



INDIGENOUS GOAT PRODUCTION SYSTEMS IN SELECTED DISTRICTS OF WESTER AMHARA, ETHIOPIA

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Abstract: Improvement in productivity of goats could be achieved through identification the current production system with constraints, refining existing practices in the system and introduction of new technologies. This study was initiated to describe the goat production systems and to identify major constraints of goat productivity in the study area. Focus group discussion, field observation and interview were used to collect the data for this study. Goats were the most predominant species of livestock owned, followed by sheep, cattle, chicken, donkey, mule and horse respectively. Mean holding of the cattle, sheep and goat kept in the study area was 5.62 ± 0.95 , 7.27 ± 2.93 and 16.53 ± 3.50 . Goats were ranked as the first in Ebnat (index of 0.40) and Gonji kolela Districts (index of 0.37) important livestock species followed by cattle with an index of 0.27 and 0.32 in two Districts, respectively. However, in Farta District cattle was ranked as first (index of 0.37) followed by goats (index of 0.33) and sheep (index of 0.14). From this study it was possible to conclude that the general production system and goat management system in the study areas was similar to other western highland areas in Amhara region and was characterized by mixed crop-livestock production system.

Keywords: goat production, crop-livestock, Western Amhara, indigenous breed

Introduction: Smallholder farmers predominate in developing countries and they are entirely dependent on agriculture for their livelihoods (Dixon *et al.*, 2001). About three fourth of the poor in developing countries live in rural areas and two-thirds of the rural people in these

countries keep livestock (Owen *et al.*, 2005). In Ethiopia, more than 85% of the human population depends on agriculture for their livelihoods (Solomon Abegaz, 2014) and usually keep livestock as pastoralists or in mixed crop livestock systems.

The livestock population of Ethiopia is currently estimated to be 53.99 million cattle, 25.5 million sheep, 24.06 million goats, 6.75 million donkeys, 1.91 million horses, 0.35 million mules and 0.92 million camels excluding nomadic areas and is diverse genetically. Goats aged two Years and older accounts about 51.44%; among

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this 45.52%, 2.77% and 2.7% are used for breeding, milk production and meat production, respectively (CSA, 2013). Indigenous goats are resistant to diseases and parasites, good flocking instinct, ability to walk long distances in search of feed, high tolerance to adverse climatic conditions, endurance to droughts and to low and fluctuating nutrient availability (Kosgey *et al.*, 2008).

Even though Ethiopia has large size of goat population, the productivity per unit of animal and the contribution of this sector to the national as well as the regional economy is relatively low. This may be due to different factors such as poor nutrition, prevalence of diseases, lack of appropriate breed and breeding strategies and poor understanding of the production system as a whole (Tsfaye Tsegaye, 2009).

Improvement in productivity of goats can be achieved through identification the current production system with constraints and introduction of new technologies or by refining existing practices in the system. In Ethiopia, the small ruminant production system in different agro-ecological zones is not studied fully and farmers' needs and production constraints have not been identified (EARO, 2001a). Assessment of the goat production system and prioritization of the production constraints is a prerequisite to bring improvement in goat productivity in the country. Understanding the production system helps to design appropriate technologies which are compatible with the system. In general, assessment of the production system is important to plan development and research activities and bring improvements in productivity.

In the study areas, goat production system is not studied and constraints are not identified and prioritized. Therefore, assessment of the goat production systems and prioritization of goat production constraints are necessary in the areas in order to achieve improvements in productivity of goats. Therefore, this study was initiated to describe the goat production systems and to identify major constraints of goat productivity in the study area.

Materials and Methods: Description of the study area:

The study was conducted in Ebnat, Farta and Gonji kolela district of Amhara region (Fig. 1). Ebnat district is located in the South Gonder administrative zone. It is located 122 km from Bahir Dar, the capital of the Amhara region and 714 km away from Addis Ababa. 50%, 35% and 15% of a District is lowland (*Kolla*), intermediate (*Woina- Dega*) and highland (*Dega*) respectively. 15%, 45%, 30% and 15% of a District is plain, mountain, plateau and others (gorges and valleys) respectively. Annual temperature and rainfall is ranges 25^oC to 30^oC and 500-900mm. Of the 249,837 hectares of land in Ebnat, 68,599 hectares are cultivable and 108,210 hectares are designated grazing lands. Crops grown include teff, wheat, barley, maize, sorghum, beans, chickpea and sesame. Major soil types are verty, sandy and loam soil. Ebnat has a total population of 122,514. The District has a total livestock population of 562,040, from this 131,505 are goats. The district's major socio- economic problem is food insecurity (Ebnat District OoARD, 2014).

