CHAPTER 3

LIVESTOCK BREEDS

"With this drought, cows no longer produce milk and hunger has arrived in our encampment. But the market is killing our animals, and not the drought."

[Fulani pastoralist, near Diffa, December 1984]

3 LIVESTOCK BREEDS

by
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NEAR LIWA, CHAD

THE BEST WAY FORWARD IS A BALANCE BETWEEN DEVELOPMENT OF THE ANIMALS AND MAINTENANCE OF THE ECOSYSTEM

INTRODUCTION

The impact of human beings on the environment, and the consequent modifications of the genetic structure of animal populations, should be seen as part of the development and evolution of a given breed[2]. It is not a question of answering for, or justifying, the negative impact of human behaviour on the environment. It is more a question of remembering that human beings, animals, plants and the environment are all inextricably linked, and that the wisest option is to manage all of them in the best way possible, given the knowledge and information that we have at our disposal. What is vital is that animal breeds be allowed to develop on the basis of the needs of human populations, taking into account the constraints of the environment in which they live.

Conservation[3] by management means submitting a sample or the whole of an animal population to controlled genetic modification with the aim of maintaining, using, restoring or improving the animal's genetic resources to meet specific production goals. In fact, the most effective way of conserving genetic resources is often to help farmers develop their breeds and make fuller use of them. Generally, in the case of Africa, the criteria for improvement will be quantitative, since animal productivity remains weak and the imperative is to provide food rather than to satisfy demands for a particular taste or fashion. Criteria for quality which may be valid in the developed countries – such as the composition of milk or percentages of fat in meat – are currently of no interest because such values have no commercial application.

On the other hand, some features must be preserved[4] during genetic improvement if the products are to have any commercial prospects. That goes for the colour of *Tabaski*[5] sheep as much as for the chickens that are used in

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NEAR DOUTHY VILLAGE (DAMASSAK), NIGERIA

HUMAN BEINGS, ANIMALS, PLANTS AND THE ENVIRONMENT ARE ALL INEXTRICABLY LINKED

sacrifices. When it comes to breeding for meat production, the build of the animal is of prime importance, since it determines how its meat will be cooked and eaten. In cultures such as those of most European countries, where time is of the essence and meat is often served grilled, it is useful to breed animals with well-developed muscles so that the meat will be tender. In Africa, however, where food is generally cooked for a much longer time, the criteria for selection will be very different.

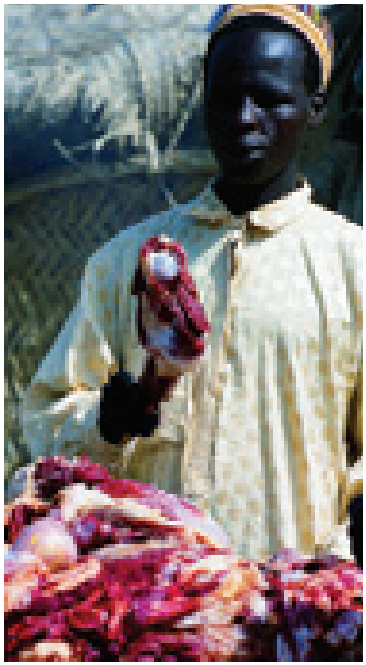
In all cases, the physical environment and the economic, social and cultural context must guide the choices made about conservation. It is clear that, in an economic system where there is very little input from the outside, the herder is alone in deciding upon his objectives when it comes to maintaining and developing his animals' genetic resources. When a country or a region has a very weak agricultural information exchange system (i.e. no means of rapid communication and no organized marketing network that would enable producers to learn about consumer needs outside the immediate area), it is quite natural that animal populations should develop according to the needs, habits, constraints and specific circumstances of the environment in which they are reared. Taking into account the major differences that can exist between habitats, climates, breeding and production systems and sociocultural conditions, the best way forward is to find as effective a balance as possible between the development of the animal and the maintenance of the ecosystem on which it depends.

2 In this chapter, the word "breed" will be taken in its broadest sense. It may refer to isolated breeds that have been well studied and documented. Alternatively it may be used to describe populations, families or subfamilies that appear in very few documents because work on their classification has yet to be completed or, in some cases, has not even started. Are the goats kept by Arab, Moorish Tuareg, Sahelian and Kanem herders all different? And what about the Logone pony? For the sake of clarity, the word "breed" will be used to describe all of these.

