

Delivering climate-resilient and productive sires to improve livelihoods of farmer communities at scale

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Contents

- Community-based breeding program
- Why CBBP
- Major outcomes/ impacts
- Scaling framework
- Commercialization model
- Key messages





Small ruminant breeding programs

- Very little work by projects, Universities, Research centers
- Most efforts focused on import of exotic and crossbreeding
- Some on-station selective breeding
- Most were expensive failures

Community-based breeding

- Participatory breeding – decentralized plans and programs
- Improvement programs carried out by communities of smallholder farmers
- Considers proper farmers breeding objectives, infrastructure, participation and ownership
- Different breeding structure depending on the scenario



Why CBBP???

- It is an alternative to often failed centralized breeding programs
 - The Dairy Goat Development Program (FARM AFRICA)
 - Amed Guya/Debre Berhan Ranches and other introductions through projects
 - Sheep and goat productivity improvement program, USAID
- Clear evidence that the program works
- Relatively cheap and easy to implement
- Owned by communities and is inherently sustainable
- Climate smart

Major outcomes/impact

- Ethiopia, more than 200 villagers directly benefiting
- Higher levels of household income (20% increase), meat consumption (threefold), and market participation (supplied 18 more sheep/goat per year to the market)
- Most of the established cooperatives have been able to build capital (e.g. Boka-Shuta cooperative has a capital of more than 150k USD)
- CBBP is strategy of choice for small ruminants in Ethiopia
- CBBP scaled to many countries, Tanzania, Malawi, Uganda, Sudan, SA, Burkina faso, Tunisia, Egypt...

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Community-based sheep breeding programs generated substantial genetic gains and socioeconomic benefits

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ORIGINAL RESEARCH
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Welfare Impact of Community-Based Veterinary and Breeding Services on Small Ruminant Keepers

Girma Tesfahun Kassie¹, Wolaitshet Asake², Aynalem Haile³, Tesfaye Getachew Mengistu⁴, Solomon Gizaw⁵, J. P. Mueller⁶ and B. Rischkowsky⁷

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ORIGINAL ARTICLE

Animal Breeding and Genetics | WILEY

Community-based breeding programmes are a viable solution for Ethiopian small ruminant genetic improvement but require public and private investments

Aynalem Haile¹*, Solomon Gizaw², Tesfaye Getachew¹, Joaquin P. Mueller³, Peter Amer⁴, Mourad Reki⁵, Barbara Rischkowsky¹



Contents lists available at ScienceDirect
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The international journal of animal biosciences



Estimation of (co)variance components, genetic parameters, and genetic trends of growth traits in community-based breeding programs of Bonga sheep

E. Areb^{1,2}, T. Getachew³, M.A. Kirmani⁴, Z. Abate⁵, A. Haile⁶

ACTA AGRICULTURAE SCANDINAVICA, SECTION A — ANIMAL SCIENCE
<https://doi.org/10.1080/0964702.2022.2067590>



Genetic parameters and trends of growth traits in community-based breeding programs of Abdera sheep in Ethiopia

Amelmal Alemayehu¹, Tadele Mirkena², Aberra Melesse³, Tesfaye Getachew⁴ and Aynalem Haile⁵



Research article
Analysis of genetic parameters and genetic trends for early growth and reproductive traits of Doyogena sheep managed under community-based breeding program

Kebede Habtegiorgis^{1,2}, Aynalem Haile³, Tesfaye Getachew⁴, Manzoor Ahmed Kirmani⁵, Deribe Gemiy⁶

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DOI: 10.1111/hj.13384

ORIGINAL ARTICLE

Animal Science Journal | WILEY

Increased number of large non-atretic follicles and co-dominance effects account for high litter sizes in Bonga sheep

Asrat Tera Dolebo¹, Aberra Melesse¹, Cristian Porcu², Tesfaye Getachew³, Aynalem Haile³, Mariem Rouatbi⁴, Zelalem Abate⁵, Muluken Zeleke⁵, Barbara Rischkowsky³, Joram M. Mwacharo³, Mourad Reki⁶

Tropical Animal Health and Production (2021) 53:42
<https://doi.org/10.1007/s11250-020-02445-w>

REGULAR ARTICLES

Estimates of genetic parameters and trends for reproduction traits in Bonga sheep, Ethiopia

