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Dorper Sheep Technology Transfer in Damot Gale Woreda: Role of Food Security

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Abstract
A cross sectional study has been conducted in Damot Gale woreda with the objectives of documenting the role and technology transfer of Dorper sheep crosses. Three PA were selected, 4, 4, and 2 Dorper sheep crosses were distributed for Cocca, Ade koysha and Wanddara PA target women, respectively to run technology transfer. The Dorper is a hardy South African composite breed, derived from a cross between the Black headed Persian, and regarded as early-maturing improved sheep breed. The breed adapts well to a wide variety of environmental conditions and has fast growth than local sheep breed in the woreda. Technology transfer is the most important tool for livestock improvement. Lack of extension service in Dorper technology transfer as a problem was identified. Further study is needed to scale upping facilitating market opportunities by connecting the marketing route of this locality with big market players
Keywords: Cross sectional, Dorper, improvement, and technology trasfer

Introduction

Ethiopia has around 26 million sheep (CSA, 2013) and most of the sheep population of the country is kept by smallholder farmers and sheep production in the country is traditional (EARO, 2001). Comparing the presence of large population, the productivity of indigenous sheep is very low mainly due to low genetic potential. And in spite of its vast land size and agricultural potential, Ethiopia has been trapped in the state of food insecurity and poverty

Within the aim of improving indigenous sheep productivity, in Ethiopia crossbreeding has been undertaken employing several exotic breed. However, efforts made so far did not bring significant change because of sustainability problems (poor performance of imported breeds from the temperate developed world into tropical countries has created a negative image for genetic improvement programmes) (Ayalew *et al*., 2003).

Food security is closely linked to the concept of livelihoods, so that analyses and assessments of the food-security situation in poverty-stricken areas have increasingly included a livelihood perspective (FAO, 2011). The sustainable livelihoods framework identifies five types of assets (physical, natural, financial, social and human) that individuals or households can draw upon selectively in the pursuit of desired outcomes, such as increased income, reduced vulnerability and improved food security.

There is no easy way to measure food security; it is a complex phenomenon determined by the interaction of a broad range of agro-ecological, environmental, socio-economic, political and biological factors. Most food-security monitoring systems draw heavily on two information sources, crop and/or livestock production data and market price information. Therefore, it is obvious that livestock sector has its own role in food security.

Recently, the Dorper was imported from South Africa to Southern Nation Nationality and People State, Wolaita zone to evaluate the breed as a potential performance (Belete *et al.,* 2014). The first Dorper batch imported to Areka Agricultural Research Center, breeding, evaluation and distribution (BED) site for the breed establishment, along with a genetic improvement programme to improve mutton yield of local sheep at Wolaita zone(AARC, 2012). So far concerning to Dorper sheep breed crosses, no adequate research has been conducted in Ethiopia. As a result, the intention of this paper is to explore the particular role of Dorper sheep in smallholder livelihoods and food security and in the socio cultural aspects of smallholder life. Therefore, the objectives of the research were: to assess Dorper sheep technology transfer and its role in feed security

Materials and Methods

Wolaita zone located at 330 kms to the south-west of Addis Ababa and 160 km from Hawassa, the regional capital city. Its altitude ranges from 1200 to 2950 masl. It has twelve woreda, of which, Damot Gale woreda was purposively selected based on Dorper sheep distribution. Damot Gale is located in between 6º51" and 7º35" North Longitude. Agro ecology of the areas is 60% highland (Dega), 28% midland (Weina Dega) and 12% (kola). The average temperature varies from minimum 13.6^{0}C to maximum 25.1^{0}C. The annual average rainfall in Damot Gale is 1175 mm. In a bimodal pattern with three distinct seasons; dry (November to February), small rains from March to June and big rains from July to October in both districts (NMA, 2013, WZFED, 2013).