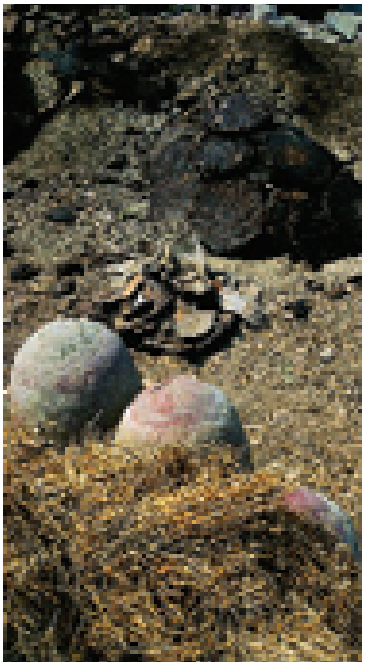
3 As far as the term "conservation" goes, we are using the definition given in the *World Strategy for Conservation*, which was prepared by the World Conservation Union (IUCN), together with the United Nations Educational, Scientific and Cultural Organization (UNESCO), FAO, the United Nations Environment Programme (UNEP) and the World Wide Fund for Nature (WWF). In this context, conservation means the management of the biosphere, with the aim of extracting the maximum advantage for the present generation, while being careful to maintain its potential, so as to be able to meet the needs and aspirations of future generations. Conservation is therefore a positive concept, which includes the preservation, maintenance, sustainable use, restoration and improvement of the natural environment.

4 Strictly speaking, "preservation" means isolating a sample of animal genetic stock and maintaining it in an environment in which there can be no risk of human forces making any irreversible genetic changes. This process can be undertaken *in situ*, when the animals are alive and living in their natural habitat, or *ex situ*, when the specimens are, for example, preserved cryogenically. The latter is a far more static concept than the former, which requires isolation but does not rule out changes through development or evolution.

5 *Tabaski* is a Muslim feast that commemorates the biblical episode of Abraham's sacrifice. God had told Abraham to sacrifice his son Isaac in order to test his faith. He was just about to do this when an angel appeared and ordered him to kill a ram instead. The feast is held two lunar months and ten days after the beginning of Ramadan.



DORO LELEWA VILLAGE (N'GUIGMI), THE NIGER



GAOUI VILLAGE (N'DJAMENA), CHAD

N'GUIGMI MARKET, THE NIGER

IN PASTORAL SOCIETIES, IN CONTRAST TO THE SITUATION IN THE GLOBAL MARKET, IT IS NOT ONLY MEAT AND MILK BUT ALSO BY-PRODUCTS SUCH AS DUNG AND SKIN THAT PLAY A MAJOR ROLE IN THE SELECTION OF A BREED

<< LEFT: THE FOOD SECURITY OF PASTORALISTS IS CLOSELY LINKED TO MILK PRODUCTION

THE ENVIRONMENT

The diversity of animal types used for livestock rearing depends to a large extent on the different ways in which people use the animals and their products. Today, most non-food animal products play only a minor role when it comes to global markets. Most energy comes from oil or coal, while most fertilizer is made from chemicals and most fabrics are of vegetable or chemical origin. In some countries, however, these non-food products are still highly important – dung, skin and wool are all significant by-products from livestock and have considerable value for their owners. Animals also represent an important capital resource in countries where a reliable banking system is often non-existent.

Foodstuffs obtained from animals – such as meat, milk and eggs – have no chemical or industrial substitutes, and these tend to constitute the main products used by livestock rearers. In some cases, they can be partly replaced by vegetable products, but consumption levels will vary widely according to income, availability and customs. In sub-Saharan Africa, most livestock breeding is aimed at providing a combination of products at any one time – such as meat and milk, meat and labour, meat and eggs, or meat and hides – to which must be added the social and capital value of the animal.

In all cases, soil remains a determining factor when it comes to choosing a production system. In the Lake Chad Basin, there are two distinct systems: a dune system and an island system.

