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Evaluation of Doyogena Sheep Community Based Breeding Programs in Southern Ethiopia

Kebede Habtegiorgis[1*], Tesfaye Getachew[3], Aynalem Haile[3] and Manzoor Ahmed Kirmani[2]

[1]Department of Agriculture, Southern Agricultural Research Institute, Areka Agricultural Research Center, Areka, Ethiopia

[2] Department of Agriculture, Jmma University College of Agriculture and Veterinary Medicine, Jimma, Ethiopia

[3] Department of Agriculture, International Center for Agricultural Research in the Dry Areas, Addis Ababa, Ethiopia

***Corresponding author:** Kebede Habtegiorgis, Department of Agriculture, Southern Agricultural Research Institute, Areka Agricultural Research, Areka, Ethiopia; E-mail: srari@ethionet.et

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Abstract

The aim of this study was to evaluate the perception of the community on the sheep community-based breeding programs (CBBPs). The survey data were collected from 236 households of 118 CBBPs participant farmers and 118 non-participants sheep keeping farmers. The survey data were analyzed using index and SPSS. The evaluation result revealed that, CBBP is acceptable and workable in the community. The direct participation of smallholder farmers in CBBP is in increasing trend. There was evidence of improvement in growth performance of lambs, twining rate, decreasing of lamb mortality, and shorting of lambing interval. After intervention of CBBP a greater number of sheep were sold and high average annual income was realized by participant's farmers. It can be concluded that genetic improvement of Doyogena sheep under CBBPs was successful and the program satisfies the farmers. Therefore, there is an opportunity to out scaled to new site and strengthen the old sites for further improvements.

Keywords: Community based; Breeding program; Doyogena sheep; Farmer satisfaction

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Introduction

Community-based breeding program (CBBPs) has recently emerged as encouraging sheep genetic improvement option. The programs have been successfully implemented in small ruminants using indigenous genetic resources of smallholder farmers in countries of Burkinafaso, Iran, Malawi, South Africa, Sudan, Tanzania, Uganda and Mongolia.In Ethiopia CBBPs was implemented to improve Bonga, Menz, Afar and Horro sheep breeds. After promising results reported from firstly established sites, CBBP was expanded to Atsbi, Doyogena, Abergelle, Konso and few other sites, in different parts of the country with the support of International Center for Agricultural Research in the Dry Areas (ICARDA) Federal government and their respective regional governments [1].

In 2012 CBBPs were adapted to doyogena district to improve doyogena sheep. The doyogena sheep is found in Kembata Tembaro zone of southern Ethiopia. The earlier studies showed that this sheep was known by different name. For instance, tibbo reported, sheep population found in Kembata tambaro zone categorized under bale breed and kocho named these sheep as adilo or kembeta area sheep population. In the study, Doyogena sheep was named by wolayta sheep ecotype. Later in 2013, a team of researcher from Areka Agricultural Research Center (AARC) partnership with ICARDA conducted a value chain analysis of Doyogena sheep. The report indicated that doyogena district is the main source of the sheep. Accordingly, CBBP was established after detail characterization of this sheep.

After implementation of CBBP, exploring the satisfaction of smallholder farmers on

the implemented CBBP operation needs to be evaluated. It was evident that, farmers have tremendous practical knowledge on livestock keeping gathered over a long period and transmitted from ancestors. It has been found that this knowledge coupled with scientific rearing of livestock results in faster improvement of livestock productivity. Unfortunately, there have been virtually limited studies to understand their satisfaction on CBBP. The previous experience has shown that, evaluating the small holder farmers' satisfaction on the operation of any sheep improvement program has resulted in the success of such program. Accordingly, the present study has been planned to explore the perception of farmer on the ongoing doyogena sheep CBBP [2-4].

Materials and Methods

Description of study area

Doyogena sheep CBBP has been undertaken in Doyogena district located at 7°20' N latitude and 37°50' E longitude of Kembata Tembaro Zone, found at a distance of 258 km to the South west of Addis Ababa **(Figure 1)**. Altitude of the district ranges from 1900 to 2800 meter above sea level.

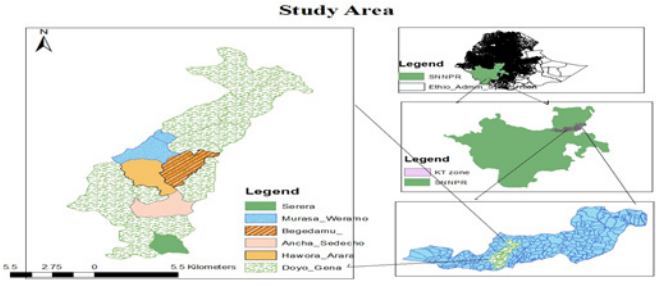

Figure 1: Mode of Transmission of Lassa Fever and Some of the symptoms.

