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Farmers' Perception for Different Disseminated Breeding Ram and their Cross in Wolyita, Southern Ethiopia

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Abstract
The study was conducted at five Worda of Wolitta zone in SNNPRs. Participatory rural appraisal approach was used to assess and collect information on farmers' perception on disseminated breeding, Bonga, Doygena, Dorper rams and their crossbred sheep. Data were described and analyzed using descriptive statistics procedures of Statistical Package for Social Sciences version 20. Sheep were the dominant species of animals kept in the study areas and they were kept for immediate cash income to solve financial problems. The major constraints to sheep production in the high land and lowland study areas were disease and parasite (ranking index 0.41and 0.37) respectively. In lowland study area feed and grazing land shortage were reported as problems ranking index 0.29. Farmers reported that Dorper sheep have better growth performance; they grow fast under best management system. Compared to Doyogena and Bonga ram, Doygena sheep has better acceptance by the farmers for its resistance to disease and parasite, ability to mate more ewe, fast growth, and attractive coat color. Susceptibility to health problem and its coat color were considered as the drawbacks of Dorper sheep in the study area. Majority of farmers were in need of Bonga and Doygena rams to use them for crossbreeding with indigenous ewes. To improve the productivity of sheep in the study area, efforts towards improving the management level and the genetic potential of indigenous sheep should be combined. It is suggested that in, Sodo Zuria, Damot Sore and Boloso Sore Worda more opportunity were existed to introduce Doygena and Bonga breeding ram while in Damot Fulasa farmer show more interest for Dorper crossbred ram.
Keywords: Wolyita, breeding ram, crossbred, and farmers' preference.

Introduction

Now a day Ethiopia has around 29.33 million sheep (CSA, 2014/15) and they may be grouped into about 14 traditional sheep populations (Gizaw et al.2007,) et al, Mengesha, 2012. They are also found widely distributed across the different agro-ecological zones of the country EARO, 2000).with respect to sheep number there 4,580,220 sheep in southern region which is vast next to Amhara and Oromia region (CSA, 2014). Farmers rear sheep mainly for sale and consumption. Sheep owners gain a vast range of products and services such as meat, milk, skin, wool, manure, gifts, religious rituals, etc. Sheep are also a means of risk mitigation during crop failures, property security and monetary saving in addition to many other socioeconomic and cultural functions (et al, Mengesha, 2012). Sheep contributes 21% of the total ruminant livestock meat output of the country, with the annual national mutton production estimated to be at 77 thousand metric tons. While contributing significantly to meat production of the country, productivity or output of per sheep is low. Thus, the productivity of indigenous sheep has to be improved and efficient sheep genetic improvement programs must be initiated to boost output and profitability of the producers. To improve sheep productivity there are two fundamental way David, etal 2006, Emelie etal2016). The first one is on station crossbreeding with exotic Dorper breeds and distribution of F1 progeny to different agroecology of the region. For Dorper on-station performance of pure exotic Dorper and its F1 was good however in the context of our region there was lack of on farm performance evaluation and its acceptance by farmer. The second one was CBBi. Distribution of CBBi improved ram was considered as the most rapid way of improving productivity of indigenous sheep breeds. Consequently there were many type efforts to be exerted to exploit these unutilized resources. Now a day in southern region sheep genetic improvement through introduction of best CBBi improved sir were wildly used. Improved Doygena and Bonga ram were wildly distribute for their outstanding lamb production and their best adaptability. For a continuous supply of improved ram southern agricultural research institute are work in collaborate with ICARDA and the regional government. Doygena community based sheep producing farmer cooperative were established for a continuous supply of improved Doygena ram. Mente Dubo breed evaluation and distribution site were established for multiplication of Dorper x indigenous sheep at Areka agricultural research Centre. On the other hand since establishment Bonga agricultural research Centre produce and distribute Bonga ram throughout the country. Times to time the demand of improved ram were increasing. However apart from distributing the ram, understanding the community 'view has relevance to the success of the genetic improvement programs .Information related to adoption of improved technologies in general is lacking. Understanding the farmer preference has a bearing on the success of breeding programs Emelie eta 2016. Therefore these studies were carried out to determine farmers' perception on these sheep breeds and their progeny for further intervention and development.

