

Animal Genetic Resources Management and Property Rights



Approximately 2 billion people depend on livestock for at least part, and in some cases most, of their livelihood. The poorest livestock keepers are the ones that most need animals that are tolerant of high temperatures and resistant to diseases and drought. These genetic characteristics are referred to as animal genetic resources (AnGR).

SOURCE:

Anderson, S. and R. Centonze. 2006. *Property Rights and the Management of Animal Genetic Resources*. CAPRI Working Paper No. 48. International Food Policy Research Institute, Washington, D.C.

While the animals kept by poor livestock keepers in marginal areas have high diversity of adaptive genetic characteristics, it is these AnGR that are most at risk of genetic erosion. One reason for this is the rising demand for animal products in developing countries, leading to changes in how livestock is raised. With population growth and increasing resource constraints, crops and livestock are being managed more intensively than in the past. However, the types of animals bred for the intensive production systems found in the developed world are often not appropriate for the production systems of the poor. Indeed, this shift from grazing-based to industrial livestock production systems brings disadvantages in terms of genetic conservation and environmental impacts.

The value of indigenous breeds of animals that are adapted to local ecosystems may only be recognized in the future when climate change and other pressures mount. The loss of hardy breeds and their corresponding adaptive genetic traits means a reduction in the range of environments that can be utilized by humankind. This suggests that there is a high potential future value to society of AnGR kept by the poor (referred to as the 'option value').

Option Values of Animal Genetic Resources

Option values refer to the benefit derived from safeguarding an asset for the option of using it at a future date. It is a kind of insurance against the occurrence of, for example, a disease or drought. The opportunity provided by locally adapted livestock for the production of manure, meat, wool, and milk, and the provision of work, transport, and social functions in harsh environments, represents an entitlement (endowment) of local people. Furthermore, in the eventuality of a wider market demand for specific traits, the livestock represent an option value for wider society.

Option value can then be projected into the future either on a global scale or on a local scale as part of the entitlements of a given household or population. The option value for a given breed increases with the uniqueness of its characteristics, with the genetic distance of its traits from others', and with the rarity of the breed itself.

Loss of Animal Genetic Resources from a Property Rights Perspective

If local people and society value AnGR, why are we losing it? One of the main reasons is *poorly defined property regimes* and inefficiencies in markets. Market failures are one of the main causes of (agricultural) biodiversity loss. When genetic resource conservation generates economic values that are not captured in the market place (e.g. less soil erosion, water conservation), the result of this 'failure' is a distortion where the incentives are against genetic resources conservation and in favor of the economic activities that erode such resources (e.g. bigger animals that eat and drink more).

To establish sustainable AnGR management regimes capable of making contributions to improving the livelihoods of poor livestock keepers, a greater understanding is required of the ways local communities organize ownership, access, and management of AnGR; as well as the enabling environment required for local people to best maintain and enhance AnGR.

Once these are better understood, sustainable AnGR management regimes should provide the means whereby local, national, and international property rights systems are integrated to provide security of assets for the poor and processes of benefit sharing from the maintenance and realization of the option values of AnGR managed by the poor.

Option Values for Species and Breed Diversity in India

For the Raika ethnic group in Rajasthan, NW India, the option value of a breed or of a species is a kind of insurance against the occurrence of, for example, a new disease or drought. Though Raika are specialist sheep breeders, their flocks typically have some goats. Shrinking land area available to these pastoralists is causing a shift towards goat production, and away from sheep, due to the goats' better foraging and browsing ability. Keeping mixed herds of sheep and goats has several advantages due to the ways the Raika manage natural resources. While sheep milk is sold every morning at the dairy collection points, goats' milk is used for household consumption. Goat meat is also preferred by the Raika and is highly valued for religious and ceremonial purposes. Goat meat achieves a higher market price than sheep meat, and sales are an important source of Raika household income, especially during the dry season.

Goats are very well adapted to the ecosystem; they are more resistant to diseases than sheep, and during the dry season they can browse trees and bushes. On the other hand, sheep have the advantage of producing wool, in addition to milk and meat. They are shorn up to three times per year, and sheep dung is considered to be of better quality than that of goats.

Beyond mixing species for optimal natural resource management, the Raika also keep some sheep of a hardy local breed in their herds, which are able to survive deficiencies in fodder and water availability, although they are relatively less productive than other breeds under good conditions. Obviously, they recognize and value the future benefits derived from safeguarding these AnGR assets.

