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Assessment of Traditional Goat Husbandry Practices in Gamo Gofa Zone, Southwestern Ethiopia

[1]*Belay Zeleke and* [2]*Meseretu Melese*

[1]Arba Minch University College of Agricultural Sciences, P.O. Box: 21, Arba Minch, Ethiopia
[2]Arba Minch University Biological and Cultural Diversity Research Center, Arba Minch, Ethiopia

Abstract: Study was conducted to assess traditional management practice and constraints of goat production in Gamo Gofa Zone, south western Ethiopia. Multi-stage purpose sampling technique was employed to select the districts and kebeles for the study. Focus group discussion and structured questionnaire were used to collect data from 225 households. Data were analyzed using descriptive statistics. Result indicated majority of the respondents were illiterate which makes the successful technology transformation as well as for improved agricultural production difficult. The study showed that the most important livestock species was cattle followed by Goat and sheep. Goats were primarily kept for asset and security purpose; milk, manure, social value, dowry to the girls' for wedding, was also raised. Uncontrolled natural mating were the main breeding practices reported by most of the respondents. Small land holding of the household plus seasonal fluctuation of feed determined the indigenous farming practice of the respondent. Seasonal fluctuations in the availability and quality of feed have been a common phenomenon, inflecting serious changes in livestock production. Dry season feed supply is the paramount problem. The feed shortages and nutrient deficiencies were more acute in dry seasons. And lack of knowledge on conservation of feeds and breeding practice were also the major problems. Hence, awareness creation and extension service on breeding practice and feed conservation technologies should be done.

Key words: Gamo Gofa · Indigenous Goat · Production System · Traditional Husbandry · Southwestern Ethiopia

INTRODUCTION

In developing countries, livestock production is mostly subsistence oriented and fulfills multiple functions that contribute more for food security [1, 2]. Livestock production is an important enterprise in Eastern Africa where about 56 % of Africa's livestock wealth is maintained. Small ruminants make a substantial contribution to the well being of the people in the region and Sub-Saharan Africa (SSA) [3, 4]. Goats are kept in all agro–ecological zones in Africa [5]. In the arid zone proper, goats are relatively much more numerous than cattle and frequently more numerous than sheep; whereas cattle are more numerous than sheep and goats in semi-arid, sub-humid, humid zones and highlands [6].

Goats account for about 30% of Africa's ruminant livestock and contribute to about 17 and 12% of the total meat and milk production, respectively. Sub-Saharan Africa (SSA) accounts for over 60% of the total, goat population in Africa, with estimated 147 million goats representing about 80 indigenous breeds or strains distributed across all agro-ecological zones and ruminant livestock production systems [7].

Similarly, in Ethiopia, Livestock support and sustain livelihoods for 80% of the rural community and 35 – 40 % of all livestock are located in the pastoral areas [8]. The country has one of the largest livestock resources in Africa with a national herd estimated to be 59.5 million cattle, 30.7 million sheep, 30.2 million goat and 56.53 million poultry. These population are widely distributed across diverse agro ecological zones of the country and not been fully exploited. In southern Nations, Nationalities and peoples Regional state (SNNPRS) 5.26 million goats are reared in various agro ecologies [9]. The total goat population of Ethiopia has increased by 30% in the last 12 years. Goats comprise 5.32% of the total

Corresponding Author: Belay Zeleke, Arba Minch University College of Agricultural Sciences, P.O. Box: 21, Arba Minch, Ethiopia. E-mail: belayzeleke63@yahoo.com.

tropical livestock units of Ethiopia, contribute an estimated 12 to 14% of meat products, 10.5% of milk production and 6% of all animals exported [10].

Livestock systems represent a potential pathway out of poverty for many smallholders in the developing world. The majority of the world's rural poor and a significant proportion of the urban poor, keep livestock and use them in a variety of ways that extend far beyond income generation. In many cases, livestock are a central component of smallholder risk management strategies [11].

Despite the importance of livestock to the diets and incomes of poor farmers, the central role played by livestock in the livelihoods of rural households in the developing world is seldom fully appreciated by policy makers, development agencies and donors. Knowledge of the available breed and heterogeneous production system will enable to design appropriate intervention for future research and enable to design policy from which the country will utilize the full potential from the cattle production subsector and/or increase the contribution of the sector to national economy. So the present study focused on assessing on traditional management practice and constraints of goat production in Gamo Gofa Zone, south western Ethiopia, which is known to be one of the potential goats producing area of the country.