Objective

•To evaluate productive performances of disseminated rams and their progenies based on farmer perception.
•To identify constraints and opportunities for future improvements and interventions

Methodology

Description of the study areas

The study was undertaken in Wolayita zones that are located in the central parts of Southern Nations, Nationalities Peoples Region (SNNPR), in sub-humid agro-ecological areas. Respective districts were selected purposefully from breeding rams were distributed. The studies areas were mandate areas of Areka agricultural research Centre. The area has two rainy seasons with highest from July to September and the rest from March to May. Improved forage like elephant grass, Desho grass, Gwatemala was widely established. The study area, were characterized by densely populated and land shrinkage. All study districts have market oriented sheep production but flock sizes are very smaller due to an acute shortage of land and population pressure.

Table 1.Description of the study sites by breeds

Description of district's	Districts			
	Damot Fulasa	Sodo Zuriya	Damot Sore	Boloso Sore
Altitude (m.a.s.l.)	1200-1500	1500 m	2000	1800-2190
Latitude (North)	6.97º 7.1'N	6º 51'N	7°35"N	7°04'60.00"
Longitude (East)	37º 38'N	37º 47'E	38°1"E	37°39'59.99"
Temperature (0C)**	12.5-19	23	17	20.15
Rainfall (annual, ml)	950-1450	1000	1200	1478.9
m.a.s.l. =meters above sea level; * **=mean daily temperature.				

Source (Respective WARDO, 2016)

Data collection

Field observation, group discussions and key informant interviews were the source of data. Based on the questionnaire Individual interview (questionnaire) were held to generate socio-economic information and management practices. For this study about 120 participants those who were experienced with bonga, doyogena and dorper improved ram were selected from the representative woredas. Group discussion was carried out composed of village leaders, religious leaders, elders, women and youths who have experience of keeping the three breeding ram and their crossbred sheep. Supportive data also considered from non-governmental organization those who distribute ram in the study area. Distributed ram data was determined through focus group discussions and using key informants within the target areas (including Keble leaders, ministry of livestock development officials and NGOs). During ram service period all distributed ram were followed up by researcher and respective Keble professional. Individual animals with the aim of providing objective information to strengthen the farmers' qualitative valuation of important traits in their sheep to be used for breeding and management purposes were considered. Farmers were requested to rank the improved breeding ram and their crossbreed lamp according to their performance. Each interviewee was interviewed in advance to select best which had suitable for the area and that according to the farmer's opinion represented the rank1(first best),rank2(second best) , rank3(third best) and rank4(fourth best), respectively.

Statistical analyses

Data were analyzed using SPSS version 20.We used for the general linear model analyses for estimation of the least squares means. Effects of agroecology based on breed and interactions between Breed and Rank and between study area and Rank were tested in chi-square. The following fixed linear model, including the main effects and 2-way interactions that were significant, was finally used to explain the variation of the sheep traits recorded: $yijkl = \mu + Sitei + Farmerj(Sitei) + Breedk + Rankl + (Breed*Site)ki + eijkl$.

Where yijkl is the interest of, either rapid growth, good adaptability, easy to manage, attractive in color and feeding habit. μ is the overall mean for the trait; Sitei is the effect of the ith site (i = high land, midland); Farmer j(Sitei) is the effect of jth farmer nested within site i (j = 1–120); Breedk is the effect of the kth breed group (k =Dorper Cross, Doygena, Bonga and indigenous); Rankl is the effect of the lth rank of the ram (l = first best, second best, third best, and fourth best); (Breed*Site)ki is the interaction effect between Breedk and Sitei; and eijkl is the. the random residual effect.

RESULT AND DISCUSSION

Sheep production system

Livestock production was the main agricultural activity for the livelihood of the smallholder farmers in Wollita Zone whereas next to crop production. Cattle, sheep, donkey and poultry are main livestock species reared by the

farm households. Root crops grown include Enset, taro, potato and crop like wheat, maize and, faba bean were major crop grown in the study areas (Barry Pound and Ejigu Jonfa, 2006, Mesfin Asaminew, 2016).

Respondents and total household members

For this study a total of 120 households were asked from the both Zones where improved ram were distributed. Of the total households, the majority (60.2%) were male headed while the remaining 39.8 house hold was female households. The overall average family sizes of households were 7.6±0.27 (table 2). As shown blow the table from highland and mid land area of the mean total male and female respondent's households was 3.9±0.17 and 3.6±0.2 respectively**.** In this study, majority household respondents were married person who maintains and is running a household were above 95.18% in both highland and midland, whereas 3.6 and 1.2 percent headed household is a widow or divorced who maintains and managing a household respectively.

