

Livestock Diversity: Keepers' Rights, Shared Benefits and Pro-Poor Policies

**Documentation of a Workshop with
NGOs, Herders, Scientists, and FAO**

**Organised by:
League for Pastoral Peoples and German NGO Forum on Environment and
Development, in cooperation with CENESTA/CEESP**



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Herders, Scientists, and FAO**

*NGO/CSO Forum for Food Sovereignty
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Executive Summary

1. It is time to initiate a treaty on livestock genetic resources

Animal genetic material and related husbandry knowledge are becoming increasingly monopolized for private interests. Civil society and others, including indigenous communities, farmer organisations, and many scientists, are concerned about the rights of those communities who have developed seeds, breeds and related traditional knowledge. Moreover, the rate of extinction of livestock breeds is extremely high. FAO warns that out of the 6400 livestock breed it has documented, around one third are in danger of extinction or already extinct. In situ conservation is generally considered to be the most effective approach.

In November 2001, FAO member governments agreed upon an International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). Although far from perfect and not yet in force, this treaty deals with the conservation and sustainable use of food and feed crop genetic resources. It arranges for a multilateral system to allow free exchange of genetic material between parties, and establishes benefit sharing as a principle. Farmers' Rights are acknowledged in the Preamble; however, without even basic rules for their implementation. Patenting is not excluded. Still, the ITPGRFA is considered useful, and immediately after the adoption by FAO member states, civil society organizations CSOs have begun to advocate for an international convention on animal genetic resources. Member governments of the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA) should now initiate negotiations for such a treaty.

2. Formal legal recognition of pastoralists' and livestock keepers' rights is due

Based on the assumption that in the past century, international movements of breeds and genes were mainly from industrial to developing countries, some have argued that there is no point in pastoralists and livestock keepers' rights. However, while documentation of the past and present movements of breeds is incomplete, such movements from South to North or South to South are clearly increasing.

The strongest forces for such movements currently are the livestock industry and research institutions. In a time when the genetic basis of high performance breeds has narrowed significantly, they search is for useful traits in traditional breeds.

There is increasing evidence that "improved" breeds have failed in many instances. While they have succeeded in favourable production environments, they have generally failed in marginal areas. Again, documentation of such cases is very patchy and needs to be completed. If suitable solutions for marginal areas are to be developed, traditional breeds and the knowledge of their keepers offer alternatives. However, in this process the rights of livestock keepers have to be protected.

3. Pastoralist livelihoods in marginal areas need to be protected and improved

Pastoralists generally utilise the most marginal areas, those unsuitable for cropping. At the same time, they keep a large variety of breeds. This diversity is due not only to the local climate, soil and other environmental factors, but also the culture and traditions of the livestock keepers. Such genetic diversity cannot be maintained and developed in gene banks. Development efforts for pastoralists have often failed, threatening the cultures and the breeds. Access to pasture land, to adequate veterinary services and to markets are considered prerequisites to conservation and sustainable use of livestock genetic resources.

4. An international convention is needed

Livestock genetic diversity is not appropriately dealt with in the existing conventions.

The **Convention on Biological Diversity (CBD)** confers regulations regarding agricultural genetic resources to FAO. The "International Undertaking on Plant Genetic Resources" was concluded as a voluntary agreement of FAO member governments in 1983, long before the CBD negotiations started. The CBD places genetic resources under national sovereignty, so that access to materials, e.g. by researchers, can be impeded. CBD implementation tends to favour government institutions rather than farming communities or pastoralists. Their rights are addressed by the CBD; however, the CBD regulations regarding "Access and Benefit-Sharing" and "Prior Informed Consent" are not yet implemented. The Bonn Guidelines for their implementation have been completed in 2002, ten years after the adoption of the CBD. Similar rules

can be expected when the ITPGRFA will be implemented.

World Trade Organisation (WTO) regulations, in contrast to the CBD or the ITPGRFA, are equipped with efficient enforcement mechanisms. Member states of the WTO have to sign the **Trade-Related Intellectual Property Rights (TRIPS) Agreement**. TRIPS neglects environmental and food security aspects, while it compels the establishment of national patent regulations on microorganisms. For plants and animals, there must be either a patent or similar regulations of their own ("sui generis"). With regard to plants, most developing countries have failed to put their own regulations into place, but have adopted the Northern UPOV regulations, often under pressure and with the limited time allowed by TRIPS. With regard to livestock, the race for IPR rules is on.

5. Differences and similarities between plant and animal genetic resources for food and agriculture

Technical differences should not be ignored nor over-estimated with regard to their influence on pastoralists' rights or an international convention. In the past, funding and scientific attention focused on ex situ conservation and this may easily lead to such an over emphasis of the importance of technical differences. Genetic diversity is best maintained and developed in situ. This is true for crops as well as livestock, and for farmers as well as pastoralists, whose rights are essential for resource conservation.

Selection and back-crossing are much slower in most animals compared to most plants. Therefore, crossings between "improved" and traditional breeds are part of the formal development strategies. In crops, selection and back-crossing allows the development and marketing of uniform

seeds. Informally, such seeds are often crossed with traditional seeds. The implications of these different genetic development and marketing strategies need further discussion.

So far, the application of gene technologies to livestock are limited, e.g. hybridization and “fixing” the genotype are hardly possible.

Modern breeding has led, however, to a situation where livestock keepers often are no longer in charge of breeding decisions and reproduction. Industrialized poultry breeds have lost some of their capacity for natural reproduction, for instance brooding capacity and mothering instincts have disappeared. The situation resembles that of the terminator technology in crops. While terminator technologies in seeds are on the threshold to application, such breeds have been promoted since several decades.

The population dynamics differ, with a lower multiplication rate in livestock (maximum a few dozens per generation) compared to crops (up to hundreds), and a generally but not always longer reproduction cycle of livestock compared to crops. Perennials, shrubs and trees may need as much time to reproduce as livestock.

Ex situ conservation is generally easier in plants than in animals. In vitro techniques with extremely low temperatures needed to conserve sperm, egg cells or tissue are more demanding and expensive.

Limited information is available on pastoral systems, especially an understanding of traditional animal breeding is lacking. Such information would be necessary to provide adequate support for livestock genetic resources conservation by communities.

6. Definition matters

The term “pastoralists” is considered to reflect the people concerned by the problems described above. However, in order to include small farmers who keep livestock, and small producers who keep livestock without having land, in urban or rural areas, the term of “**pastoralists and livestock keepers**” was chosen and used e.g. in the Action Agenda of the NGO/CSO Forum on Food Sovereignty at the World Food Summit – Five Years Later in Rome, June 2002.

Part I: Workshop Report

Introduction

*By Susanne Gura, German NGO Forum
on Environment & Development*

A new movement of livestock genetic material from the South to the North has appeared at the end of the twentieth century. So far, generally (apart from a few South to South flows), Northern breeds were introduced to the South and crosses spread in the South to increase productivity. The breeds were called "improved" because of their high production of meat, milk, eggs or wool. However, they need optimum conditions to deliver. Such "improved" breeds sometimes were a success, but this was limited to favourable areas; in marginal areas they usually failed. Nevertheless, breeds in the South have been severely affected

With technological development, especially gene technology, not only breeds, but also genes became the material of interest. The first few cases have become known, where genes from Southern breeds with interesting traits have been "found". "Found" is put in parentheses, as scientists have discovered what has been selected and developed by pastoralists and livestock keepers over several millennia. The question arises, should it be allowed to monopolize the genes and the associated knowledge?

Several international conventions are in place, and national laws are being adjusted almost everywhere to regulate monopolization of genetic material. Livestock genetic diversity as compared to crop genetic diversity has received very little attention by policy

makers or even the civil society's advocacy organisations. When in November 2001, the International Treaty on Plant Genetic Resources for Food and Agriculture was adopted by the 185 member governments of FAO, the minds became freer to start thinking of livestock. This civil society workshop is probably the first to take up this issue.

Farmers' Rights play a major role in the discussion on crop genetic resources. For the communities that have developed livestock breeds, there is not even a commonly used term. We have chosen "pastoralists and livestock keepers' rights". There is an interdependence between these communities and their breeds that has to be taken care of in the future in order not to lose the diversity. Gene banks can only conserve a small part but not develop diversity. Diverse environments and communities are needed to develop crop as well as livestock diversity. The livelihoods and cultures of pastoralists and livestock keepers need more support.

Herders utilise many marginal areas that are unsuitable for cropping. Their development potential is far from being realized (overgrazing should be discussed in the right context as well). Pastoralists are so far hardly organized beyond their communities. A few herder representatives attend this workshop and may use the NGO/CSO Forum for Food Sovereignty to improve their international cooperation.

Today's programme includes three examples from three regions, Asia, Africa and Latin America. We have invited the International Livestock Research Institute ILRI to provide a scientists' view and experience, and the relevant divisions of FAO. The International Plant Genetic Resources Institute (IPGRI) is represented here as well with their experience.