MATERIALS AND METHODS

Description of the Study Area: The study was conducted in Gamo Goffa zone of south-western Ethiopia. Gamo Goffa zone is one of 13 zones of the Southern Nations, Nationalities and People Regional State (SNNPRS) and consists of 15 rural districts and two town administrations. It laid near the center of the region around 5°57?–6°71?N latitude and 36°37?–37°98?E longitude. Its general elevation ranges from 680 to 4207 masl; it receives 600–1600 mm rainfall per annum and annual temperature ranges from 10°C to 34°C. According to [9], the estimated livestock population and beehives of Gamo Goffa zone were; 1, 301, 056 cattle; 476, 329 sheep; 392, 380 goats ;50, 296 horses; 15, 244 mules; 65, 441 donkeys; 1, 029, 170 poultry and 63, 479 bee hives.

Sampling Technique and Procedure: Multi-stage purpose sampling technique was employed to select the districts and kebeles for the study. Districts were stratified based on agro ecology in to three strata; lowland, midland and highland. Based on secondary source of information, Boreda for high altitude, Kucha for mid altitude and Arba Minch zuria woreda for low-altitude part of the Zone were selected for actual data collection. Kebeles were selected from each stratum purposively based on goat population potential, agro ecology and accessibility. Accordingly 5 representative kebeles, 15 households per kebeles were selected for each woredas. Therefore a total 3 woredas 15 kebeles, 225 households were sampled and studied at zone level.

Data Collection Methods: Focus group discussion Preliminary field visits were made after gathering secondary data from local livestock extension staff about the type and distribution of indigenous goat types in the study area. Then key informant focus group discussions were held with representatives of farmer groups, extension staff and the district administration officers. A total of twelve focus group discussions were held – four per site, each having 10–12 farmers plus a representative of the extension staff. The researcher facilitated the discussion at all sites. Similarly, the selected farmers were interviewed using a structured survey questioner. The major information gathered in the survey included the socio economic status (family size, source of income, land holding, number of livestock kept etc.) of the farmers and the production system or animal husbandry practices which includes the management of animals, watering and feeding, housing etc. and the overall resource availability and utilization.

Data Analysis: All data were entered, cleaned and managed using MS Excel© worksheet. Information compiled from focus group discussions and interview were summarized and synthesized to describe the origin, distribution, major characteristics and status of the respective goat populations and production system. The data were analyzed by descriptive statistics using MS Excel and SAS [12].

RESULTS AND DISCUSSIONS

Socio-Economic Characteristics of Households: Understanding household characteristics of farming communities are vital to know the number of household labor allocated on their main economic activities [13]. Socio-economic characteristics of respondents are presented in Table (1). Based on the result of this finding (97.3%) households in Boreda and kucha were male headed where as 5.33% of the respondents in Arba Minch Zuria were female headed, which agreed with the report of Endashaw Terefe *et al.* [13] who stated the majority

(97.1%) were male headed while only 3% were female headed households in Mursi and Bodi. Similarly, Biruh Tesfahun [14] reported higher (95%) number of male headed households in Hamer woreda. In all cases female headed were lower than the male headed; which is similar with the report of Wossenie Shibabaw [15], Tesfaye Tsegaye [16], Workneh and Rowlands [17].

The majority of the household heads were of 30-40 years old in; however, the proportion of household heads with the above- and below the mentioned age group was found in the case of Arbaminch Zuria district. Similar results have been reported by Biruh Tesfahun and Belete [14, 18]. This could have an implication that in rural area adults married in their earlier age. With regard to educational status, 75.56% of household heads in the study area were illiterate. Even though, there are primary schools around the kebele, most of the respondents do not go to school in the study districts. The proportion of illiterate in this study was lower than 88% reported for shinile zone [19]. But it is higher when it is compared to the finding of Tesfaye Tsegaye [16] who reported 67.4% for Metema district. Thus, for successful technology transformation as well as for improved agricultural production in the region, working in the compass of awareness towards education is very significant.

Livestock Possession and Species Composition: The first three major livestock species from ruminant animals in the study area were cattle, goat and sheep. Donkey and chickens were also present in large number next to ruminant animal. Because of the fact that this study involved farmers who owned goat, as a major criterion, all respondent (100%) had goat. However, the proportion of farmers who owned other livestock varies between species (Table 2). Most of the respondents select cattle as most important species followed by goat and sheep. In addition, all of the respondents confirm that none of them possess any exotic goat breed. Similarly, high numbers of local livestock population were reported [14, 18, 20-22].