NEAR CHARI RIVER, CHAD

AFTER THE MORNING MILKING, THE HERD IS MOVED FOR GRAZING. AT NIGHTFALL, IT IS GATHERED TOGETHER, A FIRE IS LIT TO WARD OFF INSECTS AND THE ANIMALS ARE LEFT TO GRAZE ALL NIGHT

>> RIGHT: THE WET ENVIRONMENT OF THE LAKE SHORE IS A PRECIOUS SOURCE OF FORAGE FOR ANIMALS ADAPTED TO ITS PARTICULAR CONDITIONS

THE LAKESHORE ENVIRONMENT

Herders make good use of the pastures that are adapted to the particular conditions of the Lake Chad area. Livestock are moved here mid-morning and left to graze around the edge of the lake for the rest of the day. Before nightfall, the herder lights a fire and gathers his animals around it in order to ward off insects. When night closes in, the herd moves off again to graze until dawn. In the morning, when the herd returns, the herder milks the cattle. This method of nocturnal grazing is also found in the Sahelian zone during the hot dry season [3.1].

The livestock system used by herders depends to a great extent on the availability of grazing or agricultural by-products, as well as on the constraints imposed by the environment – such as insects and the existence of islands. There are three main types of traditional livestock-rearers in the region.

1. **Pure pastoralists**, mainly Buduma, who practise transhumance on the islands, most notably with Kouri cattle, which can be considered a pure breed.
2. **Semi-transhumant agropastoralists**, who leave their families behind in the villages and accompany their animals as they move in search of pasture.
3. **Sedentary agropastoralists**, who live on the mainland and own herds that are mainly made up of zebu cattle and a few Kouri cross-breeds.

NEAR SELEYA VILLAGE (N'GUIGMI), THE NIGER

THE WELL OF KABELEWA VILLAGE (N'GUIGMI). THE NIGER

WODAABE MAN WITH HIS HERD. THE WODAABE ARE NOMADS AND ARE PART OF THE FULANI ETHNIC GROUP

On the islands, the main breeders and conservers of the distinctive Kouri cattle are the Buduma. These people actually come from villages on the islands, a factor which places them in a unique position when it comes to rearing the Kouri and keeping the breed pure. However, mention should be made of other ethnic groups living on the edge of the area, most notably the Fulbe and the Gorane who, in different ways, may have an impact on the future of Kouri cattle. The way in which Kouri cattle are reared is strongly influenced by the environment. The presence of water and the availability of pasture on the islands and around the lake have all led to the development of a particular system of transhumance, generally with the following patterns.

- During the cool dry season and after the harvest, the cattle graze in the village fields on the shores of the lake.
- During the hot dry season, they search for grazing on the islands.
- During the rainy season, the herds graze away from the fields on the dunes and on the mainland.

One distinctive feature of Kouri cattle is the way that they move from one island to another by swimming – a striking sight. Each community of herders owns a small number of islands and a parcel of land on the shore, and they rotate the use of pastureland between them.

NEAR TAL DESERT (N'GUIGMI), THE NIGER

IN THE INLAND DRY ENVIRONMENT, HERDS ARE CONTINUOUSLY MOVED IN SEARCH OF FORAGE

THE INLAND ENVIRONMENT

A number of different ethnic groups live in the region around the lake: Arabs, Kanembu, Kanuri, Gorane and Fulbe. Some of them have always lived here, while others pass through with their animals as part of a nomadic pattern.

Those who are exclusively herders are mainly Fulani, although the Gorane and Arabs may also fall into this category. These tribespeople do not practise farming as such because they are constantly on the move in search of new and better pastures. The Fulani raise M'Bororo cattle and small ruminants. The Gorane have cattle, small ruminants and a few camels. However, they do not breed camels on anything like the scale of some of the Arab ethnic groups [3.1].

To these should be added other transhumant pastoralists, the Kanembu, who pass along the southern shores of Lake Chad. They come from the Massakori region (Dum Dum, Mourzougui) and arrive on the shores of the lake later in the dry season. Their herds contain large numbers of Kouri cross-breeds.