Table 2.Household characteristics across the study area

Parameter	**Highland n=58**	**Midland n=62**	**Overall N =120**
	Mean	**mean ±SE**	**mean± SE**
Respondent sex			
Male	**59**	**60**	**59.75**
Female	**40.9**	**40**	**40.25**
Age(years)	**41.45±2.3**	**40.31±1.25**	**40.62±1.11**
Occupation of respondents			
Farmer	**95.45**	**98.33**	**97.56**
Governmental	**4.55**	**1.67**	**2.44**
Educational status			
Illiterate	**18.18**	**37.28**	**32**
Read and write	**45.45**	**45.76**	**45.67**
High school	**31.8**	**16.94**	**20.98**
Other	**4.54**	**0**	**1.23**
Marital status			
Married	**95.45**	**95.08**	**95.18**
Widowed	**4.55**	**3.27**	**3.6**
Divorced	**0**	**1.63**	**1.2**
Family size			
Male	**4.3±0.36**	**3.7±0.2**	**3.9±0.17**
Female	**3.6±0.6**	**3.6±0.25**	**3.6±0.2**
Total	**7.9±0.27**	**7.3±0.31**	**7.6±0.27**

Land holding

On average, the total land holding of households in the study is 1.5ha (Table 3). The size of landholding is significantly ($P<0.05$) different across the two agro -ecologies; this implies that small land holding is found in dega/high land than weyna-dega/midland areas. The possible reason might be the relations with the time more land are used for cultivation. For root crop and cereal grains, and the population is more densely due to the availability of fertile soil and attribute to the densely of human population per unit area. As a result, land holding per household has declined as human population in the area is increasing.

Table 3.Mean and standard error of land holding per household

Parameter	High land n=58	Midland n=62	Overall=120	Min	Max
	Mean ±SE	Mean ±SE	Mean ±SE		
Total land holding	0.77±0.11[a]	0.77±0.06[a]	0.78±0.05	0.0125	2.5
Crop land	0.4±0.09[b]	0.49±0.05[b]	0.48±0.05	0.0625	1.8
Fallow land	0.21±0.07[b]	0.22±0.03[c]	0.22±0.03	0.0	0.75
Grazing land	0.19±0.04[b]	0.2±0.02[b]	0.19±0.22	0.0	1.00
Land for wood	0.08±0.03[a]	0.07±0.02[a]	0.08±0.19	0.031	0.25

Livestock holding

On average, a household owned 2.98±0.34 cattle, 3±0.2 sheep, and no goat and 5.48±1.04 chickens (Table 4). There was no significant ($P<0.05$) difference in the livestock density between midland and highland area except chicken holding. The advantage of sheep over cattle was because of more productive (more prolific, less gestation interval), easily produced on a small plot of land, contribute to more flexible short-term form of investment and also easily marketable compared to cattle's.

Table 4. Livestock holing

Parameter	High land	Midland	Overall
	Mean ±SE	Mean ±SE	Mean ±SE
Indigenous			
Cattle	3.1±0.38	2.9±0.46	2.98±0.34
Goat	0.00	0.00	0.00
Poultry	3.5±0.6	6.4±1.5	5.48±1.04
Equine	0.8±0.2	0.5±0.5	0.71±0.18
Sheep flock	3.1±0.45	3±0.22	3±0.2
Male and female lamb	1.4±0.25	1.6±0.12	1.56±0.11
Mature ewe	1.68±0.17	1.8±0.12	1.8±0.1
Mature ram	1.29±0.22	1.2±0.07	1.2±0.08
Cross			
Cattle	1±0.00	1.27±0.244	1.2±0.17
Goat	0.00	0.00	0.00
Poultry	4.42±1.02	5.13±2.38	4.78±1.56
Sheep flock	1.6±0.24	1.2±0.37	1.4±0.22
Male and female lamb	1.3±0.33	1±0.00	1±0.4
Mature ewe	1±0.00	0.66±0.33	1±0.2
Mature ram	1.33±0.33	0.8±0.2	1.11±0.2
Exotic Poultry	3.08±0.65	2.95±0.46	3±0.37

Purpose of sheep keeping

Purpose of sheep keeping in the study is presented in figure 1. The primary reason of sheep keeping by the farmers was for source of income generations through the sale of live animals with an index value of 0.31and the cash obtained might be used to buy clothing and food items, pay taxes, additional fertilizers to manures and household supplies (children schools). The second main reason of sheep keeping was for meat production with an index value of 0.28 and keeping of sheep production for manure and social and cultural function were ranked as third and fourth with index values of 0.27 and 0.11, respectively. This result is in line with those of Mengistie et al, 2010), Shigdaf, etal, 2012).

