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## Community-based breeding program integration in Ethiopian Universities

Berhanu Belay, Tesfaye Getachew, Dawit Solomon, Barbara Rischkowsky,  
Aynalem Haile

ICARDA, CCAFS



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# Community-based breeding program integration in Ethiopian Universities

## 1. Background

Community-based breeding program is an emerging and alternative genetic improvement approach in smallholder and resource poor farming systems. The program is participatory in nature that captures farmer's indigenous knowledge. The prime drivers of the program are farmers and the decision is bottom-up and the resource base is internal input such as indigenous breeds that make the initiative sustainable and cost effective. CBBP increased income of participating farmers by 20% as compared to non-participating farmers (Gutu et al., 2015). Genetic gain of 0.21kg/year has been recorded for bonga sheep for six months weight (Haile *et al.*, 2020). Most participating farmers from Menz site have also graduated from a government run safety net program and they now depend on income from sale of sheep for their livelihood. CBBP is a means to conserve the local stock through improvement and utilization. The innovations in CBBP include the empowerment of farmers through cooperative organizations, pooling of small farmers flock to ensure genetic diversity, reverting inbreeding and producing best ram to be shared among breeding groups based on settlement patterns and setting prime price for improved sire through certification that has created new employment opportunities.

The program was run by involving multiple of stakeholders such that, ICARDA, ILRI and the national research system in Ethiopia. The paradox is that, the involvement of the Universities in running CBBP was dismal. However, universities are heavily involved in characterization of indigenous stock in their habitat and farming system. The majority of MSc theses have documented characterization of the indigenous stock. A number of articles have been published on indigenous stock characterization. Characterization is not the end by itself; characterization study should be accompanied by a genetic improvement of the local stock for sustainable utilization and conservation. Hence, CBBP could be the right choice to be run by Universities for multiple functions and benefits. Two approaches could be followed at University: integration of the CBBP in course content, course description and teaching resources of animal breeding course, and establishing of CBBP villages in the proximity of the Universities.

There are enabling and conducive environments to initiating CBBPs in Universities. There are more than 40 government Universities running Animal science programs. The Universities are fairly distributed in different regions and agro-ecologies possessing unique breeds for genetic improvement. For example, Wollega University has Horro Breed, a prominent breed in the proximity of the University. Injibara University has Dangila/Washera/ sheep found in its door steps. Bonga University can be engaged in improving Bonga sheep, one of the prominent breed in the surrounding of the University. Assosa University has indigenous sheep, Oromo-Arab sheep to run community-based breeding programs. Debre Berhan University has Menz sheep in its proximity, a breed which is a livelihood option for a communities living under rugged and degraded landscape. Semera University is located in the arid areas that have Afar goat in their door steps. Live animal export and abattoirs have high demand for Afar goat that requires genetic improvement to meet the existing and future demands.

The Universities have a critical mass of students and academic staff that can run CBBPs and benefit from its multiple advantages. Universities have the responsibility of running community services. However, most are alleged of not bringing impact on the lives of the communities they operate in. We believe CBBP can be an entry point in this endeavour to bring about impact as witnessed by existing CBBPs. CBBP has also the ability to synergize the triple mandates of the Universities, including research, community services and teaching. The notable advantages and the synergy that could be tapped in running CBBP are presented in Table 1.

**Table 1. Synergy of triple mandates of Higher Learning Institutions and impactful benefits in integrating CBBP.**

Mandates	Benefits
Teaching and Learning	<ul style="list-style-type: none"> <li>• Husbandry practices are exercised by students/ e.g. drenching, foot trimming, Ear tagging; Measuring; weighing, data generation, comparisons of performance/</li> <li>• CBBP village serves as learning sites, where students can learn from farmers' practices and production system.</li> <li>• Provide an opportunity to students and staff to know more farmers resources and Indigenous knowledge</li> <li>• Students get ready for future work career and serve as extension and research staff.</li> <li>• Contribute to research and community services</li> </ul>
Research and innovation	<ul style="list-style-type: none"> <li>• Research topics are picked from farmers demand and gaps</li> <li>• Serve as a longitudinal data source for research/ support MSc, PhD thesis/</li> <li>• Publication and evidence from original work</li> <li>• Genetic conservation through improvement and utilization</li> <li>• Contribute to teaching and community services</li> </ul>
Community Engagement	<ul style="list-style-type: none"> <li>• Genetic improvement</li> <li>• Improve income of farmers</li> <li>• Impactful community services</li> <li>• Contribute to research and Teaching</li> </ul>

## 2. Procedures to introduce CBBP in Universities

We approached the public Universities of Ethiopia to engage in community-based breeding programs and benefit from the engagement (Table 1). The approach was top-down, where the university presidents and vice presidents were consulted first and then we moved to work with the technical staff. The consultation of the top management followed by working with the technical staff (department heads, deans and community service directors) has contributed to the delivery of the stated activities. The procedures of CBBP village establishment are based on the guideline in running CBBP (Haile et al., 2018).