Thank is due to the League for Pastoral Peoples and to the Iranian environment organisation CENESTA for their cooperation. The Organizing Committees of the NGO/CSO Forum for Food Sovereignty made it easy to hold this workshop, and their staff have always been helpful and are still in a good mood even on this last day. Thanks are also due to the European Commission and German Technical Cooperation for their financial support.

Beyond Milk, Meat and Eggs: Animal Genetic Resources - A Necessity for Food Sovereignty¹

Nitya Ghotge, Anthra, India

India hosts a large number of livestock keepers and animals. Pastoral communities, forest communities, land owning communities and even the royalty have all bred animals to suit their needs. Rebaris or Raika, Dhangars and Gollas are pastoralist communities specialized on breeding. During colonization, Kankrej, Gir and Ongole cattle were exported to Australia and America for their beef quality. Cross breeding to enhance milk production led to a dilution of indigenous breeds, which continued until today. Draught and dual purpose breeds are rapidly disappearing. Cross breeding for sheep failed, while there was no policy for goats. To cater for urban markets, layers and broiler races were imported; while the rural areas continue to raise traditional fowl.

The needs of the rural people as well as the need to maintain and develop pure breeds were ignored by the government policy; this is the dark side of Operation Flood and the thriving poultry industry. Of great concern is the short-sightedness/unsustainability of this policy. If interest in indigenous breeds and genes is now revived, policy will most probably resort to ex situ conservation of germplasm without much concern for community-based in situ strategies that strengthen peoples' livelihoods.

The right to raise breeds of one's own choice must rest with livestock keepers. Most modern breeds have lost their mothering or brooding instincts. Most modern breeding technologies where farmers buy their breeding stock from large firms are as dangerous as terminator technology in seeds.

¹ For the full text, see Part Two

Two Mexican Case Studies on Animal Diversity²

*Raul Perezgrovas, Institute of Indigenous Studies,
University of Chiapas, Mexico*

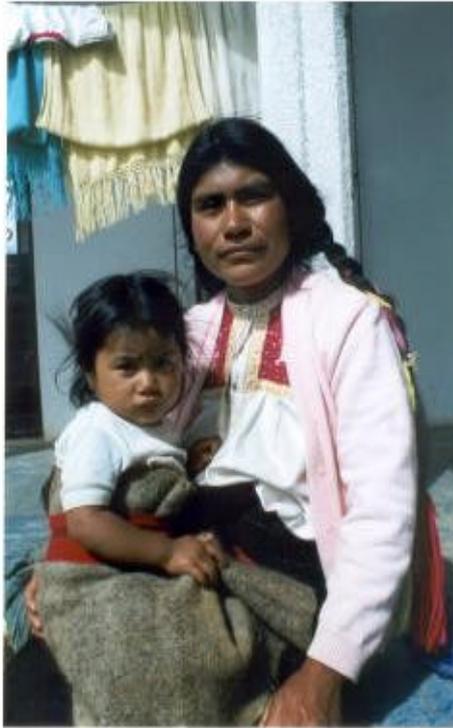
Indigenous sheep in Central Mexico began its gradual extinction in the early 1970's, when the government introduced Suffolk and other black-faced rams for cross-breeding. Farmers from this region continued their livelihoods based on the sales of mutton and wool until 1995. Then, a free trade agreement with New Zealand, and later with Australia, ruined the Mexican sheep farming and the wool market. At this time, the husbandry of sheep ended in Central Mexico, and many farmers migrated to the cities and to other countries trying to make a living through selling their labour force.

In the Highlands of Chiapas, in southern Mexico, the Merino rams introduced by the government in the 1970's never succeeded, lacking adaptation, resistance to internal parasites, and the type of wool needed by the local weavers, who utilise only ancient

techniques and instruments. Women from the Tzotzil ethnic group in this region continued to keep their small flocks of the local indigenous breeds. These breeds were originally brought from Spain in the early 16th Century, and had the opportunity to adapt to the local environment and resources, forming at least three local sheep breeds. A second attempt to introduce exotic breeds was made recently. Will the Tzotzil women continue to raise their own sheep breeds?

Government policy regarding globalization as well as livestock breeds introduction has to consider the needs, goals and opinions of the local farming communities, as well as the value of indigenous breeds that have been selected over centuries to fulfil the textile requirements of the people.

² For the full text, see Part Two



Pastoralism, Ethnoveterinary Plants and Biopiracy

Jacob Wanyama and Lucas Lolnkojine, Intermediate Technology Development Group, East Africa

The Samburu herders in Kenya depend on livestock for meat and blood, and keep donkeys for transport. Their livelihoods and the genetic diversity of their animals are threatened by international as well as the Kenyan government policies. Imported breeds do rarely serve the pastoralists' purposes. However, the resources to improve local breeds hardly exist. Herders demand

to participate in breeding programmes and to share in the benefits from the use of the genes of their own breeds. Crossbreeding is not always an appropriate solution and pure breeds have to be maintained together with the knowledge associated with the breeds.

How Pastoralists Manage Biodiversity

A Case Study of the Raika of Rajasthan (India), compiled by Lokhit Pashu-Palak Sansthan³, presented by Hanwant Singh Rathore

The Raika, a Hindu caste whose hereditary occupation is camel breeding, stick to their traditional rules for sharing and conserving resources, especially to maintain mobility, grazing opportunities and conservation of pastureland. Livestock is communal property; the ban to sell female animals is one out of a set of rules that have led to a well-managed livestock biodiversity. In addition to camel herding, the Raika engage in sheep, goat, and cattle breeding. However, although they represent the backbone of the livestock sector, hardly any interaction takes place between the Raika and the government officials for animal husbandry. For many decades, the livestock policies and activities of the state of Rajasthan have been focusing on breed improvement by cross-breeding. Although the need to conserve the indigenous breeds is now being recognized and even reflected in the official breeding policy, the linkages and collaboration with the pastoralists as main stakeholders have hardly been established.

The very reluctance of the Raika to give up their traditional ways, their tenacity in sticking to hereditary customs and their refusal to abandon their patterns of extensive animal production are responsible for the conservation of livestock genetic diversity and well-adapted breeds in Rajasthan. Recognition and support of this culture, e.g. through a participatory development approach, could help to maintain their contribution to biodiversity conservation and may help to overcome the perception of the cultures of migratory pastoralists as marginal and “backward”.

³ For the full text, see Part Two. The presentation is included in the workshop report, although it was held during a side event of the World Food Summit - Five Years later on 11 June 2002.

Livestock Research and Keepers' Rights

John Gibson, *International Livestock Research Institute (ILRI)*

The successful conservation and use of animal genetic resources will depend on an appropriate resolution of livestock keepers' rights in conjunction with the generation of appropriate knowledge, structures and policies. Scientists contribute through research to understand the unique genetic characteristics of animal genetic resources, and by providing options to harness these unique genetic characteristics in order to improve the livelihoods of livestock keepers. Scientists follow the debate on Intellectual Property Rights with great interest and can assist the debate by providing information; however, they cannot lead the discussion. This should be done by the civil society and by governments.

In the debate on movements of livestock genetic resources around the globe, it is clear that most of this movement has been from North to South, and from South to South. In this movement there have been a number of failures, but there have also been many valuable successes. An example of a north-to-south success story, where benefits have clearly flowed to the developing world, is the development of smallholder dairy production systems in upland areas based on use of exotic dairy cattle germplasm. An example of a south-to-south success story is the spread of *Bos indicus* germplasm that repopulated East Africa after the rinderpest epidemics devastated the more susceptible germplasm of the region about 100 years

ago. Such success stories were based on unhindered movement of germplasm. It is my feeling that the successes probably far outweigh the failures and that the movement of livestock genetic resources has been of greatest benefit to the developing world.

It should be noted that where movement of germplasm has clearly benefited the poor who have adopted the new germplasm, there have often been some negative consequences. For example, the widespread use of exotic dairy cattle germplasm in upland areas has in several cases led to endangerment and in some cases extinction of the indigenous germplasm. While it would be inappropriate to deny poor farmers access to more profitable germplasm, the question clearly arises as to how indigenous germplasm can be safeguarded for the future.

While the couple of examples given above are illustrative, a detailed review of the global movements of livestock genetic resources is lacking. Such a review of the global movement of livestock genetic resources, including details of the balance of successes and failures and an analysis of who has benefited from such movements is urgently needed and will be an essential input into the global debate on livestock keepers' rights.

Another important issue in the debate on livestock keepers' rights is the impact of such

rights on the research that will be needed to ensure that livestock genetic resources are utilised to benefit poor livestock keepers. In this regard there are some clear differences with research into plant genetic resources. Most notably, research in animals is much more expensive than with plants, and the routes to exploitation for profit driven companies are not as straight forward as for plants. As a result, there are few examples where companies from the developed world could make a profit from accessing livestock genetic resources from the developing world. Consequently it has proven very difficult to interest business in conservation or utilisation of livestock genetic resources.