Farmers' perception for introduced breeding ram and their F1

Farmers have reported different sheep trait preferences, since they have intimate knowledge of their respective local environments, conditions, problems and priorities (Shigdaf, etal 2012, (Duguma et al 2010).

Rapid growth and adaptability Preference

Most participant farmer preference Bonga ram (36.1%) for its fast growth ability and Doyogena ram for its ability to adapt (35.3%).Dorper was the least preferred breeding ram for its adaptability (1.5%).

Phenotypic characteristics and feeding habit preference

Color was used as a selection criterion in which mostly *bulla* /brown, red, or, red with white and/or faced were selected for breeding which agree the report of Shigdaf, in Amhara Region 2012, .similar finding Tesfaye et al (2010) reported that, farmers gave attention to coat color as main production traits of their sheep during decision making. As a result, most of the farmers (40.3%), explain that they have high interest for Doyogena and its cross the other 38.7% were for Bonga and its cross. Majority of farmers in the study areas prefer horned sheep for social value in the community and Doyogena sheep and crossbreds were preferred. However, its aggressive behavior and cause serious injuries were reported as drawback of Doyogena rams. Dorper rams and bonga were appreciated for their best feeding habit.

Reproductive ability and disease resistance

Farmer views for resistance to disease parasite were more Doyogena and Bonga with its F1 (40.5%, 32.4% respectively. Farmer explained 50% Dorper were more expose to disease and parasite as compared to Doyogena and Bonga rams. 44.3% of farmer of participant farmer said Doyogena ram have ability to produce multiple birth. Similarly 29.5% farmers prefer Bonga sheep for its ability to produce multiple births.

Table 5.over all farmers' view on introduced breeding ram and their crossbreds.

	farmer response in percentage			
	Dorper and its cross	Bonga and its f1	Doyogena and its f1	Indigenous
Rapid growth	20.5	36.1	25.3	18.1
Good adaptability	1.5	17.6	35.3	45.6
Easy to manage	38.8	26.9	4.5	29.9
Attractive color	1.6	38.7	40.3	19.4
Feeding habit	34.9	30.2	14.3	20.6
Ability to produce multiple birth	1.6	29.5	44.3	24.6
Disease resistance	2.7	32.4	40.5	24.3

Across worda Farmer report shows that its attractive coat color, sound body Size, its libido and ability

to produce twining has been expressed as best quality for Doygena rams (figure 1). Generally in Damot Fulasa, due to Catholic Church mission involvement Dorper sheep show good performance and near to thirty percent of farmers show interest for dorper ram, while in Damot Sore, Boloso and Sodo Zuria were, interested for Doyogena and Bonga ram. Bonga cross were appreciated for their rapid growth and attractive color. Dorper Crosse was selected as best for its rapid growth, easily manageable breed and its best feeding habit. Across the study Worda in Damot Fulasa Worda, farmer reported that Dorper cross were adaptable and highly appreciable by the farmer. Its aggressiveness behavior was considered as inferior quality for Doygena ram, similarly absences of its horn were considered as its poor quality for Bonga breed. It was reported, Dorper cross lamb were not easily marketed due to unfit trait for purchaser. Its coat color is not preferred by majority of farmer. In addition its poor ability to resist disease and parasite were emphasized as poorer traits of Dorper sheep.

