



THE NEED TO DEVELOP EFFECTIVE CONSERVATION STRATEGIES FOR INDIGENOUS ANIMAL GENETIC RESOURCES (AnGR) IN AFRICA

KEY MESSAGES

- *Conservation enables us to keep AnGR which have unique and beneficial attributes to mitigate unpredictable future situation like climate change*
- *Conservation helps us to maintain our heritage like culture, values and prides associated with the genetic resources*
- *Conservation needs to be linked with sustainable utilization*

INTRODUCTION

Farm animals contribute to the livelihoods and wellbeing of smallholders in marginal environments, especially women and children. The diversity of cattle, sheep, goat, pig, poultry and breeds of other farm animal species represents an irreplaceable source of traits for AnGR development in response to changing environmental and human needs. However, these AnGR are being eroded as a result of changing agricultural practices and economic, environmental and other factors. Their full potential has not been adequately documented, yet given the imminent climate change and unpredictable future scenarios, these AnGR could be important in the future because of their unique attributes (disease resistance, drought resistance, etc). Of particular concern are the high rates of loss of indigenous breeds, which, coupled with inadequate programmes for the use and management of the AnGR, is negatively impacting on livelihood options for the poor. Conservation has been suggested as one practical method to stop or slow down the rate at which indigenous AnGR are disappearing or coming under threats of extinction. The need to establish programmes for their conservation and sustainable use is well recognized. Livestock conservation practice is changing rapidly in light of policy developments, climate change and diversifying market demands. At national level conservation strategies need to be strengthened to halt the loss of animal genetic diversity and to protect the bio-cultural heritage. New technologies need to be adopted for characterization, conservation and breeding purposes. Africa is willing to contribute to the global agenda by generating knowledge and development of improved breeding material for sustainable development of the livestock sector and future food security. Some of the issues that remain unaddressed are briefly discussed in the paragraphs below.

POLICY RELATED ISSUES

Among issues raised concerning the development of effective conservation strategies for indigenous AnGR are:

- The loss of AnGR that is proceeding in African countries is due to the neglect and deterioration of local livestock production systems that are based on indigenous or locally adapted breeds and associated traditional knowledge. Livestock genetic

diversity is further compromised by the expansion of industrial livestock production systems which replace community-based systems of animal breeding and livestock production. This replacement is fueled by a range of subsidies for industrial systems while community based systems are undermined by loss of their pasture resource bases and lack of attraction for young people to farming in general, and livestock in particular.

- The current state of inventory, monitoring and characterization efforts is characterized by differences among the countries in terms of their capacity to undertake these activities. It is difficult to estimate accurately the total number of breeds of farm animals as inventory, monitoring and characterization efforts are far from complete in many countries. Despite the important roles of livestock, breed characterization is extremely weak at the phenotypic level and non-existent at the genotypic or molecular level.
- A major problem that continues to prevent and undermine the sustainable use of locally adapted breeds is the importation of exotics and their indiscriminate cross-breeding with local breeds. This continues to be a pre-occupation of governments and aid organizations who believe that they are beneficial for poverty alleviation and rural development and promote and distribute them arbitrarily, often without understanding the benefits and productivity of already existing livestock systems.
- In many countries, awareness of the diverse and significant contributions of AnGR is relatively low among policy-makers, which has resulted in the failure to adequately invest in essential institutional development and capacity building to enable countries to fully utilize and develop their AnGR. In many countries, farmers and the general public do not yet fully appreciate the essential contributions made by their livestock breeds.
- Organizing breeders presents many challenges. The maintenance of AnGR under sustainable management by livestock keepers is one of the most effective and practical ways of conserving these resources with a minimum of financial expense. However, such an approach can be successful only if it is economically viable and if sufficient technical support is provided. A participatory approach that involves livestock keepers is important, both to increase the accuracy of the information upon which the conservation activities should be based and to ensure interest and ownership of the project or programme on the part of the livestock keepers and thereby increase its sustainability.
- The influx of significant numbers of animals into the different regions, as well as the changing patterns of resources use and demand (exacerbated by government policies and subsidies), have led to a decline of traditional rules and practices for resource use/control related to local AnGR herds and rangelands. As traditional mechanisms have declined, state-sponsored resource management systems have not materialized to fill the need for coordinated control and use of resources, with existing laws, regulations and enforcement mechanisms for pastoral management, land tenure, and conflict

resolution remaining piecemeal and inadequate.

