Learning from Each Other: Experience Sharing Workshop on Implementation of Smart Pack and CBBP among Ethiopian Public Universities

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Technical Report

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Learning from Each Other: Experience Sharing Workshop on Implementation of Smart Pack and CBBP among Ethiopian Public Universities

Training Report

Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA)

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About AICCRA

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Executive summary

A workshop geared towards understanding the status of universities in implementing CBBP in terms of CBBP village establishment and streamlining and uses of the integrated curricula with CBBP was conducted in two clusters (May 31, 2023, in Bahir Dar) and (June 1, 2023, in Adama). In addition, experience exchange through the presentation of universities in implementing CBBP was presented, and the background training was delivered on SmaRT pack (Small ruminant transformation packages associated with Feed and feeding, Health interventions, Genetic improvement, and livestock marketing by ICARDA and ILRI scientists. Five Universities in the first workshop (May 31, 2023) and three Universities in the second workshop (June 1, 2023) presented their status in implementing CBBP in their respective universities. Other Universities were also allowed to reflect on their status, followed by discussion and experience sharing. The training has covered the SmaRT pack (Small ruminant transformation packages) that has addressed genetic improvement, Feed development and intervention, health intervention and market channels, and enabling environments such as cooperative organization and capacity building that hastens small ruminant value chain to produce a quality product and improve the livelihood and food security status of the community. Twenty-nine Undergraduates and thirty-seven postgraduates (five Ph.D. and 32 M.Sc programs) have streamlined Community Breeding Program in the curricula and implemented teaching practices and knowledge products of CBBP " Guideline line for setting up the community-based small ruminant breeding program is in use as a reference material to teach animal breeding courses in all universities (Haile et al., 2020) and others were used as a reference material to teach Animal breeding courses in undergraduate and postgraduate programs. Community-based breeding program villages, which symbolize climate-smart agriculture, have been initiated under the universities' budgetary and technical support. More than 58 villages have been initiated under the support of 20 universities and mobilized more than 1 million USD. The villages serve as a learning site and sources of longitudinal data to hasten research and paved the way for demonstrating CBBP that showcased impactful community services through CBBP. Other universities are also in the progress of implementing CBBP activities based on the lessons of the champion universities. More than 4440 farmers are beneficiaries of CBBP initiatives, and more than 1400 students/year are beneficiaries of a streamlined CBBP in the curriculum. The key lessons captured in implementing CBBP in the university program includes showcasing other programs to have local data and practices in teaching resource and contribute to the quality and relevance of education, resource mobilization, and demonstrating the synergy of learning, research, and community services, ensuring teamwork to bring impactful community services and a continuous capacity building and provision of training materials which could be reflected in teaching and learning efforts of universities. There are also future activities that need to address, such as strengthening CBBPs and supporting the programs sustainably and scaling up the programs based on the scaling framework and reaching out to millions of small ruminant keepers, and improving food security

and the income and livelihood of communities at household and community level. Fifty-six (two women) participants were part of the experience sharing workshop in the two venues (Bahir Dar and Adama).

Keywords: Community-based breeding program (CBBP), Scaling, SmaRT pack, Universities, Curriculum

Background

The workshop held on May 30, 2023, in Bahir Dar and June 1, 2023, in Adama was a follow-up conference executed on May 20, 2021 (Bahir Dar) and June 1, 2021 (Bisheftu). The workshop in 2021 was targeted to engage universities to establish community-based breeding programs (CBBP) in their proximity and streamline CBBP in undergraduate and postgraduate curricula at different stages.

The 2023 workshop was held to review the experiences captured by universities, evaluate the implementation status of CBBP villages under the support of universities, and the progress made in revamping CBBP in undergraduate and postgraduate curricula and subsequent use by universities. The workshop is also aimed at understanding the challenges and opportunities in implementing CBBP and sharing experiences among universities in running CBBP on the premise that there is a difference in depth and coverage in implementing CBBP among Universities.

In the first workshop of May 30, 2023, representatives of nine universities, namely Debrebirhan, DebreMarkos, Gondar, Woldiya, Mekdela Amba, Wollo, BahirDar, Injibara, and DebreTabor, participated in the workshop in Bahir Dar, Unison Hotel. In the second workshop, June 1, 2023, in Adama a total of thirteen universities, namely Haramaya, Worabe, Wolkite, Jimma, Wolaita Sodo, Wachemo, Jinka, Mizan Tepi, Assossa, Semera, Mettu; and Dilla participated. ICARDA organized the workshop through AICCRA project.

Objective

The objectives of the subsequent workshops were;

- To evaluate the implementation status of CBBP activities in terms of streamlining CBBP into undergraduate and postgraduate curricula
- To assess the use of the curricula for teaching and the initiation of CBBP villages run by the universities.
- To share experiences in implementing CBBP activities supported by respective universities.

Welcoming and Opening Speeches

Dr. Tesfaye Getachew facilitated the conference from ICARDA, and also he made a welcoming speech, introduced the agenda, and highlighted the workshop's objectives. The opening speech by Prof Berhanu Belay followed the welcoming message. He stated that there is a discrepancy in implementing CBBP in respective universities. Some lessons could be learned and pave the way to implement CBBP activities as per the guidelines and standards of CBBP implementation and become feasible in the face of the university and the community at large. It was also noted that CBBP is an activity that requires participation and contribution by each stakeholder. In the

University context, CBBP should demonstrate the synergy of research, learning, and community services and attract the attention of the community and the university. The workshop was officially opened after the welcoming and opening speech, and subsequent activities were channeled to the conference participants. The opening and welcoming address was followed by presenting the background papers by experts from ILRI and ICARDA.



