

## Assessment of Farmers' Perception on Performance of Different Disseminated Breeding Ram and their Cross to Damot Sore and Merab Badewacho Worda, Southern Ethiopia

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### Abstract

Near to 99.99 percent of sheep breeds in southern region is in the traditional way, in which indigenous breeds and types predominate. Indigenous sheep genetic improvement via 50% Dorper crossed ram introduction and community based sheep breed improvement, are found mostly under taken by southern agricultural research centre. 50% Dorper crossed ram, Bonga and doygena ram were widely distributed to different agroecology of the region. The objective of this paper is to assess the productive performance of introduced ram based farmer perceptions and to analyze performance of the introduced breeding ram in Damot sore and Merab Badewacho worda southern Ethiopia. Community based improved Doygena ram were preferred for their ability to produce multiple birth, for its attractive coat color, its resistance to health problem in Damot sore while in Merab Badewacho the breed perform less significant. Bonga ram and its F1 appreciated for fast growth and good adaptability in Merab Badewacho whereas in Damot Sore it could not perform at it is expected. Comparative performances based on farmer view show that Dorper cross were preferred for its docile behavior in Damot Sore Worda. Farmer in Damot Sore Worda appreciated the doygena ram for its sexual performance/libido. Most of the respondents reported Dorper and its cross is not easily marketable. It is suggested that in Damot Sore worda more opportunity were existed to introduce improved Doygena, Bonga and Dorper ram while in Merab Badewacho efforts should be directed to develop local sheep selection or introduced Bonga ram to smallholder farmer.

**Keywords:** Breeding sheep; Farmer perception; Damot sore; Merab Badewacho

### Introduction

To improve productivity of indigenous sheep Southern agricultural research Centre has applies its effort in many directions. One of the option was CBBI through natural selection and distribution of first best ranked ram to different agroecology of the region. Bonga and Areka agricultural research Centre established a cooperative for continuous supply of Bonga and Doyoena improved ram. For the last 4 consecutive years near to 1000 breeding ram technologies were distributed across different agroecology. Most documented work on the productive performance of indigenous sheep were at station rearing condition in the region is from research stations BED sit. Based on operational research and technology dissemination programs Merab Badewacho and Damot sore worda was selected as ORTD site and in both worda doygena and Bonga ram were distributed for genetic improvement purpose. In animal genetic improvement, during technology diffusion the question of technology adaptability is the most important one. Also the rate of adoption of a new technology is subject to its profitability and the degree of risk and uncertainty associated with it, agricultural policies, and the socio-economic characteristics of farmer's acceptances is the most important. Intensity of animal adoption and farmer preference is actually the most critical criterion in animal technology diffusion process. Smallholder sheep producer use different phenotypic features including adaptive attributes to identify and select their breeds, for centuries. Study indicate that farmers may be rejected the crossbreds F1 lamb produced from introduced ram if the progeny have phenotypic feature is dissimilarity with their local breeds. Even introduced ram and its F1 have larger body size and higher body weighted sheep it may not prefer by farmer. A study conducted for exotic sheep X local sheep cross breeding indicates except Awassi most distributed crossbreds neglected by farmer because they did not meet farmer phenotypic preference [1] in a similar case among regional

sheep breed across agroecology adaptability and farmer preference variation were observed. Thus during introduction and adaption new improved breed considering acceptance among farmers and understanding of adaption of the technology were important point. This was analyzed by examining introduced breeding sheep, their production performance and farmer acceptance relative to home-grown sheep in various phenotypic reasons. Therefore the objective of this paper is to assess interest farmer based introduction of improved sheep in Damot Sore and Merab Badewach.

### Objective

To evaluate performances of disseminated rams and their progenies based on farmer view.

To identify constraints and opportunities for future improvements and interventions.

### Materials and Methods

#### Description of study site

The studies were conducted at Damot Sore and Merab Badewach

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woredas. Damot Sore is located in between 7°35" North Longitude; and 38°1". Agro ecology of the areas is 58% highland (Dega), 42% midland (Weina Dega). The average temperature varies from minimum 13°C to maximum 21°C. The annual average rainfall of Damot Sore is 1200 mm. Merab Badewacho is situated at an altitude ranging from 1750 to 2100 m.a.s.l and located in between 7°7" North Longitude; and 37°43". The average temperature varies from minimum 15°C to maximum 27°C. The annual average rainfall varies from minimum 900 to maximum 1200 mm (Source Zonal agriculture and rural development department and the office of livestock and fishery of Damot Sore and Merab Badewacho Worda, 2016).