Sampling procedures and methods of data collection

All farmers who received improved breed (Dorper sheep) were a sample frame. A total of 65 households were monitored and considered purposively for the household survey in the current study based on Dorper sheep crosses distribution. From Damot Gale woreda, three PA were selected, 4, 4, and 2 Dorper sheep crosses were distributed for Cocca, Ade koysha and Wanddara Bolosso PA target women, respectively to run technology transfer.

Data management and analysis

SPSS (2011) software was used to analyze quantitative using descriptive statistics and graphic presentation was made by using Microsoft Office

Results

Dorper Sheep Cross Flock Composition and Dynamics

A total of 10 Dorper sheep crosses were distributed for selected farmers, of which 5(50%) were males and 5 (50%) were females (Table 1). Birth was the routes of entry into the flocks. Over 6 month period, 3 lambs were born.

Table 1: Structure, entry and exit of Dorper sheep crosses in the study area (values shown are totals across 6 households).

Start(November, 2014)		Male			Female			Total
		Young	Adult	Total	Young	Adult	Total	
	(n)	0	5	5	0	5	5	10
	%	0	50	50	0	50	50	100
Entries	Births	1	0	1	2	0	1	3
	Total	1	0	1	2	0	1	3
Exit	Sale		0	0	0	0	0	0
	Death	0	1	1	0	1	1	2
	H/ slaughter	0	0	0	0	2	2	6
	Others	0	0	0	0	0	1	2
	Total	0	1	1	0	1	1	2
End (April, 2014)								
	(n)	1	4	5	2	4	6	11
	%	9.09	36.4	45.7	18.18	36.4	54.6	100

Others indicate mechanical damage, theft and losses.

Purpose of Keeping Dorper Sheep Crosses

Table 2: Purpose of keeping (index) Dorper sheep breed crosses as ranked by respondents in the study areas.

Purpose	Damot Gale woreda, Wolaita zone		
	Cocca	Ade Koysha	Wanddara
For meat	0.28	0.28	0.30
As income source	0.25	0.23	0.24
For manure	0.13	0.14	0.11
For breeding	0.27	0.29	0.26

Index= sum of (3 X number of household ranked first + 2 X number of household ranked second+ 1 X number of household ranked third) given for each purpose divided by sum of (3 X number of household ranked first + 2 X number of household ranked second + 1 X number of household ranked third) for all purpose of keeping Dorper sheep in a production system.

Food security role of the Dorper breed

Table 3: Food security role (index) Dorper sheep breed crosses as ranked by respondents in the study areas.

Food security role	Damot Gale woreda, Wolaita zone		
	Cocca	Ade koysha	Wanddara Boloso
Minimum inputs to produce lamb	0.30	0.29	0.30
Tolerance/ hardiness of the breed	0.28	0.22	0.30
Meat acceptance	0.22	0.28	0.28

Index= sum of (3 X number of household ranked first + 2 X number of household ranked second+ 1 X number of

household ranked third) given for each purpose divided by sum of (3 X number of household ranked first + 2 X number of household ranked second + 1 X number of household ranked third) for all food security role of the breed.

Discussion

Dorper Cross Breed Sheep Flock Composition and Dynamics

Of the total monitored, Dorper sheep flock composition and dynamics 54.6% was females and 45.4% was male sheep (Table 1). The present findings are slightly higher number of female and lower number of male which agree with the report of (Deribe, 2009) in Ethiopia, irrespective of the differences in a production system and resource base. The higher female number in the flocks of the semi intensive production system was because they are retained for breeding in order to diffuse technology transfer while fewer males are kept for breeding and immediately finishes for market. Birth was the reason for entry, accounting for 1male lambs (9.09%) and 2 (18.18%) female lambs. The exit routes vary widely among the study sites. Death due to diseases, concentrate and forage bloats and other digestive disorders contributed 9.09 % in the flocks.

Food security role of the Breed

Minimum input requirement to produce lamb

Discussions with key informants and flock holders showed that farmers appreciate the capability of Dorper to produce lamb, as meat better than local sheep, with minimum input. The fact is that, Dorper sheep are able to consume diverse feed source and plant species that cannot be easily consumed by local sheep: like Crop residues (straw of wheat, teff, barley), *chat* leftover and pods and broken seeds of haricot bean), was mentioned as the amazing desirable feature of Dorper sheep breed.

