Sustainable utilization of indigenous goats in Southern Africa

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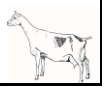
Introduction

- Approximately 38 million goats in southern Africa
  - Indigenous goats dominate
  - production takes place in rural areas utilizing marginal lands with harsh environmental conditions
- Source of livelihoods in most low-input farming systems
  - Food and nutrition security
  - Finances (goats easily dispensable vs cattle)



Phenotypic characterization of indigenous goats

- Animals classified by ethnic names or geographical distributions
  - Despite displaying similar phenotypes
- Variations observed on phenotypic characterization studies
- They are mostly multi-colored, bearded, horned, with medium to broad lopped ears, short hair and can be small to medium size
- Goats are hardy and are able to survive minimal feed availability and extreme temperatures

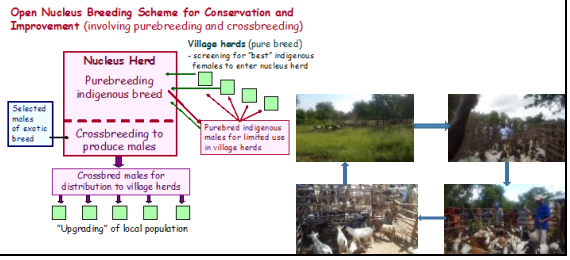
Genetic characterization of indigenous goats

- Information on goat genetic resources around the region has increased, but it is still scarce especially in Africa
  - Population sizes & structure, genetic diversity, and genetic relationship within and between populations
- Current tools include microsatellite markers, mDNA, and single nucleotide polymorphism (SNPs)

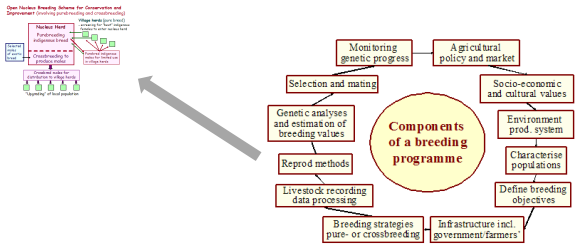
Sustainable utilization

- Change in attitude by researchers, policy makers and extension workers towards traditional goat farmers and their breeds
- Farmer involvement in decision – making is required at every stage
  - Setting up breeding objectives, implementation, record keeping, monitoring & evaluation
- Community based breeding programs (CBBPs) are increasingly becoming important for sustainable management and utilization of animal genetic resources

Community based breeding programs



Community based breeding programs



Steps followed in Malawi CBBP implementation

RESULT 1	**Inception meetings and stakeholder meetings at National and Local levels**
Activity 1.1	Stakeholder consultative meeting, community meetings and target community visits
Activity 1.2	Selecting project communities and breeds
Activity 1.3	Characterization of target sites and breeds
RESULT 2	**Participatory definition of breeding objectives, preparation of breeding program**
Activity 2.1	Personal interviews, Focus group discussions and ranking of animals
Activity 2.2	Conduct an assessment of alternative breeding plans through modelling
Activity 2.3	Sensitization on breeding objectives, animals and plans to follow
RESULT 3	**Assembly of breeding populations**
Activity 3.1	Training of local project participating farmers and local monitors
Activity 3.2	Assembly and identification of breeding populations
RESULT 4	**Data recording & management, buck selection & management**
Activity 4.1	Data recording and management
Activity 4.2	Selection and management of breeding bucks

R4 : Data recording & management, buck selection & management all involve the community

Evaluations done in Ethiopia show genetic and economic benefits of CBBP


Small Ruminant Research

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

J.P. Mueller, A. Haile, T. Getachew, M. Rekik, B. Rischkowsky

ARTICLE INFO

ABSTRACT

- In Malawi
  - Communities appreciated CBBP as mitigating inbreeding and improving sizes of offspring
  - Results shows increased carcass yields

Production constraints

- Financial resources
- Environmental factors (rainfall, temperatures, dimate change)
  - Shortages in feed and drinking water
  - In appropriate breeds use
- Land shortages
- Interventions ??
  - government incentives through subsidies on veterinary and feed supplies
  - Cooperatives – pooling resources and sharing costs and inputs
  - Integrate indigenous knowledge, scientific evaluations and extension services in CBBP

Marketing of goats and their products

- Live sales via farm-gates sales, middlemen, auctions, local butcheries
- Niche products
  - Coloured hides, extra-fine fibre
  - Meat, milk
- Agro-tourism
  - Local and international tourists visit communities where they are kept for viewing, photography and exploration
  - Handicrafts or garments with distinctive designs

Gender aspects and marginalized groups

- Women mainly involved in goat rearing vs males
- Challenges in women and marginalized groups??
  - Poor access to land
  - Little involvement in decision-making, credit, markets, assets and technical information
- Interventions?
  - Gender sensitive policy initiatives ensuring that women and men have equal access to land, research and extension services, credit and other facilities
  - Training and capacity building

Regional policy and legal framework

- Individual country efforts in conservation and management of indigenous goats
  - Regional data integration
- Harmonization of common policy, and creation of a user-friendly and accessible regional database
- Legal framework that facilitate the exchange of genetic resources and samples between countries
  - especially with the advent of shared facilities like regional gene banks and genetic analysis laboratories

Future research and development

1. Establishment of effective breeding population sizes, not known for most indigenous goat breeds
2. More data collection, genotyping, analyses and documentation
   i. Population structure, genetic diversity analyses and relationships
   ii. Selective signals, and association studies can be conducted for various traits including adaptation and disease resistance traits
3. Meta-analyses of genomic data which has already been collected on different goat breeds within the region
   (Hefer *et al.*, 2004; Mdladla *et al.*, 2016) in South Africa, Zvinorova (unpublished) in Zimbabwe and Monau (unpublished) in Botswana

4. Implementation and evaluation of CBBPs, with the aim of conserving the local breeds, improving production and integrating marketing

Thank you