Farta district is situated at 11°40' N latitude and 38° E longitude and located at about 97 km north-east of Bahir Dar, capital city of the Amhara Region and 667 km away from Addis Ababa, capital of Ethiopia. It lies within an altitude range of 1920-4135 m a.s.l. The district receives an average annual rain fall of 900-1099 mm and a mean-range temperature of 9-25 °C. 56%, 42.5% and 1.5% of a District is intermediate (*Woina- Dega*), highland (*Dega*) and *Wurch* respectively. 29% and 45% of a District is plain and mountain respectively. The remaining 26% is gorges and valleys. Of the 103,457 hectares of land in Farta, 61,242 hectares are cultivable, 11,568 hectares are grazing lands, 13,813 hectares are arable, 5,910 hectares are forest land and 1,149 hectares are bushes and shrubs. Crops grown include wheat, barley, beans, potato, maize and chickpea. 50%, 30% and 20% of soil are brown, red and black respectively. Farta has a total population of 281,280. The District has a total livestock population of 432,822 from this 40,193 are

goats. The district's major socio-economic problem is food insecurity (Farta District OoARD, 2014).

Gonji kolela is located south of Bahir Dar in the Mirab Gojjam Zone, with an altitude of 2216 meters above sea level, annual average temperature 21 °C and annual average rainfall 1338mm. It is situated 70-km southwest of Bahir Dar. 57% and 47% of a District is lowland (*Kolla*) and intermediate (*Woina- Dega*) respectively. 16% and 20% of a District is plain and mountain. The remaining 26% is gorges and

valleys. Of the 64,186 hectares of land in Gonji kolela, 34,336 hectares are cultivable, 671 hectares are grazing land, 14,686 hectares are arable and 14493 hectares are forest, bushes and shrubs. Crops grown include teff, wheat, barley, maize, sorghum, beans and chickpea. Major soil types are salty, loam and heavy clay soil. Gonji kolela has a total population of 21,333. The District has a total livestock population of 260,685, from this 52,350 are goats. (Gonji kolela District OoARD, 2013).