Figure 1. Opening speech on the need for sharing experience on CBBP by Prof Berhanu Belay, Consultant, ICARDA

Background papers

The community-based breeding program was initiated in 2007 to improve the genetic worth of local small ruminants in the farmers' setting. The achievements in genetic improvement called up the inclusion of other SmaRT pack (Small Ruminant value chain Transformation) components to create the enabling environment and exploit the dividends of genetic improvement. The features of the SmaRT pack include genetics improvement, health, feeding, marketing, and gender and social inclusiveness. For completeness and maximum benefit from the small ruminant value chain, professionals presented the components of the SmaRT pack in the following order.

Genetic improvement and the linkage between CBBP and PU

The presentation by Dr. Tesfaye Getachew resonated around strengthening and upscaling sheep and goat community-based breeding through breeding which was shared with university staff engaged in implementing CBBP. It was noted that CBBP was initiated in 2009 in six communities

with the commitment of ILRI, ICARDA, BOKU, the Ethiopian research system, and communities. As time goes, it was supported by small ruminant value chain development under different initiatives. CBBP has been supported since 2012 under CRP-Livestock; from 2018-2021, the initiative was supported by the SmaRT pack; since 2022 to date, CBBP has focused on optimizing and scaling CBBPs under SAPLING. CBBPs can be considered the best alternatives for small ruminant genetic improvement; they are relatively cheaper, reduce time to reach the community, have less disease risk – have high survival, and allow to do research fitting farmer management. The results from the implementation have shown;

- Substantial genetic progress
- Those who participated in the program earned 20.6% more gross income per year
- Increased demand for improved sires for breeding
- Increased mutton consumption in which CBBP participating farmers on average slaughter three lambs per year as compared to non-participating farmers who slaughtered one lamb per year.

The farmers under the safety net program graduated and generated their family income and subsistence, particularly for the Menz area, and CBBPs increased from 6 to 200. CBBP has also influenced policy in which the experience and research output has been integrated into undergraduate and postgraduate programs, and CBBP is reflected and considered in the Ethiopian livestock master plan as an alternative genetic improvement program. Livestock mega projects supported by development partners such as the Livestock and Fisheries Development Project (LFDP) and Livestock Development in Lowlands (LDLL) have included CBBP as an alternative livestock improvement program to improve red meat production in Ethiopia.

There was a long-awaited interest to scale up and scale out the CBBP and reach several small ruminant keepers. To scale up CBBP, a scaling-up model was developed (Muller et al. 2021). Three alternative options were identified to reach more farmers to advance CBBP and improve the income and livelihood of small ruminant keepers (Fig. 1). Replicating CBBPs in different areas allows producing top and improved rams that can serve as a scaling strategy of CBBP technology and knowledge. The production of improved sires in CBBP villages, retaining improved sires in the same CBBP village, disseminating extra improved sires in the production unit, and expanding the production units to produce lambs to run finishing operations is another alternative scaling mechanism. Using improved sires from CBBP through AI and efficient natural mating scheme within CBBP domain and production unit is a scaling strategy that will increase genetic gain of the base population and improve the livelihood options of communities.

Transformation of small ruminant production is feasible through clustering breed habitats and scaling CBBP technologies in the cluster. ICARDA and partners have developed a scaling framework by clustering breeds with common characteristics and pooling institutions working on a specific breed and reaching out to more households and flocks. ICARDA took the facilitation

role, ran subsequent discussions with key stakeholders, and organized a genetic improvement initiative governed by the steering committee. The steering committee constituted stakeholders working on small ruminants such as research centers, universities, the private sector, NGOs, and the agriculture extension. In forming a cluster, the procedure followed includes running a consultative workshop, experience sharing and creating a steering committee, developing the ToR of the initiative and cluster, and developing short and long plans. The name of the cluster and initiative was also given a unique name to ensure legal backing and scaling. The clusters and initiatives formed and coverage is presented below in Table 1.

Table 1. Clusters and initiatives to foster scaling up CBBP in Ethiopia.

Sr. no	Genetic improvement Cluster	Cluster coverage	Sheep population	Institutions engaged	Specialization
1	WaWo	Gojjam and Wollo	4, 000,000	ARARI, ARLIA, Bahir Dar University, WLRC, Injibara University, Andassa Research center, Debre markos Research centre, Debre Markos University	Gojam-Washera sheep Wollo- Cross-breed and Wollo sheep
2	Bongacho – Bonga's Gold	Bonga, Mizan Tepi, Dawro	500,000	SWEARI, SWEAD, Bonga research centre, Bonga University, Mizan Tepi University	Bonga sheep
3	Menz- Shoa	North Shoa	1, 000,000	Noth Shoa LDA, Debre Berhan Research Centre, Debre Birhan University	Menz Sheep
4	Wolaita-Doyogena	Wolayita, Doyogena, Silite, Guraghe	500,000	Areka Research centre, Wolayita University, Worabe Research Centre, Worabe University, Wolkitie University , Wachemo University	Wolayita Sheep

The scaling framework links CBBP-production Unit, finishing and market access. CBBPs are mainly targeted to produce proven sires for replacement, improve sires sold for production units, and improve population performance (Table 1). The production unit constitutes the highest population size, where it receives proven rams from the CBBP sites and is committed to producing lambs for slaughter and finishing. The proven sires are sold at premium prices, and reproductive biotechnology like Artificial Insemination could be used to hasten the dissemination of the best genetics. The finishing part is a feedlot operation, where young lambs are purchased

mainly from the production unit and lambs from CBBP, which are not selected for breeding based on their genetic worth. Market incentivizes the CBBP scaling initiative and is a cross-cutting matter that facilitates the marketing of proven rams for breeding, fattened, and inputs in the sheep production industry.



