RESEARCH PROGRAM ON Livestock

CGIAR

More meat, milk and eggs by and for the poor

Policy brief:

"Community-Based Breeding Programs and upscale strategies for sheep and goats in Ethiopia"

Emna Rekik, Tesfaye Getachew, Mourad rekik, Barbara Rischkowsky and Aynalem Haile

ICARDA

ILRI INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

ICARDA Science for resilient livelihoods in dry areas

CIAT International Center for Tropical Agriculture Since 1967 Science to cultivate change

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

SLU

CGIAR is a global partnership that unites organizations engaged in research for a food-secure future. The CGIAR Research Program on Livestock provides research-based solutions to help smallholder farmers, pastoralists and agro-pastoralists transition to sustainable, resilient livelihoods and to productive enterprises that will help feed future generations. It aims to increase the productivity and profitability of livestock agri-food systems in sustainable ways, making meat, milk and eggs more available and affordable across the developing world. The Program brings together five core partners: the International Livestock Research Institute (ILRI) with a mandate on livestock; the International Center for Tropical Agriculture (CIAT), which works on forages; the International Center for Research in the Dry Areas (ICARDA), which works on small ruminants and dryland systems; the Swedish University of Agricultural Sciences (SLU) with expertise particularly in animal health and genetics and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) which connects research into development and innovation and scaling processes.

The Program thanks all donors and organizations who globally supported its work through their contributions to the CGIAR system.

Editing, design and layout—(Organization Name) …….

Cover photo—Caption (photo credit: Organization Name/Name of photographer).

ISBN: ……

- Citation: Emna Rekik, Tesfaye Getachew, Mourad rekik, Barbara Rischkowsky and Aynalem Haile, 2021. Community-based breeding programs and upscaling strategies for sheep and goats in Ethiopia. Policy brief, Addis Ababa, Ethiopia: ICARDA.

Contents

Community-Based Breeding Programs and upscale strategies for sheep and goats in Ethiopia

Executive summary

Community-based breeding programs (CBBPs) for sheep and goats have been operating in Ethiopia for a decade and genetic progress in growth and reproduction traits has been observed together with other socio-economic benefits, although at a pilot scale. The Ethiopian government has identified CBBPs as strategy of choice for genetic improvement of small ruminants. To make impact to the lives of large number of rural poor, CBBPs need to scale. Therefore, scaling up of CBBP is necessary to see large scale and continuous gains across Ethiopia. Complementary interventions like animal health, feeding and market intervention are also needed to address challenges and to enhance farmers' livelihoods from small ruminants' genetic resources. The Ethiopian government and the private sector need to invest in strategic areas around CBBPs to make the programme work for the poor and be sustainable in low-input systems. Scaling up strategies should be an essential component of the pilot design.

Introduction

Ethiopia has a large and diverse population of small ruminants, which contribute substantially to the livelihood and income of the rural poor. Since 2009, Community-based breeding programs (CBBPs) have been implemented in Ethiopia as an alternative approach to increase small ruminant productivity and help communities harness the growing global demand for meat. CBBPs was introduced to Ethiopia by ICARDA, in partnership with the International Livestock Research Institute (ILRI), the Austrian University of Natural Resources and Life Sciences (BOKU), and the Ethiopian National Agricultural Research System. The programme's focus on building local capacity through education and training, is leading to sustained genetic improvement of indigenous breeds of sheep and goats and creating systematic breeding programs at the community level, including organized animal identification and recording of performance and pedigree data (Haile et al. 2020).Participation in the CBBPs improved livelihoods through increasing revenue from income streams and growing the asset base of smallholder farmers. The program also enhanced smallholder resilience by providing a buffer from exogenous shocks.

While CBBPs commonly start as small initiatives, the wish to scale up is implicitly present, including more farmers/communities in the region and additional actors, such as policymakers NGOs, Universities to bring impact at scale.

Genetic gains

CBBP resulted in sustained genetic gains in small ruminants in Ethiopia. Since its implementation many studies have reported an improvement in growth and reproductive performances, such as lamb growth rate, lambing interval, reduced mortality in goats and sheep. Haile et al (2020) indicated that six-month weight increased over the years in sheep (e.g. In Bonga, the average increase was 0.21±0.018 kg/year, followed by 0.18±0.007 and 0.11±0.003 kg/year in Horro and Menz, respectively).

Socioeconomic gains

CBBPs have resulted in substantial benefits to the communities as evidenced by an increase in farmer income by 20% and tripling community consumption of foods from animal sources. In Ethiopia, as many as 7,000 households have benefited from the innovative approach. Farmers have also created more than 50 formal breeder cooperatives - building capital from reinvestments, including the buying of rams and bucks to continually improve the productivity of their flocks (Haile et al. 2020). One cooperative in Southwest Ethiopia, for instance, has generated around US $96,000 in capital, which is being used to reinvest in community improvement projects. The Government of Ethiopia incorporated the CBBP approach into the country's livestock master plan, and is investing US $560,000 for upscaling of the scheme across the country.