Animal management

Sheep flocks in this study were managed by CBBP members. All CBBP cooperatives are licensed and formally registered. All animals were identified with plastic ear tag. Each CBBP cooperative have code of identification number. The ear tag contains cooperative code, animal Id, and year of birth. All the data were recorded in recording book. The content of recording book includes baseline record, lamb record and ewe's record. Newly joined animals were recorded in to baseline-recorded format. The data recorded in the recording book contain owners name, animal ID, dam ID, sire ID, birth weight, birth date, birth type, animal sex, parity, coat color, weaning weight, 6-month weight, nine-month, mating date, and post-partum weight [6].

Feeding: The main feed sources for animals included Enset, products of Amicho, corm, crop residue, improved forage/grass, crop aftermath, kitchen leftover, and purchased concentrates. Flocks graze with tethering in the small private land. Feeding in day time and housing at night time is practiced. Often one big house was constructed from bamboo or locally available materials, and shelter for sheep was constructed inside one main house.

Veterinary service: Free veterinary service was provided for CBBP participant farmers. Sheep are de-wormed for internal parasite two times a year in January and June. In addition, sheep was given ivermectin for external parasite control, when external parasite infestation is observed (as per the need). Vaccination against black leg, CCPP and FMD (Orf) has been given once a year while for pasteurellosis, pneumonia and PPR vaccination was given twice a year. Animals were injected with broad spectrum antibiotics (Oxytetracycline L.A.). These operations were usually carried out before and after the rains. Anytime stress was suspected the animals were offered multivitamins (injectable).

Cooperative administration: Each CBBP cooperative has four committees, namely: main committee, control committee, price determiner committee, and selection committee. The committees are responsible for effective functioning of the program. For each breeder cooperatives one data enumerator and 2 health professionals were employed [8].

Selection strategy followed: Selection of breeding rams takes place separately for each CBBP cooperatives on a programmed date, 2 times per a year. The researcher identifying the candidate breeding rams, based on the performance data recorded by the enumerators. Before 2016, selection was done based on the previously quantified selection criteria of overall excellence of animal phenotype. From 2017 onwards, selection was done based on candidate animal estimated breeding value (EBVs) and candidates phenotypic soundness. In the first stage, candidate ram's pre-selection and ranking takes place based on WWT. In second stage breeding rams were again ranking based on their 6WT EBVs. Top 10% of the superior breeding rams (1st ranked) were retained for service. 2nd ranked were sold for breeding purpose to other communities. The third ranked were either castrated to be fatted or marketed to prevent unwanted mating.

Selected best breeding rams serve not more than one year because, the rams become big in size and aggressive. Breeding rams holder members sign agreement with the cooperative commitment when they receive the breeding rams. Rams holder handle the breeding rams efficiently. After one-year service, the breeding rams were sold to other area of the region [5].

Source of survey data

The survey was conducted to both participant and non-participant communities. The non-participant farmers were selected from the five breeder cooperatives (Kebeles) and from three neighboring sheep keeping communities (Lemi seticho, Wasera/Eutugae and Gamora Geuwada). The non-participants were initially (first stage) purposely selected based on their (i) experience in sheep rearing as active sheep owners, (ii) proximity with participant farmers, (iii) understanding about sheep breeding and (iv) knowledge about the on-going CBBP in that community. In the second stage, both non-participants and participant farmers, as per sample size, were selected randomly

The details of the farmers selected for survey are The survey was conducted through: (i) individual interviews; (ii) Focus group discussion (FGD) and (iii) key informant interviews. A semi-structured questionnaire was prepared and pre-tested before going to actual interview. Afterwards, some changes were made in accordance with respondent's opinion.

The questionnaires were administered to the randomly selected households by the researcher of Areka Agricultural Research Center (AARC) and by a team of enumerators. Information through questionnaire from the members were gathered regarding their satisfaction on CBBP, participation and perception on CBBP, trend in improvement, perception on economic importance, perception on breeding ram selection and breeding ram management, awareness development and challenges faced in running the program. Similarly, from non-participant information related to their view about CBBP were considered.

To support the individual interview, focus group discussion was held with a group comprising of 6-8 members of experienced elders in each cooperative. Discussions were done by using a prepared checklist. The discussion was focused on farmers' perception of the breeding programs, how ram selection is going, rams using, level of ownership of the programs by the communities, challenges faced in running the programs. Besides, key informant interviews had been conducted with district office of marketing and cooperative office, district office of livestock and fishery. Discussions were done mainly to assess their knowledge and linkage with the cooperatives. Key informants were asked with a well-prepared checklist. The interview also included local administrations and development agents [9].

Results and Discussion

Participation of community in CBBP

The implication of community participation in CBBP is clearly explained. He pointed out that, when farmers participate in whole process of flock improvement program, the breeding program become successful and farmer's adoption is very high. In the study. CBBP were successful and the farmer's participation is still high in the country.

