

Synthesis report of two workshops conducted on Engaging Ethiopian Universities in Up-scaling Community-Based Breeding Programs

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Introduction

Two consecutive workshops were conducted on 20th and 27th of July 2021 at Bahir Dar and Debrezeit, respectively. The workshops were aimed at engaging Ethiopian Universities in up-scaling of community based breeding programs (CBBP) through incorporation of CBBP in animal breeding curriculum and being involved in the implementation of CBBP in the vicinity of the Universities. In the first workshop representatives of ten Universities namely: Debrebirhan, DebreMarkos, Gondar, Woldiya, Mekdela, Wollo, Bahir Dar, Enjibara, DebreTabor and Debark have participated in the discussion which lasted one day. Additionally representatives of the regional research institute, the notational Animal Genetic Improvement Institute (NAGII), the regional livestock agency and the national and regional coordinators of the Livestock and Fisheries Sector Development Project (LFSDP) have participated in the workshop. The venue for the first workshop at Bahir Dar was Naky Hotel. In the second workshop which took place at Debrezeit Gold Mark Hotel, a total of eleven Universities namely: Haramaya, Hawassa, Jimma, Bonga, Wolita Sodo, Arsi, Wollega, Wachemo, Mizan tepi, Assossa, and Semera have participated. Here also the regional livestock agencies of Oromia and Southern Region, representatives of research institutions and centers, NAGII, and LFSDP have taken part in the workshop.

The two specific objectives of the workshop were

1. To discuss how the experience gained with regard to implementation of CBBP in Ethiopia could be incorporated in the higher learning Animal breeding curriculum
2. On how Universities can be engaged in community based breeding programs in the areas where they are found and how this can be related to community service and research.

Hence, the workshops are designed to create a conducive condition for the realization of two deliverables:

- Incorporation of CBBP in Curriculum of Universities
- The initiation of CBBP by Universities in their proximity

Workshop at Bahir Dar

After Introduction of the program of the workshop by Professor Berhanu Belay an opening remark was made by Dr Firew Tegegn, President of Bahir Dar University. In his talk he has welcomed the

idea of engaging Ethiopian Universities in up-scaling CBBP. He has also indicated a contribution that can be made by the CBBP to sustainable development goal (SDG). He has given information on the livestock population, ownership pattern, the contribution livestock makes to livelihood, the existing gap in production level and availability of livestock products. He has also presented a comparative data on the research staff in research and Universities.

Overview of CBBP as an emerging Genetic Improvement Strategy was presented by Dr Aynalem Haile of ICARDA. He has presented a comparative pattern of consumption of animal source foods in developed, sub-Saharan countries and in Ethiopia. He has also indicated the potential for increased production that can meet domestic and export market demand, and the failure to meet the export target for the Second Growth and Transformation plan (GTPII). In his presentation the need for genetic improvement was highlighted along with efforts made in the past in the country to realize genetic gain in small ruminants. Past project activities of Farm Africa to improve goat production through crossbreeding, the introduction of exotic sheep germplasm by Amed-Guya and DebreBirhan ranches in the past, the Ethiopian sheep and goat productivity improvement program were mentioned along with the absence of sustainable improvement after the implementation of the projects. The introduction of community based breeding program as an alternative way of genetic improvement has been mentioned by Dr Aynalem along with the gain in terms of positive change in birth weight (not selected for), weaning weight and six-month weight, increased meat consumption, increased income of about 20% and increase in the capital producers have. Based on the experience scaling up and out to other areas of the country and to other countries have been done with funding from World Bank-Livestock and Fisheries Sector Development Project, USDA, and Accelerating the impacts of CGIAR Climate Research in Africa (AICCRA) project etc. as an impact at scale program. With implementation of the CBBP there has been attempt towards optimization of the programs, designing schemes that can fit the pastoral and agro-pastoral systems, breeding structures in different setups, adopting data capture programs and introduction of genomics to refine the breeding program. As key messages he has stressed the importance of institutional arrangements, capacity building, and value chain approach for success of CBBPs.