Challenges to scaling up

Engagement of local and regional institutions: In many sites, CBBP is more of a community engagement project, where existing staff and local participants lead their own cooperatives. Formalization of CBBP is lacking in some regions of the country at municipal and district levels. While scaling up approaches in Bonga were approved and undertaken by Bonga research centre, in another region, Menz, the scaling up initiatives were not well organized and not welcomed by the regional government. Participation of local and regional personnel enhances community and individual farmer commitment and may be instrumental for additional development interventions such as vaccination campaigns, communal forage reserves, value adding and marketing strategies.

National coordination and ownership: currently there is no national coordination mechanism for CBBP. ICARDA, and its partners, have been playing a coordination role for a decade. Scaling up CBBP at the national level is not possible in the absence of formal federal and regional level coordination and national ownership (Kaumbata et al. 2020). Coordinated actions and alignment of interests are imperative to promote CBBPs from the innovation systems perspective (Wurzinger et al. 2021)

Partnerships: The majority of existing CBBP's partners are composed of research and academic institutions. While these institutions provide value addition in the scientific and technical domains, they are not best suited for the commercialization and monetization of CBBP. Currently there is a lack of viable commercial partners that would be critical in the commercial scaling up of CBBP. Partnerships are an important strategy to bring innovations to scale, as they combine the competencies of different actors to address difficult

development issues, create breakthroughs, and combine different types of financing to create and sustain solutions (Kaumbata et al. 2020)

Sustainable funding: While CBBPs started as externally funded projects, a shift toward continued national support would be necessary for CBBP to be sustainable. There is co-funding from the government but not necessarily flexible or sufficient to cover all programme's needs. This type of extra-budgetary funding is often unpredictable. In order to ensure scaling up of the programme, there is need for regular and predictable funding so that long term planning and implementation of scaling up strategies is possible.

Upscaling approaches

Several pilot CBBPs have been implemented in Ethiopia since 2010. However, to make an impact on a broader scale, CBBPs need to cover a much larger population and area. Improved genetics produced in the CBBPs also need to be disseminated to a wider area, through either natural mating or reproductive biotechnologies such as artificial insemination. Mueller et al. (2019) developed a methodological framework for up/out scaling options of CBBP. As indicated, there are three strategies to increase the availability of improved rams/bucks: increase the number of CBBPs, increase the supply of improved rams/bucks per CBBP and increase the use of improved rams/bucks. These approaches can upscale to a certain degree, however, they remain technical. There is a need for more institutional and policy level strategies to maximize upscaling of CBBP.

Artificial Insemination: Up scaling of CBBP using AI may have a great opportunity to disseminate the superior genes from the CBBPs to the base population without generation lag; enables to get more candidate males with similar age; and has the power to adjust the breeding season to occur early in the ample feed availability that provide a good environment to the breeding dams for better chance of conceiving, and increase growth performance of progenies thereby improve the flock profitability over replicating CBBPs and base flocks. AI facilitates pedigree recording and therefore contributes to improve the accuracy of breeding value. This would result in additional genetic progress and increased benefit for CBBP. Another aspect which makes AI programs attractive is better prevention of the spread of sexually-transmitted diseases. A combination of adjustments in the design of breeding programs with AI leading to reduction of costs, increase of conception rate, selection for additional traits of economic interest and improved selection accuracy would make this strategy more profitable. Operationalization of AI is, particularly expensive unless the government absorbs the initial investment in infrastructure.

Increasing the number of CBBPs: Replication of CBBP across the country is guaranteed to bring high returns on investment. The number of CBBP's has increased from the initial eight to more than 40 (Haile et al., 2019). Looking at the benefits and practical feasibility of CBBP, the Ethiopia government is investing in establishment of additional CBBPs through its regional research and extension system. Economic benefit and return on investment were highly favourable for the strategy aiming at replicating current CBBPs and increasing the number of rams from reaching base herds.

Increasing the number of rams/bucks production and dissemination of more CBBP rams can be highly profitable and helps to out-scale the program regionally. According to Muller et al

2019, a single CBBP could disseminate 200 rams yearly, which would benefit about 600 farmers directly (200 /10, where 10 is the average number of ewes per farmer).

The above avenues, to reach a larger sheep/goat population with improved rams/bucks, are not exclusive and should be considered jointly when planning different programs. Below are further strategies to complement upscaling at the institutional and policy levels.

