terms of farming system, the community practices animal rearing and crop production (mixed farming system).

2.2. Sampling Techniques and Sample Size

From the total 17 kebeles of the wereda, 6 kebeles were selected purposively based on the experience of sheep production. From each kebele, 20 farmers, a total of 120 farmers were selected by using systematic random sampling.

2.3. Data Collection Method

To collect data, structured questionnaires were developed and pre-tested for consistency and applicability of the objectives of the study. Focal group discussions were made to enrich the primary data.

2.4. Data Management and Analysis

The data collected were analyzed by using SPSS software version 20. The results were reported using descriptive statistics, such as mean, percent and frequencies and presented in form of tables, charts and graphs. For ranking major constraints and opportunities of sheep production, priority index was employed using the following formula:

$$\text{Priority index (PI)} = \frac{(F1 \times 3) + (F2 \times 2) + (F3 \times 1)}{F \text{ total}}; \text{ where ,}$$

F1= Frequency of the first rank;

F2= Frequency of second rank

F3 = Frequency of third rank and

FT= Frequency of total respondent

3. RESULT AND DISCUSSION

3.1. Production System, Purpose of Keeping Sheep and Flock Size

The major livestock reared in the area were cattle, sheep and poultry. As an integral part of the mixed farming system, livestock production in the study area plays a substantial role in the household food security.

Analysis of the sheep production system in the area indicated that 100 (83.3%) of the respondents kept their sheep under extensive system followed 20 (16.7%) who practice semi-intensive system of management. Sheep production plays a significant role in the life of man whether in the rural or urban areas in a variety of ways. From the results of the current study, the predominant reason for keeping sheep by majority of the farmers (80.8%) is as a source of money to supplement family income. The rest (19.2%) of farmers kept sheep for use during festivities and direct consumption. The result shows that most farmers keep sheep for sales in order to meet family expenditures. This finding is similar with that of Getachew et al. (2010) and Gebretsadik et al. (2012). Such animals are sold to raise money needed to pay off loan, purchase farm inputs like fertilizer and other household needs, replace large ruminants, even pay the school fees of children and to solve other immediate family needs.

Farmers on average had 4 heads of sheep per household. Sheep production was practiced as side line to other agricultural activities. Based on the results of this study, there were no farmers that base their livelihood only on sheep production. The result is in agreement with the finding of Yenesew *et al.*, (2013).

3.2. Litter size

Majority of the households (60%) in the present study area responded that twin birth is common in the area which is comparable to the observation reported by Tsedeke (2007) and Belete (2009) in-mixed crop livestock production in Alaba area of SNNPR and Goma district of Jimma zone, respectively.

3.3. Feed Sources of sheep and utilization of improved forage

The main feed resources for sheep production in the study area are natural pasture, improved forage and crop residue (Table 1) showing varied availability in different seasons. Natural pasture or indigenous grass was the

main feed resource during the rainy season whereas natural pasture, crop residue and improved forage, in the dry season. The same results have been reported by Abebe (2000) and Getahun (2008) that the main feed source is communal grazing land, crop residues and crop stubble.

Table 1. Major feed sources of sheep in the study area

No	Major feeds of the sheep	Frequency	Percentage
1	Improved forage species	28	23.3
2	Indigenous grass	58	48.4
3	Crop residue	10	8.3
4	House hold leftover	6	5
5	Tubers	14	11.7
6	Atella	4	3.3
N		120	100

It was found that 85% farmers were providing supplementary feed and the remaining 15% were selling their sheep as a strategy of coping drought or feed scarcity. The supplementary feed includes wheat bran, and atella,. With the exception of widely distributed Dasho grass, the supply of other grass species is very limited. Among the sampled households, 28.3% respondents have not planted improved forage species and the remaining 71.7% respondent planted improved forage species on their garden and closure areas which shows there should be effective extension service to encourage farmers to grow improved forage species.

According to Table 2, on months August and February, serious feed scarcity was prominent. Among the sampled households, 80% of the respondents utilize different feeds: agro industrial by-products, tubers and other feed supplements whereas 20% of the respondents sell their sheep specially lambs to reduce feed requirement of sheep on dearth period. During November, December, June and May, there were excess feed supply that encourage farmers to fatten their sheep by buying additional sheep from the market.

Table 2- Availability of sheep feed in different seasons

No	Months	Season of feed scarcity	Season of serious feed scarcity	Season of feed availability	Season of excess feed availability
1	September				
2	October				
3	November				
4	December				
5	January				
6	February				
7	March				
8	April				
9	May				
10	June				
11	July				
12	August				

3.4. Watering of sheep

Among sampled respondents, 50% of the respondents provide water for their flock twice per week in dry season , 20 % daily and 30% of the respondents do not provide water for their flock. The result is in agreement with the finding of Belete (2009) who reported that half of the farmers provided water twice a day in dry season.