Virtually all research into genetic characteristics, conservation and utilisation of indigenous livestock germplasm is taking place in public domain research institutes and Universities with the primary aim of finding benefits for farmers in the developing world. The scale of that research is very small in relation to the needs and opportunities, and

it has proven difficult to fund even the small amount of research that is going on. Moreover, sovereignty issues already create difficulties for research scientists to access genetic resources, which limits the research that takes place. If countries and communities move to further limit access to genetic resources, the little research that is currently underway may be reduced substantially, because donors will be reluctant to fund such work if sovereignty issues make application of results difficult and because researchers will have difficulty accessing the germplasm they need for the research.

The debate on livestock keepers' rights will need to move ahead cautiously and be fully informed about how benefits can be obtained through utilisation of livestock genetic resources. It would be very unfortunate if the debate led to barriers to exchange and sharing of germplasm. Such barriers would likely be most damaging to the livestock keepers whose rights it is sought to protect.

Why We Need Livestock Keepers' Rights to Save Livestock Genetic Diversity

Ilse Koehler-Rollefson, League for Pastoral Peoples⁴

The "Livestock Revolution" projected for the coming decade will not only increase consumption of livestock products from standardized production systems but also erode further the genetic diversity that is already far more narrow than in crops. Livestock industries should be made to internalize these costs. Ex situ conservation is not an adequate alternative to the selection and breeding achievements of livestock keeping communities.

Examples for the increasing South to North movement of livestock genes including patent applications show that livestock keepers' rights are urgently due. More-

over, secure grazing areas and other development efforts are needed; this could at the same time improve sustainable use of marginal areas unsuitable for cropping.

A detailed action agenda is presented, especially with a view to an international convention following the example of the International Treaty on Plant Genetic Resources for Food and Agriculture adopted by FAO member states in November 2001.

⁴ For the full text, see Part Two.

Livestock Keepers' Rights on the Way to an Interna- tional Convention

*A panel discussion with all presenters and Irene Hoffmann, FAO,
With floor participation; Moderator: Simon Anderson, Imperial College, UK*

Irene Hoffmann, FAO Animal Production Service Chief, explains the Global Strategy on Farm Animal Genetic Resources devised by the Animal Genetic Resources Working Group which is part of the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA). This group acts on the request of FAO members. A State of the World Report is currently under preparation. Country reports were invited in 2001, and guidelines provided and regional training workshops carried out in 2001 for their preparation. FAO has a world watch list on animal diversity, a regular bulletin, and a video series that can be requested. NGOs could contribute to the national reports by contacting governments.

The Domestic Animal Diversity Information System (DADIS) is fed by national governments. There are indications that more breeds are registered than exist, at least in India. DADIS and ILRI have recently agreed to merge their data. Neglected are especially ecosystems based work, livelihood systems, indigenous breeding aspects, long term views.

John Gibson plans to explore whether molecular technologies can help community based breeding. He points to the fact that the dairy industry is developing in rural Kenya.

Jane Toll and Michael Hale of International Plant Genetic Resources Institute (IPGRI) report on the activities regarding livestock within the CGIAR's Systemwide Initiative on Genetic Resources. With the erosion of the genetic base and the spread of "improved" breeds, diseases of cattle and poultry are also spread, and indigenous livestock keepers are affected without compensation. There is need for more information on cases of movements of genetic resources between countries, and on indigenous knowledge. The cooperation between FAO and ILRI would be crucial.

Ways have to be devised for prior informed consent and for benefit sharing as foreseen by the Convention on Biological Diversity.

The representative of a Bedouin tribe in Jordan describes the various species of livestock, especially camels and goats, and their multipurpose uses. The trade rules of WTO do not reflect at all the needs and traditions of the people.

The Mongolian representative informs that 400 nomadic tribes in his country are leading an extremely difficult life. Long distances and communication problems make it almost impossible to defend their interests.

The representative of the Negashoi tribes in Southern Iran reports on the settlement policies in Iran and their effect on genetic resources conservation. Since 1992, Iran has a Ministry for Nomadic Affairs, and that year, an International Conference on Nomadism was held. However, pastoralists do not have an international association.

Part II: Full Papers and Annex

Beyond Milk, Meat and Eggs: Animal Genetic Resources - A Necessity for Food Sovereignty

Nitya S. Ghotge and Sagari Ramdas, ANTHRA

Background

70 % of India's population lives in her villages. Over 70% of them are farmers and keep livestock. Considering India's size and population that is a considerable number of people and animals.

Some are pastoralists who do not traditionally own land but migrate from region to region in search of fodder for their animals and a livelihood for themselves. Others live in forests or on the fringe of forests. Yet others are small and marginal farmers for whom livestock is a critical ingredient to make their farming viable. For many the life style has not really changed in hundreds of years. What has changed though is the environment which in an era of shrinking space is squeezing them out of their livelihoods.

These people rear livestock not merely for milk and meat to feed the urban rich. In fact there is hardly any vertical integration

by which their products make it to the city. They actually rear livestock to cater to a number of personal needs and demands including food, fibre, manure, cash, social acceptance, status, bride price, sport. Livestock is often the only asset of value they own serving a cultural, social, economic and environmental need.

These farmers are more often than not criticized because their production systems are poor and they are unable to feed into an ever hungry and insatiable urban market. They are often accused of keeping too many 'unproductive' animals which are then blamed for destroying the environment. In truth, the productivity is seldom measured in terms of efficiency against resources available and it is because the environment is wasting at such a rapid rate that these farmers are forced to stock animals that make very few demands on resources: on fodder, on veterinary care and on labour. Over years these animals have been selected by different stake holders for traits such as

disease resistance, feed efficiency, ability to withstand migration, periodic drought as well as for diverse other reasons such as fighting and racing abilities and physical characteristics such as colour, size, and gait. These are the stakeholders for whom animals and their genetic diversity are essential for survival.

Livestock Breeding in India

The development of different breeds from their wild progenitors is a process which has taken many thousands of years. In India, breeds have been created by a process of natural selection as well as human intervention. Different communities have selected different breeds to cater to their requirements. Pastoral communities have developed breeds which can tolerate the stress of migration as well as are able to survive long periods of drought. Forest communities have bred animals which are resistant to diseases, are able to withstand the attack of natural wild predators as well as for specific sports. Landowning communities have selected cattle breeds which are good for traction, ploughing and can provide manure for their crops, and other agricultural needs. Royalty have been responsible for selecting breeds to suit the needs of war.

Careful breeding choices have been made by all these groups to suit local conditions. Amongst pastoralists, male animals are carefully selected as breeding stock and retained in the herd while the rest are sold. Care is also taken to prevent inbreeding by changing the stock periodically or bringing in animals from other herds.

Some of the other crucial factors influencing selection are:

- Criteria related to production traits or assumed to be related to production traits such as rate of growth of young ones, milkyield.
- Known genetic defects of the individual animal, its parents or offspring. Such animals are rejected.
- Economic and logistic constraints: Animals which demand heavy feed resources may not be welcome in resource poor areas.

Breeding is a specialized activity and in most areas it has been specialized communities -most often pastoralists- who are the actual breeders. In India communities like the Rebaris or Raika, Dhangars, Gollas have traditionally been responsible for rearing and breeding livestock, maintaining gene pools and preserving breeds.

Indian Breeds of Livestock

Species	World	India (FAO)	India (ICAR)
Cattle	787	30	30
Buffalo	72	19	15
Sheep	920	59	42
Goat	351	29	20
Pig	353	3	3
Ass	77	3	3
Horse	384	9	6
Camel	56		8
Chicken	606		18

Source: Domestic Animal Diversity Conservation and Sustainable Development; Ed: Sahai and Vijh (2000) SI publications Karnal

Loss of genetic material and the introduction of exotics

Although trade with different countries like Arabia did introduce new and different breeds of livestock into the country as well as possibly the export of different breeds out of the country the major changes have really happened more recently.

During the process of colonization two events happened which somewhat changed the profile of breeds in India. Colonizers found that Indian breeds were not quite suitable for milk production as compared to European breeds and therefore began cross breeding efforts to upgrade breeds to better producers of milk. At the same time draft cattle breeds from India like the Kankrej, Gir and Ongole were found to have superior beef breeds and were exported to the emerging colonies of Australia and America. While this probably did not really erode the number of breeds, what did happen though is on one hand good indigenous material got diluted and on the other some very fine genes left the country.

Post Colonization, Independent India

The 1940's and 50's were years of enormous world food shortages and at that time it was necessary to create food surpluses. Breeding was seen as a tool to create these surpluses and it seemed appropriate to upgrade all livestock breeds to those which produced more milk, meat and eggs. The animals used for up-grading local stock were usually exotics from temperate countries. A quick look at the breeding policy and its efforts over the past fifty years gives an idea of the achievements in the field.