Arab agropastoralists are almost entirely sedentary and live on the mainland. Their production system is dominated by agriculture, most notably the cultivation of maize, sorghum, millet and gombo. Their herds are smaller and groups of livestock belonging to several different owners are sometimes managed together. Many of their animals, especially goats and poultry, are fed on household scraps, such as fruit and vegetable skins, or crop residues, such

KALBAMA ISLAND (BOL), CHAD

PEUL FAMILIES CONSTANTLY MOVE BETWEEN WET AND DRY ECOSYSTEMS

as straw, hay and bran. Rearing animals is therefore a subsidiary activity that utilizes the by-products of the main activity, which is crop production. As a result, these animals incur a virtually negligible production cost and their development depends directly on that of the farming system which supports it. If crop production becomes more intensive, so does the production of animals, and vice versa.

For this reason, periods of low livestock production are unlikely to have a direct effect on a household. By the same token, the development of breeds able to adapt to catastrophe is relatively unimportant.

In spite of this, it is more than likely that these agropastoralists have the ability to select the breed of any species according to their own particular needs, although it remains to be seen why the selection of breeds has not been stabilized in the area. The truth is most probably that this is a highly complex process, with one group of herders responsible for the conservation of a breed that is adapted to a natural system while other pastoralists are introducing a farming system aimed at maximizing the production of crops rather than animals (in which case local breeds disappear and new breeds are introduced that maximize the utilization of crop by-products). Sometimes it must be accepted that there are no animal breeds that are perfectly adapted, or able to adapt, to all the constraints of the environment.

NEAR LOGONE-GANA VILLAGE, CHAD

SHEWA ARAB SEDENTARY AGROPASTORALISTS LIVE ON THE MAINLAND. THEY ARE MAINLY FARMERS AND OWN SMALL HERDS, WHICH OFTEN FEED ON CROP RESIDUES AND AGRICULTURAL BY-PRODUCTS

NEAR LIWA, CHAD

AGROPASTORALISTS TEND TO SELECT BREEDS ACCORDING TO THEIR SPECIFIC NEEDS, BUT THE PROCESS IS COMPLEX AND DYNAMIC

NEAR SELEYA VILLAGE (N'GUIGMI), THE NIGER

KOURI CATTLE ARE A UNIQUE BREED WELL ADAPTED TO THE SEMI-AQUATIC ENVIRONMENT OF THE LAKE

THE ANIMALS

The modifications of the natural environment, through desertification and fluctuations in the water levels of the lake, have had a tremendous impact on the farmers and herders of the Lake Chad Basin. These modifications have, quite naturally, led to changes in the way that the lake dwellers live their lives and use their animals.

CATTLE

Kouri cattle

The environmental and climatic conditions of the Lake Chad Basin are not well suited to an extensive pastoral system based on the Sahelian zebu, but pastoral production can rely on Kouri cattle, a unique breed adapted to these conditions. Also known by a variety of local names (Kuburi, white cattle of the lake, Buduma, Bahari, Baré, Borri and Dongolé), the Kouri is one of Africa's most ancient breeds and is perfectly adapted to its semi-aquatic habitat. However, changes in the landscape and in the rearing practices of local herders have led to an increase in cross-breeding between Kouri cattle and local breeds of zebu, such as the Arab and the M'Bororo zebu.

The Kouri belongs to the species *Bos taurus* and is a member of the cattle group that has long horns but no hump. Its natural habitat is the islands and shores of Lake Chad. It is characterized by its large size – from 140 to 150 cm high at the withers and with a thoracic circumference of 170 to 190 cm – and by the striking white colour of its coat. Its head is long, wide and thick, and its ears are medium-sized, but wide and set horizontally.

The Kouri has a massive build with a well-developed bone structure. Sexual dimorphism is very pronounced in this breed, most notably in the horns. These are large, white and tipped with black, lyre-shaped and carried high above the head, or wide and crescent-shaped. Near the base, the horn is hypertrophied and porous. Here, it can measure as much as 80 to 100 cm in circumference. On the islands, there is more variety in the shape of the horns, the

NEAR N'GUIGMI, THE NIGER

CHANGES IN THE ENVIRONMENT AND IN REARING PRACTICES HAVE LED TO AN INCREASE IN CROSS-BREEDING BETWEEN THE KOURI AND THE ZEBU

onion-shaped ones being the most spectacular. Contrary to popular belief, the horns of the Kouri do not help the animal to keep its head afloat while it swims between the islands. In fact, the cattle keep their horns out of the water as they swim and, because of their cumbersome weight and shape, they are poor swimmers. Animals with well-developed horns are believed to have a shorter lifespan. By the same token, cows with short horns are believed to be better milkers.