Dr Tesfaye Getachew of ICARDA has given a presentation on lessons in initiating CBBP with focus on steps to be followed and organization. The presentation has covered the existing situation in relation to the contribution of livestock and the productivity level, what we need to achieve and how to realize what we need as a components of breeding objective that can be realized, and the current work on CBBP on sheep and goats as implemented by higher learning and research institutions. He has also indicated the up-scaling of the CBBP in Amhara, Benishangul, Oromia, Tigray region in collaboration with LFSDP, some NGO's and higher learning institutions. Up-scaling has also extended to other countries including Tanzania, Uganda and Iran. He has explained the steps of CBBP which include Identification of Target site/ breed/ community (size and coverage, equity, willingness, sufficiently large flock size- presence of minimum of 500 breeding female); definition of breeding goal/trait (based on identified Trait preferences of the community in the different CBBPs), definition of selection criteria, and developing breed structure-Breeding

plan. He has indicated the initiation of CBBP in Ethiopia on four sheep breeds namely: Menz, Bonga, Afra, Horro and the success achieved and the failure encountered (particularly in Afar breed which is kept under pastoral and agro-pastoral production system). He has also mentioned other aspects which need consideration:

- How long does a sire be used?
- Use of different selection criteria
- male to female ratio,
- varied population size,
- choice may not be straight forward all the time (need to evaluate alternatives)
- Engaging communities – workshop, cooperative formation, forming the leadership
- Identification and recording,
- Having multi-purpose animal collecting yard

He has also stressed on other issues which are related to:

- Recruitment of enumerators and data recorders (preferably someone within the community and residing there);
- Ranking selection and sire management;
- Phenotypic selection at the beginning but as data accumulates selection should be based on EBV estimates which come from analysis of data using softwares e.g. WOMBAT, DMU; and
- Considering socio-cultural aspect of the community that may have relevance to the CBBP.
- Having adequate finance (e.g. revolving fund for sire transaction)

The achievements attained so far have also been listed by Dr Tesfaye. Publications on CBBP results (e.g. Aynalem et al., 2020), Model village establishments, implementation of sire certification, introduction of reproductive technologies, engaging youth group in fattening non-selected and culled animals, developing health interventions, improving grazing land management, introducing climate smart agriculture; sheep and goat becoming main agricultural activity; increased contribution of sheep and goats to livelihood and household income, substantial genetic progress which is comparable to international standard of about 1% per year; development of capacity, and growth of breeder cooperatives with a sizeable capital are among the achievements.

In addition to the achievements the following activities have been reported accomplished or underway:

- Scaling out – breeding sire dissemination to other non-CBBP flocks or AI -to communities surrounding the CBBP
- Developing digital database,
- Workshop on up-scaling CBBP in Amhara region
- Establishment of low cost AI facilities – mobile tent, microscopes, small generator etc.

- Digitizing data system Anicloud/Dtreo CLEANED (Comprehensive Livestock Environmental Assessment for Improved Nutrition)
- Optimization of CBBP – by taking into consideration starting from phenotypic selection and move to selection index based on records, early age culling, sire use un-certain sire – reconsidering traits, the proportion of sires to retain, across age selection, when to select (e.g. Muller et al., 2021)

He has also raised the issue of integrated data development and the role Universities can play in addressing challenges pertaining to follow up, along with research institutions, NAGII etc.

Experiences of higher learning institutions on implementation of CBBP in the areas close to the Universities were presented by Injibara University and Bahir Dar University. Both Universities have worked on Washera (Agew or Dangla) sheep. In the presentation description of Washera sheep along its production system was given and the importance of sheep in production system highlighted. Activities conducted so far in the implementation of CBBP by Injibara University were research team organization; target breed and site selection (Awi zone based on criteria); Stakeholder meeting and community awareness creation; Animal identification and recording; Baseline ram selection and acquisition (from market); Ram selection at site etc... Among challenges faced during implementation were early selling of lambs; lack of transportation to the CBBP site and refusal of some of the farmers for ear tagging of their sheep. As the CBBP progresses it is planned to create market linkage and promote further ear tagging of animals.

