



Animal Genetic Resources: Their Conservation and Management

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The Food and Agriculture Organization's (FAO) Domestic Animal Diversity Information System (DAD-IS) currently reports that approximately 8800 different livestock breeds exist, which is often referred to as "global animal genetic resources (AnGR)" with approximately 38 different species to meet our needs for food, clothing, draught power, and cost savings. These animal species, breeds, and strains have economic, scientific, and cultural values to mankind for food and agricultural production, and they play an important role in global food systems as the main source of animal protein, accounting for one-third of all protein consumed by people. Native breeds, in particular, are highly suited to local agro-ecological zones, resistant to developing illnesses, and give sustainable economic returns, if tiny.



The Indian subcontinent is one of the world's 12 major biodiversity resource hubs, where flora and wildlife were domesticated in antiquity. FAnGR (Farm Animal Genetic Resources) provide food security and genetic variety. Farmers are breeding livestock that narrows the spectrum of genetic variability in order to increase cattle output. Conservation efforts are mostly led by the government, but people, stakeholders, and non-governmental organisations must play a larger role in maintaining genetic variety. It is critical to use these resources wisely and improve their quality in order to ensure their sustainability and capacity to satisfy future needs.

Traditional wisdom

The emphasis should be on identifying, collecting, collating, and comprehending the traditional knowledge accessible for the sustainable management of varied grazing and wasteland ecologies, as well as animal genetic resources. Animal genetic resources (AnGR) variety has been maintained in India for a very long period (3,000 years) on the basis of our farmers' traditional expertise. This folk wisdom should be documented and explored. Traditional practises should be combined with contemporary techniques to allow cattle to be fed from natural feed/fodder resources in hill/desert/plain habitats.

Management of databases

Breed characterization work requires the creation and standardisation of technique, sample size, and data processing package suited for field data. The NBAGR has excellent data bank capabilities, however the quality of data feedback from resource agencies is quite low. When funding bodies approve animal husbandry initiatives, they should make it a requirement that one set of data be sent to the national animal data repository at NBAGR.

The use of genetic resources

The national policy for managing and enhancing livestock genetic resources should have specific goals and objectives, and these goals and objectives should be based on an analysis of the population of livestock, disease issues, the availability of feed resources, changes in the social structure, and the sustainability of the production system in terms of market demand for products and prices.

Policy on Animal Breeding

A unique discussion with a larger engagement of stakeholders is required for the breeding policy, which must include a system for livestock conservation. Similar to this, the Animal Biodiversity Bill should be widely publicised before it is finalised to spur discussion and increase its effectiveness in the context of animal genetic resource protection. It is necessary to build a legal framework that links animal population reduction with conservation and vertical genetic improvement.

Human Resource Development

Scientific and technical manpower must be adequately trained for correct and critical identification of each breed, its description based on phenotypic and genetic characteristics including the production environment. The Department of Animal Husbandry and Dairying, in conjunction with Indian Council of Agricultural Research, must come up with an R&D and HRD plan for this sector.

Biological Diversity Convention (CBD)

We should take the following actions to properly align with the CBD process:

- Examine the connection between access and benefit and IPRs.-sharing clauses, such as the creation of standards or best practises to achieve equal benefit-sharing of genetic resources used.
- Assessment of the effects of international IPR-related mechanisms, such as TRIPs, on the CBD's Article 8 goals.
- Creation of a protocol to safeguard indigenous knowledge and local community resource rights.
- Contributing to current WIPO proceedings on "new beneficiaries."

Conservation and Management

Conservation measures taken by countries encompass in situ and ex situ measures. With a vision for "Effective Conservation, Sustainable utilization, and equitable sharing of benefits arising from the access and use of biological resources"

Species Specific Recommendations

General: There is large genetic diversity in livestock as reflected in important domesticated species and a large number of known and lesser known breeds/strains. Where the numbers are extremely small, immediate efforts should be made to conserve those breeds, preferably in situ. Species-wise recommendations for breeds, which require priority attention for conservation, are as follows:

Cattle: There are a few institutional herds and individual breeders who offer cattle breeds including Red Sindhi and Sahiwal, which have breeding tracts in Pakistan, and Tharparkar, for which we share a breeding tract with Pakistan. From a crossbred background, a variety of new breeds, including Frieswal, Karan Swiss, Karan Fries, and Sunandini, are in various phases of development. It is vital to continue improving and conserving them.