3.5. Housing of sheep

Different types of sheep houses were used in the study area. Keeping sheep in the main house together with the family is very common in the study area (100%) which is in agreement with the finding of Tsedeke (2007). No separate housing was reported from the respondents. In contrast to this study, Yenesew *et al.*, reported that 9% of the households provided separate housing. Barn cleaning of sheep houses was common in the study area and it is mainly a responsibility of women.

3.6. Most common Diseases and their control

The findings of this study indicated that the major common diseases encountered in various flocks in order of significance were pasteurellosis, Pneumonia and internal parasites which hamper performance of sheep. According to the study, farmers utilize different local medicines like dimbilal, garlic, tobacco and other tree leaves as traditional medication means while their sheep get sick. Use of commercial medicine or taking sick sheep to public clinic is less common. The result is in agreement with the finding of Yenesew *et al.*, (2013) who reported that pasturolloisis, fasciolloisis and internal parasites were the common diseases in the study area.

3.7. Extension service for sheep production

According to the results of this survey, about 56.6% interviewed households have access to credit services. The main credit source (70%) of the sample respondents was Omo micro- finance and 30% were cooperatives and other sources. About 23.3% of respondents got training on sheep management where as 76.7% of respondents did not get the chance of training. Out of the trained respondents, 90% of them need additional training.

3.8. Major Constraints of Sheep Production

The major constraints of sheep production in the study area is presented in Table 3. The most serious constraint hindering sheep production in the study area is lack of capital with an index value of 0.149. According to the sheep producers, another most devastating phenomenon that curtails sheep productivity is land shortage with an index value of 0.148. Feed scarcity and untimely credit access were the third and fourth constraints with index values of 0.143 and 0.128 respectively. Similar finding has been reported by Abebe *et al.* (2000) that feed shortage in the dry and rainy season, diseases, inadequate veterinary service and lack of capital are the main sheep production constraints in Lallomamma Mider District, North Shoa.

Table 3. Constraints of Sheep Production

No	Variables	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	F-sum	PI	Rank
1	Feed scarcity	13	9	13	16	6	0	1	2	0	0	473	0.143	3
2	Water shortage	0	1	0	4	0	0	3	1	17	34	120	0.036	10
3	Disease/ parasite	0	0	1	1	2	4	6	4	29	13	154	0.046	9
4	Land shortage	17	10	13	16	1	1	0	0	1	1	490	0.148	2
5	Market problem	0	0	1	3	5	14	16	11	3	6	238	0.072	7
6	Inbreeding	1	1	6	3	13	23	5	5	1	2	320	0.097	6
7	Capital problem	27	7	8	5	5	4	1	3	0	0	495	0.149	1
8	Poor management	0	0	3	4	2	6	8	32	5	0	232	0.070	8
9	Awareness problem	0	8	10	4	17	7	11	2	1	0	369	0.111	5
10	Untimely credit access	12	14	6	7	5	3	6	1	4	2	425	0.128	4
Total												3316	1.000	

PI=Priority Index

3.9. Opportunities of sheep production

Despite there were many constraints that affect sheep production in the study area, there were also a couple of opportunities to improve sheep production such as presence of good breed, government intervention, credit and market access, presence of NGOs, road and infrastructure and favorable agro-ecology. From the study, as indicated in Table 4, favorable agro-ecology was the primary opportunity with an index value of 0.313. The second opportunity of sheep production is presence of adaptable local breed with an index value of 0.236 and market access and government intervention were ranked as third and fourth opportunities with index values of 0.207 and 0.129 respectively. With regard to government interventions, Areka research center and ILRI have been engaged in supporting and providing an opportunity to improved technologies and capacity building through training on sheep production.

Table 4. Opportunities of Sheep Production

NO	Variables	1st	2nd	3rd	4th	5th	6th	F-sum	PI	Rank	
1	Presence of good breed	3	37	10	5	3	1	265	0.236	2	
2	Presence of NGOs	1	4	0	2	7	33	79	0.070	5	
3	Credit access	0	3	0	3	6	14	50	0.045	6	
4	Government intervention	0	1	14	21	7	7	145	0.129	4	
5	Market access	1	14	32	2	11	0	232	0.207	3	
6	Favorable agro-ecology	57	0	1	1	1	0	351	0.313	1	
Total									1122	1.000	

PI= Priority Index

4. CONCLUSION AND RECOMMENDATION

4.1. CONCLUSION

The study wereda has favorable agro-ecology for sheep producing. The local breeds have better productive and reproductive potentials. However, because of shortage of capital, lack of credit on required time, land scarcity, feed shortage, awareness problem and poor husbandry system, the wereda in general and the rural sheep producing households in particular have not been sufficiently benefited from the sheep production sub sector. Despite all constraints and challenges currently facing the sheep production sub-sector, there are still encouraging opportunities and potentials to boost production and quality of sheep production in the study area. The entirely extensive production system along with feed shortage call for improvement of husbandry practices.