In the presentation by Bahir Dar University it was disclosed that the CBBP is being implemented in an area where the University is making integrated intervention and activities done so far include preliminary survey, provision of training, and purchase and distribution of rams to beneficiary community. It was mentioned that the procedure followed was not strictly CBBP type and there is need to improvise. Areas which need focus were improved and uniform data collection, continuous follow up, allocation of adequate budget, and ensuring project ownership (responsibility) at individual and institutional level.

In a presentation made by Prof. Birhanu on ‘‘dividends of Integrating CBBP in a curriculum and initiating CBBP in proximity of Universities’’ he has outlined on how to cascade CBBP in Ethiopian Universities through creation of CBBP villages and integration of CBBP in the curriculum. CBBP as an emerging and alternative breeding strategy is explained to have dissemination strategy that is designed from the beginning unlike conventional breeding. The integration of CBBP in the curriculum and in the research activities of Universities is stressed to include the social aspect, the genetic aspect and the complementary activities (feed, disease control and marketing). He has also forwarded the challenge to incorporation of CBBP in the curriculum of the Universities because of the fact that currently curricula are harmonized across Universities and has limited room for flexibility. Additionally the new educational road map strives for Universities to focus on becoming Center of Excellence in a specified field or activity (e.g.

research) and non-research Universities may find it difficult unless considered in community service program. Potential ways to incorporate CBBP in curriculum are suggested to be:

- Amendment – change within the course outline, course description, course module
- Introduction of new course
- Open up a new program

Given the limited amount of autonomy to manipulate course contents the current initiative is suggested to be based on amendment. Relevant courses to CBBP in the Curricula of Ethiopian Universities include: Animal sciences; Animal genetics; Animal breeding; Reproductive technologies; Biotechnology. In most cases important aspects such as characterization of animal genetic resources and CBBP are not included. Upon inclusion of the CBBP in the curriculum as course amendment, the need to consider them in course outline, PPT, course notes, reference books etc. was emphasized in the presentation.

The introduction of CBPP in the existing curriculum has dividends in terms of ensuring dynamic nature of curriculum, existence of research evidence, ensuring synergy of teaching and learning and scaling up to other Universities and countries.

In addition to consideration of CBBP in curricula, involvement of Universities in implementation of CBBP in the community at the proximity has a dividend in terms of realizing impactful community services; showing Genetic improvement, conservation and utilization in action (practice); as source of longitudinal data which can be of value for research pertaining to post graduate programs; as learning labs in the field; creating possibility of integration and synergy of the triple mandates (Teaching and learning; Research and innovation; and Community Engagement) of higher learning institutions; ensure sustainability by scaling up and out CBBP; and as a way of making contribution at national level. Because of the absence of need for expensive and elaborate research facilities new Universities will be more beneficiary if they get involved in CBBP activities, while it is also beneficial to Research Universities to be impactful and generate well accepted and quality publications.

It is mentioned that ICARDA can provide technical and advisory support to the Universities in the incorporation of CBBP in the curriculum and also in scaling up of CBBP in the vicinity of the Universities. Both undertakings (curriculum and up-scaling) require commitment and interest (not giving up); top management to Head of Department engagement; Coordination; teamwork and well specified role in a team; allocation of optimal budget; planning for any other new engagement; engaging farmers from the outset to avoid any excessive expectations, and are listed as important considerations to overcome challenges that may occur along the way. As any breeding activity CBBP requires longtime and prolonged investment and this needs to be taken into consideration. In CBBP incremental or transformative approach can be undertaken. The incremental case can be exemplified by selection for growth traits while the transformative can be exemplified by

successful genomic selection for traits such as litter size where substantial change can be realized within a short period.