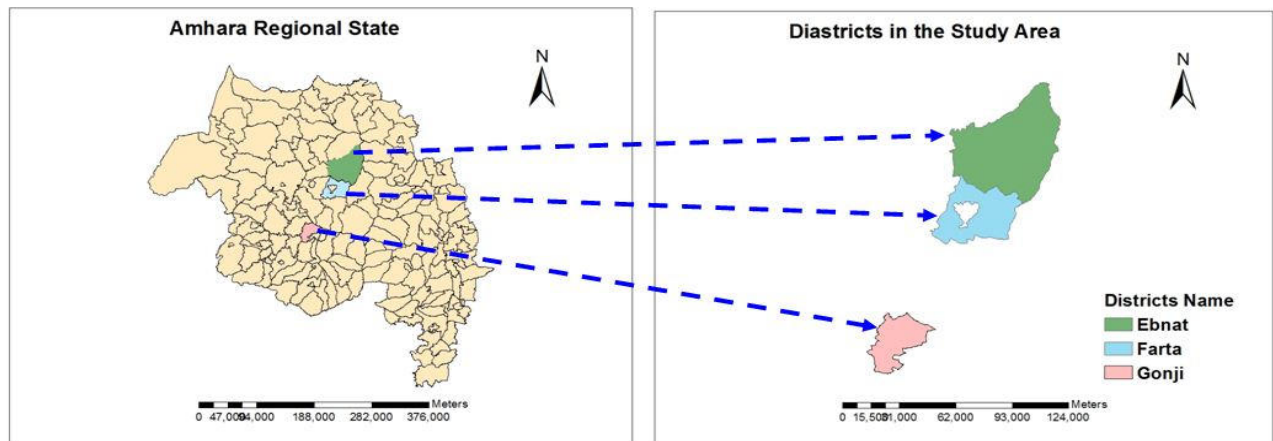


Figure 1. Map of the study areas

Data collection: The overall data were collected through secondary data collection, focus group discussion, individual interviews and field observations. From Gonji kolela and Farta district, three KAs' were purposively selected based on goat population: from Ebnat District five KAs were selected based on goat population as well as agro ecological differences. Households having at least 3 goats were purposively selected for the questionnaire survey; and a total of 45 households were used for the work.

FGD and field observation were used to support individual interview. Individual interview with FGD were used to assess and collect information on goat production system. The FGD were the composition of people believed to be knowledgeable about past and present social and economic status of the area, community elders and story tellers.

Data analysis: Data collected through questionnaire were described by descriptive

statistics using Statistical Package for Social Sciences (SPSS version 20). Pair wise comparison was undertaken for some results when it was significant difference between means. Indices were calculated to provide ranking. Index was calculated as:

Index = $\frac{\text{Sum of } (3 * \text{number of households who ranked first} + 2 * \text{number of households who ranked second} + 1 * \text{number of households who ranked third})}{\text{sum of } (3 * \text{number of households who ranked first} + 2 * \text{number of households who ranked second} + 1 * \text{number of households who ranked third})}$ for overall reasons, criteria or preferences.

Results and Discussion

Goat Production and Management

Feed resources and availability: The different feed resources reported in the study area were natural pasture, established pasture, crop aftermath, hay, crop residues, fallow land and concentrates (Table 1). The main feed resource

for goat in each District is natural pasture or browsing species both during dry and wet seasons. This is because, rangelands provide the major source of feed in both wet and dry seasons and extensive system of grazing is the only grazing practice for all Districts throughout the year.

In general the main feed resources to livestock in study area are range lands which include communal grazing lands, natural pasture, bushes and shrub areas. Among the feed resources, the natural pasture consists of a wide range of browse species and grasses. Bushes and tree branches like *bisana, girar, agam, tembelel, chocho, kitkita, kamo, abalo, ader, atat, kento, gaba, mota, abna, sheha, ebka, enkua, arna, gimero, woira* etc... are major feed

resources for goats during the dry season as well as wet season the study areas. Bushes and trees are major feed resources for goats during the dry season where there is no other source of feed. This result is in agreement with the previous studies (Tesfaye Tsegaye, 2009; Endeshaw Assefa *et al.*, 2011).

During the dry season, the important feed sources that farmers use next to natural pasture were crop residues, crop aftermath and hay respectively in Ebnat (index of 0.36, 0.18 and 0.05) and Gonji kolela (index of 0.33, 0.12 and 0.04) Districts. While, the important feed sources next to natural pasture were crop aftermath, crop residues and hay respectively in Farta District (index of 0.18, 0.12 and 0.10).

Table 1. Ranked feed sources for dry and wet season

	Dry season				Wet season			
	Rank 1	Rank 2	Rank 3	Index	Rank 1	Rank 2	Rank 3	Index
Ebnat								
Natural pasture	46.2	38.5	8.3	0.38	84.6	33.3	0	0.73
Established pasture	0	0	0	0	15.4	50.0	0	0.23
crop aftermath	0	23.1	66.7	0.18	0	0	0	0
Hay	7.7	0	8.3	0.05	0	0	0	0
Crop residues	46.2	30.8	16.7	0.36	0	0	0	0
Fallow land	0	7.7	0	0.03	0	16.7	0	0.04
Farta								
Natural pasture	76.9	8.3	0	0.44	100.0	0	0	0.65
Established pasture	0	8.3	0	0.03	0	50.0	0	0.17
crop aftermath	15.4	25.0	11.1	0.18	0	0	0	0
Hay	7.7		44.4	0.10	0	20.0	0	0.07
Crop residues	0	25.0	33.3	0.12	0	0	100.0	0.02
Fallow land	0	16.7		0.06	0	10.0	0	0.03
Concentrate	0	16.7	11.1	0.07	0	20.0	0	0.07
Gonji kolela								
Natural pasture	73.7	10.5	10.5	0.42	100.0	0	0	0.70
Established pasture	0	10.5	5.3	0.04	0	60.0	0	0.15
crop aftermath	0	15.8	42.1	0.12	0	0	0	0
Hay	0	5.3	15.8	0.04	0	0	0	0
Crop residues	26.3	47.4	26.3	0.33	0	0	75.0	0.04
Fallow land	0	0	0	0	0	20.0	25.0	0.06
Concentrate	0	10.5	0	0.04	0	20.0	0	0.05