Asrat Tera¹, Tesfaye Getachew², Aberra Melesse³, Mourad Reki², Barbara Rischkowsky², Joram M. Mwacharo², Zelalem Abate⁴, Aynalem Haile⁵

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ANIMAL
BIOSCIENCE

Estimation of co-variance components, genetic parameters, and genetic trends of reproductive traits in community-based breeding program of Bonga sheep in Ethiopia

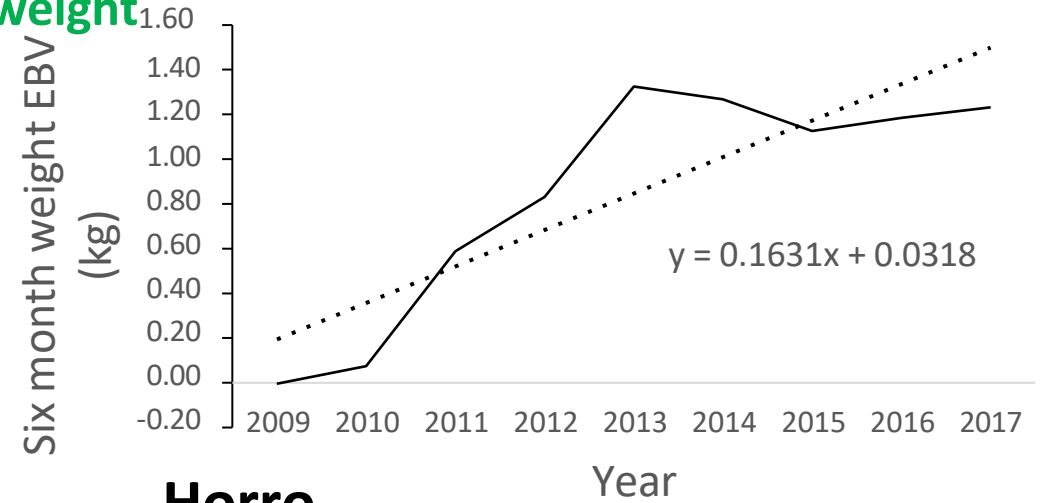
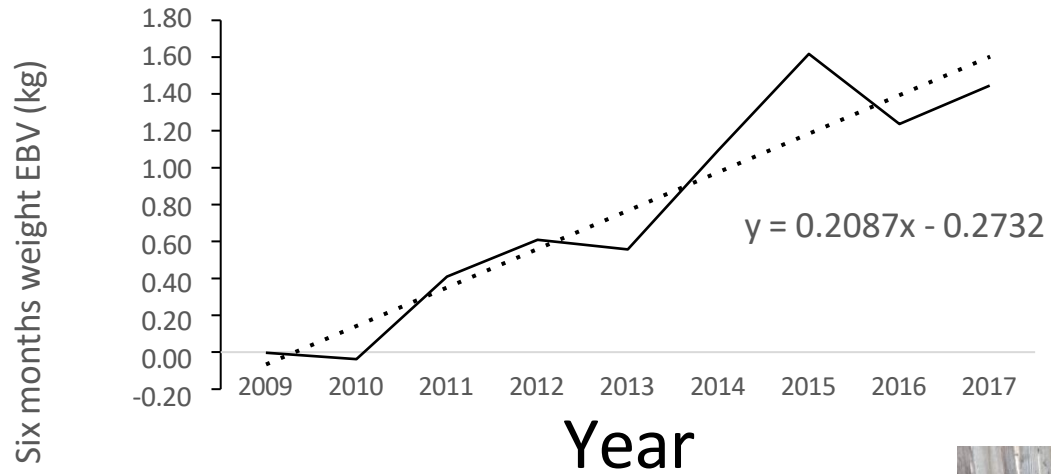
Ebadu Areb^{1,2}, Tesfaye Getachew³, MA Kirmani⁴, Tegbaru G. Silase¹, and Aynalem Haile⁵