Figure 2. Scaling framework to enhance market-oriented community-based breeding program

The future activities ahead of us include expanding the coverage of CBBP, monitoring and improving and ensuring sustainability through follow-up, mapping, and evaluation of PUs, laid down optimized and functional PU and CBBPs with proper linkage. The initiative's steering committee has the mandate of leading and coordinating genetic improvement, livestock development, and strengthening the technical capacity of experts from livestock extension, research, and universities. Manual development to run PU, creating market linkage, and engaging youth and women in income generation through cooperatives organization and fattening is an activity ahead.



Figure 3. Presentation on genetic improvement as a component of SmaRT pack for small ruminant improvement.

Health monitoring and intervention

The presentation by Dr. Erdachew Yitagesu focused on disease prevalence and associated health intervention in CBBP sites to improve the health status of the flock. The major diseases and parasites prevalent in CBBP villages are the parasitic (lungworm, liver fluke, Gastrointestinal parasites, and coenuruses), bacterial diseases (pasturellosis, pneumonia, diarrhea caused by bacterial species such as *Escherchia species, salmonella species, clostridia species)* and viral diseases (mainly sheep and goat pox). The primary activities in CBBP villages regarding animal health perspective are understanding the seasonal prevalence of diseases, deworming of the flock based on the deworming colander, health monitoring, and producing health evidence on reproductive diseases for sire certification. The first step in a health intervention program is monitoring the diseases and parasites that constitute a routine collection of information on disease prevalence, productivity status of the flock, and other disease aspects in a population. A deeper understanding of the disease prevalence requires executing surveillance, which is a more intensive form of data recording than monitoring. Surveillance includes gathering, recording, and analyzing data and disseminating information to interested parties. A deeper understanding of parasite and disease prevalence supports setting up deworming and vaccination calendars and introducing health interventions. The major interventions in CBBP sites include an integrated herd/flock health approach to reduce the impact of respiratory disease in Small Ruminants in Ethiopia, improving reproductive performance of small ruminants through reproductive biotechnology, community-based control of gastrointestinal tract (GIT) parasites, coenuruses control and setting health intervention calendar for health intervention such as deworming and

vaccination. From a practical point of view, the health specialist/professionals should be part of the CBBP team to contribute to running CBBP in the vicinity. Farmers' cooperatives are instrumental in implementing health interventions in the CBBP sites for different classes of sheep in the flock.



Figure 4. Presentation on Health Intervention as a component of SmaRT pack for small ruminant improvement

Feed and nutrition to advance fattening

The presentation by Mr. Muluken Zeleke focused on feed development and interventions in CBBP villages. Feed and nutrition is a component of the SmaRT pack that is key in improving the small ruminant value chain. The feed development component transforms the traditional fattening practice into improved fattening opportunities. A limited scope of business orientation characterizes the traditional fattening program, on top of this, the duration of fattening is more than a year, and feeding is not based on the animal's nutrient requirement. On the other hand, improved fattening is characterized by the recruitment of fast-growing animals, and feeding is based on nutritional requirements and purpose of production (e.g., reductive youth group, increasing demand for meat). Hence, ICARDA, through the feed and nutrition unit, is reaching out to youth and women in finishing operations to generate income through value addition and shortening the fattening period through feed intervention. The strategy to benefit from feed development is linking CBBP with entrepreneurial opportunities for sheep fattening, targeting youth and women groups to ensure gender and social inclusiveness. Strategic supplementation

and balanced feeding to enhance ewe and doe reproduction is also a strategy to produce more lambs/kids for fattening and income generation. Evaluating local forage-based options for strategic supplementation and fattening has opted to diversify the feed resource base. The approach for strategic feeding and entrepreneurship is through integrative sheep fattening that adheres to technical innovations encompassing feed Inventory in quality and quantity, incubating productive forage development, developing least-cost ration from a locally available feed in different forms, transferring unselected animals for fattening and feeding animals according to their requirement. The social information is also part and parcel of integrative approaches to sheep fattening that include collective entrepreneurship via the formation of sheep-fattening youth, women groups, and cooperatives, entrepreneurial skills development training, as well as sharing, co-generation, and knowledge transfer of good practices, a community of practice platforms to improve vertical and lateral private and community engagements through public radio programs. This entails that any CBBP program should include a committed nutritionist to benefit from the expertise in feed development and fattening operations.



Figure 5. Presentation on Feed Intervention as a component of SmaRT pack for small ruminant improvement

Marketing and marketing infrastructure

The presentation of Dr. Getachew Legesse from ILRI focused on livestock marketing intervention to enhance CBBP. It was articulated that Ethiopia has diverse agro-climatic settings suitable for producing different kinds of livestock. However, livestock marketing and production are paradoxical, and supply and demand are in disarray. Market infrastructure and incentivizes livestock production are key in fueling livestock production. There is dissatisfaction both from the demand and supply chain. The buyers complain about the shortage of products in the market

and the supply chain, and the suppliers complain that there is no market for livestock products. Often, live animal marketing did not consider the market information systems, market facilities, and collective action of cooperatives for marketing, e.g., sales of breeding sires and meat animals to urban markets and slaughterhouses. The presentation also acknowledged the potential buyers' and their characteristics to hasten small ruminant marketing. The domestic markets included household consumers, hotels, butchers, restaurants, supermarkets, NGOs buying animals for restocking, and farmers/pastoralists with specific demands. For example, local hotels buy cheap small ruminants regardless of color, age, and sex. The export market has criteria to purchase and suit the customer's demand. The criteria include male and uncastrated animals, animals with a live weight of not more than 15 kg (for Dubai) and 24 kg (for Kingdom of South Africa), animals with good body condition, and animals of younger age (under a year old) are preferred. Consumers' criteria limit the number of animals that can enter the export value chain.