## Data collection

Data were collected via field observation, group discussions and key informant interviews. Based on the questionnaire Individual interview (questionnaire) were held to generate socio-economic information and management practices. Farmers included in this study were those who have detail information about the breed and use it so far. The selected farmers had, ram holder, and have comparative knowledge about the distributing breeding ram, i.e., Bonga, Doygena and indigenous additionally Dorper sheep were considered for Damot sore districts. In these study collaborative agency who carried out breeding sheep distribution were involved. This was determined through focus group discussions with Worda office of livestock and fishery development officials and breeding sheep holder within the target areas including local leaders, ministry and NGOs were involved.

In total of, 60 breeding ram beneficiary farmers and breeding ram service user were asked, from 25 from Merab Badewacho and 35 from Damot sore. Of the 60 beneficiary farmers, 35 for Damot sore worda respondents have satisfactory information for the three sheep breeds groups, whereas 25 for Merab Badewacho had only Bonga and Doygena and their cross. During data collection farmers were requested to classify the introduced sheep groups according to their preference and capability of adaptability. In addition farmers were requested to classify based on morphology and coat color, growth ability easiness to manage, feeding habit and mainly, when possible, use of their knowledge of the preference of each animal. Within each of the three breed groups. According to the farmer's opinion represented the rank 1 (first best), rank 2 (second best), rank 3 (third best) and rank 4 (fourth best), respectively. Distributing Breeding sheep were from CBBI improved sheep from Bonga agricultural research Centre and Areka agricultural research center Doygena CBBI. Thus, the origin of improved breeding sheep is from different agroecology of the region.

## 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 were significant, was finally used to explain the variation of the sheep traits prefer by farmer:  $y_{ijkl} = \mu + \text{Site}_i + \text{Farmer}_j(\text{Site}_i) + \text{Breed}_k + \text{Rank}_l + (\text{Breed} * \text{Site})_{ki} + e_{ijkl}$

where  $y_{ijkl}$  is the trait of interest, either rapid growth, good adaptability, easy to manage, attractive in color and feeding habit.  $\mu$  is the overall mean for the trait;  $\text{Site}_i$  is the effect of the  $i$ th site ( $i$ =high land, midland);  $\text{Farmer}_j(\text{Site}_i)$  is the effect of  $j$ th farmer nested within site  $i$  ( $j$  = 1–120);  $\text{Breed}_k$  is the effect of the  $k$ th breed group ( $k$ =Bonga and its Cross, Doygena and its cross, and Dorper and its cross and indigenous);  $\text{Rank}_l$  is the effect of the  $l$ th rank of the ram ( $l$ =first best, second best, third best, and fourth best);  $(\text{Breed} * \text{Site})_{ki}$  is the interaction effect between  $\text{Breed}_k$  and  $\text{Site}_i$ ; and  $e_{ijkl}$  is the random residual effect.

## Result and Discussion

### Respondents and total household members

For this study a total of 60 households were asked from the both study area where improved ram were distributed. Of the total households, the majority (66.67%) were female headed while the remaining 33.33 house hold was male households. The overall average family sizes of household's were  $4.45 \pm 0.383$  (Table 1). In this study, majority household respondents were married person who maintains and is running a household were above 85.71% whereas 14.29 percent headed household is widowed.

### Choice of breeding rams

For the success of indigenous sheep genetic improvement understanding the community breeding animal preference is important [2]. The first issue is choice of breeds. Sheep producing communities commonly prefer to keep their own traditional breeds to meet their multiple breeding objectives. Farmer's preferences for breeds are influenced by their perceptions of their breeds and previous genetic improvement effort in the area. Farmer reported different preference for introduced breeding ram and their cross, for instance in Merab Badewacho Bonga ram and its cross were significantly preferred for its fast growth rate (ranking index 0.63), its coat color (0.474) and for its best feeding habit (0.43). Doygena sheep is preferred for its ability to produce multiple births in both study area (Table 2). In both study area no encounter of market problem for introduced Doygena and Bonga ram cross. Generally in Merab Badewacho majority of the interviewed farmer have an interested for Bonga sheep than Doygena and indigenous sheep. On the other hand for Damot sore worda Doygena breeding ram and its cross were appreciated for its fast growth rate (0.33), for its best adaptability (0.33), for its attractive

Parameter	Damot sore n=35	Merab Badewacho n=25	Overall N=60
	Mean ± SE	mean ± SE	Mean ± SE
Respondent sex			
Male	11	9	33.33
Female	24	16	66.67
Age(years)	49.00 ± 20	36.82 ± 1.08	42.91 ± 1.11
Marital status			
Married	86.6	90	85.71
Widowed	13.4	10	14.29
Total family size	5.5 ± 0.50	3.46 ± 0.27	4.45 ± 0.383

N=number of respondents

**Table 1:** Household characteristics across the study area.

*Bula* and light red coat color (0.333) and for its ability to resist disease and parasite (0.36), for its ability to mate more ewe (0.52), and for its ability to produce multiple birth at one delivery (0.44), Dorper cross is preferred for its best feed habit (0.33), and its docile behavior. In both study area aggressive behavior of Doyogena ram is not preferred by farmer' (Table 2).