## 2.1. Curriculum Integration

The cultures of periodic integration of emerging scientific findings in the curriculum are dismally practiced in Ethiopian Universities. A curriculum is believed to be dynamic in nature; however in practice our curriculum seems to be static. In filling these gaps, communication was made with 25 Universities offering Animal science program to integrate CBBP in their respective curricula. The first step undertaken was, review the curriculum and identify the gaps and propose curriculum amendment and also install the culture of using local data in teaching and learning practice. It was evident that, the local data are not reflected in the course description, course content and course material. Books and reference materials that have been written based on our local context are not extensively in use as part of the learning resource materials. Inclusion of CBBP and local data in the curricula has called for a consultative meeting and a capacity building training on selected topics of community-based breeding program. We organized two separate meetings and had discussion with officials and technical staff of 23 Universities. During the meetings, it was agreed that there is a need to integrate CBBP in the curriculum to ensure the relevance of education and show the dynamic nature of the curriculum. A committee led by ICARDA experts was set to draft the curriculum amendemnts and circulate among Universities. The committee worked out the curriculum amendemnts at each stage and circulated to participating universities and obtained a feedabck. The final amended curriculum was passed to the respective universities and CBBP was integrated in the currriculum by convening meeting with respective course team and deperment council. Through a continuous follow up and lobby 21 Universities/Colleges have integrated CBBP in the curriculum and a resource materials reflecting CBBP are turned into a reference materials for Animal Breeding course offered in the third year of Animal science students.



*Fig 1. Workshops participating Universities in Two venues*

## 2.2. CBBP Villages Establishment

We approached 25 Universities to persuade them to establish CBBP villages in their proximity. All universities showed interest to initiate CBBP villages by engaging multidisciplinary team and allocating budget for up to five years. The Universities were convinced to support the program and benefit from the CBBP initiatives in teaching, research and community services (Table 1). A workshop was also organized to show the benefits of establishing CBBP villages. The workshop deliberately involved Animal breeders and community service directors of universities. The technical steps in establishing CBBP was demonstrated based on the Guidelines in setting CBBP (Haile et al., 2018). As per the recommendations till now 7 universities have established 14 CBBP villages as per the guideline. The remaining, 18 universities are working hard to establish CBBP villages. The CBBP routine activities are underway in universities who are running CBBP.



**Fig 2. Community awareness in running CBBP in villages (right) and Base line recording (left)**



**Fig 3. Rams selected for distribution in CBBP villages' under the supervision of Universities, Mekdela Amba University (right) and Injibara University (left)**

### **2.3. Capacity building and Memorandum of Understanding**

The informal discussion with university top management and technical staff led to a consultative workshop and plan a capacity building and experience sharing workshop. To this effect, as has been alluded to, two workshops were organized. The first workshop was held in Bahir Dar on July 20, 2021 and the second workshop was organized in Bisheftu on July 27, 2021. The theme of the conference was “ **Scaling up Community-Based Breeding Programs through Ethiopian Universities**”. The workshop started with presentations on selected topics such as Overview of CBBP as emerging genetic improvement strategy; lessons in initiating CBBP and Steps in establishing CBBP; Lessons from Universities in running CBBP and Cascading CBBP in Ethiopian Universities. Group discussions were also part of the workshop to ascertain the relevance of CBBP in university settings. At the end of the workshop a home take assignments were given to participants to share their experience to top management and concerned technical staff at college and department level. Based on the demand of the universities, a training of trainers was held in which one animal breeding professional from each university was invited and trained on relevant topics to advance CBBP such that, setting breeding objectives, breeding structure, CBBP data management and analyses and dividends of CBBP villages to University activities. The workshop was organized during November 11 and 12, 2021 at Adama. Twenty five staffs were trained for two days. The feedback from the participants was appealing and encouraging. The feedback from the staff who took training is presented in the following Box.

**Feedback 1.** *The capacity building training in CBBP data management and analyses is based on real experience that will be useful for setting CBBP villages in our proximity. the lesson we captured can be transferred to our students and our staff in a team.*

**Feedback 2.** *The training was so intensive and we shall use the skill to benefit our students and other academic staff.*

**Feedback 3.** *We have enjoyed the training. We did not receive such a kind of training in our undergraduate and post graduate programs. This will create a condition to learn and exercise more and turned us a real breeders and also run CBBP based on experience and knowledge.*

### **Outputs**

- Seven universities have established 14 CBBPs villages
- CBBP has been integrated in a curriculum of 21 Universities/colleges and 4 universities are in the pipeline
- The lesson have paved the way to extend the experience to integrate Climate Risk management in the program of 8 Universities
- Stakeholders have been attracted e.g. CCAFS and 25 Universities
- A platform is created to showcase the synergy of triple mandates of Universities through CBBP
- Universities are contributing towards genetic improvement and food security

### **Sustainability ensuring mechanisms**

- CBBP is Institutionalized through university engagement

- The Triple mandates of higher education (teaching, research and community services) are synergized.
- Capacity building at each stage (technical staff, farmers, and cooperative leaders) is in progress.

### ***Way forward***

- Extend the experience to other Universities in Ethiopia
- Extend the experience to Universities in Africa
- Extend the experience to other programs

### ***Conclusion***

CBBP is an alternative genetic improvement program implemented in low input system. Measurable benefits have been achieved in pilot CBBPs in Ethiopia. The program was implemented by ICARDA, ILRI and national research systems with little engagement of Universities. Universities are now engaged in integrating CBBP in a curriculum and establish CBBP villages. Engaging Universities ensures scaling up of the CBBP and support their teaching, research and community service efforts. The experiences of integrating new findings and local data in the curriculum of Universities can be extended to other programs of the universities.

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