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Community-based breeding: a promising approach for genetic improvement of small ruminants in developing countries

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Outline

- Introduction
- Methodologies
- Main findings
- Conclusions and lessons
- Future directions

Introduction

- Genetic improvement of livestock in developing countries remains a challenge
  - Within-breed selection and crossbreeding programs based on proven approaches from developed world have in many cases failed
- Main reasons:
  - Lack of capacity, infrastructure and institutional arrangements
  - Lack of involvement or participation of livestock keepers in the design and implementation of the programs
  - Lack of adaptation in “improved breeds”

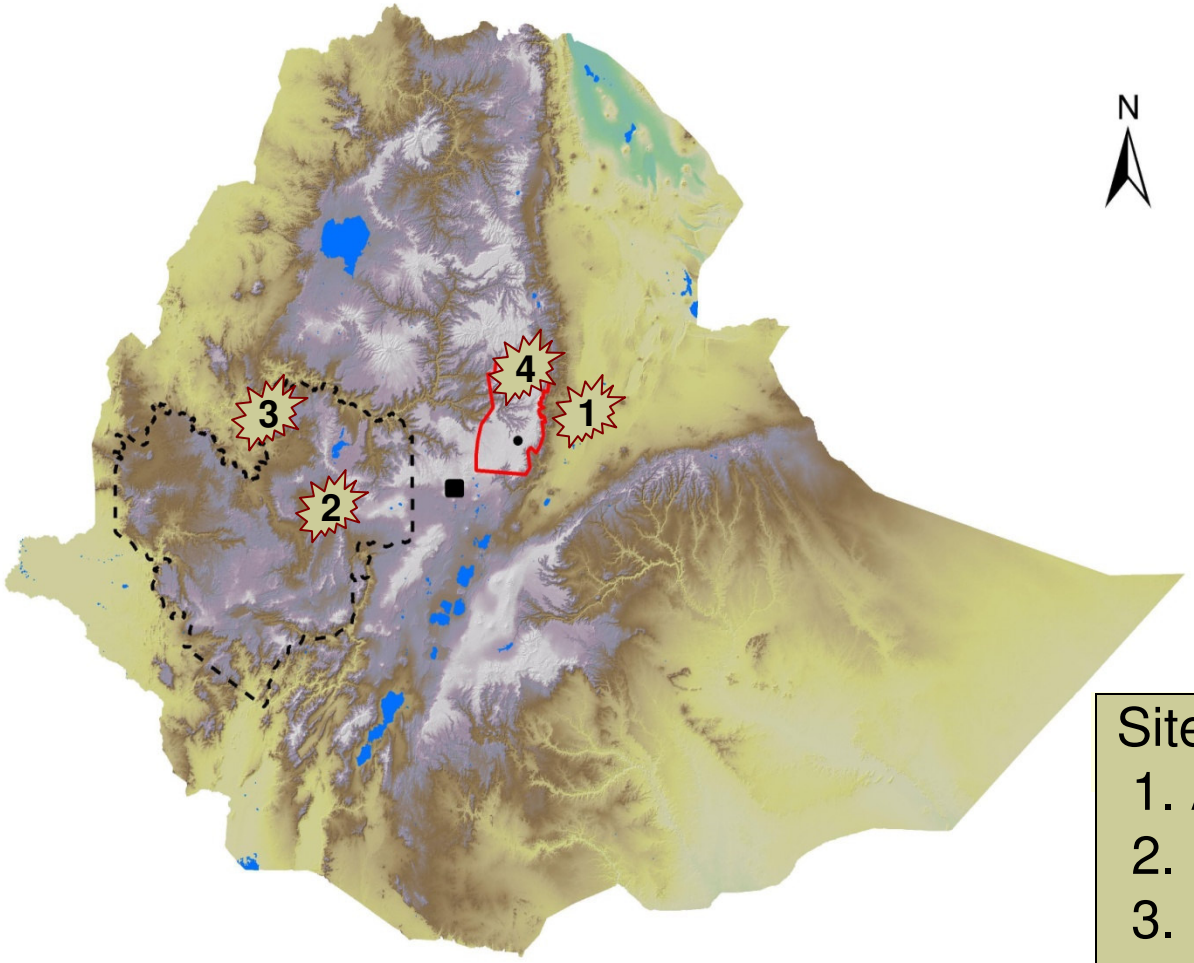
Introduction…

- New thinking:
  - Involve local communities and institutions at the start
  - Design community-based breeding program suitable for smallholders with their participation
  - Implement (test) the program with smallholders on farm