Workshop at Debrezeit

At Debrezeit the workshop started with program introduction by Professor Berhanu and followed by an opening remark given by Dr Thomas Cherinet, Coordinator of the Livestock and Fisheries Sector Development Project (LFSDP). In his remark Dr Thomas has raised the collaboration between the project and ICARDA on implementation scaling-up of CBBP in Ethiopia, particularly in the areas where the project is being implemented. In his attempt to introduce the LFSDP to the participants Dr Thomas has indicated that the project has three components. The components are Component A: Linking More Productive Farmers to Markets; Component B: Strengthening National Institutions and Programs; and Component C: Project Coordination, Monitoring and Evaluation, and Knowledge Management. He has also stressed the importance of collaboration with higher learning institutions to ensure the sustainability of CBBP. Dr Aynalem and Dr Tesafye of ICARDA have given similar presentation to the one given in Bahir Dar. Experiences of Universities in establishment of CBBP and lessons learned from the implementation were presented for Haramaya University by Professor Mengistu Urge. He has reiterated previous genetic improvement efforts by Haramaya University and the lack of sustainability in all the projects. He has discussed how the CBBP has started in collaboration with ICARDA and the status of the program at the moment where identification of sites, distribution of rams, and data collection is under way by recruiting enumerators and data collectors. He has also mentioned the presence of positive gesture from the University management and the availability of some research funding from sources such as competitive research grant within the university, regular budget etc. About 477 female animals and 40 males are identified at the initial stage of the implementation of the CBBP.

Professor Birhanu has also given similar presentation to the one in Bahir Dar on Dividends of Integrating CBBP in a curriculum and initiating CBBP in proximity of Universities.

Discussion at Bahir Dar Workshop

A group work guide (shown below as Part I and II) was provided to groups and group discussion was made on the following:

Part I. CBBP integration in Animal Science curriculum/possibilities and actions

- Course description/ content / course outline/module by chapter incorporated
- Experiences and gap analysis in incorporating emerging issues/local data in a curriculum
 - Do we need to include local data / experience e.g. CBBP in a curriculum?
 - Do we have data/scientific resources to include in the curriculum? Identify the research evidence and incorporate as chapter or sub-topic e.g. CBBP

- What steps (what admin requirements) to follow to integrate local data in a curriculum/ as per the internal guidelines/ to integrate?
- Other issues/ any
- Reporting officially by integrating in /Dates

The following Suggestions were made:

- Curriculum on CBBP important- Scientific resources and data available from various sources/ Applied animal breeding will be the right place to incorporate
- To incorporate the CBBP in undergraduate curriculum as pilot program by including it as sub-chapter while at graduate level it be Included as a chapter.
- To incorporate CBPP in animal breeding courses (add to course description) until end of August with a plan to start teaching in 2021/2022 academic year.
- There is possibility for modifying a curriculum within a limit of 10% at instructor, college or department level. This can be agreed and be enforced at the Amhara Universities forum for implementation with a top down approach to maintain harmony among Universities.
- Need for determining what level to be included at undergraduate and at graduate level. A revised curriculum with a course description/module to be submitted to a senate by department heads. The revision will be based by the content to be developed by ICRDA. The content and the need to incorporate CBBP be communicated to the Universities. Prof. Berhanu Belay, Dr Solomon Abegaz Guangul and Dr Mengistie Taye to develop the contents until 15 August, and by Sept. 30 the Universities finalize the incorporation process.

Part II. CBBP villages in the proximity of Universities

- Do we need CBBP supervised under respective Universities? Why?
- Is there initiative to include CBBP in respective Universities?
- What administrative steps to follow and persuade the management?
- What possible advantages to capture by setting CBBP?
- What challenges do we anticipate? If so how do we ameliorate the problems?
- Other issues in relation to CBBP?
- Reporting through accomplishment and time line
 - Proposal approved/ Budgeting evidences/ 5 year/
 - Kickoff schedules
 - Minutes of Committee

The following were suggested and reached consensus upon:

- CBBP within proximity is believed to be important because its contribution to strength research and be a working material for students' research and as community service.