Mammalian Genome (2019) 30:339–352
<https://doi.org/10.1007/s00335-019-09820-5>

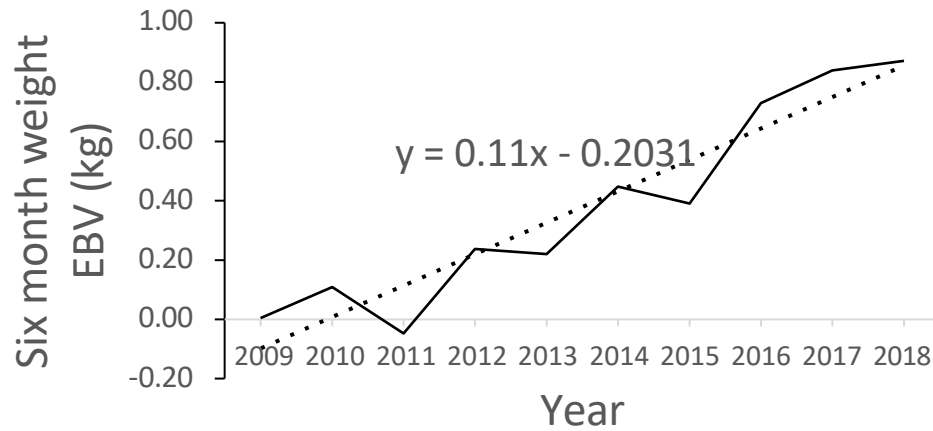
Genome-wide scans identify known and novel regions associated with prolificacy and reproduction traits in a sub-Saharan African indigenous sheep (*Ovis aries*)

Asrat Tera Dolebo^{1,2}, Negar Khayatadeh³, Aberra Melesse², David Wragg⁴, Mourad Reki⁵, Aynalem Haile⁵, Barbara Rischkowsky⁵, Max F. Rothschild⁶, Joram M. Mwacharo⁵

Substantial genetic progress: six months weight



Bonga



Menz



Bonga



Horro



Menz

Scaling framework

Strategies were

1. Replicate existing CBBPs
2. Increase the number of breeding males produced and disseminated per CBBP
3. More intense use of CBBP sires in nucleus and base



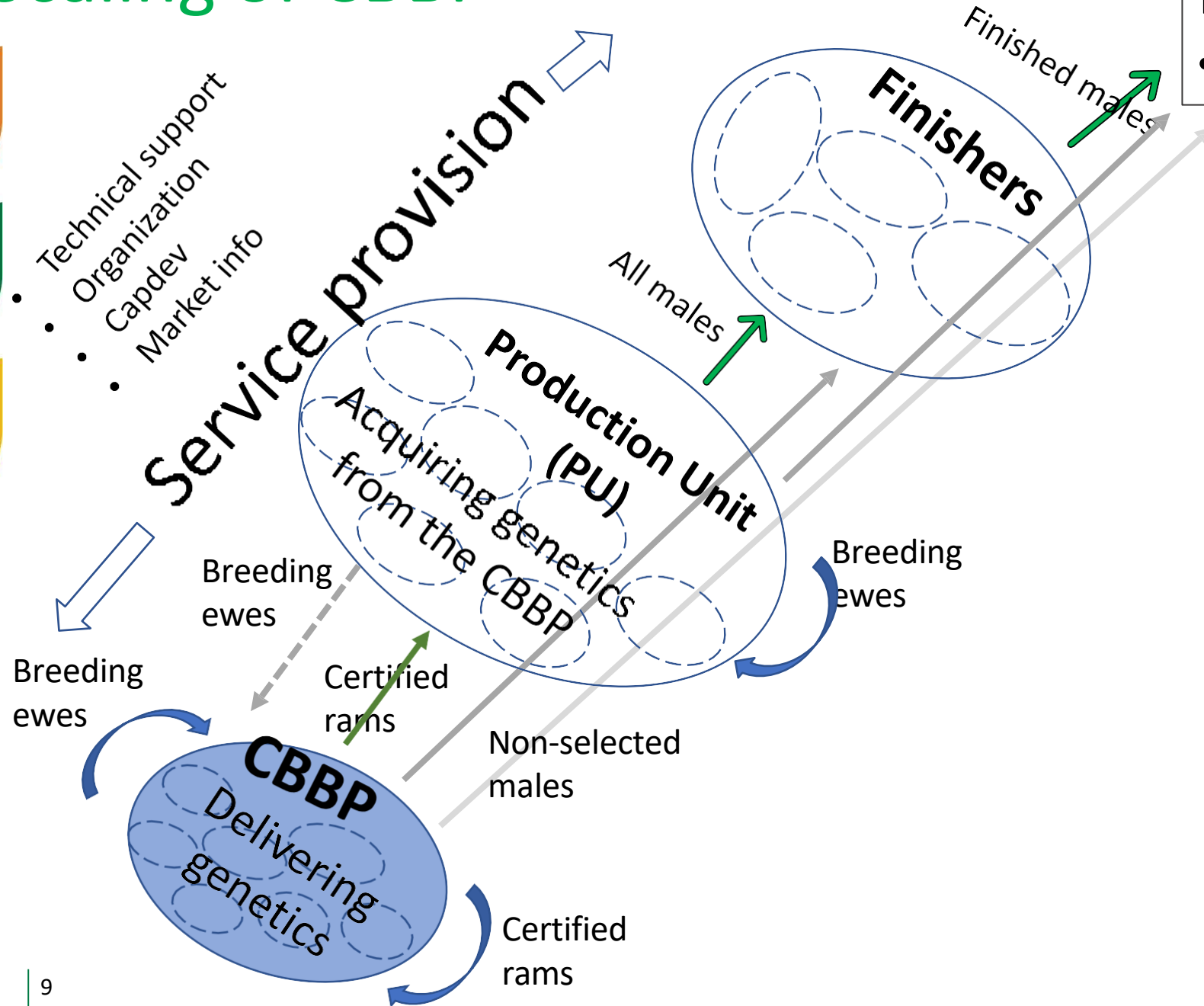
Genetic progress and economic benefit of community-based breeding programs for sheep out- and upscaling options in Ethiopia