As a result, the number of male animals that can meet the criteria of export abattoirs is limited, which can translate into the functionality of abattoirs under their capacity. Abattoirs can process 200 K tones/annum, whereas their capacity is to process 20 million small ruminants/annum, which entails that the abattoirs are operating only 10% of their installed capacity. Poor productivity, market channel, and poor quality product have led sheep and goat off-take rates to 17 % and 18%, respectively. Low off-take means poor livelihood and income in the face of the livestock keeper. A low off-take rate will lead to a high stocking per hectare, overgrazing, natural resource degradation, and higher greenhouse emissions. The major challenges in the Meat Export Sector include a shortage of supply of export quality animals, long marketing channels, high transaction costs (up to 6 hands until factory gate), low proportion of final price reaching farmers, seasonal nature of the supply, lack of vertical linkage of producers with buyers and weak horizontal linkage among producers (groups, cooperatives, etc..), poor access to market information, no further processing of meat to fetch better prices and become competitive in the domestic markets (to obtain live animals), limited destination markets (United Arab Emeritus and Kingdom of Saudi Arabia), poor understanding and support of what is going on in breed improvement, availability of transboundary, trade limiting diseases and weak health services. It was suggested that to revert the challenges and maximize the benefits of the small ruminant value chain, support innovative marketing initiatives such as digital marketing, provision of market information to producers, strengthen collective actions, market linkages between the CBBP community and export market actors, consumer cooperatives and institutional consumers. The smaRT pack has clearly understood the contribution of market channels and facilities in hastening small ruminant production that has attempted to introduce digital marketing and link CBBP breeders' cooperatives with consumers by reducing the engagement of middlemen and brokers.



Figure 6. Presentation on Market Intervention as a component of SmaRT pack for small ruminant improvement

CBBP and Universities' efforts

The presentation by Prof Berhanu Belay emphasized the role of universities in implementing CBBP under university supervision and dividends registered concerning setting CBBP in the proximity of universities. ICARDA facilitated the initiation of CBBPs in the university's proximity to serve as a learning site for students, a source of longitudinal data for postgraduate and graduate research and support, and a community engagement hub. It was also emphasized that a community-based breeding program symbolizes climate-smart agriculture (CSA) by meeting the three pillars of CSA (increasing productivity, adaptation, and mitigation). CBBP is targeted to ensure genetic gain and increase productivity through selective breeding. The program works on adaptive and indigenous breeds to ensure resilience. Feed development, disease control interventions, and enhanced off-take through marketing channels contribute to mitigation. Therefore, CBBP symbolizes climate-smart agriculture. The presentation also noted that small ruminant management is closely linked to women. For example, the orphans of lambs because of the death of dams/ewes are getting care from women, the manure management, including composting and the amendment to the soil in the backyards, is handled by women, and above all the types of lamb to be slaughtered by taking into account color and conformation during festivals is decided by women, that has necessitated having at least one women-led cooperatives in each university and through this arrangement more than ten women-led cooperatives have

become functional. Hence, CBBP addresses youth and women, which symbolizes gender and social inclusiveness that meets both the aspirations and values of both ICARDA and AICCCRA.

The linkage and collaboration created between ILRI-AICCRA and universities are reflected through

- Memorandum of understanding of 31 universities signed with AICCRA/ILRI/ICARDA
- Streamlining of CBBP in the University curricula
- Allocation budget for the implementation of CBBP in villages
- ICARDA discharged responsibilities regarding capacity building and provision of supplies to take the baseline to initiate CBBP villages.
- Universities consider the CBBP project as a five-year flagship project.
- Engaging staff and students in the program
- Continuous monitoring and evaluation.

Universities that have integrated CBBP in undergraduate and postgraduate programs have ensured the use of local data and reference materials in teaching and learning that may enhance the quality and relevance of education. The output of the collaborative activities are appealing in; that more than 31 Universities streamlined CBBPs in UG program, 17 Universities integrated CBBP in 5 Ph.D. and 31 Master's degree programs, and also allocated more than 1 million dollars to set up 57 CBBP villages, they have employed enumerators to collect data in the field, the staff is assigned for running the programs, medicament purchase and capacity building expenses are also covered for smooth execution of CBBP. Running a robust breeding program takes time and investment. Participating Universities have started using the CBBP villages as a learning site for students and engaged postgraduate students in CBBP villages to undertake research for their thesis. A regular and tireless effort is required in the future to take performance data and transfer the data in D'tero platform, organize functional CBBP breeding cooperatives, allocate of budget for the program, ensure quality ram distribution, organize women-led breeding cooperatives, utilize CBBP as learning sites and create enabling and complementary activities such as feed development and marketing of lambs. Therefore, a strong team needs to evaluate and support CBBP sustainably and cost-effectively and participate with the farmers at each stage and improve the program.



Figure 7. Presentation on the role of universities in implementing SmaRT pack for small ruminant improvement

Feedback from Universities

Bahir Dar Workshop

Bahir Dar workshop was held on May 30, 2023, at Unison Hotel, involving nine federal government public universities running CBBPs. The respective Universities have reported their progress and shared good practices and challenges. It was noted that a periodic visit to the CBBP sites and experience-sharing and feedback conferences are required to fine-tune CBBP initiatives and ensure the complementarity of Universities.