Figure 1.indivdual animal trait preference across districts

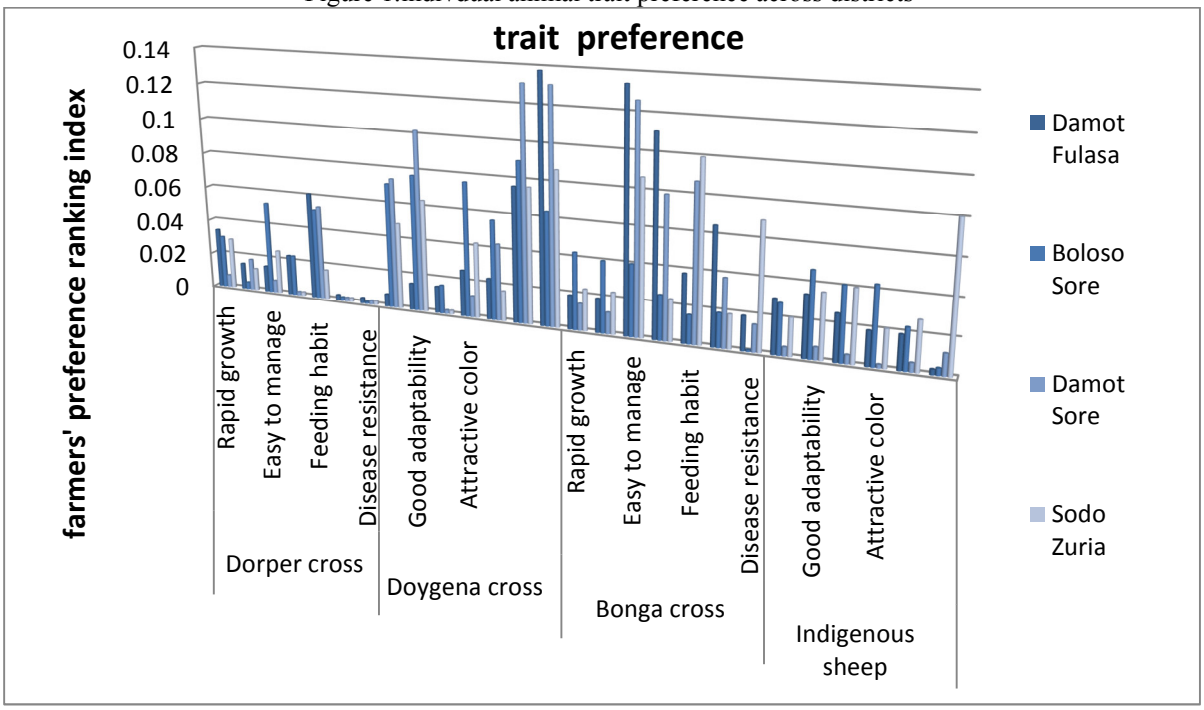


Table 6.breeding rams preference in percentage across study wordas

Breed	Farmers interest in percentage			
	Damot Fulasa	Boloso Sore	Damot Sore	Sodo Zuriya
	%age	%age	%age	%age
Dorper cross	31.04	21.4	10.43	26.36
Doygena cross	29.83	37.4	45.40	30.64
Bonga cross	30.43	31.8	41.10	33.0
Indigenous sheep	8.70	9.5	3.07	10

Source of breeding breeding sheep

The respondents results indicates that most of farmers obtain breeding ram by purchasing (47.16) and gift from different source. These is due to we concentrate only for distribute ram user during data collection. Home born ram were also use as breeding ram for neighbors. 42.18 percent of lamb was use as breeding animal. According the farmer explain fair degree of inbreeding can be expected in the flock as a single ram may be siring a number of offspring's without controlled breeding system . Similar finding is reported from Tesfaye et al (2010a, 2011b) as cited by Fsahatsion, etal,2013, for Washera sheep breed and traditional sheep production and breeding practice around Gamogofa.

Table 7.Source of sheep

Sheep source	Rams		Ewes		Lambs	
	Response	Frequency	Response	Frequency	Response	Frequency
Home born	23	21.69	14	17.72	27	42.18
inherited	8	7.5	13	16.45	8	12.5
Purchased	50	47.16	23	29.11	13	20.31
Gift	25	23.58	29	36.7	16	25

Possible opportunity to expand sheep production

Availability of high market demand and easy to manage were reported as opportunity for sheep production Shortage of land with population pressure is forcing farmers to shift from large ruminant to small ruminant production. The growing demand for meat from small ruminants, the improving transportation infrastructure and the experience of farmers in small ruminant keeping are providing opportunities to enhance the contribution of the sector (Legesse, et al 2008)..

Table 8. Possible opportunity to expand sheep production.