4.2. RECOMMENDATION

- ✓ Providing better access of credit to minimize capital shortage
- ✓ Provision of training on sheep production and flock management
- ✓ Improving genetic potential of sheep by selection increases sheep reproductive potential.
- ✓ Efforts should be made to alleviate the main constraints that hindered sheep production in the study area
- ✓ Expanding improved forage species to overcome the scarcity of feed which will be encountered during dry seasons. There should be forage promotion program to expand improved forage availability.

5. REFERENCES

- Abebe Mekoya, Alemu Yami, Mekonnen Hailemariam 2000. Management of traditional sheep production in Lallomamma Mider district, North Shoa, Amhara. Pp. 143 – 153. Proceedings of the 7th annual conference of the Ethiopian Society of Animal Production (ESAP). Addis Ababa, Ethiopia, 26 – 27 May 1999, ESAP (Ethiopian Society of Animal Production).
- Belete Shenkute, 2009. Production and Marketing Systems of Small Ruminants in Goma District of Jimma Zone, Western Ethiopia. An Msc Thesis Presented to School of Graduate Studies of Hawassa University, Hawassa, Ethiopia. 98p.
- CSA, 2013. Federal Democratic Republic of Ethiopia Central Statistical Agency. Agricultural Sample Survey. Volume II, Report on Livestock and Livestock Characteristics. Statistical Bulletin 570. Addis Ababa, Ethiopia.
- Dinksew Taye and Girma Abebe, 2000. Socio-economic aspect and husbandry practices of sheep in Awassa. pp. 113-117. In: The opportunities and challenges of enhancing goat production in East Africa. Proceeding of a conference. Markel, R.C., Abebe, G. and Goetsch, A.L. (eds.). Langston Univ., OK (USA). E (Kika) da la Garza Inst. for Goat Research; Debub Univ. Awassa (Ethiopia). College of Agriculture, 10-12 Nov. 2000, Awassa, Ethiopia.
- DOFED, 2006. Basic data of the Doyogena woreda Finance and Economic Development Department, Doyogena.
- EARO (Ethiopian Agricultural Research Organization), 2001. Feeds and nutrition research strategy. EARO (Ethiopian Agricultural Research Organization), Addis Ababa. 40p.
- FAO, 2004. Livestock sector brief: Ethiopia livestock information, sector analysis and policy branch (AGAL), Rome.
- Gebretsadik, Z. T., Anal, A. K. and Gebreyohannis, G. 2012. Assessment of the sheep production system of northern Ethiopia in relation to sustainable productivity and sheep meat quality. International Journal of Advanced Biological Research, vol 2(2), 302-313.
- Getachew, T. Haile, A., Tibbo, M., Sharma, A. K., Solkner, J. and Wurzinger, M. 2010. Herd management and breeding practices of sheep owners in a mixed crop-livestock and pastoral system of Ethiopia. African Journal of Agricultural Research volume 5(8).
- Getahun Legesse (2008). Productive and Economic performance of Small Ruminant production in production system of the Highlands of Ethiopia. PhD. Dissertation, Univ., of Hohenheim, Stuttgart-Hoheinheim, Germany.
- Gizaw Solomon, Van Arendonk, J.A.M., Komen, H. Windig, J.J. and Hanotte O., 2007. Population structure, genetic variation, and morphological diversity in indigenous sheep of Ethiopia, *Animal Genetics*. 38: 621-628.
- Ibrahim, M. N. M. and J. B. Schiere, 1989. Feeding of urea-ammonia treated rice straw. A compilation of miscellaneous reports produced by the straw utilization project (Sir Lanka). Pudoc Wageningen. pp. 1-28. Kosgey I S, Verbeek E, Kanis E, and Bett R., C 2007. Socio-economic factors influencing small ruminant breeding in Kenya. Livestock Research for Rural Development. 19 (6).
- Markos Tibbo, 2006. Productivity and health of indigenous sheep breeds and crossbreds in the central Ethiopia highlands. PhD dissertation. Department of Animal Breeding and Genetics, Faculty of Veterinary Medicine and Animal Sciences, Swedish University of Agricultural Science(SLU), Uppsala, Sweden.
- Tsedeke Kotcho, 2007. Production and marketing of sheep and goats in Alaba, SNNPR. An Msc Thesis Presented to School of Graduate Studies of Hawassa University. Hawassa, Ethiopia. 104p.
- Yenesew Abebe, Solomon Melaku, Azage Tegegne and Firew Tegegne, 2013. Assessment of sheep production system in Burie district, North Western Ethiopia. *Global Journal of Agricultural Research; Vol.1, No.2, pp.29-47.*