### Possible opportunity to expand sheep production

The greatest number of respondents' reason for expansion of sheep production in the study area is for their immediate return (ranking index for Damot Sore and Merab Badewach) were 0.29, 0.31 respectively as shown in Table 3. In addition high market demand availability (ranking index 0.28), and appropriate for slaughter (0.21) were reason reported for Merab Baewacho farmer. For Damot sore easy to manage (0.27), high market demand (0.0.22) similarly for appropriate for slaughter were main raised reason. It is possible to say almost all

of the interviewed farmer shows the future interest to continue and/or expand sheep production. Among the reason of sheep production expansions, immediate return and high market demand are the most appreciated issues currently for sheep production. These results are agreed with the report of Fshatsion, 2013 Tsedeke [3] and Belete et al. [4] in Gamo Gofa Zone, Halaba area and Jimma zone.

### Selection criteria for breeding sheep

The preferences of farmer to select best breeding rams are presented in Table 4. Regarding with animal sex majority of farmer show interest for both male and female animal farmer reported that Dorper with its F1 and Bonga with its F1 were susceptible with disease and parasite (Table 5). For Damot Sore worda, respondents show interest for Doygen (40%) and for Bonga (33.33) ram while in Merab badewacho only Bonga was selected for breeding. The primary selection criteria were in the Damot Sore were based on the breed Physical appearance

Respondents interest in choice of breeds	Ranking index						
	Damot Sore				Merab Badewacho		
	Dorper cross	Bonga cross	Doygena cross	Indigenous	Bonga cross	Doygena cross	Indigenous
For its rapid growth	0.30	0.30	0.33	0.07	0.63	0.21	0.16
For its instantaneous adaptability	0.21	0.24	0.33	0.18	0.27	0.20	0.53
For its Docile Behavior	0.40	0.23	0.10	0.27	0.333	0.167	0.500
For its attractive coat color	0.212	0.242	0.333	0.212	0.474	0.369	0.158
For its best feeding habit	0.333	0.300	0.300	0.067	0.43	0.41	0.16
For its ability to resist disease and parasite	0.14	0.21	0.36	0.29	0.39	0.19	0.42
For its ability to mate more ewe	0.09	0.26	0.52	0.13	0.25	0.43	0.31
For its ability to produce multiple birth	0.15	0.26	0.44	0.15	0.37	0.47	0.17

Table 2: Ranking of introduced improved sheep and their cross by beneficiary farmers.

Reasons	Rank of reason									
	Damot sore					Merab Badewacho				
	R1	R2	R3	R4	index	R1	R2	R3	R4	Index
High market demand	9	3	6	1	0.22	13	14	4	0	0.28
Easy to manage and keep	7	12	3	1	0.27	12	9	0	0	0.21
Immediate returns	12	3	8	1	0.29	15	7	15	0	0.31
Appropriate for slaughter/consumption	8	5	2	5	0.22	7	11	6	1	0.21

Index = ((4 for rank 1) + (3 for rank 2) + (2 for rank 3) + (1 for rank 4) divided by sum of all reason mentioned by the respondents.

Table 3: Possible opportunity to expand sheep production.

Respondents response for breeding sheep selection	Study site			
	Damot Sore		Merab Badewacho	
	N	% age	N	% age
By sex				
Male	7	29.16	3	7.5
Female	5	20.83	14	35
Both types	12	50	23	57.5
Based on breed type				
Dorper cross	6	24		
Bonga	8	33.33	17	62.96
Doygena	10	40	7	25.92
Indigenous	1	4	3	11.11
Sheep breed susceptible with disease and parasite				
Dorper(50%) and its F1	9	42.85		
Bonga and its F1	10	47.61	3	23.5
Doyogena and its F1	1	4.7	6	8.8
Indigenous sheep	1	4.7	2	17.64
Selection criteria for breeding sheep				
Physical appearance(length, color, height)	11	52.38	9	42.85
Breed performance	7	33.33	10	47.61
Progeny performance	3	14.28	2	9.5

Table 4: Respondents response for breeding sheep selection.