In this regard, Doyogena sheep CBBP was started with 148 males and 24 females 'household in 2 cooperatives. Subsequently, another three cooperatives started the program. Since the formation of cooperatives, farmers of the community were continuously joining CBBP. Achievements of participating farmers have attracted other farmers and members are an increasing trend. Currently, more than 614 households were directly participating in this breeding program. Since the initiation of CBBP, there was no report of dropouts from all the cooperatives unlike the reported dropouts from CBBP membership in Horro, Menz.

Farmers perception on CBBP

About 99.1% of participant farmers revealed, that CBBP is acceptable and workable in the community. In addition, the FGD result displayed that farmers were satisfied by introduction of CBBP in their respective areas due to for the improvement of their sheep. During the survey and FGD, non-member farmers were asked about their interest to join or to form new cooperative. The result indicated that about 94.8% of non-member farmers showed interest to join the breeder cooperative or to establish new cooperative. We did not find noticeable challenge that can hinder non-participant farmers to become a member of breeder cooperative or to establish new cooperative except some farmers raise economic problem to pay membership share. This indicated that these farmers were ready to establish the breeder cooperative in future and thus more work need to be done from district office of marketing and cooperative, district office of agriculture and Areka Agricultural Research Centre. Farmers know the importance of best breeding ram's selection. Higher proportion of farmers agrees on the requirement of selection for sheep genetic improvement. Additionally, and key informant support farmer response.

Farmer perception on inbreeding

The farmers' perception about inbreeding problem was captured through questionnaire and FGD. The results revealed that majority of the farmer are familiar with inbreeding. There is significant knowledge difference between the member and non-member farmers. Participant farmers are aware of inbreeding with its effect and solution. Due to continuous follow-up and training, they could capture better knowledge about effect of inbreeding and measurement taken to reduce it. On the other hand, non-participant farmers are aware of inbreeding, however, they do not take any measure to solve the problem, as they believe inbreeding is not a major problem for animal productivity. In the breeder cooperatives, breeding rams had been assigning out of its location and service allowed for only one year. At the time of breeding ram's allocation, researcher, data collector and cooperative committee take care to avoid mating between relatives. Unselected rams were either castrated or sold.

Challenges for CBBP intervention

Lack of transparency and management, financial related problem, Problem related with breeding ram selection and management and lack of training and facility were ranked as first, second, third and fourth constraints.

Financial related problem: One critical problem reported from all cooperatives is lack of audit. Before three years ago, two cooperatives were audited and benefits had been shared to members. However, it was evident from discussion that auditing was not done afterwards. The other three cooperatives had not been audited so far. Discussion with District marketing & cooperative officers revealed that, improper file management is one major reason to delay their auditing. In the same connection, lack of finical skill in committee had been raised during the discussion. This caused difficulty to audit timely. The reason might be poor educational background of financial committee. Similar problem and reason were reported by Gutu et al. It was also learned from key informant interview that all cooperatives

are legally registered. Training on financial record keeping and support need to be provided from district office of marketing and cooperative.

Lack of transparency and management: The problem existed in all cooperatives but it was very critical for non-audited cooperatives. It was related with weak linkage with the district office of cooperative. Poor commitment of selected committee for regular meeting and weak leadership were reported during the discussion.

Problem related with breeding ram selection and management: The challenge of young and fast-growing lambs being sold for cash needs, is reported from the discussants and key informant. This caused keeping the best rams in the CBBP difficult. Accordingly, researcher from AARC discussed with the cooperative committee to use their revolving fund available on their account to buy young lambs before they are sold in the market. However, lack of sufficient financial capital was reported as a problem from the cooperatives.

Lack of training and facility: Lack of training and awareness was reported from newly joined members. In this regard, awareness creation needs to be done about the program. Another problem reported from two cooperatives were lack of tin roofed sheep holding yard. Large sheep holding tin roofed yard were built for three cooperatives by ICARDA.

Conclusion

In the community, CBBP is acceptable and workable. Member farmers displayed better knowledge to manage inbreeding. Member farmers obtained significantly better price from sale of sheep and they sold, a greater number of animals comparing with non-member farmers. The participation of farmers in CBBP is in increasing trend since establishment. However, there is challenge in transparency of cooperatives committee, breeding ram selection and capacity building. Therefore, the committees of cooperatives be made functional, strengthened and made more transparent. Farmer perception should be changed toward the chief objective of breeding program. Improving capital for each cooperative and easy access to credit services will enable the members to retain young and fast-growing lambs till selection age and their sale will be prevented and finally making the breeder cooperatives self-sustained breeder cooperatives operation are needed. Linkage between district office of marketing and cooperative, district office of livestock and fishery should be improved. Awareness/training to newly joined members concerning CBBP principle along with other aspects of improvement in feeding, managements needs to be organized on sustainable basis.

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