J.P. Mueller^{a,*}, A. Haile^b, T. Getachew^b, M. Rekik^c, B. Rischkowsky^b



Scaling of CBBP

- Technical support
- Organization
- Capdev
- Market info



Components

- Input/ service provision
- Feed intervention
- Health interventions
- Market linkage
- Genetic improvement
- Genetic dissemination

WaWo Scaling initiative

Wahera
(584392HH)

28 CBBPs with 10,000 ewes

4500 breeding sires/Anum

266k ewes in the PU

187k lambs/year for market

1,373,123 lambs/ year



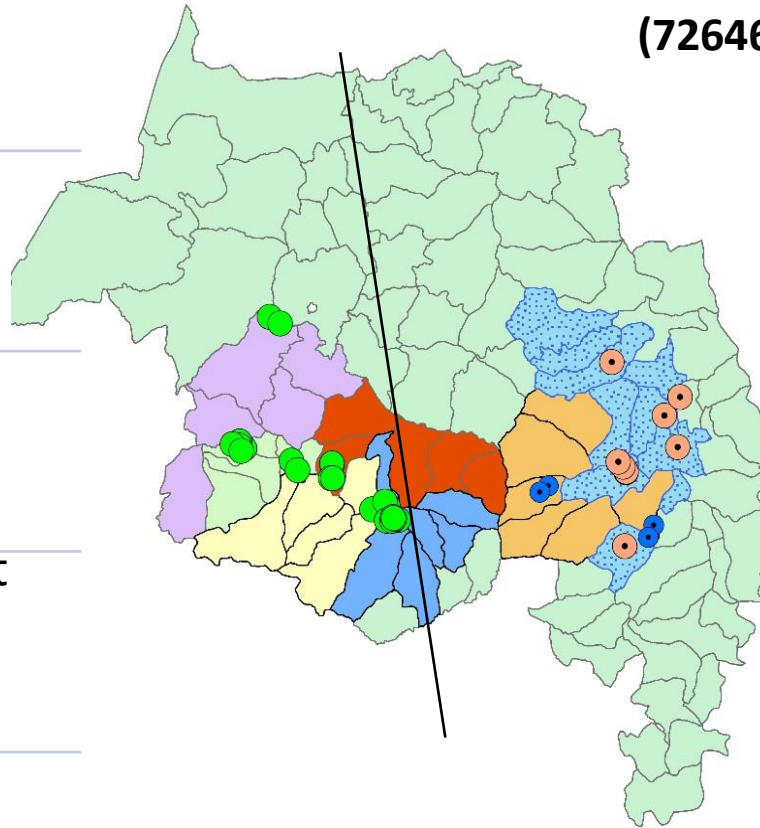
Wollo
(72646HH)

