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Upscaling Konso goat community-based breeding programs to the surrounding base populations

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Contents	Page No.
Background	2
Approaches and outcomes	2
Consultative workshop	3
Site selection and buck group formation	3
Buck procurement and dissemination	4
Artificial insemination as means of genetic dissemination	5
Market linkage	6
Partners	7
Future plan.....	8
Conclusion	8

Upscaling Konso goat community-based breeding programs to the surrounding base populations

Background

Sheep community-based breeding programs (CBBPs) were started in Ethiopia in 2009. Since then CBBPs has been expanded in many areas in the country as well as other countries following promising results in genetic progress and economic benefit to the community. As part of its expansion, Konso goat community-based breeding program was started in five villages (Arfaide, Baide, Mesoya, Jarso and Tebela Kuchale) in 2013. About 458 households and has been participating in the breeding program. Participating farmers benefited from CBBPs by selling their improved goats for breeding as well as for meat. Regular training and follow-up from researchers, extension agents and the cooperative office helped the community to improve their goat husbandry practices. The genetic progress and benefit observed in the CBBP flocks need to be expanded to the surrounding community flocks. This can be attained by developing a good sire dissemination scheme. Top breeding sires can be retained in a community flock however the remaining surplus bucks need to be transferred to the base in the surrounding flock. Natural mating and artificial insemination were used as a tool to disseminate improved genetics.

Approaches and outcomes

Main components include consultative workshop, site selection and community organization in the upscaling sites, procurement and dissemination of improved bucks, use of estrus synchronization and artificial insemination as means of dissemination, linking non-selected animals to the market.

Consultative workshop

A consultative workshop with local partners and discussion with the community were held in Karat town 22 to 26 February 2021. Konso zone livestock and cooperative heads and experts, Karat zuria district and Kolme cluster livestock and cooperative heads and experts, enumerators from the five villages, center director of Arba Minch Agricultural Research Center, livestock director of the Southern Agricultural Research Institute, researchers from Arba Minch Research Center participated. The objectives of the workshop were to agree/plan on the framework to site selection, sire procurement and distribution, producer cooperative and mating group formation, artificial insemination, market linkage and so on.

Site selection and buck group formation

Training of trainers and awareness creation was given for the experts (zone-to-kebele level) and kebele administrative bodies by AMARC researchers on basic concepts of animal breeding and genetic dissemination of improved genetics, goat management, pedigree and performance recording, economically important small ruminant diseases and parasites, small ruminant health management, forage development and utilization, the importance of cooperative and marketing, site selection, farmer selection and community organization. Then extension experts identified appropriate upscaling sites and training was provided to selected farmers regarding buck group formation, benefits of using improved bucks and linking non-breeding animals to the meat market. Improved breeding buck can serve about 25 to 30 breeding does in a mating season. Thus, each buck group were created considering the number of breeding bucks available for the mating, neighborhood, flock mixing in watering and grazing and willingness to participate in a group. In all sites, development agents did

home to home survey to register households and their flock size. Accordingly, a total of 479 breeding buck groups were created around the five sites each group having two to five households.

Buck procurement and dissemination

Candidate bucks were selected from the older five goat CBBP sites based on their estimated breeding values. Availability of candidate breeding bucks were checked and registered by enumerators. Farmers representatives from the upscaling sites were engaged in approval of selected bucks considering their preference to coat colour and other morphological characters. All selected bucks were then weighed to calculate price for each animal. A total of 479 selected bucks were then procured and transferred to the buck groups randomly using a lottery system. A total of 1456 households were involved in this. These households receiving breeding bucks will be organized as producer cooperatives and always expected to buy improved bucks from the CBBPs (breeder cooperative). The cash anticipated from the sale of the disseminated 479 bucks (after giving service) will serve as an asset for the community to buy replacement breeding bucks. This will allow establishing a permanent breeding buck market linkage between breeder and producer cooperative. A total number of bucks procured and disseminated, average weight, and the total price is presented in Table 1.

Table 1. Details on number of bucks procured and disseminated by site

Site	Candidate buck	selected	Mean kg	Hhs	Price - ETB
Arfaide	86	64	20.93	228	120556.8
Baide	82	60	24.28	300	131112
Jarso	62	50	20.9	210	94050
Tebela Kechale	77	65	20.3	220	118755
Mesoya	98	72	20.8	216	134784
Tebela	71	62	19.9	186	123100
Mesoya	90	55	17.7	156	97250
Jarso	70	51	22.3	156	113950
Total		479		1456	933,557.8

Price per kg live weight was 90 ETB for the first five and 100 ETB per kg live weight for the last three columns.