During wet season, an important feed source next to natural pasture was established pasture in all Districts. Fallow lands provide least source of feed for goats in Ebnat District (index of 0.04). In Farta District, the feed source next to natural pasture and established pasture were hay

(index of 0.07), concentrates (index of 0.07), fallow land (index of 0.03) and crop residues (index of 0.02) respectively. Similarly, fallow land, concentrate and crop residues, respectively, provide as a least amount of feed sources in Gonji kolela District.

Table 2. Ranked categories of goats for fattening

Category of goats	Rank 1	Rank 2	Rank 3	Index
Ebnat				
Culled young male	14.3	0	0	0.09
Young females	0	0	33.3	0.03
Young males	28.6	0	0	0.18
Castrates	57.1	40.0	0	0.47
Older males	0	40.0	0	0.12
Older female	0	20.0	66.7	0.12
Farta				
Culled young male	0	14.3	0	0.05
Young males	0	28.6	0	0.11
Castrates	71.4	14.3	0	0.46
Older males	28.6	28.6	0	0.27
Older female	0	14.3	100.0	0.11
Gonji kolela				
Culled young female	0	0	10.0	0.01
Young females	0	6.7	10.0	0.04
Young males	0	20.0	10.0	0.10
Castrates	86.7	13.3	0	0.56
Older males	13.3	33.3	10.0	0.22
Older female	0	26.7	60.0	0.08

Majorities (66.7%) of respondents have both private and communal grazing land and 33.7% of respondents were used only communal grazing land for their livestock's. 68.9% of respondents in the study areas reported for goat flocks graze/ browse together with other livestock species. Most farmers are applied only free grazing method than the combination of free grazing with cut and carry system both for dry and wet season. The availability and quality of forages are not favorable and uniform in nutrient quality all year round. As a result, for animal that is not supplemented the gains made in the wet season is totally or partially lost in the dry season. Most farmers in the study area are supplement their goats specially lactating does, pregnant does, bucks and kids with roughage, mineral like salt and concentrates like bran of

different pulses, bean, wheat and barley. Most respondents in Ebnat District were fattened mainly castrates (index of 0.47) and young males (index of 0.18). However, majority of farmers in Farta and Gonji kolela Districts were fattened mainly castrates and older males (Table 2).

Water sources and watering: River water was reported to be the major water source for goats in Ebnat (index of 0.83) and Farta (index of 0.56) Districts (Table 3). The other water sources next to river were spring and water well, respectively, both in Ebnat and Farta Districts in line with the result of previous studies (Tesfaye Tsegaye, 2009; Belete Shenkute, 2009). While in Gonji kolela District, spring (index of 0.53) was the major water source followed by river, pipe water and dam/pond, respectively.

Table 3. Ranked water sources for goats

Water sources	Rank 1	Rank 2	Rank 3	Index
Ebnat				
River	84.6	100.0	0	0.83
Spring	15.4	0	0	0.14
Water well	0	0	100.0	0.03
Farta				
River	61.5	33.3	0	0.56
Spring	23.1	0	100.0	0.21
Water well	15.4	33.3	0	0.19
Pipe water	0	33.3	0	0.04
Gonji kolela				
River	52.6	0	0	0.43
Spring	47.4	83.3	0	0.53
Pipe water	0	16.7	0	0.03
Dam/pond	0	0	100.0	0.01