Purpose of Keeping Goat: Goats were primarily kept for asset and security purpose, whenever there is a need of cash they sell their goat. Hence they serve as an immediate source of income. Similarly, they used as an indication of wealth status; owning large number of livestock brought respect and high social value within the society. Since the lives of rural areas highly linked with livestock, they use them for different purposes in the social life. For instance, during cultural ceremonies and social festivals large numbers of livestock (mainly goats) were slaughtered, hence they keep large number of goats during such public events. Wide ranges of importance of goats and other livestock species viz: source of income, milk, manure, social value, dowry to the girls' for wedding, were reported by Biruh Tesfahun [14], Belay Zeleke and Minale Getachew [23], Chebo, Ayalew and Wuletaw [24], Mahilet Dawit [25], Tesfaye Kebede [26].

Land Holding and Grazing Land Availability: Land is one of the most important resources required for any agricultural farming activities. The results indicate that the average land holding were 0.9 hectare and the largest proportion of farm size was allocated for cultivation. The majority of the farmers (87.82%) reported that they have a land used for crop production whereas 11.18 % of the respondents use a rented land for crop production. On the other hand 70.22% and 21.59 % of the respondents have their own and rented grazing land respectively. The study area is known for its communal grazing and it was confirmed by the respondents as 88.95% of them use communal grazing land. 70.22% of the farmers use their own open grazing land whereas, 11.58 % of them uses a rented open grazing land.

Feed Source and Grazing Management: Grazing was practiced without sex and age separation except kids which were usually separated until they grow strong enough to browse in wild. The type of grazing land is summarized in Table (3). Goats are traditionally reared under an extensive system of management on open grassland (77.33%), tree cover grassland (9.33%), bush/shrub grasslands (8.45%), stone covered grazing land (4 %) and swampy grazing area (0.89%) under a continuous grazing system. The study showed that natural pasture, hay, crop residue and crop after math were the common feed resources used in the study area. Natural pasture was the major feed source in rainy season across all the studied area. Similar result was reported by Tadesse Estefanos *et al.* and Shigdaf Mekuriaw *et al.* [27, 28]. However, the major feed resource commonly used in dry season was crop residue as reported by 81%, 83 and 72% of the farmers in Kucha, Boreda and Arba Minch Zuria woreda respectively.

Seasonal feed shortage was among the major constraints that limit livestock production in the study area. Similarly, feed shortage was reported to be a major production constraint in many parts of the country [29-33]. One or more grazing management has been practiced by farmers to alleviate feed shortage in different

Table 1: Socio-economic characteristics of respondents

	Boreda (N=75)		Arba Minch Zuria (N=75)		Kucha (N=75)		Overall (N=225)	
Descriptor	N	%	N	%	N	%	N	%
Sex								
Male	73	97.3	71	94.67	73	97.3	217	96.44
Female	2	0	4	5.33	2	0	8	3.56
Age(years)								
20-29	5	6.67	6	8.0	2	2.67	13	5.78
30-39	44	58.66	40	53.33	56	74.67	140	62.22
40-49	24	32.0	21	28.0	16	21.33	61	27.11
50-59	2	2.67	8	10.67	1	1.33	11	4.89
Education								
Illiterate	58	77.33	52	69.33	60	80.0	170	75.56
Primary school	15	20.0	18	24.0	12	16.0	45	20.0
Secondary school	2	2.67	5	6.67	3	4.0	10	4.44
Family size	Mean±SE	Mean±SE	Mean±SE	Mean±SE				
	7.50±0.34	5.25±0.26	7.28±0.33	6.67±0.19				

Table 2: livestock possession of the respondents

Specious type	Breed type	Number of respondents	Frequency
Cattle	Local	200	88.89
	Cross		0
Sheep	Local	133	59.11
	Cross		0
	No Sheep	92	40.89
Goats	Local	225	100
	Cross		0
	No Goat		0
Chicken	Local	143	63.56
	Cross		0
	No Chicken	82	36.44
Donkey	Local	146	64.73
	Cross		0
	No Donkey	79	35.27
Goat as Most important specious			
1st ranked		40	17.78
2nd ranked		164	72.89
3rd ranked		21	9.33

forms (Table 4). The management varies with season; free grazing is practice more in dry season (47.11%) and herded grazing (29.77%) is practice during wet season. This could be due to the fact that in dry season there is shortage of feed which leads for communal grazing where farmer allow their animal to graze anywhere. Whereas the use of paddock 22.22% and tethering 37.33% in dry season were also reported. Similarly, 44.89 % of the respondents practice tethering in wet season. The increase in number could be afraid of the rain and related disease out breaks also. On the contrary Zero grazing has not been practice.