Injibara University

Injibara University runs CBBP in the Washera sheep breed, one of the prominent breeds in Ethiopia. Four Breeding cooperatives in four villages (Segenet Maria, Zimbri K/Mihret, Dagi Avolla, and Manguda) were established in 2021. One of the villages (Manguda) is a women-led sheep breeding cooperative. The university allocated a budget, formed team members to run CBBP initiatives, purchased rams for distribution to farmers, employed enumerators to collect data, and created a functional CBBP village serving as a learning site, community engagement platform, and a source of longitudinal data to facilitate research. It was also acknowledged that ICARDA has contributed to building the capacity of staff running the CBBPs, provided materials for taking baselines, and supported the establishment of small-scale and mobile artificial insemination facilities. CBBP is streamlined in undergraduate and postgraduate programs, and the guideline line for setting up a community-based small ruminant breeding program is used as

reference material to teach animal breeding courses (Haile et al., 2020). The baseline has been taken, and monitoring activity is underway. The flock composition and status of the cooperatives are presented in Table 2.

Table 2. Washera Sheep CBBP villages' current information under Injibara University

Sr.no	Villages	Number of farmers	Cooperatives registration status	Flock Composition		
				Ewe	Ram	Lambs
1.	Segenet Mariam	131	√	920	32	2135
2.	Zimbri K/Mihret	123	√	481	19	1773
3.	Dagi Avolla	235	√	925	33	1713
4.	Manguda	130	√	668	21	754
Total		**619**	4	2994	**105**	**6357**

CBBP, run by Injibara University, is constrained by several issues that need a follow-up to create a model and operational program, such as young age lambs selling (< 3 months), parasite load, transportation constraint for supervision, few farmers did not show interest to be a cooperatives member, feed shortage, market linkage, a limited capacity of farmers and cooperatives leaders. The following activities need to be strengthened to ensure a robust CBBP operation such as: supporting cooperatives, monitoring and managing the project, analyzing recorded data and generating publications, developing forages in the cooperative sites and selected owners, introducing AI technology in the selected village, capacity building and awareness creation, organizing field day, enumerators training about D'tero and regular medication to control internal and external parasites. The lessons learned from Injibara University include establishing functional cooperatives, establishing one women-led cooperative, continuous follow-up and monitoring, enumerators recruitment based on community recommendation, proportionate ram distribution based on settlement patterns, and a strong testimony of farmers broadcasted in various media channels. The linkage of community-based breeding programs and production units is also crucial to building a functional and robust CBBP.

Debre Birhan University

Community-based breeding program (CBBP) under the support of Debre Birhan University was initiated in 2022. University runs CBBP in the Menz sheep breed, one of the prominent breeds in Ethiopia. The program initiation followed the steps in establishing CBBP villages. They had also visited both Bonga and Menz CBBP sites run by research centers before initiating CBBP. Three CBBP villages are recognized and licensed as cooperative organizations by the District

Cooperative offices. The flock size and household number are presented in Table 3. The university has allocated a budget, enumerators have been recruited, rams are selected and distributed based on settlement patterns, and CBBP is considered a flagship project under the university program. CBBP is streamlined in undergraduate and postgraduate programs, and the guideline line for setting up a community-based small ruminant breeding program is used as reference material to teach animal breeding courses (Haile et al., 2020).

Table 3. Menz Sheep CBBP villages' current information under Debre Birhan University

CBBP coop	Household	Breeding Ewe	Breeding ram	Ewe lamb	Ram lamb	Total
ዳልቻ (Filagenet)	39	320	18	262	199	781
ወሰራ (Wosera)	57	413	38	463	245	1121
ቆብአስጥል (Woynber)	34	326	-	249	237	812
Total	130	1059	56	974	681	2714

The CBBP implementation under Debre Birhan University is constrained by the resistance of a few farmers to participate in the programs. Keeping more than one ram in the flock, unable to find digital weighing balance and shearing machine in the market, and shortage and expensiveness of anthelmintics. The university has planned the following activities such as continuing data collection, farmers training, feed and forage improvement, breeding ram selection based on EBV, gender and youth mainstreaming, facilitating technical and logistical support(office construction input, office tables, computer), and fulfilling shearing facilities (such as diesel generator and shearing machines). The lessons drawn from Debre Birhan University are the recognition of the program as a flagship project by the university, a strong team mix to run the program, the engagement of key stakeholders, cooperative organization, and collaborative work with Debre Birhan research center and extension offices. CBBP is streamlined in undergraduate and postgraduate programs, and the guideline line for setting up a community-based small ruminant breeding program is used as reference material to teach animal breeding courses (Haile et al., 2020). The linkage of community-based breeding programs and production units is also crucial to building a functional and robust CBBP.

Wollo University

The community-based breeding program was initiated with the support of Wollo University on May 22, 2022, through the participation of key stakeholders. The unique feature of the CBBPs run under Wollo University is that they run the program in cross-bred sheep (Awassi x Wollo) in two villages and pure Wollo sheep in two Villages. The university has allocated a five-year budget

and is considered a flagship project. The project included four CBBP villages and identified production sites near CBBP villages. Baseline data, ram distribution, cooperative organization, health intervention, and enumerators' training and engagement have been done. The project is linked with national and international partners such as Oklahoma State University and the Livestock and Fisheries Development Project run by the MoE under the support of the World Bank. In the CBBP program, three students are engaged are running their research for their DVM thesis. CBBP is streamlined in undergraduate and postgraduate programs, and the guideline line for setting up a community-based small ruminant breeding program is used as reference material to teach animal breeding courses (Haile et al., 2020). Flock composition and household number are presented in Table 4.

