

Livestock Breeds in Traditional Animal Genetic Resources Management



To appreciate the role that traditional communities play in the conservation and management of animal genetic resources (AnGR), it is important to understand the social institutions and cultural traditions that define the animal management choices available to farmers. Indeed, social and cultural forces are often the most important factors in diversifying livestock (and livestock production systems) and in developing distinctive breeds.

Social and cultural factors influencing the decisions of a farmer include:

- traditional livestock management practices;
- the role of livestock in culture and livelihoods; and
- the ethnic or community identity to which the farmer belongs.

The value of a breed in the lifestyle or identity of a particular social group is what encourages its maintenance. Breeds may have specific, unique traits valued by the community that are not obtained from other 'exotic' animal populations. Breeds may also be valued because of their place in local traditions because of:

- their use in religious or other cultural ceremonies;
- for production of products valued in traditional meals; or
- medicinal practices requiring specific qualities.

In its strictest sense, a breed designates a closed or partially closed population. Mating pairs are drawn only from within the population and relationships among individuals are documented. Members of a breed have developed under the same selection pressures and share common ancestry. To be successful, they must constantly change in response to changes in societal needs as reflected in market demand. The change is achieved through selective breeding as well as 'injection' of bloodlines from other breeds. However, for a population to retain its identity as a breed, there has to be less gene flow from outside relative to matings among members of the breed.



Social organization and institutions in a community can influence farmers' access to, and management of, household and community level resources, affecting their action regarding the farm AnGR. For example, land tenure and ownership systems vary between and within communities in terms of: private or communal ownership; equitability of distribution; size and number of parcels of household land; and intra-household access to land. A farmer's landholdings and how they are distributed, their sizes and quality may influence decisions about breed choices and allocation of land area among breeds.



Traditional Breeding Goals and Objectives

In comparing the evolution of western agriculture versus that of developing countries, one often encounters the statement that the present day animal (and crop) genotypes (breeds, strains, landraces) in developing regions are predominantly a result of natural selection. On the other hand, those in developed countries are a product of "many generations of artificial selection." This is a misconception.

For centuries, farmers in the traditional sector everywhere in the world have used, for selective breeding, phenotypic features, such as:

- physical characteristics;
- measures of yield;
- product quality; and
- adaptive attributes.



These phenotypic characteristics are used to identify or distinguish breeds. They are often the basis for the names farmers give to specific animal types or strains, usually within a range of animals of a particular type or breed owned by the broader community. Thus, the large diversity of coat color patterns in the Nguni cattle of southern Africa are classified by the Nguni herders into an elaborate system of names. Each refers to a set of color combinations. Phenotypic characteristics are also used in designating preferred or valued traits and as 'criteria' for making selection decisions to achieve selection goals.

Breed as a Unit of Genetic Diversity Measure

Recognizing the names farmers give to animal populations is important because the "farmer-named population" is the unit that farmers manage and use as basis for selection decisions. The name or description of a population as used by the farmer may not only be related to physical characteristic(s), but could also relate to the original source of the breeding material. Both names and traits, which define these names, may also be related to the biological performance (e.g., egg production, size, shape, color, milk yield or quality, aspects of adaptation, etc.). Farmers perceive these attributes at various stages of animals' growth and development.

Livestock populations developed in different socio-cultural, ecological or geographical settings will become genetically distinct as a result of genetic drift and differential selection pressures, natural and artificial. This is true, provided they have been reproductively isolated from other populations developed under different conditions. Thus, the indigenous livestock from different regions of the world should probably be assumed a priori to represent different "breeds." It seems clear that populations with different adaptational characteristics or possessing unique physiological characteristics should be recognized as different breeds. Even if the populations are relatively closely related based upon measures of genetic distance, this distinction should be drawn.



Clearly, the traits, which farmers use to identify a 'breed' may be complex and are always deeply embedded in the culture and tradition of the community. Any attempt aimed at improving or conserving the breed has to understand these complexities and they must be taken into account when developing the intervention strategies.

Consistency in Names of Breeds/Strains

Farmers may or may not be consistent in naming and describing breeds or strains. It may happen that even within a village or community, different clans or families have different names for what is essentially the same breed or strain. This may be due to differences in valued traits, functions or other phenotypic characteristics or use of names linked to origin of the germplasm, separately or in combination with valued characteristics. To the extent that these are important not only in understanding the evolutionary history of the genetic diversity in the breed, but also as an input in formulating AnGR management strategies relevant to the communities, it is crucial that any discrepancy in names be discussed and reasons for differences understood.



It is very interesting that, in Africa, for example, present day breed names assigned by scientists, tend to have geographical connotations with names of tribes or ethnic communities. This 'naming system,' provides a useful analytical basis for broader environmental and cultural links to animal diversity. However, it over-simplifies the situation and ignores potentially important subtleties at local levels, which could provide insights into the historical breeding systems that have shaped existing genetic diversity. Thus, any study aiming to understand breeds, as they exist today, must include on-farm surveys designed in such a way that the indigenous knowledge by local communities can be captured, analyzed and subsequently used in designing AnGR management initiatives.

Nonetheless, the influence of local environments and, most importantly, the artificial breeding efforts of the diverse communities (which own the breeds) must be considered.

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