Investment: Government commitment and support is essential for CBBP sustainability. Incentives by governments for private sector investment in CBBPs could result in sustainable and yet rewarding benefit to all actors in the small ruminant value chain. Collaborating with government to further scale-up the CBBP could be possible so that the impact will be more visible and help to influence the private investors. The private sector, including farmer cooperatives, veterinary drug suppliers, feed processors and traders, could play role in provision of inputs and services to support breeding programmes. As the private sector is not well developed and is business oriented and investment in breeding programmes may not result in lucrative immediate benefits, incentives by government are needed. Incentives by governments for private sector investment in CBBPs could result in sustainable and yet rewarding benefit to all actors in the small ruminant value chain.

Institutionalization: The alignment of the CBBP with national and/or regional policies should be reviewed as it is paramount for the CBBP to have government support to ensure its sustainability. Institutionalization of the programme in a sensible and practical way is key for sustainability of the CBBP and to attain potential genetic gain in the long run (Lamuno et al 2018). Continuous technical and institutional support to cooperatives from national research and extension is crucial to their sustainability. Strengthening the financial capacity of the cooperatives and by linking the communities to better markets and providing continuous technical support could contribute to sustainability of the CBBP. Demand for better trained breeders has also led to Ethiopian national universities to officially incorporate CBBPs into their curricula. Combining the CBBPs with the capacity building in higher education (involving MSc/PhD candidates, technical staff) will have a very positive outcome.

Scaling-up resilient improved breeds: The small ruminants are important in ensuring food security under a changing climate, as they provide households with both nutrition and disposable income. Genetic improvement is an important tool to accumulate response to selection and it can be used to reduce livestock emissions and create more resilient and adaptive animals to climate change. More collaboration with climate change driven organizations will help address this issue. Climate Change, Agriculture and Food Security (CCAFS) has partnered with ICARDA in 2018 to upscale the community-based small ruminant breeding program in Doyogena, Ethiopia.

Establishment of gender specific CBBP: CBBP can greatly benefit from the inclusion of women, who make up a large proportion of those working in agriculture, especially in rural areas. It will also help smallholder women to move from subsistence to self-reliance. For example, in 2018, a gender-targeted CBBP was implemented in Serera Bukata village, Ethiopia. The program enabled women participants to challenge stereotypical images and provided them with an opportunity for ownership and control over resources and assets. Expanding similar programme will benefit both parties

Implications and recommendations

Enhance organizational capacity of cooperatives and monitoring system of national research institutes: more training and better cooperation with district cooperative promotion offices would help to strengthen the organizational capacity of cooperatives. Tailored training on financial management and record-keeping are needed. More importantly, the monitoring system of research institutes and technical back-up needs to be enhanced. Better monitoring system should also ensure flow of information among ICARDA, ILRI, national researchers and the cooperatives.

Creation of a financially sustainable system: Assisting the cooperatives to acquire reliable income generating assets, introducing value-added fee on sold products or negotiating for government subsidy and/or any other strategy that will guarantee sustainable revenue generation. Participation of the private sector and participation of processors and retailers of small ruminant products can boost incomes of smallholders contributing to sustainability of smallholder breeding programmes. For this to materialize, initial long-term investments and government incentives are essential. Such incentives could include, but are not limited to: tax exemption on inputs for specific period, access to credit facilities and land (Haile et al., 2019).

Monitoring and evaluation: monitoring and evaluation is a critical component of an effective scaling up process (Brizzi & Mangiafico, 2014). However, monitoring and evaluation of scaling up processes differs from monitoring and evaluating results of pilot CBBPs. A scaling up monitoring system needs to monitor the scaling up intermediate goals, rather than the defined CBBP project outputs and outcomes. Monitoring and evaluation of the pilot programme assesses whether the tested model has been successful, and lessons of what worked and did not work, while monitoring system for the scaling up process provides feedback on whether right conditions and enabling environments for scaling up are being created for scaling up to succeed, and whether the programme will be sustainable (Hartmann &Linn, 2008).

Facilitate women's participation: ensure women's participation in the CBBP so that they could benefit from the program. It is also important to represent women in the leadership to help them address their interests.

Improve transparency of the leadership committees to members: progress made and challenges encountered in running the CBBP needs to be communicated to members. Particularly, a tradition to periodically report income/losses and auditing should be embraced by all cooperatives. Equally important for better follow of information is members' active participation in meetings and other assignments of the cooperatives.

Support in market linkage and value addition practices: this would help to maximize the benefit from genetic gains to enhance farmers' livelihoods from sheep and goats. Linking farmers to urban markets in central areas where there is better demand and price for mutton would help farmers realize the potential benefits from sheep. Farmers' access to better markets would also encourage them to practice value addition in sheep. Organized farmers in well-structured cooperative makes market linkage and introduction of new practice easier.