Table 4. Wollo Sheep CBBP villages' current information under Wollo University

CBBP villages	Cooperative status	HH	Flock compoision				Total
			Breeding Ewe	Breeding ram	Ewe lamb	Ram lamb	
Ambeya	Feasibility study + working document preparation	62	492	110	122	88	812
Jibat	Feasibility study + working document preparation	58	471	8	155	120	754
Dajallo	Feasibility study + working document preparation	51	398	49	102	98	647
Degendo	Feasibility study + working document preparation	76	322	30	79	57	488
Total		247	1683	197	458	363	2701

There are challenges that CBBP is facing that need corrective action that, includes intervention to reduce the mortality of ewes and rams, the fading of ear tags, and a lengthy process to organize breeder cooperatives. Future activities that need attention include building capacity at each stage, forming women-led cooperatives, setting breeding objectives, cooperatives organization, and soliciting research grants. The linkage of community-based breeding programs and production units is also crucial to building a functional and robust CBBP.

Mekidela Amba

CBBP, under the supervision of Mekidela Amba University, was initiated in 2021. However, there was an interruption in the program due to the conflict in North Ethiopia. The program was reinitiated on December 6, 2022, and launched in multiple stakeholders' presence. The university allocated a five-year budget and engaged a multidisciplinary team (Breeders, Animal Production, Animal Nutrition, Animal Health, and Marketing). In addition, the university purchased selected rams and employed enumerators for data collection. Two of the CBBPs are at the university's doorsteps, which could serve as a learning site and be accessible for follow-up and supervision. The unique feature of the CBBPs under Mekidela Amba University is that they run the program in cross-bred sheep (Awassi x Wollo) in two villages and pure Wollo sheep in two Villages. The cross-breeding program is ultimately targeted to produce a synthetic breed through the crossing and subsequent selection to meet the breeding objectives chosen through the participation of the community and the scientific backing of professionals. Establishing CBBP in cross-bred and pure Wollo sheep breeds and initiating women and men-led CBBP will pave the room for a comparative study and enhance research and development. ICARDA has supported the programs in setting up small-scale mobile AI facilities to disseminate the best genetics that requires capacity building to make the AI facility functional. CBBP is streamlined in undergraduate and postgraduate programs, and the guideline line for setting up a community-based small ruminant breeding program is used as reference material to teach animal breeding courses (Haile et al., 2020). Flock composition and households engaged in the CBBP are presented in Table 5.

Table 5. Wollo Sheep CBBP villages' current information under Mekidela Amba University

Villages	**Flock composition**				**Households**		
	Ewe	Ram/ Castrates	Lambs	Total	M	F	Total
Marye	835	105	510	1450	155	18	173
Jarso	543	84	268	895	85	10	95
Shimbosa	385	87	123	595	75	7	82
Mariam Sefer	447	62	186	695	59	6	65
Total	2210	338	1087	3635	374	41	415

A lengthy process in budget administration, shortage of transport for supervision and a limited commitment from some team members constrain the implementation of CBBP by Mekidela Amba University. The main activities remaining are to create a robust and functional CBBP, such as the castration of non-selected rams, deworming, creating a model and best CBBP, legalizing

cooperatives, making one of the CBBP to women-led, building cooperatives and designing a short market chain for economic improvement, the establishment of Model AI site at the campus in support of ICARDA and implementing of SmaRT pack. One of the university's aspirations is to create a model CBBP that meets the characteristics of a climate-smart village and a hub that synergizes teaching, research, and community engagement.

Debretabor University

The community-based breeding program, with the support of Debre Tabor University, was launched on June 2022 by engaging several stakeholders (Regional, Zonal, and district Agricultural development offices, farmers, Research centers, and Universities). University runs CBBP in the Farta sheep breed, one of the prominent breeds in Ethiopia. The program is implemented in three CBBP villages (Wonber, Deldalit, Adebo), where Adebo CBBP breeders cooperatives will be women-led. The number of households engaged is about 240 farmers and 600 ewes. Table 6 indicates the progress in running CBBP by Debre Tabor University. The major activities undertaken are researcher team formation, baseline recording, awareness creation of the community, budget allocation by the university, ram distribution, and using the sites as earning sites. CBBP is streamlined in undergraduate and postgraduate programs, and the guideline line for setting up a community-based small ruminant breeding program is used as reference material to teach animal breeding courses (Haile et al., 2020).

Table 6. DT Sheep CBBP villages' current information under DT University

CBBP villages	Cooperative status	HH	Flock Composition			
			Breeding Ewe	Breeding ram	Ewe lamb	Ram lab
Wonber (ወንበር)	Not established yet	80	Data entry is not completed and we did not filter the data by villages yet. But the total ewes are 600	Data entry is not completed and we did not filter the data by villages yet. But the total Rams are 85	Data entry is not completed and we did not filter the data by villages yet.	Data entry is not completed and we did not filter the data by villages yet.
Deldalit (ደልዳሊት)	Not established yet	80				
Adebo (አደቦ)	Not established yet	80				

The major challenges the program faces are limited transport (field car) access, selling the best rams (young rams) by the community, few farmers are not willing to cull unwanted rams for breeding, the unwillingness of few farmers to rotate rams, and training D'treo is limited. The tasks remaining to be done in the future include completion of the baseline data recording, performance data collection work will continue, follow-up, and supervision field day organization by engaging key stakeholders and establishing cooperatives and staff training in data management in D'treo and other tools.

Bahir Dar, DMU, UoG, Woldiya and Debark University

The universities (Bahir Dar, Debre Markos, Gonder, Woldiya, and Debark University) were given a two-minute presentation. The above universities have allocated budgets, a team has been formed, and the progress is encouraging. For example, Bahir Dar University has a Bir Adama watershed project in which CBBP is a comprehensive watershed development project component. Bahir Dar University has identified the project site, allocated the budget, employed enumerators, and distributed rams. Woldiya and Debre Markos University have allocated a budget, identified the CBBP site, created awareness in the community, and are currently undergoing baseline and ram distribution. Debark University is working on Semen Sheep and is now under proposal development to solicit a budget from the university. A detailed report will be captured in the upcoming evaluation meeting. The activities of universities in this category are ongoing that need to be strengthened based on the guidelines for running CBBP. CBBP is streamlined in undergraduate and postgraduate programs, and the guideline line for setting up a community-based small ruminant breeding program is used as reference material to teach animal breeding courses in all universities (Haile et al., 2020).