Housing: Almost all farmers (97.8%) in the study areas shelter their goats. Almost all respondents (90.9%) housed their goats together with other livestock species. Most (52.3%) of respondents housed kids together with adults during night time.. From the interviewed households, 44.4%, 51.1% and 2.2% of households shelter their goats in separate house with roof, family house (guro) and yard without roof, respectively (Table 4). Guro is a shelter inside the main house which is separated by half height of wall. The majority of the respondents in Ebnat District provide shelter their goats in separate house with roof (46.2%)

and family house (46.2%). While lowland areas of the District those are closer to Tekeze river (7.7%) did not shelter their goats. This was as result of huge number of animals as well as goats kept far from residential and the goat keeper manage the goats round the year and he takes 1/3 of the new born kids in a year with special agreement. All farmers in Farta and Gonji kolela Districts shelter their animals during the night time. Most (76.9%) of respondents in Farta District shelter their goats in separate house which have roof. However majority (78.9%) of respondents in Gonji kolela District shelter their goats in family house.

Table 4. Housing/enclosure for goat

Housing type	Ebnat (%)	Farta (%)	Gonji kolela(%)	Overall (%)
separate house with Roof	46.2	76.9	21.1	44.4
In family house(guro)	46.2	15.4	78.9	51.1
Yard without Roof	0	7.7	0	2.2
no house	7.7	0	0	2.2

Majority of interviewed households in the study areas used grass and iron sheet to construct roof of houses for their goats (Table 11). Mostly

wood (88.6%) and stone (52.3%) were used to construct wall and floor of animal houses, respectively.

Table 5. Housing materials used for

	Ebnat (%)	Farta (%)	Gonji kolela(%)	Overall (%)
Roof				
Iron sheets	16.7	16.7	84.2	46.5
Grass	66.7	83.3	10.5	46.5
Wood	0	0	5.3	2.3
Plastic	16.7	0	0	4.7

Wall				
Grass	16.7	0	0	4.5
Wood	66.7	100.0	94.7	88.6
Stone	0	0	5.3	2.3
Plastic	16.7	0	0	4.5
Floor				
Wood	16.7	0	31.6	18.2
Stone	50.0	69.2	42.1	52.3
Soil	16.7	30.8	26.3	25.0
Plastic	16.7	0	0	4.5

Division of labor for management of goats: In general, all activities regarding work of goat management in all study areas was similar and done by the family labor (Table 5). Respondents reported specific responsibilities of different age group of household members. In all the study areas, the responsibility of purchasing of goats, selling of goats and caring for sick goats was the responsibility of families greater than 15 years

age specially husband in line with Tesfaye Tsegaye (2009). However, all the family labor has responsible for herding (62.2%), breeding (48.9%) and feeding (75.6%). Few respondents in Ebnat District reported family labor greater than 15 years especially wife was responsible for making dairy products. However, this was not practiced other study areas.

Table 6. Members of household responsible for different activities

	Ebnat (%)	Farta (%)	Gonji kolela(%)	Overall (%)
purchasing goat				
Family labour <15 year	0	0	5.3	2.2
Family labour >15 year	84.6	100.0	94.7	93.3
all the family labour	15.4	0	0	4.4
Selling goat				
Family labour <15 year	0	0	5.3	2.2
Family labour >15 year	69.2	100.0	94.7	88.9
all the family labour	30.8	0	0	8.9
Herding				
Family labour <15 year	23.1	38.5	15.8	24.4
Family labour >15 year	7.7	7.7	21.1	13.3
all the family labour	69.2	53.8	63.2	62.2
Breeding				
Family labour <15 year	38.5	0	15.8	17.8
Family labour >15 year	23.1	53.8	26.3	33.3
all the family labour	38.5	46.2	57.9	48.9
Caring for sick goats				
Family labour <15 year	0	0	5.3	2.2
Family labour >15 year	53.8	53.8	94.7	71.1
all the family labour	46.2	46.2	0	26.7
Feeding				
Family labour <15 year	15.4	7.7	10.5	11.1
Family labour >15 year	23.1	7.7	10.5	13.3
all the family labour	61.5	84.6	78.9	75.6
Milking				

Family labour <15 year	25.0	0	0	25.0
Family labour >15 year	50.0	0	0	50.0
all the family labour	25.0	0	0	25.0
Making Dairy Products				
Family labour >15 year	100.0	0	0	100.0

Most (68.9%) of respondents reported goats are herded together with other livestock species like cattle and sheep during the day time (Table 7). Mostly (71.1%) new born kids were managed

separately from matured and older age groups during the day time for up to two month near the house.