Ensure farmers access to other services: creating enabling environments is vital to attain a possible benefit from CBBP and improve farmers' welfare. Organized farmers as sheep breeders would increase the economies of scale and bargaining power of farmers. Hence, similar to the linkage to output markets, linkage to input market (feed supply and health service) would be easier for cooperatives as the scale would minimize cost and attract suppliers.

Incorporate socioeconomic data into biological data collection: collection of socioeconomic data (household income, education data, health prospects) would be possible at the same cost using the already employed enumerators.
Enhance collaboration and understanding among stakeholders: a better understanding of the CBBP approach and the role of local genetic resources would help sell the technology to government bodies. Commitment from national researchers also needs to be enhanced and they need to own the process. Building the capacity of the cooperatives so that they could own the process themselves is an alternative. Yet in the short run, it would be wiser to improve research institutes' support and commitment to the program. Arranging experience-sharing among regional governments and breeder cooperatives would help to share better practices. This is helpful to show the impact of political willingness on the CBBP and the benefits that could be realized.

Acknowledgements, contributing team members

- Funder acknowledgements: CRP Livestock

- Names, positions and emails of contributing research team members: Emna Rekik, Tesfaye Getachew, Mourad rekik, Barbara Rischkowsky and Aynalem Haile

Related publications and further reading

Brizzi, A. & Mangiafico M. (2014). Scaling up results. Available online: https://www.ifad.org/documents/10180/3b9385c2-242f-492f-bed4-f33bc4d777ee.
Bruh W, Gebretnsae M, Community based small ruminant breeding programs in Ethiopia: Progress and challenges, Small Ruminant Research, Volume 196, 2021, 106264, ISSN 0921-4488, https://doi.org/10.1016/j.smallrumres.2020.106264.
Gutu Z, Haile A, Rischkowsky B, Mulema A.A, Kinati W. and Kassie G. 2015. Evaluation of community-based sheep breeding programs in Ethiopia. Addis Ababa: ICARDA. https://hdl.handle.net/10568/76233
Haile A, Getachew T, Mirkena T, Duguma G, Gizaw S, Wurzinger M, Soelkner J, Mwai O, Dessie T, Abebe A, Abate Z, Jembere T, Rekik M, Lobo R.N.B, Mwacharo J.M, Terfa Z.G, Kassie G.T, Mueller J.P, Rischkowsky B, Community-based sheep breeding programs generated substantial genetic gains and socioeconomic benefits, Animal, Volume 14, Issue 7, 2020, Pages 1362-1370, ISSN 1751-7311, https://doi.org/10.1017/S1751731120000269.
Haile A, Gizaw S, Getachew T, et al. Community-based breeding programmes are a viable solution for Ethiopian small ruminant genetic improvement but require public and private investments. J Anim Breed Genet. 2019;00:1–10. https://doi.org/10.1111/jbg.12401
Hartmann A. & Linn, J. F. (2008). Scaling up: A Frame-work and Lessons for development Effectiveness from Literature and Practice. Working Paper 5. Wolfensohn Centerfor Development, Berlin, Germany. DOI:10.2139/ssrn.1301625
Kaumbata W, Nakimbugwe H, Haile A, Banda L, Mészáros G, Gondwe T, Woodward-Greene M. J, Rosen B.D, Van Tassell C.P, Sölkner J, Wurzinger M. 2020. Scaling up community-based goat breeding programmes via multi-stakeholder collaboration. Journal of Agriculture and Rural Development in the Tropics and Subtropics, 121 (1), pp. 99-112. doi:https://doi.org/10.17170/kobra-202005281298.

Lamuno D, Sölkner J, Mészáros G, Nakimbugwe H, Mulindwa H, Nandolo W, Gondwe T, Van Tassell C P, Gutiérrez G, Mueller J and Wurzinger M 2018: Evaluation framework of community-based livestock breeding programs. *Livestock Research for Rural Development. Volume 30, Article #47.* http://www.lrrd.org/lrrd30/3/mari30047.html

Mueller J.P, Haile A, Getachew T, Rekik M, Rischkowsky B, Genetic progress and economic benefit of community-based breeding programs for sheep out- and upscaling options in Ethiopia, Small Ruminant Research, Volume 177, 2019, Pages 124-132, ISSN 0921-4488, https://doi.org/10.1016/j.smallrumres.2019.06.025.

Wurzinger M, Gutiérrez Gustavo A, Sölkner J, Probst L. Community-Based Livestock Breeding: Coordinated Action or Relational Process. Frontiers in Veterinary Science volume 8, 2021, URL=https://www.frontiersin.org/article/10.3389/fvets.2021.613505 ISSN 2297-1769, https://doi.org/10.3389/fvets.2021.613505