The objectives of livestock development found scattered through India's plan documents, are clearly reducible to two primary

objectives namely

- Increasing milk production and
- Supplying milk to the urban centres

→ 1951- 56 (1st five year plan)

During the first five-year plan (1951-56), along with the two above-mentioned objectives, was an objective to improve the supply of quality draught bullocks for agriculture purposes.

The breeding policy aimed at producing a population of dual purpose milk and draught animals by a breeding strategy of

- Selective breeding of indigenous cows
- Grading up of non-descript cows with Indian breeds to improve their milk producing capacities
- Selective breeding of draught animals

→ 1956-61 (2nd five year plan)

The second five-year plan (1956-61) continued the above policy and strategy. However in both plans there was no practical operational plan or scheme to improve the quality of draught animals and achieve a dual-purpose population of animals.

→ 1961-66 (3rd five year plan)

There was a clear shift in the breeding strategy from the third 5-year plan (1961-66), with emphasis on developing crossbred cattle for increasing the production of milk.

→ 1966-69 (3 annual plans) and 1969-1974 (4th five year plan)

These plans placed "Dairy development", enhancing milk production and transporting milk to urban areas as the corner stone of government policy on livestock development. The policy was institutionalized through the establishment of NDDB (National Dairy Development Board) and operationalised through Operation Flood. Crossbreeding of cattle with exotic breeds to enhance the milk producing genetic potential of local breeds,

became the thrust of national breeding strategy and buffaloes gained a pre-eminent role in the Indian Dairy Industry.

Breeding strategy: 5th, 6th and 7th plans (1974-79, 1980-1985, 1985-1990)

The Operation Flood project dominated these years, and consequently the breeding strategy too was to continue the strategy of crossbreeding with exotics.

8th 5 year plan (1992-1997)

Once again after a gap of close to thirty years, there is mention of the need to evolve a policy on draught animals in this plan, however without any relevant strategy to achieve this concern.

9th five year plan (1998-2001)

This plan yet again emphasized increased milk production through a strategy of crossbreeding with exotics.

Breeding strategies for different categories of animals

1. Breeding strategy for draught and dual purpose animals

As mentioned earlier there has been a complete neglect this category of animals. In their over zealotness to promote crossbreeding and enhancing milk production over and above everything else, policy makers lost the opportunity of consolidating the policy directives of the 1st and 2nd 5 year plans and of evolving a population of dual-purpose livestock. Many breeds such as the Nagore, Ongole and Deoni are rapidly disappearing from their home tracts as exotics and buffaloes replace them. This will affect not merely the sustainability of local breeds, but also the sustainability of agri-

culture, as replacing draught animals with fossil fuel powered machines is not a suitable alternative in the long run. Secondly valuable manure available from animals is also decreasing.

2. Breeding strategy for buffaloes

The increase in buffalo population that has occurred all across India, has largely been as a response to market stimulus and price incentives and also the fact that in the irrigated areas of the country buffaloes are able to utilize the increased crop residue, can be easily stall fed and are generally easy to manage and support the plan for providing milk to urban centers. None of the plans however mention a specific breeding plan/policy to enhance the productivity of buffaloes and in many areas in fact enhancing productivity has de-facto been translated into upgrading the local buffalo breeds by crossing them with Murrah/Surti breeds rather than selection within the particular breed for excellence.

3. Breeding strategy for sheep and goats

While successive plans provided a conducive policy environment and promotional schemes for sheep development, the sheep population hardly grew over the four decades of planned growth. The breeding policy for sheep has been directed towards enhancing the wool production by upgrading local sheep with exotics. However, all these crossbreeding schemes have been a failure.

On the other hand while all plans have had a very cautious approach to goat production, and in fact went to the extent of advocating a policy of restricting and limiting the goat population in the country, the goat population between 1951-1990 has increased by over a hundred percent. There have been absolutely no breeding policies for goats.

4. Breeding strategy for poultry

70-75% of the total poultry population in the country continue to be Desi breeds and are found in the rural areas, reared under backyard systems. To date there have been absolutely no policy directives to utilize genetic material from valuable indigenous breeds of fowl, many of which have adaptations for disease and heat tolerance. Instead the breeding programme has been to develop layers and broilers using exotic genes from the leghorn and Rhode Island to be raised under commercial systems which then feed into the urban market.

With a completely skewed and misguided policy, what in effect has happened is many of our finest breeds of livestock and poultry are on the brink of extinction. There are no pure lines and strains with which to produce further crosses. There is no information on the population of these breeds, as the livestock census has never taken into account indigenous breed populations. And, for many breeds like the Ponganur cattle of South India the populations have reached a point of no return. Which is extremely sad, as the Ponganur is believed to have an excellent feed efficiency ratio a trait invaluable in times of fodder crisis. One can only wonder how many valuable genes have disappeared forever and how many more are likely to get washed away unless some serious action is taken.

Other factors responsible for the disappearance of breeds

It is not merely a skewed breeding policy which is responsible for disappearing breeds. Other factors are

- Disappearing forests and grazing lands and a shrinking fodder base
- Increasing mechanization of rural operations rendering draft animals redundant

- Fodder varieties being replaced by cash crops and hybrids which have no fodder value
- Lowered demand for certain traditional livestock products
- Indiscriminate breeding efforts like castrations, cross breeding, by other agencies, including NGO's and welfare organizations.

Emerging concerns

Current projections in the livestock sector predict growing demands for meat and milk products in developing countries including China and India. It is hoped that that the worlds poor will be able to meet these demands. Unfortunately if one goes by the past experiences in India and the two success stories that the countries livestock experts love to talk about, it is not the poor who have benefited by these programmes. The great dairy revolution wherein an aggressive cross breeding programme sought to improve the milk producing capabilities of Indian cows has not really benefited the poor. To be able to maintain these animals, which make heavy demands on feed, water and veterinary care you have to be a farmer of means. Like wise the successful story of poultry industry is not steered by poor women who rear back yard poultry but rather by private entrepreneurs who stepped in to make use of a market opportunity. But, what the two programmes have systematically done is to ignore local breeds and their potential in their bid to produce one uniform breed either producing milk, meat or eggs.

The poor still need traction animals and manure to ensure they can farm their small plots. Tractors and mechanized farming systems are often completely inappropriate in small land holdings and hill slopes, which is where the poor usually live. Jersey and Hol-

stein Friesian crosses cannot cater to these needs. What these farmers need are animals that can withstand diseases, tolerate ectoparasites and survive harsh conditions including droughts and floods. Local breeds have been raised by stockholders for years to cater to the needs of the poor in a particular region. They fit in different ways into complex rearing patterns, which cannot be governed by monoculture policy directives, issued from the Centre.

Modern science has sought to develop **monocultures** of animals catering to the demands of a narrow urban product, which is dictated by current fashions, in food habits, health regimens and artificial projections. This is neither desirable nor really possible nor does it take into consideration the long-term needs of the poor and the marginalised. Even if interest in indigenous breeds, and genes is revived it will probably also emphasize ex-situ conservation of germplasm through frozen semen/embryo technologies, without the slightest concern for community strategies to implement in-situ conservation strategies that conserve as also strengthen peoples livelihoods.

Food sovereignty and animal genetic resources

Different breeds of livestock strengthen farming systems and livelihoods in complex and diverse ways. Not only do animals provide a source of nutrition themselves, they are invaluable to small farming systems as they provide energy, draft power and manure without which the farmer would not be able to crop at all. By the very diversity of livestock species and breeds, farming systems and produce they protect against market saturation. Diversity also helps preserve important genes and resources which may be an answer to tomorrow's problems.

The right to raise species and breeds of one's choice and the right to make an informed choice about the kind of technology options being offered by policy interventions and development programmes must rest with livestock owners and farmers. Today most small holders and farmers in developing countries are coerced into making choices without knowing the true consequences of what these choices foretell. Most breeding tools and technologies are as dangerous as terminator seeds in plants. Under commercial crop farming systems farmers **buy** their breeding stock from big multi nationals. If care is not taken these systems will also creep into smaller farming systems thereby wiping out small farmers, as they will not be able to afford what the market has to sell. How then do we attain food sovereignty?

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Two Mexican Case Studies on Animal Diversity

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Two stories of two very different Mexican livestock keepers are presented, one of a Central Mexican farmer (“John Global”), one of a Tzotzil woman from the Chiapas Highlands (“Jane Wise”). Before 1970, both raised indigenous sheep breeds, John Global for wool sales and meat consumption, Jane Wise for wool weaving and manure for her crops.

The Mexican government policy in 1970 successfully introduced cross-breeding with Suffolk sheep in Central Mexico. John Global was able to make a living with his 200 cross-bred sheep. However, local breeds became extinct, the cost of which was never considered. The Merino cross-breeding introduced in Chiapas was a failure, all exotic sheep died. Jane Wise continued to raise her small flock of around ten indigenous sheep.