Goals and purpose

- **Goals**: Improved productivity and income of sheep owners by providing access to improved animals that respond to improved feeding and management, targeting specific market opportunities
- **Purpose**: Development of successful community-based small ruminant breeding schemes that suit the communities' conditions and farmers' needs

Methodologies



Site/breed
1. Afar
2. Bonga
3. Horro
4. Menz

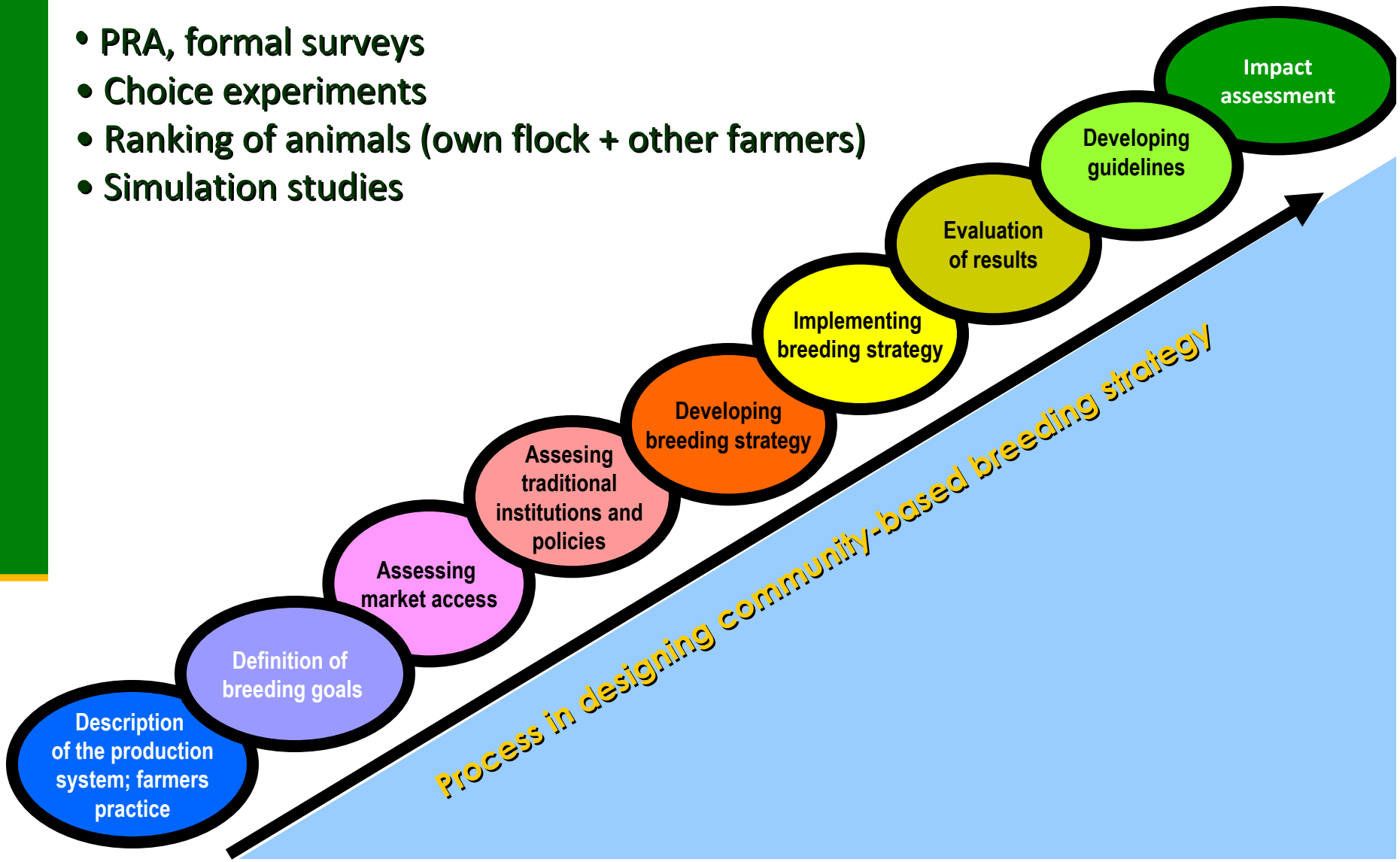
The breeds

Production systems, households and animals

Project sites	Production system	Households	Sheep enrolled
Afar	Agro-Pastoralism	125	2,500
Bonga	Mixed crop-Livestock	125	2,500
Horro	Mixed crop-livestock	125	2,500
Menz	Sheep-barley	125	2,500
Total		500	10,000

Designing participatory community-based breeding

- PRA, formal surveys
- Choice experiments
- Ranking of animals (own flock + other farmers)
- Simulation studies



Main Achievements

- Stakeholders consultation workshops
- Site and community selection
- Description of production systems
- Participatory definition of breeding goals
- Choice experiments, individual own flock ranking, group ranking

Main Achievements…

- Heritability and correlations of preferred traits and social networks
- Simulation studies – generated alternative selection schemes
- Farmers selected their preferred selection program
- Program implementation started in June 2009
- Two rounds of best rams were selected in Feb and July 2010
- Revolving fund created by purchasing selected rams as property of the community

Awarding ceremonies for best animals and best farmers

Award Badges

Burdizzo Castrator

Scientific outputs

More than 20 publications. Few examples from scientific journals:

- Mirkena et al. 2010. Genetics of adaptation in domestic farm animals: a review. Livestock Science. 132 (1-3), 1-12.
- Duguma et al. 2010. Participatory approaches to investigate breeding objectives of livestock keepers. Livestock Research for Rural Development. Volume 22, Article #64. Retrieved April 14, 2010, from http://www.lrrd.org/lrrd22/4/dugu22064.htm