Kouri cows have a remarkable reproductive capacity, given their habitat. They first calve at around 36 months of age, with an average interval of 16 months between each subsequent birth. Given that the average lifespan for this breed is 12 years, a cow can easily produce between six and eight calves during her lifetime – a figure that underscores not just the ability of this breed to make the best advantage of an extremely harsh and difficult environment, but also the extent of the work and knowledge invested in the Kouri by local herders.

NEAR SELEYA VILLAGE IN GUIGMI), THE NIGER

THE KOURI HAS A REMARKABLE REPRODUCTIVE CAPACITY

At birth, a male calf will weigh around 25 kg and a female 22 kg. Growth continues until the age of five years, when an adult male will weigh between 400 and 700 kg and a female between 350 and 400 kg. Growth rates vary according to environmental conditions but, in traditional surroundings, can be as much as 450 g per day up to the age of two years. Average daily weight gains of 635 g have been observed over a period of 140 days in intensively reared Kouri cattle of an average age of three years.

Milk yields range from 4 to 6 litres daily. The lactation period varies from six to ten months, with an average annual milk production of around 1 300 litres. Natural weaning usually occurs at seven to eight months, when the mother's milk dries up. The Kouri cow is a better milker than the Arab zebu, which accounts for around 90 percent of the cattle population of Chad as a whole but which only produces between 2 and 3 litres of milk per day. In the 1960s, breeding centres at Maiduguri in Nigeria and at Matafo in Chad managed an output of 1 200 litres of milk per lactation, with a record of 2 440 litres and a lactation period of 314 days. Regrettably, these centres have since been abandoned, as a result of various events and circumstances that have shaken the region.

The most striking feature of Kouri cattle is the way in which this breed has managed to survive and evolve and be so successful, despite living in a particularly difficult habitat, with problems including the presence of the islands, the floating vegetation and a high level of parasites (such as tsetse fly). That this has happened is due, in part, to the skills of local herders, who, down the years, have learned to make the utmost of the characteristics and aptitudes of this breed. As far as anyone is aware, Kouri cattle do not exist anywhere else in the world. It would be interesting to learn why this particular breed has been able to establish itself so successfully in the region, when other races, especially the zebu, have found it much more difficult.

Defining Kouri cattle: the great debate

The study of this breed, which is found only in Chad and around the lake, is a fascinating one – but not everyone agrees on the animals' make-up. The Kouri is striking for the unusual shape of its horns and for the fact that it thrives in such a difficult habitat, producing good quantities of milk in spite of the constraints. The Kouri is undeniably a taurine because it has no hump and it possesses the Y chromosome common to all *Bos taurus*. As far as the herders of the region are concerned, it also has the gait and bearing of a taurine, rather than that of a zebu. However, researchers say that the breed's autosomal markers suggest that the Kouri is more closely related to the zebu than to the taurines.

In Africa, the concept of breed is a fluid one. A breed is seen as a grouping of animals that satisfies the needs of a group of herders, who identify themselves in relation to this particular animal. A breed is not a fixed entity, to be managed according to a particular standard or to any stud book. In its classic form, the Kouri is white, with lyre- or crescent-shaped horns that are thick and bulging. However, herders also readily accept cattle with brown coats, since parent animals with white coats can produce descendants with different coat colours.

Researchers use different criteria to characterize this breed. A study using 14 microsatellite markers to examine two populations of Kouri – one of which was typical and presumed to be pure, and the other of which had some coloured components and was presumed to be mixed – showed that the variability in the number of alleles was lower in the cattle thought to be of mixed breed than it was in those deemed to be pure. If homogeneity is a criterion for defining a breed, then it would seem that the herders' vision is the correct one.

This brief sketch serves to show that only the people who live with – and off – a breed can really be in a position to define it. What is needed is an understanding of their objectives so that they can be helped to get the best out of the breed in the given circumstances. That is the type of assistance that African herders really require from researchers.

NEAR SELEYA VILLAGE (N'GUIGMI), THE NIGER