The 1995 trade agreement with Australia and New Zealand allowed duty free imports of wool and sheep. This led to a complete collapse of the market for mutton and local wool and consequently of sheep farming in Central Mexico. John Global migrated to the large urban centres in Mexico and to the rural areas in the United States.

Those who care about rural livelihoods and/or about genetic resources conservation ask: Who decided to cross-breed the local sheep from Central Mexico? Who chose the exotic breeds? Who is responsible for extin-

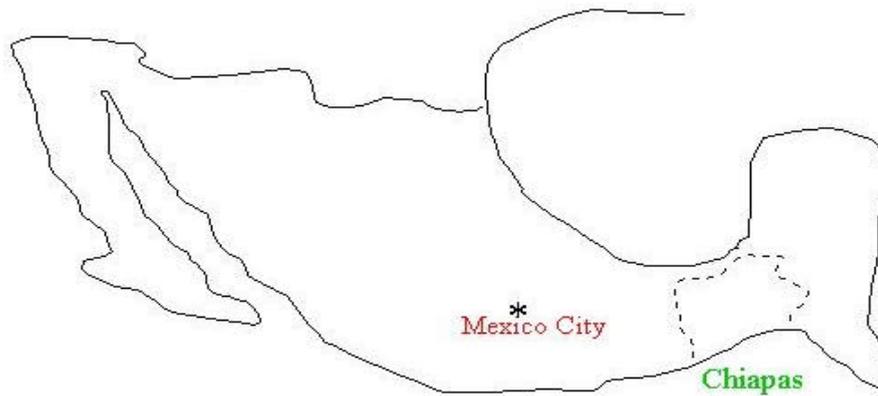
guishing a local breed? Who asked John Global about his opinions, preferences, and goals? Who is responsible for the end of the rural livelihoods offered by 400.000 sheep in Central Mexico?

In the mountains of Chiapas, the government is currently trying to introduce “hair sheep” for cross-breeding purposes, allegedly because wool prices are at its lowest ever. The success of a hair sheep in the Highlands is not possible; the religion of Jane Wise prohibits the killing of sheep or the consumption of mutton. On the contrary, she continues to weave the wool of the local sheep, the “true sheep” as these coloured breeds are named in the Tzotzil language. She needs the white, black and brown fleeces of her true sheep to weave the typical Tzotzil clothes, and to sell handicrafts, and the manure of these animals is necessary to fertilise her crops. This has been the Tzotzil way, and it has been passed on orally for endless generations of shepherdesses and weavers. But for how long?

Those who care about rural livelihoods and about genetic resources conservation conclude and ask: In Chiapas, the traditional sheep husbandry system is endangered. The local livelihoods are threatened by top-down decisions. Is Jane Wise prepared to fight against “hair sheep”? Shouldn't we acknowledge and support Jane Wise in Chiapas and the other indigenous livestock keepers around the world?

Date: 1970

Place: Central Mexico Chiapas Highlands



Date: 1970

Place: Central México Chiapas Highlands

Human population:	2,000,000	200,000
Sheep population	400,000	150,000
Sheep type:	Medium size, coarse wool	Small size, coarse wool, long staples
Strategies:	Consumption of mutton and wool sales	Fleeces for weaving & manure for crops
Government approach:	Suffolk cross-breeding	Merino cross-breeding
Outcome:	F1 sheep	All exotic sheep died

Date: 1970

Place: Central México Highlands



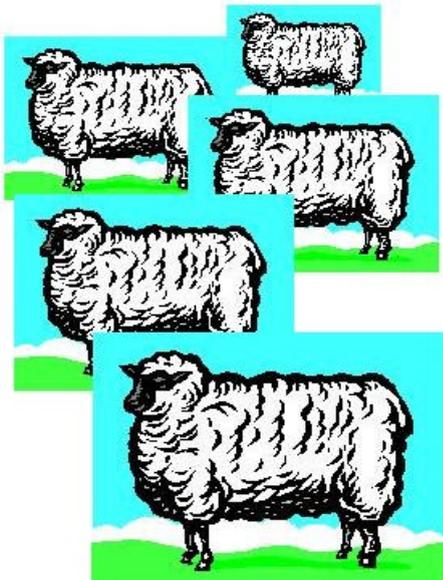
John Global,
200 sheep

Central Chiapas Highlands



Jane Wise and
siblings, 10 sheep

Central México
John Global's sheep



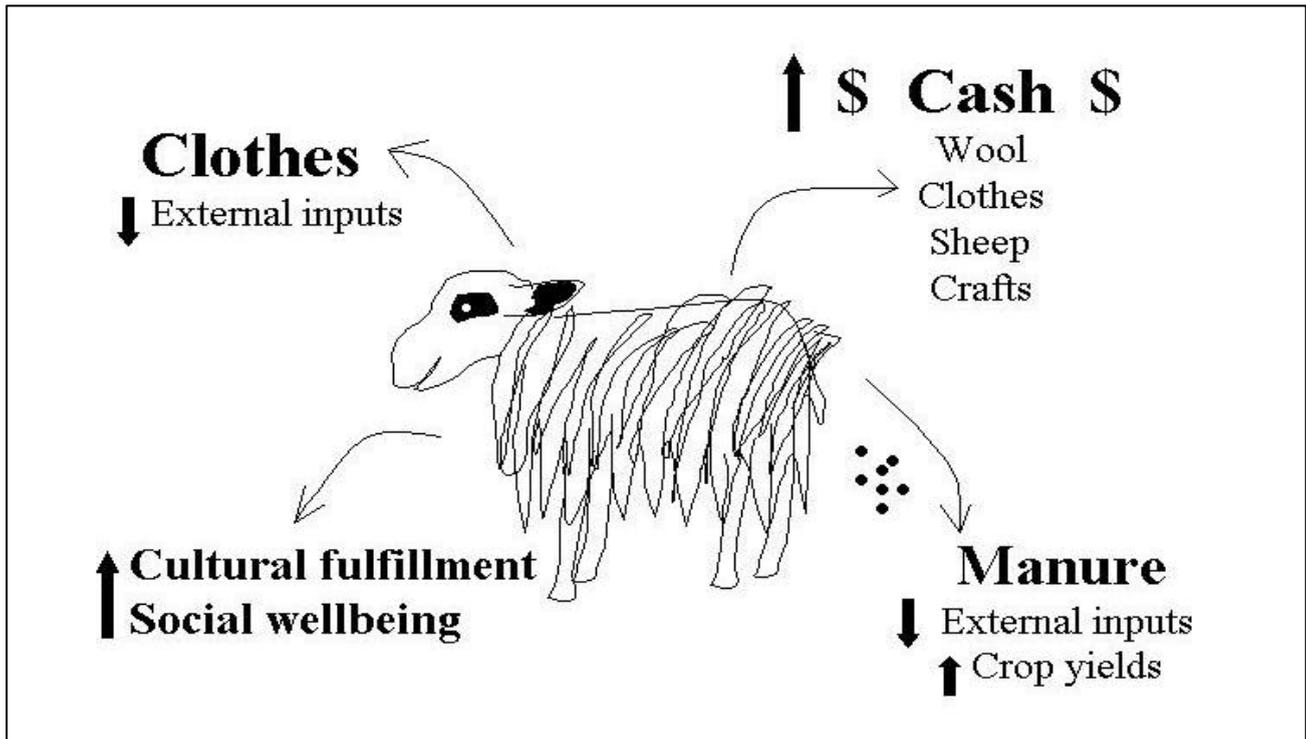
Chiapas Highlands
Jane Wise's flock



Date:	1995	
Factor:	Duty free imports of live sheep, mutton, and greasy and clean wool from NZ and Australia	
Effect:	Collapse of sheep farming	
Place:	Central México	Chiapas Highlands
Sheep population:	Close to zero	150,000
Strategies:	Migration, labour force	Weaving, handicraft sales
Government approach:	Agriculture subsidies	Hair sheep cross-breeding
Outcome:	Extinction of local sheep	Hair sheep for Jane Wise?

What does Jane Wise think about globalization?





Conclusions:

Who decided to cross-bred the local sheep from Central México?

Who chose the exotic breeds?

Who asked John Global about his opinions, preferences, goals...?

Who is responsible for extinguishing a local breed?

Who is responsible for the end of a livelihood?



Conclusions:

Chiapas sheep and the traditional sheep husbandry system are in danger

The local livelihood is threatened by top-down decisions

Is Jane Wise ready to fight against 'hair sheep' in Highland Chiapas?

Shouldn't we all do something to acknowledge and support all the Janes Wise around the world?