Table 7. Response to goat flock herded during the day time

Goat group	Ebnat (%)	Farta (%)	Gonji kolela(%)	Overall (%)
Male and female are separated	0	7.7	0	2.2
kids are separated	76.9	38.5	89.5	71.1
All classes goat herded together	23.1	53.8	10.5	26.7

Health: One of the limiting factors in goat production in the study areas were diseases. The most commonly diseases affecting goats and causing most losses in the areas were pasteurellosis, anthrax, sheep and goat pox and PPR (Peste des Petits Ruminants).

Goat mortality: Deaths reported by households over the last 5 years are shown in Table 8. Higher death for all Districts was reported for kids less than 6 months age group followed by does while the least was reported for castrates. The higher mortality of kids is probably due to the susceptibility of this age group to diseases and parasites, decline in the condition of their dams as a result of different disease burdens that

leads to lowered milk production, coupled with parasitic infestation of the lambs themselves. It was found that the mortality rate of castrates was the least; this may be due to de-worming and intensive care castrates. This report is similar with other reports in the country (Tsedeke Kocho, 2007; Belete Shenkute, 2009). There was significant ($p < 0.05$) variation among the Districts that differs in flock density mortalities of all age groups except castrates. Significantly higher values were found in Ebnat District for kids less than 6 months (19.77 ± 5.61), does (15.31 ± 6.16), bucks (6.62 ± 1.71), female kids 6-12months (4.46 ± 1.96) and male kids 6-12months (4.31 ± 1.95), respectively.

Table 8. Mortality of goats by age and sex group (Mean \pm SE)

	Ebnat	Farta	Gonji kolela	Overall
Kids < 6 months	19.77 ± 5.61^a	1.77 ± 0.45^b	2.79 ± 0.62^b	7.40 ± 1.10
Male kids 6-12months	4.31 ± 1.95^a	0.38 ± 0.24^b	0.95 ± 0.35^b	1.76 ± 0.62
Female kids 6-12months	4.46 ± 1.96^a	0.46 ± 0.24^b	0.89 ± 0.30^b	1.80 ± 0.62
Bucks	6.62 ± 1.71^a	0.15 ± 0.10^b	0.37 ± 0.16^b	2.11 ± 0.65
Does	15.31 ± 6.16^a	0.92 ± 0.26^b	1.16 ± 0.29^b	5.18 ± 1.99
Castrates	0.69 ± 0.47^a	0.08 ± 0.08^a	0.37 ± 0.14^a	0.38 ± 0.15

^(a,b) Means with the same letters within a raw are not significantly different at 0.05 level

Causes for deaths: Many causes for death were reported by the interviewed households. Disease was the major cause for death in all study areas (9). The causes for deaths of goats that farmers report next to disease were predators (index of 0.24) like fox and hyena and feed shortage

(index of 0.16), respectively, in Ebnat District and predators (index of 0.34), accident (index of 0.10) and poisoning plants, respectively, in Gonji kolela Districts. While accident (index of 0.17) and predators (index of 0.15), respectively, were reported next to disease in Farta District.

Table 9. Ranked Causes for Goat death

	Rank 1	Rank2	Rank3	Index
Ebnat				
Predators	0	85.7	50.0	0.24
Disease	76.9	14.3	50.0	0.6
Feed shortage	23.1	0	0	0.16
Farta				
Predators	18.2	0	0	0.15
Disease	72.7	50.0	0	0.68
Accident	9.1	50.0	0	0.17
Gonji kolela				
Predators	18.2	63.6	0	0.34
Disease	72.7	18.2	0	0.55
Accident	9.1	18.2	50.0	0.10
Poisoning plant	0	0	50.0	0.01

Most of the farmers use government veterinary (48.9%) and the combination of government veterinary and open markets (17.8%) for prevention and treatment of their goats (Table 10). About 76.9% of Ebnat District and 42.1% of Gonji kolela District house holds use only government veterinary for their goats. However,

respondents in Farta District mainly use both government and private veterinaries. Some farmers (7.7%) in Ebnat District reported that they did not use any kind of veterinary service for their goats as well as other livestock species due to they are kept far from residential area.