Figure 8. Experience shared among Universities in implementing SmaRT pack for small ruminant improvement

Feedback from Adama Workshop

Adama workshop was held May 30, 2023, at Hillside Hotel, involving 11 universities running CBBPs. The respective Universities reported progress and shared good practices and challenges in the following order. Four Universities presented the progress in detail, and others were allowed to report briefly. The Universities will be given a chance to show their progress in detail in the subsequent evaluation meeting.



Figure 9. Experience shared among Universities in implementing SmaRT pack for small ruminant improvement

Haramaya University

Haramaya University, in collaboration with the International Center for Agricultural Research in the Dry Areas (ICARDA), started Hararghe Highland Goats CBBP in mid-2021 in two villages. These are Damota and Karoterkanfe villages (kebele) of Haramaya district which started with 30 bucks and 707 breeding females in 193 households. In 2022, the project scaled up the CBBP sites to three by adding one new CBBP called Becheke Kebele. In 2023, the project also scaled up the CBBP sites to five villages by adding two new CBBPs: Tinike and Ifa Oromia kebeles. Haramaya University recruited three enumerators on a contractual basis, renewed yearly based on their performance in running data collection. Three cooperatives named Damota, Karoterkanfe, and Becheke (Gadaa) have breeding cooperatives registered by the district cooperative organization. The unique feature of the university is a strong collaboration with local operating projects such as the Livestock and Fishers Development project (LFSDP), which has linked CBBP with fattening to reach out to the market demand and improve the income of the goat keepers. Haramaya University, in collaboration with Haramaya District Agricultural Office (LFSDP), constructed a shed to fatten goats at Damota Kebele. Currently, they have started- goat-fattening activities. The linkage between CBBP and value addition through fattening is exemplary that should be scaled up. CBBP is streamlined in undergraduate and postgraduate programs, and the guideline for setting up a community-based small ruminant breeding program is used as reference material to teach animal breeding courses (Haile et al., 2020). Table 7 indicates the progress in running CBBP under Haramaya University.

Table 7. Hararghe Highland Goat CBBP villages' current information under Haramaya University

Village	Households	Flock composition		
		Does	Bucks	Kids
Ifa	51	141	9	141
Tinke	155	384	30	384
Becheke	177	567	62	567
Karoterkanfe	100	300	33	300
Damota	247	864	85	864
Total	730	2256	219	2256

The major challenges faced in running CBBP under Haramaya University included budget constraints, quality of data collection by enumerators, the resignation of enumerators, feed cost/shortage of feeds in terms of quality and quantity, selling breeding goats by farmers, over expectation of farmers and stakeholders on the project. The plan included bucks selection from CBBP sites based on the selected criterion, constructing fattening houses and offices for the rest of the sites, providing health services for households, engaging farmers in solving problems, creating proper market linkage, and feed production and utilization for selected CBBP sites.

Wolita University

The university initiated the CBBP project in 2022 in one CBBP breeder's cooperative, and two other breeder cooperatives are in the process. The university engaged several stakeholders such as Zone and Woreda Livestock Office, ICARDA, Woreda Administration Office, Woreda Cooperative Office, Kebele Administration Office, Kebele extension workers, CBBP Cooperatives, Areka Agricultural Research Centre and Biodiversity Office. These offices have signed a memorandum of understanding and shared roles to implement CBBP per the standard guideline. The university has assigned one M.Sc student to run research for his dissertation, indicating the university's commitment to using the CBBP site as a learning and research site. CBBP is streamlined in undergraduate and postgraduate programs, and the guideline for setting up a community-based small ruminant breeding program is used as reference material to teach animal breeding courses (Haile et al., 2020). Table 7 indicates the progress in running CBBP under Walaita University.

Table 7. Wolaita sheep CBBP villages' current information under Wolaita University

Villages	House Holds	Flock composition			
		Ewe	Ram/ Castrates	Lambs	Total

Dalbo Atwaro	96	502	32	1212	1746
Bittena, Karchache and Waraza	122	560	New	New	
Ade Aro and Buge	102	520	New	New	
Total	320	1582			

Challenges include feed shortage (seed for forage development and feed supply for fattening), financial shortage, inability to expand CBBPs, early selling of rams, and lack of experience in cooperative committees. Future activities include expanding CBBP, linking CBBP with PU, persuading university management for more budget, completing baseline data, recruiting enumerators, and concurrent activities such as feed development and health interventions.

Jinka University

This project was started in 2021 with the primary objective of characterizing sheep ecotypes based on morphological characteristics, followed by establishing community-based breeding programs and improving local sheep breeds. Two villages were considered (Woset and Dell). Community awareness training and baseline data collection in the two sites were conducted, followed by ram distribution based on the settlement patterns. CBBP is streamlined in undergraduate and postgraduate programs, and the guideline line for setting up a community-based small ruminant breeding program is used as reference material to teach animal breeding courses (Haile et al., 2020). Table 7 indicates the flock composition and households under CBBP initiatives.

Table 7. Jinka sheep CBBP villages' current information under Jinka University.