Housing: Providing a shelter for animal has impact on their productivity. Goats being small in size they are exposed to danger. Hence providing a good house can decrease environmental stress and improve productivity. Keeping animals with different size could cause loss in productivity [23]. Though the type and way of housing vary among individual farmers livestock housing is a common practice in the study area. Hence 17.25 % of the respondents keep their livestock with their family inside one house. However, 25.75 % of them use a separate house. The rest (57%) used conditional housing means they provide the house whenever necessary. For instance during rainy season and if there danger from wild animal and theft they kept with their family and during dry season they kept them in separate house or left them on the field. Majority of the respondents (32.09%) provide separated corral that have a rudimentary roof, which is thought to protect goat flock from rain and 22.67% and 2.24% of the farmers use open yard that tied with the living house and veranda houses were observed respectively.

Table 3: Land holding and grazing land availability

		Land owner type	Kucha	Boreda	Arba minch zuria	Total	%
Land holding	crops	own	70	66	62	198	87.82
		rented	5	9	13	27	11.18
	grazing	own	52	58	48	158	70.22
		rented	13	11	2	26	11.58
		other	2	6	10	18	8.18
Communal grazing	yes		73	66	61	200	88.95
	no		2	9	14	25	17.05
Type of grazing land							
Open grassland		70	64	40	174	77.33	
Tree cover grassland	own	1	6	14	21	9.33	
Bush/shrub grassland	own	2	2	15	19	8.45	
Stone covered	own	2	3	4	9	4	
Swampy grassland	own	0	0	2	2	0.89	

Table 4: Grazing management practices in the study area

Grazing management	Season	Total no. respondents	%
Free grazing (un herded)	Dry season	106	47.11
	Wet season	95	42.22
Herded	Dry season	39	17.33
	Wet season	67	29.77
Paddock	Dry season	50	22.22
	Wet season	18	8.0
Tethered	Dry season	84	37.33
	Wet season	101	44.89
Zero grazing	Dry season	0	0
	Wet season	0	0

Fig. 1: Housing system in kucha

Water Sources and Watering: Ruminates as any other animal require water to maintain the water content of the body and water availability affects voluntary feed intake; less water leads to inadequate intake of dry matter. For animals kept under pastoral production system, the frequency of watering is very important [34]. During the dry season, water is available only from wells and some lakes and streams [35]. The major water source was river which is in agreement with Biruh Tesfahun and Belay Zeleke and Minale Getachew and Mahilet Dawit [14, 23, 25]. Watering of goat flock in the study area usually is carried out by taking goat flocks to water points. During the wet season 94.64 % farmers allowed their flock to take water as they needed and when they want. Whereas, on dry season majority of the farmers 69.34% farmers allowed access to water only once per day. 53% the farmers use water which is available 1-7 km around the area in dry season. In wet season 64.03% of the famers find water source easily < 1 km.

Breeding Practice and Selection Criteria for Breeding Animals All of the respondents (100%) in the current study agreed they use natural mating. Focus group discussions and interview revealed that most of goat owners have no control on the mating of their animal. The use of communal rangeland and common source of water were the main reason for uncontrolled mating. The respondents also revealed that the major selection criterion of breeding doe and breeding buck was appearance. The same holds true in the previous study reported by Biruh Tesfahun , Belete, Belay Zeleke and Minale Getachew and Mahilet Dawit [14, 18, 23, 25]. Similarly, Growth rate, prolificacy, mating ability and color were among the top criteria used for selection.

Constraints for Goat Production: Respondents did mentioned different challenges but most of them were related to land and feed shortage. In addition, disease, Scarcity of water, drought and genotype were as among major constraints. The quantity and quality of feed resources available for animals primarily depends upon the climatic and seasonal factors [30, 36, 37, 38, 39, 40]. On the other hand during surplus production most of the feed were wasted because they don't have knowledge of feed conservation. Lack of knowledge on breeding practices, market information, lack of awareness on any technological packages and technical issues with the agricultural development agents were also mentioned as additional constraints.

CONCLUSION

Most of the respondents in the current study were illiterate which makes the successful technology transformation as well as for improved agricultural production difficult. This study showed that the most important livestock species were cattle followed by Goat and sheep. Goats were primarily kept for asset and security purpose; milk, manure, social value, dowry to the girls' for wedding, was also raised. Uncontrolled natural mating were the main breeding practices reported by most of the respondents. Small land holding of the household plus seasonal fluctuation of feed determined the indigenous farming practice of the respondent. Seasonal fluctuations in the availability and quality of feed have been a common phenomenon, inflecting serious changes in livestock production. Dry season feed supply is the paramount problem. The feed shortages and nutrient deficiencies were more acute in dry seasons. And lack of knowledge on conservation of feeds and breeding practice were also the major problems. Hence, awareness creation and extension service on breeding practice and feed conservation technologies should be done.

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