How Pastoralists Manage Biodiversity

A Case Study of the Raika of Rajasthan (India), compiled by Lokhit Pashu-Palak Sansthan⁵, presented by Hanwant Singh Rathore

Introduction

The Raika are a Hindu caste whose hereditary occupation is camel breeding. Originating in Afghanistan, they seem to have migrated to India in connection with the Muslim invasions that started in the 10th century. They quickly established a reputation for their expertise in camel breeding and, until the beginning of the 20th century, took care of the camel breeding herds of the Maharajahs. When these were dismantled at the time of Independence, the Raika switched to supplying draft camels to farmers and camel carters.

The Raika are a subgroup of the Rebari, the largest pastoral group of Western India that is concentrated in Rajasthan and Gujarat and estimated to number about

500,000-800,000 people⁶. The Raika consist of two groups that do not intermarry, the Maru and Godwar Raika. The Maru Raika are most densely distributed around Jodhpur and in Pali district of Rajasthan, whereas the Godwar Raika can be found in southern Pali district and in Sirohi district. According to their myth of origin, the first Raika was specifically created by Lord Shiva (an Indian God) to take care of the one-humped camel.

Although Raika identity remains closely associated with the camel, they have diversified into sheep, goat, cattle, and even buffalo keeping. This caste provides an important service to farmers and rural poor by providing draught animals (camels and bullocks), as well as cows with good milk yields. As large-scale producers of sheep, many of which are exported to the Middle East, they also generate substantial amounts of foreign currency for India.

⁵ Lokhit Pashu-Palak Sansthan, P.O. Box 1, Sadri 306702, District Pali, Rajasthan, India. E-mail lpss@sify.com. In cooperation with the League for Pastoral Peoples, under their joint "LIFE" programme. The presentation is included in this workshop report, although it was held during a side event of the World Food Summit-Five Years Later on 11 June 2002.

⁶ Srivastava, V. 1999. Some characteristics of a 'herding caste' of Rajasthan. Pp. 303-319 in Human Ecology, Special Issue No.7.

The Raika are not just professional livestock breeders, but also have a great deal of compassion for their animals, which they feel for as if they were their children⁷. Keeping animals is more than a business for them; it is also regarded as a divine duty, expressed in the belief that it was God Shiva who entrusted them with the task of looking after the camel. Many of them stick to camel breeding although it generates hardly any profits.

Social rules for sharing and conserving resources

Raika society (*samaj*) is governed by many rules designed to ensure the social and ecological sustainability of their herding system. Unfortunately, many of these rules are in conflict with mainstream development and not attuned to remaining competitive in the current economic scenario of privatizing resources.

Maintaining mobility and grazing opportunities

The need to ensure access to grazing and preserve pastures is reflected in their traditional rules barring landownership and construction of houses. Until quite recently, the caste *panchayat* (council of elders) punished the building of *pucca* (permanent) houses because this undermined their mobility. Perpetrators were outcasted. Outcasting (*olma dena*) means the exclusion of a person and his family from all social interaction with the rest of the community. In some areas, even now, the purchase of private land is punished with outcasting, the

rationale being that the land will then not be available for grazing⁸.

Conservation of pastureland

Foresters and others often accuse the Raika and their herds of destroying the vegetation. In fact, being aware of the need to conserve pasture, they manage the grazing resources very carefully. Earlier they practiced rotational or sequential grazing of the different livestock species, restricting access to pastures to specific times of the year. The other villagers regarded them as protectors of the *gochars* (village grazing grounds)⁹. Even today it can be observed that in villages where the Rebari have the majority in the *gram panchayat* (village council), the village grazing grounds are in excellent condition, while in other villages they usually have deteriorated and been encroached upon¹⁰.

Livestock is communal property

Livestock is conceived not only as private property, but also as asset of the community as a whole that must be stewarded for future generations. Therefore, female animals are not to be sold outside the community. This rule used to be especially strict with respect to camels which changed ownership only in the form of *dhamini* (gift by the family of the bride). Cows, on the other hand, seem to have been largely exempt from this rule. Elder Raikas sometimes attribute droughts and other natural calamities to the Gods being angry, because some community members have started selling female sheep.

⁷ Petition to district administrators for putting stop to sell of camels for slaughter, signed by 40 community representatives in a meeting held in the Ram Raika Temple on 25th of November, 2001.

⁸ Interview with Beraram Raika in village Lundara on 10 March, 2002. (LPPS Field Notes)

⁹ Information provided by Bhopa Otaramji in village meeting in Mundara held during All-India Meeting of Pastoralists on 22 March, 2002.

¹⁰ pers. communication by Kalyan Singh (Bali), president of Godwar Unt Palak Vikas Samiti (Godwar Camel Keeper Development Society).

Because of the increasing difficulties of finding grazing opportunities, some Raika have started selling female camels at the Pushkar Camel Fair, held every November. When it became known that many of them were taken for slaughter in other parts of the country, community leaders called a meeting of all Maru Raikas in November 2001. They drafted a letter to the district administrators, asking for support in stopping this development. In it, they state “the sale of female camels means the beginning of the end of our way of life”¹¹.

There is also a custom that young men who have not inherited livestock but want to start a sheep or goatherd can request – and will receive – animals from relatives and other community members¹².

Managing livestock biodiversity

The Raika have also developed intricate strategies for genetically manipulating their livestock populations, resulting in descript breeds endowed with an optimal balance of production and adaptability traits.

Camel breeding

For camels, the Raika keep oral records of genealogies, tracing the ancestry of their herds in female lines. (Every animal has a name and a female camel is usually named after its mother). If a person owns a good quality male, there is an obligation to make it accessible to anybody else who needs his females to be mated. Some breeding bulls

can attract hundreds of females, clearly exceeding their service capacity. On the other hand, the sale of female camels to anybody outside the community is against traditional customs (although this is now starting to change). Female animals used to change ownership only at the occasion of marriages, being sent as *dhamini* when the bride joins her in-laws.

The male camels to be used for breeding are selected with great care, although, due to economic constraints, not all breeders can afford to use the highest standards. A large number of criteria are taken into account, including looks, size, colour, temperament, and milk yield of the mother and other female relatives. In the first year, a male camel is allowed to serve only a limited number of females, but if the offspring turns out well, then it is used more widely. It is regarded as a good sign for a bull’s hereditary quality if the calf has more similarity with the father than the mother. In order to prevent inbreeding, the bulls are changed every four years¹³.

Sheep breeding

The Raika dominate Rajasthan’s sheep breeding sector. Most of the sheep are kept in migratory herds, with the length of migration depending on herd size and the amount of rain that falls in the particular year. Raika families with larger herds go on group migration for 9 months of the year, returning to their villages only during the rainy season – when grass is available. The Raika distinguish a large number of different breeds and strains but their classification system shows little overlap with the scientific one¹⁴. Some

¹¹ Petition to district administrators for putting stop to sell of camels for slaughter, signed by 40 community representatives in a meeting held in the Ram Raika Temple on 25th of November, 2001

¹² Pers. communication by Hanwant Singh

¹³ Koehler-Rollefson, I. 1992. The camel breeds of India in social and historical perspective. *Animal Genetic Resources Information* 10:53-64, Rome.

¹⁴ Geerlings, E. 2001. *Sheep husbandry and ethno-veterinary knowledge of Raika sheep pastoralists in Rajasthan, India*. M.Sc. thesis, Environmental Sciences, University of Wageningen, The Netherlands.

of these, such as the *Boti* breed, are drought and disease resistant to the extreme and will survive the most scorching temperatures. Others, for instance the *Bhagli* breed, are less resistant, but therefore have higher production potential and give better yields during good years. Keeping a mix of genotypes enables the Raika to optimize both good and bad years. Breeding rams are selected with great care, only from mothers regarded as excellent. They are singled out as lambs and then given special care. The rams are prevented from breeding during certain times of the year to ensure that lambs are born only during favourable seasons. They are also exchanged with other herds in regular intervals to avoid inbreeding.

For decades, the Sheep and Wool Department of the Government of Rajasthan sought to upgrade the local breeds for prolificity and wool yields by crossbreeding with exotic rams (*Rambouillet* and *Merino*). But due to high mortality, problems with feed supply and other factors these measures failed to achieve a measurable impact and the Sheep and Wool Department was finally dismantled¹⁵.

The Raikas on the other hand are astute breeders and adapt their breeding goals to market situations. In the current economic scenario - global glut of wool, especially of the coarse carpet type of wool they used to produce - it makes no sense to produce wool. They purposefully purchase rams with desired characteristics from far-flung areas, such as long-legged animals of the *Dumi* breed from Gujarat to improve meat yields. Because there is a chronic shortage of milk in the villages (most of it is transported to the cities), some Raika have begun selecting for milk yields as well.

Goat breeding

The Raika distinguish basically two breeds of goat. One is the "black" or "Marwari" goat, the other the spotted/piebald *Sirohi* goat. The former is drought-adapted to the extreme, but also has fairly low milk yields. The latter is a good milker and gained recognition as result of a failed crossbreeding project. In the 1980s, the Government of India and the Swiss Development Co-operation initiated the Indo-Swiss Goat Project, which sought to enhance the performance of local goats by artificial insemination with semen from imported bucks. Field performance recording revealed that the crossbred goats were not superior under the given conditions. The project was reformulated to concentrate on selective breeding within the *Sirohi* goat¹⁶.