Artificial insemination as means of genetic dissemination

More than 1900 breeding does were checked for pregnancy using ultrasound. Most of them were tested positive. Better feed availability due to unexpected rain in the area creates a conducive environment for mating. A total of 580 does were tested negative for pregnancy received two injections of Enzaprost hormone 11 days apart to synchronize estrus. Then fixed time insemination between 48 to 56 hours after the second injection was carried out by a team. About 500 breeding goats were inseminated artificially using superior bucks. For this task, a working team and

resources were mobilized from ICARDA and different research centers (Bonga, Debre Berhan, Doyogena, Jinka and Sekota) across the country.

Semen collection and insemination were carried out under the tree shade and a portable tent used for semen processing (Figure 1). A portable generator was used for the power supply. Four technical teams were organized for ultrasonography, semen collection, processing and insemination. Each team was led by a senior and trained researcher. Household members including kids and women were participated in availing and managing breeding does and bucks during the implementation of pregnancy detection, semen collection and insemination.

Human resource capacity development was achieved during the artificial insemination campaign. Researchers from Arba Minch Research Center and experts from Konso district livestock office were trained on reproductive technologies. They were engaged in all the tasks under the supervision of the senior experts. Arba Minch research center was equipped with artificial insemination facilities like ultrasound, spectrophotometer, generator, artificial vagina, insemination materials and so on.

Market linkage

Linking the non-selected animals to the market (both export and local) market is crucial for the sustainability of the breeding program. Goat traders usually buy Konso goat at a lesser price compared to the neighboring Borana goat. This is mainly attributed to the wrong perception of meat darkening problem linked with Konso goat. We hypothesized that Konso goat is not linked to the meat darkening problem. To test this, we designed an experiment to send typical Konso goats directly to users via export abattoirs to test the meat quality. Alana the biggest slaughter abattoir in Ethiopia

promised to send vehicle to collect animals and send them to his consumers in the middle east. However, it was challenging to send animals with all efforts made for the last six years. In this regard, discussions were re-initiated among different market actors (producers, enumerators, traders and cooperative leaders). This was led by a senior market researcher. We are successful by engaging traders onboard. Finally, a total of 97 nonelected bucks were sent to slaughterhouses and the meat was exported to the middle east market to test the quality of meat in the foreign market. We received positive feedback and confirmed that there was no association between meat darkening and Konso goat. No darkening was observed both at slaughter and export. Required weight varied by target countries. Body weight of 15 to 25 kg with good body condition is the most preferred weight group. We provide this feedback to the community and different stakeholders. They were happy with the feedbacks. Getting uniform animals in the required amount to the export market and creating the proper link between producers and slaughter abattoirs is crucial. We need to have discussions among actors to establish proper market linkage. Awareness creation on how to avail uniform animals at a time, different market issues like encouraging farmers to sell younger animals, understanding the difference between breeding and meat animals, entrepreneur training for cooperative leaders and farmers. Breeders at Arbamich Research center need to set a clear demarcation between breeding and non-breeding animals. Economists may work on the feasibility studies and economic assessment and return on investment of selling younger and older animals.

Partners

Upscaling konso goat community-based breeding program was supported by the United States Department of Agriculture (USDA). ICARDA in collaboration with Arba

Minch Research Center leads the technical implementation of all the activities. Zone, district-level experts and kebele development agents are responsible for community organization, facilitating buck use and buck monitoring in the upscaling sites. Southern Regional Research Institute oversees the program. Experts from different research Centers in the region (Areka, Bonga and Jinka) and out of the region (Sekota and Debre Berhan) participated in the artificial insemination campaign. ICARDA provided technical and financial support via USDA project.

Future plan

Organizing the community in the upscaling sites, follow-up of the disseminated bucks, follow-up and data collection on inseminated does, castration of non-selected bucks, linking meat animals to market and digitizing database system will be our next tasks.

Conclusion

Upscaling Konso goat community-based breeding program through the dissemination of improved genetics using natural mating and artificial insemination is progressing very well. So far, 479 breeding bucks disseminated to the surrounding base population benefiting about 1500 households. This will facilitate breeding buck market linkage between breeder and producer cooperatives. Long-term commitment and good integration among partners are crucial for the sustainability of the breeding program.