- A document which guides the Universities on how they can integrate CBBP in community service or research undertakings within the vicinity of Universities be developed.
- Challenges related with Staff turnover; budget administration; lack of commitment by the collaborating extension wing, resistance from farmers, shortage of transportation for field work are suggested to be addressed from the outset and along the way in implementation of CBBP in the vicinity of the universities.
- The CBBP within the vicinity of Universities should be of two tiers: the first one is for Universities who started to strength what they have by increasing the collaboration with the extension system while those Universities which haven't started to begin implementation and as such it was suggested that Debrebirhan, Gondar and Wollo Universities to initiate CBBP within the proximity of their Universities by mid to end of October, 2021 while DebreMarkos and Debark initiate in November and early December of 2021.
- Signing of MoU between Universities and ICARDA was suggested to ensure sustainability and accountability. However, letter of cooperation to be written by ICARDA to the universities indicating their agreement to cooperate in implementing CBBP is suggested instead. The placement of the coordination of the CBBP by the Universities and whether it be under the community service or research is suggested to be decided by each university as it suits the institutions internal governance. Each university is requested to fill a commitment form with a Planning and Monitoring check list related to schedule for delivery or implementation of CBBP.
- In the future experiences gained by the Universities will be evaluated and be scaled up to other Universities elsewhere in Africa after another work shop of the Universities sometime in October/ November.

Discussion at Debrezeit Workshop

Similar Group guide as shown above as Part I and II were used for group work at the Debrezeit workshop:

CBBP integration in Animal Science curriculum/possibilities and actions

- The CBBP be included as a sub-chapter at undergraduate level and as a chapter with practicals at graduate level was suggested for incorporation of CBBP in the curriculum. With regard to choice of courses for inclusion of CBBP, animal breeding course at undergraduate and Applied Animal breeding or Designing Breeding Programs at Graduate level were identified. Inclusion of success stories from other CBBPs as evidence in the development of the curriculum was also suggested. With no change in credit hour the CBBP is agreed to be incorporated in the course description at both under graduate and graduate level and to be approved at department level/department head/department council or at the level of Vice President for Academic affairs. The other suggestion was for the

procedure to start from course team and end at department level. ICARDA was requested to develop a harmonized draft content for both under and post graduate level to be commented and enriched by universities for finalization. Later a committee of three which include Dr Tesfaye Getachew of ICARDA, Dr Gemeda Dhuguma of Wollega University and Wondimu from Wachamo University was established to draft the content. For the under graduate the CBPP is scheduled to be implemented as of 2014 (2021/2022 academic year and the curriculum modification to be finalized before the beginning of the academic year. For the graduate program the preparation of the content will be done along with the undergraduate content but implemented will be done as the need arises. It is suggested that ICARDA to write a letter about the workshop outcome and the consensus reached so that the work can be owned by the University management. Training for teaching staff on CBBP after the inclusion in the curriculum has been suggested.

- Inclusion of some component of CBBP in the new curriculum for high-school has also been suggested.

Establishing CBBP villages in the proximity of Universities

Importance of CBBP Villages within the proximity of Universities has been stressed in relation to obtaining local data, integrating teaching and learning process, acquiring hands of experience, job creation, improvement of livelihood and in capacity building and availing economic benefit to the communities. Additional benefit in increased community awareness on scientific approach on genetic improvement has also been raised.

- Some universities have indicated to have initiatives pertaining to CBBP while others expressed there will be no difficulty in having new initiatives. As such initiation and implementation is suggested to begin with the universities schedule for research review or budget allocation and universities to report the state of progress the latest in November, 2021. The mainstreaming can be done through proposal development for research or community service competitive funding.
- Challenges to be addressed with respect to budget, resistance from the staff or administration in some cases, lack of strong commitment, sustaining for long period of time, the need for dependable market outlet, lack of skill etc. have been raised. Taking actions that can address the challenges e.g. training, raising awareness, working with other stakeholders were suggested to get attention.
- Use of the budget from competitive portfolio or allocation of dedicated budget for CBBP without the need to compete (so that the program will not be discontinued because of lack of budget) has been suggested.
- Guidelines developed by ICARDA and others on related topics will be made available for the implementation of CBBP. In addition to that ICARDA will provide some support at the initial stage in a form eartags and applicators.

Some relevant references to be consulted in relation to the objective of the workshop.

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