Cattle breeding

The Rebari also have developed the *Nari* cattle breed, which is locally famous but scientifically as yet unrecognized. This breed combines disease and drought resistance with reasonable milk yields and good draught qualities. It also retains patterns of behaviour that enable it to repel attacks by leopards and other predators. In case of attack, the cows form a circle around their calves and shield them with their long forward arched horns. Many *Nari* keepers report that the cows also apply this strategy to protect their owners, using their dangerous horns to chase anybody whom they perceive as threatening their owner or caretaker. The *Nari* cow is remarkably free of diseases although it can fall prey to infection with Foot and Mouth Disease. According to its owners, the only disease it succumbs to is drought and starvation.

Nari cows produce 4-8 kg of milk per day, depending on the quality of feeding, and in addition to nurturing their calves. Their

¹⁵ Kavoori, P. 1999. *Pastoralism in Expansion: the Transhuming Herders of Rajasthan*. Oxford University Press India, New Delhi.

¹⁶ Indo-Swiss Cooperation 2000. *Capitalizing on experience in Indo-Swiss cooperation in livestock development in India*. Intercooperation, Bern, p. 26.

milk is high in fat content and therefore used for production of *mava* – the base of Indian sweets. The male calves are in good demand as work animals by local farmers.

The large breeding herds are kept in migratory systems. Fresh-milking and late pregnant cows are left behind in the villages while the rest are taken on long treks to Gujarat or Haryana, returning only during the rainy season. Cows may be sold while on migration and many male calves are purchased by Bhats (a caste specialized in trading cattle and salt) who castrate them and then sell them in other areas, especially in the Mewar region of Rajasthan. This is thus a breeding system that supplies many people with either good draft animals or milking cows.

Maybe because the Nari breed has so far escaped the attention of animal scientists, it has fared better than the officially recognized breeds. Most of these have been subjected to crossbreeding with exotic breeds and hardly exist in the pure form.

Conclusions

Unfortunately, neither animal science professionals nor policy makers recognize the significant contribution of the Raika community in upholding livestock biodiversity and conserving the famous indigenous breeds of Rajasthan. In 1948, a scientist commented upon them as having “not yet begun to appreciate scientific facts of breeding, their methods of breeding and management are antiquated and uneconomic and they have no breeding policy”¹⁷. Since then, official opinion has not changed. Migratory pastoralists are *a priori* perceived as marginal and “backward”. Although they are the backbone of the livestock sector, hardly any interaction takes place between the Raika and the government officials for animal husbandry. For many decades, the livestock policies and activities of the state of Rajasthan have been focusing on breed improvement by crossbreeding and artificial insemination¹⁸. Although the need to conserve the indigenous breeds is now being recognized and even reflected in the official breeding policy, the linkages and collaboration with the pastoralists as main stakeholders have not been established.

It must be recognized that it is precisely the reluctance of the Raika to give up their traditional ways, their tenacity in sticking to hereditary customs (not selling female camels) and their refusal to abandon their patterns of extensive animal production that is conserving livestock genetic diversity and well-adapted breeds in Rajasthan. For this they are entitled to receive support and respect.

¹⁷ Kavoori, p. (citing Narayan).

¹⁸ Koehler-Rollefson, I. and Rathore, H.S. 2001. Indigenous, “exotic” and “non-descript” breeds; the political ecology of animal genetic resource management in Rajasthan. Paper presented at the Fourth International Conference on “Rajasthan in the New Millenium”, held by the Institute of Rajasthan Studies in Jaipur, 28-30 December.

Why We Need „Livestock Keepers’ Rights“ to Save Livestock Genetic Diversity¹⁹

Presented by Ilse Koehler-Rollefson

Livestock genetic diversity: Product of cultural and ecological diversity

Since people first started to domesticate animals in prehistory, they have taken them into the remotest corners of the globe and utilised and selected them for a wide range of purposes. The cumulative result of these 10,000 years of animal husbandry and breeding are more than 6000 livestock and poultry breeds adapted to every conceivable set of ecological circumstances and production or livelihood system. The diversity entailed in these breeds is one of the most powerful and valuable assets for future human generations: it represents a genetic “arsenal” for responding to an array of unpredictable events. Possible scenarios for which we need to be equipped with a broad genetic base would include environmental change, outbreaks of diseases, or changing consumer wishes and breeder preferences.

Livestock genetic diversity: Victim of globalisation

Forces that can be subsumed under the larger heading of “globalisation” are now rapidly depleting this irreplaceable and priceless material and cultural asset that has taken ten millennia to develop. They include the replacement of traditional cultures and livelihoods with “western” values and ways of life, the promotion of cross-breeding or substitution of indigenous breeds with exotic breeds, and the expansion of industrialised animal production systems into developing countries.

As a consequence of these processes, the large diversity of locally adapted breeds is rapidly being replaced by a small number of high performance breeds adapted to the normative conditions of factory farming. While these breeds are veritable milk and meat producing machines, they have a very narrow genetic base, tend to require sophisticated inputs and have lost many of the fitness traits essential for survival outside intensive production systems. They suffer from decreased fertility levels, loss of essential instincts, low resistance to disease, and produce mass rather than class, i.e. products with little taste, meat with high water content,

¹⁹ League for Pastoral Peoples with the support of Lokhit Pashu-Palak Sansthan, information provided by Raika pastoralists, and the LIFE Network of NGOs. The paper was presented by Ilse Köhler-Rollefson.

or products that contain a level of hormones or antibiotics that is unacceptable to many consumers. (Pastoral/smallholder production and factory farming are, of course, two extremes of a wide spectrum of production systems, but worldwide there is a strong trend towards industrialised farming, as is acknowledged in the term “Livestock Revolution”).

Pastoralists and indigenous communities: Keepers of the genes

In the current scenario, domestic animal diversity is conserved mostly by those people who either resist integration into mainstream development or who occupy remote areas where development efforts do hardly reach. By continuing to subject domesticated animals to the forces of natural selection, and also by deliberate choice, they ensure that traits for disease resistance, as well as abilities to cope with drought, scarce fodder, and climatic extremes, do not disappear from the gene pool. Of special significance for the conservation of distinct livestock breeds with unique adaptational traits are the pastoral societies and certain indigenous smallholder communities. For many generations and centuries, the livelihoods of these people have been based on the breeding of livestock. Living in close interdependence with their animals, they have developed intricate social mechanisms and indigenous knowledge systems for maintaining livestock populations with an optimal balance of production and fitness traits. The social mechanisms of pastoralists include restrictions on selling females to anybody outside the community as well as many sharing and exchange mechanisms. Indigenous knowledge pertains to selection for certain traits, pedigree keeping, offspring testing, prevention of inbreeding, and castration.

Even the identity of many pastoral cultures and other indigenous communities is based on their association with particular

livestock species and this is pertinent to their role in conserving threatened breeds and species. Some of them even believe that looking after their animals is a divine duty and they therefore have an innate sense of responsibility for their welfare, sometimes continuing to keep them even under adverse circumstances.

Interest of livestock industries in genes of indigenous breeds

For many decades, the gene flow was mostly directed from the “North” to the “South”. Cross-breeding with exotic breeds was a favourite strategy for “up-grading” the productivity of indigenous breeds. While this approach has provided positive results in ecologically better endowed high-potential areas, it has generally resulted in failure in marginal environments. It was, to some extent, driven by the search of breeders’ associations from developed countries for new markets for their animals.

But more recently, animal breeders and breeding companies of developed countries, as well as animal scientists, have become interested in certain genetic traits of the locally adapted breeds from developing countries. Australian cattle breeders imported Tuli and Boran cattle from Zimbabwe and Zambia to upgrade their own breeds with respect to fertility and vitality. Pig breeding companies seek to transfer specific genes from local breeds into industrial lines to improve meat quality. Reportedly, transnational companies with interest in the poultry industry systematically collected specimens of the many indigenous poultry breeds of Southeast Asia. Scientists are now screening African indigenous breeds for genetic resistance to endoparasites. Since commercial dewormers have lost much of their efficiency, a genetic “fix” would be of much benefit to the global livestock industry, especially all sheep producers.

Implications for traditional livestock keepers

“Bioprospecting” is historically well documented and the search for “new blood” has often also been a feature of traditional livestock breeding systems. For instance, Arabian Bedouin tribes had developed mutual raiding of camels into a highly ritualised art to ensure access to new genetic material. There have also been cases of attempts to monopolise genetic resources. In the 15th century, Spain’s economic supremacy was based on the production of fine wool from the Merino sheep; therefore the death penalty was imposed on anybody taking this breed outside the country.