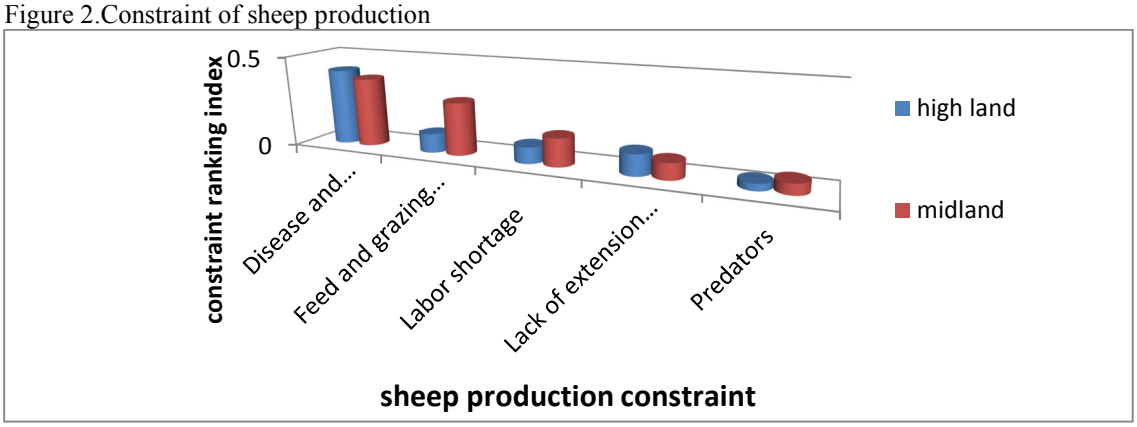
Reasons	Possible opportunity									
	Highland					Midland				
	R1	R2	R3	R4	index	R1	R2	R3	R4	Index
High market demand	10	3	6	1	0.29	24	23	4	2	0.328
Easy to manage and keep	4	12	3	1	0.28	12	22	18	1	0.283
Immediate returns	9	3	8	1	0.29	15	7	23	1	0.240
Appropriate for slaughter/consumption	2	1	2	15	0.14	4	5	6	37	0.150

Table 11. Reproductive performance compared

Constraint of sheep production

In both agroecology health problem was major constraints to sheep production (ranking index0.41 and 0.38) respectively and feed shortage were (0.1 and 0.29 respectively. The other constraints listed by farmers for sheep production include lack extension support and in adequate labor.

Figure 2.Constraint of sheep production



Feeding and watering constraint;-in the study area near to 53%,55.4% of farmer raised as presence of feed problem and the remaining 46% ,44.59of respondents report totally no problem of feed shortage in mid land and high land respectively(table).Farmers also explain ,due to lack of adequate rainfall, above ninety percent of feed shortage was occur during dry season. The major feed shortage coping mechanism in mid land and high land were crop residue 77.27%, 65.71%, hay making 13.63%, 17.14%, flock size reduction 0%, 5.7%, and follow land grazing 4.54%, 8.5 percent respectively. Sheep grazing type were grazing alone and grazing with other livestock species.

Table 9. Constraints to sheep production in the study areas.

Main reason for feed shortage	Constraint ranking									
	Highland					Midland				
	R1	R2	R3	R3	Index	R1	R2	R3	R4	index
Land shrinking and decline in productivity of grazing land	8	4	0	0	0.34	19	8	2	1	0.32
Increase of animal population	0	1	1	0	0.04	2	0	4	8	0.07
Cultivation and protection on grazing land	1	2	3	1	0.13	0	7	9	8	0.14
Drought	1	0	2	2	0.08	13	10	5	2	0.28
Increase of human population	4	5	3	1	0.30	2	7	9	2	0.15
Lack of awareness	2	0	2	2	0.11	2	1	0	1	0.04

House availability

In the study area farmers have house for their sheep during night time throughout the year to protect them from predators, cold or hot weather, and to protect from rain. This is in agreement with report of Shigdaf,etal (2012) distributed sheep housing purpose at Farta and Lay Gayint districts of South Gonder Zone of Amhara Region, and Belete et al (2010) that all small ruminants are housed for protection from adverse weather conditions and predators in western Ethiopian highlands. Majority of farmer in highland (76.9%) and midland land (64.41%)

were always housed their sheep in the main family house together with other livestock.