Hardiness

As far as winter hardiness is concerned, they always have access to a wind break when the wind howls; they are not being housed with the exception of those that lamb during the winter. To the truth colder temperatures, taking zero degrees without a problem is good enough for. However, since Dorpers can also be found further North in colder climates. We are sure that a lack of winter hardiness is not a trait applying to Dorper sheep. Besides this, the easy lambing, good mothering and fertility as well as the adaptation is one of good peculiarity trait for the breed.

Adaptation and meat acceptance

The high adaptability traits, early maturity and easy to manage the breed made superiority in the studied area, this finding agrees with the previous report of Gavojdian *et al.* (2013). Pre-weaning mortality was low agree with Belete *et al.,* 2014 (2.93%), due to the breed is so voracious, non selective bushes and has good appetite which develops immunity to against with diseases. This reflects organic meat production through non conventional feed sources, which enhance meat acceptance and keeps leanness and colorfulness of meat.

Provide organic fertilizer and as income generation

Farmers keep Dorper sheep for many reasons, the major reasons being that they are the source of food for meat and income generation as cash and a form of savings was reported to be for meat (lamb production). Besides these major reasons, some respondents used Dorper ram as breeding purposes through natural mating for themselves and for neighboring per ram they cost 10 birr. This reflects that they are gaining income. And they used the manure's of Dorper sheep for fertilizer. This agrees with (Amelmal (2011). Farmers with no cattle reared sheep for the purpose of manure, because, '*enset*' particularly at its early stage require high amount of manure.

Dorper sheep crosses Technology Transfer

As a party of heart of technology innovations, the Triple Helix System, the government agency has been a leading provider and contributor of new knowledge and technology transfer such as livestock production, some commercial animal technology transfer and others. Moreover, such a strategy provided opportunities for training and collaborating with the community, academics and the company by transferring technology based on the guidance of the country's economic and social development. The synergy, therefore, played a pivotal rule in collaboratively developing these people's community as depicted in Figure 1.

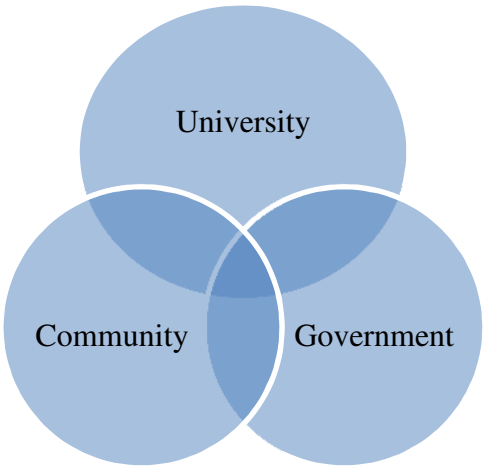

Figure 1: The Triple Helix System

Farming systems in developing countries require skilled transfer agents to communicate the complex needs of farmers to researchers (Kaufman, 2005). There is often a shortage of such skilled workers, but training and subject-matter specialists can help improve skills. A receptive and open attitude on the part of researchers contributes to improving channels of communication. Communication and direct collaboration may be difficult because either one or both groups are incapable of dealing with the other.

Conclusion and Recommendations

Dorper sheep breed was improved and has good adaptation comparing with our local sheep breed. Besides this, Dorper has good lamb production than indigenous sheep. Technology transfer is a good tool for livestock improvement. Moreover, such a strategy provided opportunities for training and collaborating with the community, academics and the company by transferring technology based on the guidance of the country's economic and social development. In view this; the following recommendations were forwarded,

- Agro ecological and socioeconomic aspects of farming systems should be taken into account in technology development and consolidation.
- Technology transfer groups should be aware of technologies available to farmers.
- Feedback regarding transferred technologies should be provided to research so that necessary adjustments can be made to future technologies

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