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


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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”.
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

Afar
Bonga
Horro
Menz
<table>
<thead>
<tr>
<th>Project sites</th>
<th>Production system</th>
<th>Households</th>
<th>Sheep enrolled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afar</td>
<td>Agro-Pastoralism</td>
<td>125</td>
<td>2,500</td>
</tr>
<tr>
<td>Bonga</td>
<td>Mixed crop-Livestock</td>
<td>125</td>
<td>2,500</td>
</tr>
<tr>
<td>Horro</td>
<td>Mixed crop-livestock</td>
<td>125</td>
<td>2,500</td>
</tr>
<tr>
<td>Menz</td>
<td>Sheep-barley</td>
<td>125</td>
<td>2,500</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>500</td>
<td>10,000</td>
</tr>
</tbody>
</table>
Designing participatory community-based breeding

Process in designing community-based breeding strategy

- Description of the production system; farmers' practice
- Definition of breeding goals
- Assessing market access
- Assessing traditional institutions and policies
- Developing breeding strategy
- Implementing breeding strategy
- Evaluation of results
- Developing guidelines
- Impact assessment

- 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
More than 20 publications. Few examples from scientific journals:


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
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!