Disease prevalence

The major health problems reported were Internal and external parasite (54.71%, 50.22%) and (45.29%, 49.78%) for high land and mid land area respectively. From the listed disease pasturellos and pink eye disease were economically important while parasite ovine foot rot and GIT parasite were highly prevalent. Different traditional knowledge is not that much available. Farmers treat its sick animals to vet health clinics.

Table 10.List of diseases reported by farmers in the study areas.

Major sheep disease and parasite	Common health problem				Symptoms
	Amharic name	Local name	Highland %age	Midland %age	
Disease			45.29	50.22	
ovine pasteurelosis/ respiratory problem	*Goreresa*	*Bochuwa*	45.5	60.7	Nasal discharge, emanation, death
Blue tongue	*Sugeta*	*Sugeta*	8.7	-	Stop eating
Anthrax	*Aba senga*	*Telekeya*	20	19.6	Sudden death,
Sheep common cold /Coughing	*Sal*	*Kofiya*	0.0	8.9	Frequent coughing, discharge
Abortion/brucellosis	*Wureja*	*Awuchaya*	1.3	2.7	
Pink eye	-	*Ayfiya sahuwa*	24.6	8.0	Eye redness, eye become cloudy and blindness
Internal and external parasite and non-infectious disease			54.71	49.78	
GIT parasite	*Kezen*	*Kera*	32.26	17.1	Diarrhea, emaciation, rough hair coat, loss of appetite and death
ovine foot rot	-	*Odo*	35.48	32.4	causes inflammation of the hooves and Lameness
External parasites(leech, hard and soft tick, mange mite)	*Alket/mezger*	*Danko*	19.35	37.8	Itching,
Bloat/Poisoning/non infectious	*nefate*	*Pura*	12.90	12.6	stop gastric circulations, bloating then death

N.B local name of the diseases were given in Wolaita language

Figure 3.Dorper 50 %crossbred ram (right) and it's F1 (left)

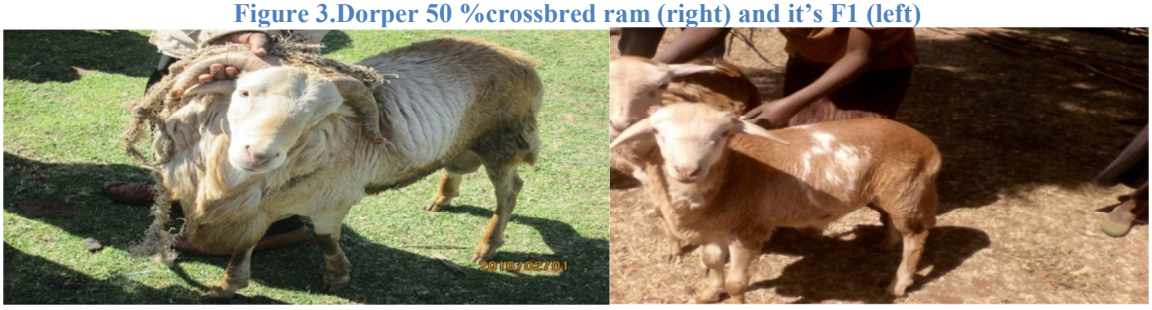


Figure 4.Doyogena Ram(left) and its F1(right)

Figure 5.Bonga rams (right) and its F1 (left)

Conclusions and Recommendations

Based on farmer perceptions' we can conclude that, productive performances of different breeding ram were vary and some of breeding ram were not preferred by the farmer. Sheep keeping in the study areas are important for the livelihood of the farmers. Bonga and doyogena ram and its F1 have been more preferred by the farmers for their ability to resist disease and parasite, easily adaptability, fast growth, and attractive coat color. Dorper sheep were appreciated for its docile, non-aggressive and best feeding habit, however, its susceptibility to disease and parasite, its coat colors were emphasized as inferior quality of the breed. Lamb born from Dorper was not easily marketed due to unfit trait for purchaser. Crossbred F1from the ram were better preferred by the farmers for their overall merit of both adaptation and productivity. Farmers in Damot Fulasa show interest for mostly for Dorper ram, and additionally, Doyogena and Bonga ram while in Damot Sore,Boloso and Sodo Zuria are, only in need of Doyogena and Bonga ram to use for crossbreeding with indigenous ewes .Disease prevalence and shortage of feed are the most important sheep production constraints and therefore efforts should be made on improving veterinary service and the feed availability.

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