- The conservation of domestic AnGR requires strategies and programmes, namely the control and optimization of production and reproduction parameters. Genetic resources, conservation tools, management strategies and ideal conservation models that could be employed are not available. Countries have much to do to establish and implement policies, laws and regulations to promote the convergence of the biodiversity conservation strategies with the management of local AnGR. As a result, there is no coordinated management or conservation of AnGR, or control of cross-breeding between local and exotic breeds, and in fact there are no government policies/strategies or legal framework to support such efforts.
- Market trends favor the high output breeds thus threatening the use of locally adapted ones. A structural impediment is the lack of coordinated marketing strategies for local AnGR, or indeed for basic market information on supply, demand, prices, etc., which greatly limits the ability of local AnGR producers to expand their markets and secure optimum prices. Markets generally fail to completely capture the value of locally adapted AnGR as potential stocks of genes that can serve as a source for future breeding, or as source of non-market benefits. Marketing of endemic ruminant livestock is primarily done on a local basis and through informal networks with poor price and availability information.
- Every sound conservation effort bears a cost which differs with perspective on the particular population or breed, countries, regions and production environments. Although the conservation potential is considered as a good indicator for conservation decisions, it does not give information on how to allocate the conservation budget to maximize the conserved diversity. It is necessary to assign appropriate shares of the conservation budget to the different breeds once the decision is made as to which population or breeds should be sampled.

LESSONS LEARNT ON DISCONTINUATION OR FAILURES IN CROSSBREEDING PROGRAMMES IN AFRICA

In 2014/2015, AU-IBAR undertook a study among 42 of the countries on the status and development of their AnGR. The study was part of a broader programme whose goal was to get countries to be effectively involved in the sustainable utilization of AnGR, and to carry out their functions in ways that ensure food security and improved livelihoods. As part of the Study, information was sought from MS as to status of conservation strategies by responding to the questions below:

Threatened breeds, at risk of extinction or in need of conservation initiatives

Many breeds of livestock were listed as “**threatened**”, a somewhat fewer numbers listed as “**at risk of extinction**”, but scores of breeds were listed as “**needing conservation**”.

	Number of breeds needing conservation
Cattle	71
Sheep	48
Goats	42
Poultry	47

From the listed number of breeds needing conservation, it was concluded that many countries saw the need for conservation as an intervention to halt or reduce further genetic erosion in affected breeds. The Study also found out that the lack of conservation programmes was mentioned by most countries (37 out of 42 or 88%) as a primary threat associated with loss of breed numbers or diversity in their countries.

Conservation strategies or action plans for AnGR in place

The expression of need for conservation of certain breeds was noted to have been backed by action plans and conservation strategies in some instances. For example, of 35 countries that responded to the question whether their countries had conservation strategies, 19 (54%) responded in the affirmative.

Existing conservation incentives in place

A large number of countries, 26 (74%), reported to have some programmes that could be described as incentives to conservation. Nearly 50%, (20 out of 39), countries reported private sector role in conservation.

Impacts of conservation programmes on agricultural production and food security

It was concluded from the Study that the rate of development of conservation programmes as intervention against genetic erosion in AnGR would be a determinant on the nature of management designed for AnGR in a given country or region. Conservation programmes with in-built genetic improvement programmes that involve communities was judged likely to have a different approach to AnGR management, compared with other conservation approaches such as ex-situ conservation or on-station conservation of selected breeds.

SETTING THE POLICY AGENDA

The Agenda setting for policy discussions, formulation and the communication of the policies should consider:

Prevention of loss of valuable indigenous genetic diversity

As a result of up-grading the local breeds for improved production, there is loss of valuable indigenous genetic diversity. There is a need to reverse the trend by documenting traditional knowledge on local AnGR breeds and breeding practices, organize breeders into formal associations, characterize existing AnGR breeds, with particular emphasis on the respective

environment in which these animals are kept, provide incentives to the breeders of local AnGR, establish robust and sustainable in-situ and ex-situ conservation programmes for those animals which have not been identified as possessing unique characteristics and which are currently not utilized and are therefore in danger of extinction, develop strategies for the utilization of local breeds in crossbreeding programmes in environments where such genotypes can be sustainably used.