Table 10. Kind of veterinary services for goats

	Ebnat (%)	Farta (%)	Gonji kolela(%)	Overall (%)
Government veterinarian	76.9	30.8	42.1	48.9
Shop or market	0		21.1	8.9
Government veterinarian & Private veterinarian	0	38.5	5.3	13.3
Government veterinarian & market	7.7	23.1	21.1	17.8
Private veterinarian & market	0	0	10.5	4.4
All the 3 services	7.7	7.7	0	4.4
no veterinary service	7.7	0	0	2.2

Major Constraints to Goat Production: A good understanding of the existing production constraints in the study regions is essential for planning appropriate interventions. The major constraints in goat production in the area are given in Table 11. Both feed and grazing land shortage and high prevalence of disease (index of 0.30) were the most limiting constraint in goat production of Ebnat goat owners. Feed shortage in both seasons limits productivity of goat and it was further deteriorated due to the absence of awareness and practice of feed conservation techniques. In Farta District high

prevalence of disease (index of 0.36) was mentioned by the goat owners as the most limiting factor for goat production followed by feed and grazing land shortage (index of 31). Most respondents complained about the efficiency of veterinary service provided by the government. Disease was also identified as important constraints for Gonji kolela goat owners. Feed shortage was the least limiting factor next to water shortage by goat owners of Gonji kolela. This is because the area receives good rain and there is a relatively large area of browse plant species. Moreover, forage

development has been given more attention in Gonji kolela District. Both lack of market and predators (index of 0.14) were reported as limiting factors of goat production in Ebnat District. Lacks of improved genotypes, predators, lack of market were also reported as limiting factors of goat production in all study areas. Water shortage was the least constraints

than other factors while it was not mentioned by Farta goat owners. This result is in line with goat production constraints reported for many parts of Ethiopia (Tesfaye Tsegaye, 2009; Belete Shenkute, 2009; Derbie Gemiyu, 2009; Dhaba Urgessa *et al.*, 2012; Solomon Abegaz, 2014)

Table 11. Ranked goat production constraints

Constraint	Rank 1	Rank2	Rank3	Rank 4	Rank 5	Index
Ebnat						
Feed shortage	46.2	30.8	16.7	0	0	0.30
Water shortage	7.7	0	0	25.0	20.0	0.06
Disease	38.5	46.2	0	12.5	0	0.30
low genetic potential	0	7.7	33.3	50.0	20.0	0.14
Market	0	7.7	8.3	12.5	40.0	0.06
Predator	7.7	7.7	41.7	0	20.0	0.14
Farta						
Feed shortage	50.0	33.3	25.0	0	0	0.36
Disease	30.0	44.4	25.0	0	0	0.31
low genetic potential	10.0	11.1	37.5	25.0	0	0.17
Market	0	0	12.5	50.0	50.0	0.07
Predator	10.0	11.1	0	25.0	50.0	0.1
Gonji kolela						
Feed shortage	15.8	5.3	11.8	14.3	11.1	0.12
Water shortage	5.3	10.5	5.9	0	0	0.06
Disease	57.9	15.8	11.8	14.3	0	0.30
low genetic potential	10.5	31.6	29.4	7.1	33.3	0.20
Market	0	10.5	29.4	35.7	44.4	0.14
Predator	10.5	26.3	11.8	28.6	11.1	0.18

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Conclusion

From this study it is possible to conclude that the general production system and goat management system in the study areas was similar to other western highland areas in Amhara region and was characterized by mixed crop-livestock production system. Goat farming is an important component of the farming activity in the study areas. The higher flock size of goats in Ebnat District and high potential of biomass production in Gonji kolela area would

suggest the scope of goat improvements in both study areas. However, goat production was constrained by high disease prevalence, feed shortage, lacks of improved genotypes, predators and other problems. Thus, technological intervention is crucial to alleviate the identified constraints for the improvement of smallholder goat production in the studied area.

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