Buffalo: The description and appraisal of lesser-known breeds such the Kaziranga, Toda, Marathwadi, Sambalpuri, Kalahandi, and Paralakhemandi, as well as their development and protection, would need significant surveying.

Sheep: All of the 42 sheep breeds in Jammu and Kashmir, as well as other native breeds like the Pugal, Nilgiri, and Garole, require emergency preservation measures.

Goat: Of the 20 goat breeds, the Jamnapari, Barbari, and Surti are in danger of going extinct and require conservation measures. The genetic development of goats has benefited greatly from these breeds. It also has to be researched and improved upon other goat breeds, such as Black Bengal and Osmanabadi.

Camel: Bikaneri, Jaiselmeri, Kuchchi, and Mewati are the four most significant camel breeds. Less well-known breeds include Marwadi, Mewadi, Sindhi, and Shekawati. These breeds need to be accurately described, judged, conserved, and improved.

Donkey: Despite the fact that donkeys exhibit a wide range of phenotypic traits, nothing is known about their genetic diversity. Surveys must be conducted to describe and assess the many breeds of donkeys that are accessible in the nation.

Pig: Pigs differ greatly from one another in terms of size, colour, performance, etc. These categories require thorough definition and appraisal, and actions for their enhancement and conservation must be performed.

Yak: About yaks' genetic resources, nothing is known. Yaks living in various places vary in terms of size and reproductive efficiency. These variations must be investigated and used in conservation.

Mithun: Regarding physical performance, domestication patterns, and mithun genetic resources, little is known about their physical conformation and genetic makeup. Varying regions of the North-Eastern states have varying sizes of mithuns. Studies should be conducted to describe and assess these categories.

Poultry: Several poultry species, including chicken, duck, guineafowl, and quail, contribute significantly to food and revenue. These species have significant genetic variety, which must be identified and used for advancement and conservation.

Personal pets: Since these species are increasingly important as pets for households and other useful purposes for policing, defence, and other duties, it is necessary to describe and evaluate native and exotic breeds of pet animals (dogs, cats, and birds), and their improvement requires immediate attention.

Strategy for Livestock Biodiversity Conservation

The genetic resources of animals have been preserved using a variety of techniques. These include preserving breeds and populations in their natural habitat, as well as cryopreserving semen, eggs, embryos, skin, blood, and DNA fragments. Focusing on features that raise the breed's economic worth to the communities involved would strengthen the feasibility of a livestock genetic resource strategy.

1. Cryo-conservation as a means of maintaining breeds, should also be considered where specific animal genetic resources are at risk of loss because farmers have not been profiting from their use under the preventing production circumstances in situ.
2. It is necessary that identification, characterisation, evaluation and documentation of the livestock genetic resources are completed in the next five years.
3. A complete description of each breed should be generated on the basis of different profiles including 5 habitat distribution, physical conformation, adaptation, production, reproduction and socioeconomic aspects.
4. A complete database should be developed on populations of different breeds within each livestock species of the country. The database should also identify factors threatening the extinction of breeds.
5. The National Bureau of Animal Genetic Resources (NBAGR) has a significant role to play as a nodal agency for different aspects of breed characterisation and conservation.

The Global Strategy for the Management of Farm Animal Genetic Resources

Management of farm animal genetic resources comprises understanding, using, developing, maintaining, and accessing them. Under the CBD, countries have sovereignty over their genetic resources, but also the responsibility to manage them sustainably. With respect to animal genetic resources, this also pertains to breeds that are currently not of economic interest. The Global Strategy offers countries a comprehensive framework for advancing the sustainable development, conservation, characterization and access to farm animal genetic resources, comprising:

- A multilateral platform for direct government engagement and policy creation.
- A country-based global infrastructure to assist countries in cost-effectively planning, implementing, and maintaining national animal genetic resource management policies.
- A technical project aiming at assisting countries in taking effective action in the areas of sustainable intensification, conservation, characterization, and access to Animal Genetic Resources.
- A reporting and evaluation system to guide Strategy execution, enhance cooperation, coordination, and policy formulation, and maximise activity cost effectiveness.

Conclusion

An essential component of protecting key species is the Regulation. Its escalating gradation establishes the best path for the growth and maintenance of priceless uncommon breeds, providing a fantastic opportunity to safeguard that true national asset.