5 CBBPs with 5,500 ewes

1971 breeding sires/Anum

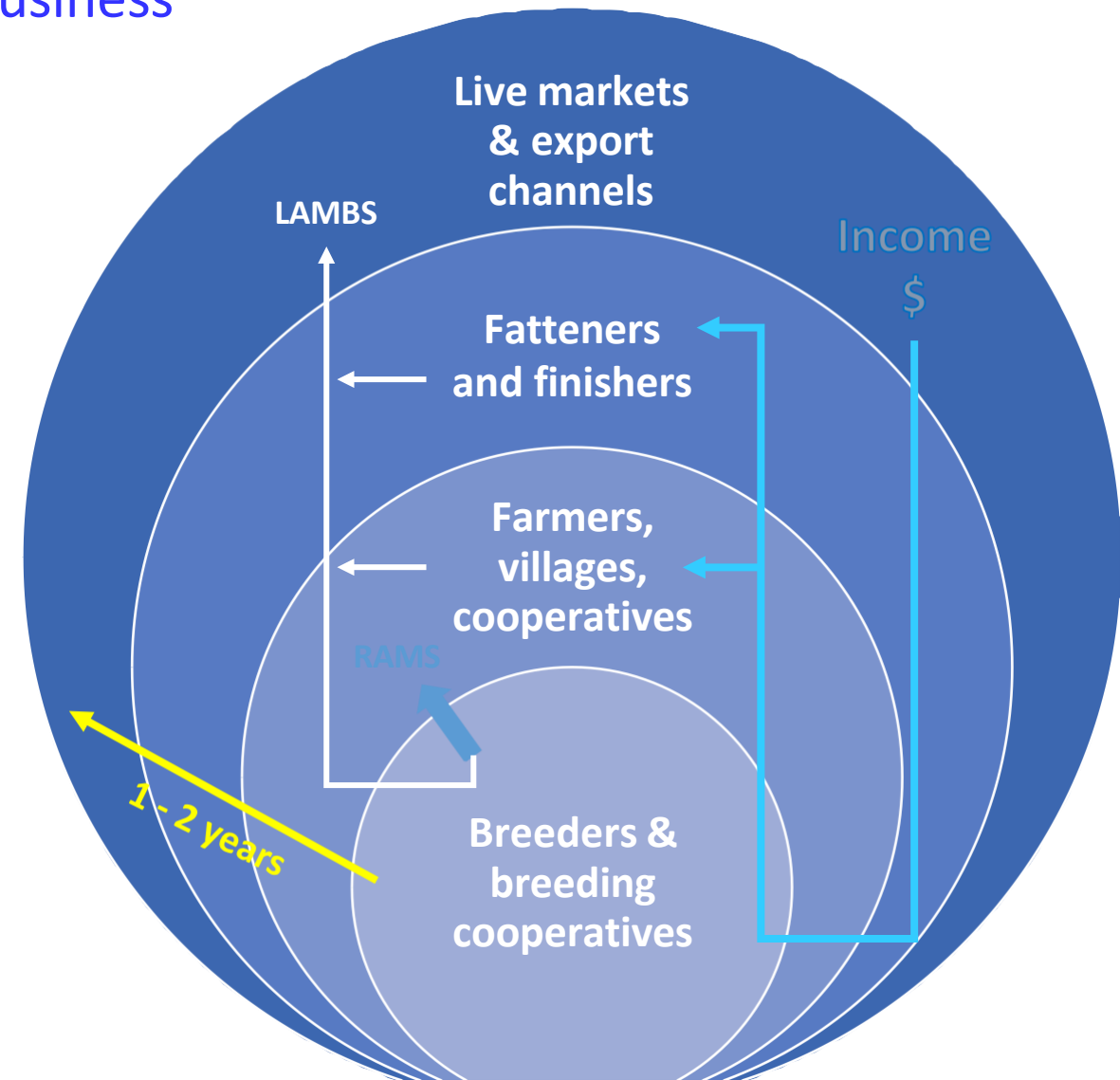
169K ewes in the PU

101K lambs/year for market



From subsistence to commercialization model

- Private sector involvement in small ruminant business
 - Minimal
- Our model
 - Community group
 - Legal cooperatives
 - Commercial entities
 - Our approach is based on dissemination of improved genetics produced in CBBPs through breeder cooperatives (with focus on youth and women) who will be capacitated and supported to take up the role, as a business venture.



- Is an attractive option for genetic improvement
- Pedigree and performance recording is possible
- Results is measurable genetic gain and socio-economic benefits;
inbreeding controlled
- Works for all species, schemes could be developed for different systems
- Good opportunity for genomics and reproductive biotechnology
interventions

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