Local Rules and Institutions for Animal Genetic Resources: Evidence from India

Table 1 illustrates a synthesis of the wide range of rules regarding animal ownership and resource use and control in the Raika pastoralist community in Rajasthan. They include rules related to boundaries, access, position (social status), scope, aggregation and payoff, and authority and information.

Property right regimes, land types, and access to each type of property also contribute to AnGR management. The Raika example highlights the importance of the right to make decisions related to the selection of animals, which may involve purchase, loan, exchange, and other means at the moment of breeding.

The right to make and implement husbandry decisions related to the rearing of the animal is also important, as well as the right to prescribe slaughter, which may be religiously and culturally directed. Unfortunately, environmental policies aimed at natural resource conservation and fading reciprocity between farmers and livestock keepers are challenging the sustainability of AnGR management in this harsh environment.

Table 1. Property Rights Rules for the AnGR of Raika Pastoralists in Rajasthan, North West India

Property Rights Rule	Example from Raika AnGR Management Systems in Rajasthan
Boundary rules	Sale of female animals out of the Raika caste is prohibited. The rule governs access and avoids outward flows. Although declared as religious, this norm has political and economic aspects. Members of other communities are prevented from starting the activity of animal breeding, thus not exceeding the use of common property resources. Females are maintained inside the flock as renewable production resources, preventing financial collapse in emergency situations.
Access rules	Being able to gain access to breeding male animals depends on community boundaries and personal relationships.
Position rules	Livestock owner may dedicate the animal to God and define who has access to the animal, including for loan. The owner has to ensure good condition of the <i>sand</i> (animals with religious value) until its natural death.
Scope rules	Female small ruminants, holy males, and any cattle cannot be slaughtered. Furthermore, no money can be gained from the <i>sand</i> through the provision of breeding services.
Aggregation and payoff rules	<p>Collective access and use of genetic resources require the livestock breeders to contribute to feeding (ghee, oils, sweets, and fodder).</p> <p>Each herder, depending on his access to labor and capital, will adjust the number of animals grazed in the <i>gochar</i> (common grazing lands). Periods of resource appropriation with respect to small and large ruminants accessing common land. Small ruminants, more destructive of the available fodder, are allowed in only after the larger ones.</p> <p>Communal mechanisms of solidarity towards herders in need.</p> <p>'Common bull' and 'buffalo bull' purchased by all the villagers for their religious value. The activity of grazing is also organized in common for all the village cattle and buffaloes. This institution is called 'four legs'; and works during the rainy season when the animals need to be kept out of the agricultural fields. It relies on a 'villager herder' paid by all cow and buffalo owners.</p> <p>A 'Gowsala' is a collective shelter where non-productive and productive cattle are brought at an inter-village level during drought.</p>
Authority and information rules	Selection mechanisms of AnGR vary across species. For small ruminants the choice is personal and may benefit from informal advice. However, the purchase of a bull is a village matter; the best knowledge available in the community is identified and utilized.

Conclusion

Poor people that keep indigenous animal breeds provide a service to society that is unrecognized and unrewarded. These animals and their wider value to society are partly maintained through traditional husbandry and property rights rules and practices, often in very harsh environments.

Collective action for AnGR management by the poor is only possible where the genetic resource is central to livelihoods in cultural and/or socio-economic terms. The way such collective action is organized — in terms of equity of access, exclusivity of benefits, etc. — depends not only on the characteristics of local AnGR ownership rights, but also on who has access rights to the common property resources required for animal production. Traditional practices of animal husbandry central to the management of AnGR are at risk and in some cases are breaking down in the face of external factors that are also marginalizing livestock keepers.

Towards a Sustainable AnGR

Processes for the maintenance of local institutions of AnGR management are required to allow the development of markets and the provision of incentives for the conservation of AnGR option values managed by the poor. Local property right systems need to be taken into account and respected (where possible through integration) in the development of national legislation for AnGR management.

Sustainable AnGR management regimes should provide the means whereby local, national, and international property rights systems are integrated to provide security of assets for the poor. A process of negotiation over AnGR property rights is required between the sets of actors currently involved in managing AnGR of likely high option value (often poor livestock keepers) and those investing in the biotechnology necessary to exploit these option values.



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Suggested Reading

Anderson, S. 2004. *Environmental Effects on Animal Genetic Resources*. Review for the FAO AGAP. Rome: FAO. <<http://www.fao.org/ag/cgrfa/docs.htm#bspftp:/ext-fao.org/ag/cgrfa/BSP/bsp28e.pdf>>

Sourcebook on **Resources, Rights, and Cooperation**, produced by the CGIAR Program on Collective Action and Property Rights (CAPRI)