- Getachew et al. 2010. Herd management and breeding practices of sheep owners in a mixed crop-livestock and a pastoral system of Ethiopia. African Journal Agricultural Research. 5(8), 685–691.
- Edea et al. 2009. Morphological and biometric characterization of Bonga and Horro indigenous sheep breeds of smallholders in Ethiopia. Ethiopian Journal of Animal Production. 9(1), 117-133.

Scientific outputs…

- Morphological characters, body weight and body measurements of Menz and Afar sheep breeds. Ethiopian Journal of Animal Production. 9(1), 99-115.
- Identification of smallholder farmers and pastoralists' preferences for sheep breeding traits in Ethiopia: Choice model approach. Submitted
- Estimates of economic values for important traits of two indigenous sheep breeds of Ethiopia. Submitted
- Community-based alternative breeding plans for indigenous sheep breeds in four agro-ecological zones of Ethiopia. Pending
- Phenotypic ranking experiments approach in identifying preferences of smallholder farmers and pastoralists for sheep breeding traits in Ethiopia. Pending

Capacity building

- 8 MSc students completed their studies
- 2 PhD students will finish by Jan 2011
- Researchers, Extension agents, Enumerators, and Farmers received on-the-job training attended workshops
- Guidelines for setting up community-based breeding prepared based on lessons learnt in the project

Conclusions

- Breeding projects require initial funding and technical help, but should be planned to become self-driven
- The challenge for field geneticists is to organize programs fitted to each situation and sustainable in time
- For high impact a functional genetic structure is necessary
- It is essential to have farmers motivated, organized and trained (awarding best performers would be an asset)

Conclusions…

- Involve all stakeholders right from the start
- Farmers are innovative in finding ways to combine production and adaptation to their breeding stock
- A need for intelligent balance of genetic principles and consideration of practical aspects
- Solutions to practical problems may be found through experience and basically from farmers themselves
- Continuous feedback is necessary


Thank you!