But never before has there been such a huge imbalance in power between the people who continue to steward breeds with unique and interesting genetic traits and those who may want to make use of them. On one side there are largely traditional societies that still stick to the notions of communal property, subscribe to economies ruled by ethical and social principles, and rely on oral rather than written transmission of knowledge. The universe of these traditional cultures is essentially restricted to that of their community and they have very limited awareness of the global developments beyond their boundaries. On the other side, there are commercial interests seeking to establish intellectual property rights over each and any piece of genetic information, with all the advantages of the global information society - access to computers, e-mail and gene sequencing machines. Again, the extremes of a range of systems are referred to here, but appropriation attempts of transnational companies over plant genetic resources (patents of Basmati rice and neem preparations) can provide lessons, and a warning, to the animal genetic resource sector.

In view of this enormous discrepancy, it is an almost foregone conclusion that the marginalised communities that currently still

act as stewards for a considerable part of humanity’s greatest genetic treasures will lose this invisible battle for control over valuable genetic resources - of which they are not even aware that it is being fought. Only if remedial action is initiated immediately and a sincere effort is made by all stakeholders to implement the provisions for benefit-sharing of the Convention on Biological Diversity, will these societies be able to benefit from what represents their most important material asset. It is also urgent to implement policies and supportive measures which ensure that pastoralists and smallholders remain in control of the use and the breeding of their livestock. Public organisations with a global mandate, such as the International Livestock Research Institute (ILRI) and the Food and Agriculture Organisation of the United Nations (FAO), should take the lead and allocate resources towards identifying ways and means for fulfilling the obligations of the CBD towards pastoral and traditional communities that keep valuable breeds of livestock; national public institutions should follow their lead. On one hand, the role of traditional livestock keepers in breed conservation and development must be rewarded, while on the other hand they must be protected from bio-piracy and other interventions which undermine their control over their animal genetic resources.

Providing diversity conserving livestock producers with infrastructural and marketing support

In the long-term, conservation of livestock genetic diversity is equally or more important and crucial for food security than maximising the productivity of selected breeds. The pastoralists and other livestock keeping communities, who still keep animals in extensive systems in harsh environments subjecting them to selection by natural factors, conserve and develop livestock genetic

diversity. Thereby they fulfil an important task that benefits all of humanity and it stands to reason that they should be rewarded for this important service they provide.

An estimated 640 million subsistence farmers, 190 million pastoralists and more than 100 million landless people raise animals in marginal areas. They have to cope with a lack of infrastructure, experience difficulties of marketing their products and of accessing animal health care; pastoralists and landless people are further disadvantaged by encroachment on their traditional pastures. This forces large numbers to abandon their rural livelihoods and seek employment in cities. Making livestock production in marginal areas more secure and profitable could slow down rural-urban migration. Providing marketing support and development of infrastructure could be developed into a form of benefit-sharing that rewards pastoralists and smallholders for their role in ensuring future food security. Benefit-sharing thus has the potential for becoming a powerful tool for creating rural jobs and employment, especially in marginal areas.

Livestock industries externalise costs for genetic diversity

Promoted by decades of favourable policies and public support to conventional science, intensive livestock production systems generate enormous amounts of milk and meat at relatively low prices. But, relying only on a small number of genetically narrow breeds, they are one of the prime movers in genetic erosion processes among the world’s livestock population. In addition, they contribute indirectly to genetic erosion by engaging in mass production that renders traditional livestock production systems uncompetitive.

It is predicted that the demand for meat and milk in developing countries will more than double over the next two decades, en-

hancing the expansion of intensive animal production. This phenomenon referred to as “Livestock Revolution” threatens the livelihoods of pastoralists and smallholders and their animal genetic resources - a danger that is well recognised in livestock policy circles and currently the subject of much debate.

But intensive production systems can produce so cheaply mainly because they are allowed to externalise the costs for maintaining animal genetic diversity (as well as those for pollution) and because they are usually subsidised. The burden for conserving domestic animal diversity is currently shouldered by the FAO and national governments - all of them suffering from a chronic lack of funding.

Charging industrial producers for the genetic erosion they cause could provide a tool for financing conservation efforts by the FAO, governments, and traditional livestock keepers.

Conclusions

Domestic animal diversity is essential for future human generations to develop breeds adapted to largely unforeseeable ecological and economical scenarios. In the coming decade, industrialised animal production systems will erode domestic animal diversity to a major extent, by expanding standardised production systems to most parts of the globe and by one-sided selection for productivity. Traditional cultures keeping animals in diverse and challenging environmental situations conserve genetic diversity. An alternative to their diverse, dynamic and efficient genetic resources conservation systems is not within sight! Sustaining these community-based systems of animal genetic resource management is therefore an urgent necessity. It requires secure grazing areas, marketing and infrastructural support, acknowledgement by formal institutions, and adequate benefit-sharing if genetic resources are made

available for research and serve as reservoir for maintaining vitality and fertility of high performance breeds.

Protocol on livestock keepers' Rights

In the interest of ensuring food security for future generations and to achieve some measure of social justice for marginalised communities in a globalising world, the adoption of a protocol on "Livestock Keepers' Rights" to amend the CBD and develop a regulatory framework comparable to the International Treaty for Plant Genetic Resources is desirable and necessary.

Action Agenda

1. Formally acknowledge the role of pastoralists and traditional societies as custodians of livestock genetic diversity and as creators of valuable breeds

Action to be taken:

- Recognise and explicitly acknowledge the role of pastoralists and other livestock raisers as stewards of breeds with irreplaceable genetic traits by according them “Livestock Keepers’ Rights”.
- Expand the scope of breed documentation methods beyond recording quantitative and phenotypical characteristics, as it is current scientific practice. Also document breeding mechanisms and practices as well as indigenous knowledge to establish the intellectual contribution of pastoralists to the development of indigenous breeds.
- Conduct an economic evaluation of indigenous breeds that includes their contribution to the livelihoods and the well-being of livestock keepers. This will provide a basis for benefit-sharing agreements.

2. Inform pastoralists and other societies about the commercial potential of their breeds

Action to be taken:

- Rigorously adhere to the principle of “prior informed consent” that is laid down in the Convention on Biological Diversity (CBD) and in the African Model Law. Educate and raise awareness of pastoral and smallholder communities about the commercial potential of their genetic resources. No research should be undertaken before indigenous com-

munities have not been fully informed and given time to evaluate and reflect the implications of making their genetic resources available for research.

3. Implement benefit sharing in accordance with CBD and African Model Law.

Action to be taken:

- Support pastoral societies and smallholder communities by means of capacity building and legal assistance so that they can negotiate for maximum benefits for their genetic resources.

4. Support community-based management of animal genetic resources by creating enabling and supportive environments

Action to be taken:

- Ensure secure grazing rights, as well as access to water and marketing facilities for pastoralists and smallholders. Support marketing of their products under a special “green” label to distinguish it from factory farming products.

5. Stop animal industries from externalising their costs

Action to be taken:

- Promote the concept of a “genetic erosion” tax, similar to that of a pollution tax. Proceeds could be used to support the FAO’s animal genetic resource unit, appropriate national research institutes, support to the implementation and enforcement of “Livestock Keepers’ Rights”, or for structural support to the livestock producers of marginal areas.

About the Authors

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Hanwant Singh is a native of Rajasthan in the far west of India where he has been working with Raika pastoralists since 1991. He is founder member and director of Lokhit Pashu-Palak Sansthan (LPPS), an NGO for indigenous livestock research and development, that was set up in 1996. Besides arranging camel health care services, Hanwant's activities have focused on empowerment for the Raika and on facilitating their interaction with the government. Current efforts center on restoring grazing rights on former common property resources, on assuring prophylactic animal health care and on gaining recognition for pastoralists as custodians of genetic resources.

John Gibson is the leader of the Livestock Genetics and Genomics Programme at the International Livestock Research Institute (ILRI) in Nairobi, Kenya. He is also a Professor of Livestock Genetics at the University of Guelph in Canada. His research experience is in quantitative and molecular genetics, in the design and optimisation of genetic improvement programs, and in the characterisation and utilisation of livestock genetic diversity. His present focus is on conservation and utilisation of indigenous genetic resources for future food security and poverty alleviation.

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Abbreviations

CBD	UN Convention on Biological Diversity
CGIAR	Consultative Group on International Agricultural Research
CGRFA	FAO Commission on Genetic Resources for Food and Agriculture
DADIS	FAO Domestic Animal Diversity Information System
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
GTZ	German Technical Cooperation, Eschborn
ICAR	Indian Council on Agricultural Research, New Delhi
ILRI	International Livestock Research Institute, Nairobi
IPGRI	International Plant Genetic Resources Institute, Rome
ITPGRFA	UN International Treaty on Plant Genetic Resources for Food and Agriculture
TRIPS	Trade-Related Intellectual Property Rights
UPOV	Union for the Protection of New Plant Varieties, French derivation
WTO	World Trade Organisation