Conservation through Utilization of AnGR

African countries require special attention with regard to the utilization and conservation of AnGR. Simultaneous consideration must be given to the immediate need for genetic improvement, and to the conservation for future unforeseen needs. Many different possibilities of conserving animal genetic material exist. Animal parks are gaining popularity and should be utilized more in the future. Semen can be kept frozen and used for artificial insemination, storing frozen semen is a relatively cheap way of medium-term conservation. Work is also now underway on several species for the storage of frozen embryos. Large-scale selection programmes for the evaluation of the animal strains are required.

Strengthen and promote institutional, national and regional collaboration and co-operation for in situ and ex situ conservation

The current coordination activities are fragmented and require actions to develop synergies, reduce duplication of effort, increase efficiency and effectiveness and give direction to activities both within and outside governments. Areas where regional cooperation is essential or can add additional value to national efforts in achieving AnGR conservation include: facilitation of cooperative management of shared ecosystems; coordination of activities to conserve migratory and other common species and their habitats; coordination between existing and future multinational and regional programmes/project in biodiversity conservation; sharing of information and data, and experience and or best practices; and capacity and awareness building.

Strengthen capacity (infrastructure and skilled personnel) for in situ and ex situ conservation

All stakeholder groups in all the countries need to be capacitated to understand the economic and social values of their local indigenous breeds, to understand that the general notion of their local indigenous breeds being inherently inferior to the exotic types is erroneous, and that development of comprehensive policies, policy incentives and supporting regulations are crucial for the conservation, management and utilization of the indigenous breeds as well as for enhancing food security and livelihoods. Those capacities need to be enhanced, with new institutional models and collaboration among public institutions and between public institutions and private farmers.

Develop and promote incentive systems toward in situ and ex situ conservation

Major advances have occurred in the past decade to improve reproductive technology. Advances in artificial insemination, embryo transfer, and cloning increase the incentives for AnGR research and conservation. These technologies can significantly expand the market for a successful breeder. They speed up the process of genetic improvement, reduce the risk of disease transmission, and expand the number of animals that can be bred from a superior parent. Improved access to national, regional and international markets can enable AnGR breeding farms to sell their products worldwide. The increase in the size of the potential market strengthens incentives to invest in AnGR conservation.

Characterization of the conservation value of the different breeds

The first step toward an efficient conservation strategy for AnGR is the proper characterization of the conservation value of the different breeds and wild relatives. Effective management of farm AnGR requires comprehensive knowledge of the breeds' characteristics, including data on population size and structure, geographical distribution, the production environment, and within- and between-breed genetic diversity. However, the implementation of the subsequent steps is more complex, as conservation strategies for farm AnGR must integrate technical, economical, sociological, and political parameters.

POLICY OPTIONS AND RECOMMENDATIONS

Policy options to resolve some of the outstanding issues and enabling environments for thriving conservation programmes include:

- African governments should make adequate provisions and invest in building awareness, and the shaping of public opinion on the need for conservation. Clear messages that emphasize that responsibilities for biodiversity conservation go beyond government and farmers, and that they benefit the society as a whole, must be put in the public domain. The impact of such awareness should be evaluated from time to time.
- African governments should give immediate and due priority and attention to the effective allocation of predictable and agreed resources for AnGR conservation. The enhanced budget allocation should support efficient infrastructure required for breeding, conservation (e.g. gene banks), production management and monitoring and control, recording systems and decentralized network of breeding facilities (e.g., local breeding centers, AI services).
- African governments should, as a matter of urgency, develop and implement legal frameworks and policies for in situ and ex situ conservation where they are currently missing. Where they exist efforts must be made to strengthen and broaden them in line with international standards, and robust enough to be able to generate outputs that meet existing international obligations and commitments.

- African governments must be abreast with current international norms on access to genetic resources ensure that their citizens benefit from provisions under international conventions and protocols. Equitable arrangements for benefit-sharing are needed, and broad access to genetic resources must be ensured. An agreed African framework for the management of these resources is crucial.
- African governments through the Ministries and Agencies responsible for AnGR should identify breeds of livestock that are at risk of extinction and those threatened to develop and implement cost-effective conservation measures to ensure genetic diversity is maintained.
- African governments should create enabling policy and economic environments that support the development of niche markets for target breed and products at national and regional level. These enabling environments should encourage the establishment of breeders and farmers associations. Technical support should be put in place to strengthen the analytical, organizational and management skills of breeders and farmers for sustainable management and conservation of local and target transboundary breeds.

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