Major constraints	Rank of constraint									
	Damot sore					Merab Badewacho				
	R1	R2	R3	R4	index	R1	R2	R3	R4	index
Disease and parasite	21	6	1	0	0.469	14	17	2	2	0.36
Feed and grazing land shortage	4	12	1	0	0.244	27	14	0	0	0.48
Labor shortage	0	5	1	0	0.077	6	5	3	1	0.15
Lack of extension support	2	8	7	0	0.208	0	0	0	1	0.00
Predators	0	0	0	1	0.005	0	0	1	4	0.02

Table 5: Major sheep production constraints.

Local name		Common name	Ranking index by location		symptoms
(Amharic and Wollitta language)	Hydia language		Damot Sore	Merab Badewacho	
Goreresa, (Amheric), Bochuwa (Wollitta language)	Kutisojaboeye	ovine pasteurelosis/ respiratory problem	2	1	Nasal discharge, emanation, death
Sugeta ((Wollitta) language)	Sugeta	Blue tong	5	2	Tongue and Mouth swelling, stop eating
Aba senga (Amheric), Telekeya (wollitta language)		Anthrax	6	-	Sudden death,
Sal (Amharic), Kofiya, wollitta language)	Kutisojaboeye	Lung warm/Sheep common cold	3	4	Frequent coughing, discharge
Wureja (Amheric language, Awuchaya wollitta language)	Kereqrema	Abortion/brucellosis	-	3	Abortion
Ayfiya sahuwa (wollitta language)	Jeltilosoxile	Pink eye	7	7	Eye redness, eye become cloudy and blindness
Kezen (Amheric), Kera (wollitta language)	Enishasha	GIT parasite	1	6	Diarrhea, emaciation, rough hair coat, loss of appetite and death
Odo (wollitta language Alket/ mezger(Amheric) Danko (wollitta language)		Externa parasite like ovine foot rot leech, hard and soft tick, mange mite)	4	5	inflammation of the hooves and Lameness Itching,
Nefate(amheric) Pura (wollitta language)		Bloat/Poisoning/non infectious	-	8	Discharge, stop eating, stop gastric circulations, bloating then death

Table 6: Common types of diseases and parasites.

(length, color, height) of the ram (52.38%) while the introduced breed performance (47.61) was the primary selection criteria for Merab Badewacho. This finding is in agreement with the results of Fсахatsion, 2013.

### Major sheep production constraints

The main sheep production constraints reported by the beneficiary for Damot Sore districts were disease and parasite (rank index 0.54 and feed shortage (0.28) and lack of extension support (0.24) were second and third constraint in the area table). For Merab Badewacho districts the primary reported problem was feed and grazing land shortage (rank index 0.301). Health problem and labor shortage were the second and third problem reported by farmer index ranked 0.226, 0.092, respectively. The present study for extension support is disagreeing with the report of Ermias, 2015 (Table 6).

### Common types of diseases and parasites

Major diseases and parasites were ranked by farmer according to the disease relative economic importance. These diseases were identified by the symptoms when asked for the respondents and the symptoms. Based on the survey results GIT parasites, ovine pasteurelosis/respiratory problem and lung warm/Sheep coughing are the most important diseases prevalent in the Damot sore worda and ranked first, second and third respectively. External parasite, blue tong and anthrax were prevalent and ranked fourth, fifth and sixth respectively. Pasteurellosis, blue tong and brucellosis are the most important diseases prevalent in the Merab Badewacho and ranked first, second and third, also the

same incidences of lung warm, external parasite and GIT parasite were prevalent. Among the above mentioned diseases Pasteurellosis, blue tong and brucellosis causing the most serious/economic loss in Merab Badewacho. These study is agree with the report of Fсахatsion, 2013 GIT parasite is cause of huge loss for huge amount of lambs, ewes and rams. of it can be concluded that, ovine pasteurelosis/respiratory problem the major problem in both study area [5].

### Conclusion and Recommendation

In both study worda respondents appreciate Bonga sheep for its ability to adapt and its progeny fast growth. In Damot Sore farmer like all three breeding ram. However their interests for Doygena breeding ram were much higher. In breeding sheep aspect Dorper sheep was not meet farmer interest because of black coat color. It is suggested that to achieve upsetting farmer breeding ram interest which is increasing time to time further increasing of breeding ram producer cooperative work are needed.

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