Sites	House Holds	Breeding ewe	Male: Female	Total Ram needed
Woset	84	600(658)	1:30	20
Dell	175	690 (750)	1:30	23
Total	**259**	**1,290 (1408)**		**43**

The challenges encountered include budget limitations, the reluctance of a few farmers to accept ear tags, and limited cooperative organization experience. The future activities are establishing breeder cooperatives, purchasing more best-performing rams and distributing them to the communities, castration of unwanted rams, more profound training, and follow-up.

Others Universities (Mizan Tepi, Assosa, Wachemo, Worabe, Mettu, Selale, Dilla, Arba Minch, Wolkite)

Universities such as Mizan Tepi University and Assossa Universities have budget allocation from the university, a researchers' team has been assigned, the baseline has been taken, ram/buck distribution has been done, enumerators are employed, and data collection is progressing. The universities such as Wachamo, Worabe, Mettu, and Selale have allocated a budget for the program, and community selection, community awareness, and baseline date recording are underway. The Universities such as Arba Minch, Wolikite, and Dilla University are under proposal development to solicit funds from their respective Universities.

Cross-cutting and key messages

- Universities have mobilized resources and established community-based breeding programs by assigning team of experts to synergize research, community engagement, and learning that needs fine-tuning.
- The status of universities in implementing CBBP is variable, and it requires standardization and optimization to benefit from the programs.
- The linkage between CBBP and PU is a means to scale up the practice, which needs a follow-up to strengthen the scaling operation.
- Implementing CBBP requires participation and capacity building at each stage, field supervision, and expert feedback that needs to be strengthened.
- The data collected through monitoring should be used for evidence-based decision making such as ram selection based on EBV and plan multi-trait selection.
- Ensuring gender and youth engagement in CBBP and finishing activities is a means to address gender and social inclusion.
- Community-based breeding program and SmaRT pack symbolize climate-smart agriculture that captured increasing productivity, resilience/adaptation, and mitigation through off-take, feed development, and health intervention.
- Persuading the farmers and other stakeholders to implement the SmaRT pack is essential and mandatory to create a robust CBBP.
- Experience sharing through a periodic conference and feedback involving concerned stakeholders is essential to create a robust CBBP that ensures scaling and reaching millions of small ruminant keepers.
- Early selling of lambs is a cross-cutting experience among farmers that requires a technical intervention to select lams/kids at an early age, retain a few sires chosen for breeding, and persuade farmers not to sell at an early age.

Annex

Annex 7. 1. List of the participants attended the workshop on evaluation of CBBP implementation in the Universities (May 31, 2023, Bahir Dar)

No	Name	Organization
1	Zemedkun Diffe	Mekdela Amba University
2	Dr. Wale Tesfaye	Mekdela Amba University
3	Dr. Kassa Shawle	Mekdela Amba University
4	Biruk Wondie	Mekdela Amba University
5	Abdu Jemal	Mekdela Amba University
6	Allula Alemayehu	Wollo University
7	Selamawit Fantahun	Wollo University
8	Mohammed Yasin	Wollo University
9	Mr. Hulunim Gatew	Debre Berhan Universty
10	Mr. Ayele Negash	Debre Berhan Universty
11	Mr. Amezen Worku	Debre Berhan Universty
12	Nitsuh Walelign	Debre Markos University
13	Natnael Teshager	Debre Markos University
14	Nurelgn Mohammed	Woldie University
15	Alubel Alemu	Debre Tabor University
16	Dr Hailehezeb Cheru	Debre Tabor University
17	Gedefaw Kindu	Debre Tabor University
18	Mr. Godadaw Misganaw and	Gondar Universty
19	Dr Tsegaw fente	Gondar Universty
20	Esubalew Admasu	Bahir Dar University
21	Tesfaye Getachew	ICARDA
22	Muluken Zeleke	ICARDA
23	Birhanu Asaye	Injibara University
24	Melkam Tsega	Injibara University
25	Yetayih Ayana	Injibara University
26	Melesse Dejen	Debre Tabor University
27	Erdachew Yetagesu	Debre Berhan Research Center

28	Solomon Abegaz	Woldia University
30	Tadess Misganaw	ARARI
31	Tesfaye Getachew	ICARDA
32	Berhanu Belay	ICARDA
33	Getachew Legesse	ILRI
34	Erdachew Yitagesu	DBRC

Annex 7. 2. List of the participants attended the workshop on evaluation of CBBP implementation in the Universities (June 1, 2023, Adama)

No	Name	Organization
1	Sisay Legese Negawo	Metu University
2	Feki Misbah	Wolktie University
3	Mulugeta Tilahun	Metu University
4	Melkamu Girma	Haramaya University
5	Dugassa Dessalegn	Haramaya University
6	Seid Aragaw Hassen	Haramaya University
7	Timketa Dagne	Oda Bultu University
8	Hussien Siraj Yimam	Jinka University
9	Bogale Woldie	Wachemo University
10	Solomon Debebe	Jinka University
11	Oumer Sherif	Assosa University
12	Befikadu Zewdie	Assosa University
13	Aragaw Abera	Jimma University
14	Chencha Chebo	Arba Minch University
15	Sebsib Ababor	Jimma University
16	Ermias Belete	Wolaita Sodo University
17	Eyob Onto	Werabe University
18	Iyasu Lefamo	Jinka University
19	Fikiru Getachew	Salale University
20	Adisu Mosisa	Salale University
21	Baradin Aman	Borana University

22	Nigus Endalemaw	Semera University
23	Zelalem Admasu	Mizan Tepi University
24	Regasa Begna	Mizan Tepi University
25	Biruh Tesfahun	Dilla University
26	Tesfaye Getachew	ICARDA
27	Berhanu Belay	ICARDA
28	Getachew Legesse	ILRI
29	Erdachew Yitagesu	DBRC

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