



The Karen Commitment

Proceedings of a Conference of
Indigenous Livestock Breeding
Communities on Animal Genetic
Resources

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Indigenous Livestock Breeding Communities
on Animal Genetic Resources**

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Fax: +49-(0)228-92399356
E-mail: info@forumue.de
Internet: www.forumue.de

Editors

Ilse Köhler-Rollefson
Jacob Wanyama

Workshop documentation

Kamwati Wango

Copyediting and layout

Paul Mundy, Bergisch Gladbach, www.mamud.com

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Top: herders in Mongolia
Middle: Ankole cattle, Uganda
Bottom: Raika woman with sheep, India
All photos courtesy of workshop participants

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Foreword

Jacob Wanyama
ITDG–East Africa

Ilse Köhler-Rollefson
League for Pastoral Peoples

Pastoralists and other indigenous livestock breeding communities have developed a large number of farm animal breeds with unique genetic adaptations. In times of widespread, indiscriminate crossbreeding or substitution with exotic breeds, these marginalized people have acted as custodians of pure breeds that represent the result of many generations of traditional knowledge and active genetic manipulation for certain culturally defined criteria. It is now acknowledged that these breeds are often endowed with very desirable genetic traits, such as disease resistance, fertility and general fitness, which are not present in the genetic make-up of high-performance animals.

In general, these breeds are not protected by any intellectual property regime. This renders them vulnerable to biopiracy, since scientific and commercial interest in their genetic components is set to intensify. Breeding for disease resistance and genetic disease control is regarded as a promising new avenue in livestock production in view of the fact that many disease-causing organisms – worms, bacteria, viruses, and protozoa – are becoming increasingly resistant to drugs and vaccines.

Indigenous livestock breeders, as holders of the rights over these biological resources, thus represent prime stakeholders in the emerging debate about legal and regulatory frameworks for the sustainable use of farm animal genetic resources, including a ‘breed treaty’, as pendant to the International Treaty on Plant Genetic Resources.

The Convention on Biological Diversity, in its Article 8j, also calls for recognition of the vast amount of *in-situ* conservation carried out by traditional communities. This call is reflected in Part III of the International Treaty on Plant Genetic Resources, on ‘farmers’ rights’. The concept of Farmers’ Rights is based on the past, present and future contributions of farmers in conserving crop genetic diversity. This provision entitles farmers to the right to save, use, exchange and sell farm-saved seed, to participate in decision-making, and in the fair and equitable sharing of benefits arising from the use of plant genetic resources.

In the envisioned animal treaty, the equivalent to Farmers’ Rights would be ‘Livestock Keepers’ Rights’. This term was proposed and discussed during the NGO/CSO Forum for Food Sovereignty held parallel to the World Food Summit in June 2002.

What should such Livestock Keepers’ Rights entail? This is a question that must be debated and answered above all by the prime stakeholders themselves – by the many pastoralist and indigenous livestock-keeping communities. This was one of the main reasons for ITDG-EA and LPP to cooperate in organizing an international workshop to bring together as many representatives as possible from these communities and to facilitate discussion between themselves and with selected resource persons. The workshop had the following goals:

- To raise awareness among indigenous livestock-breeding communities about international developments and the global agenda with respect to livestock.
- To document the links of indigenous communities with particular livestock breeds.
- To showcase the importance of cultural diversity and diverse agricultural production systems for farm animal genetic diversity.
- To discover commonalities and differences, and maybe a common identity, between the various livestock-dependent groups.
- To develop strategies for influencing the international discussions on animal genetic resources from the grassroots perspective.
- To articulate the linkage between the sustainable use of livestock breeds and access to grazing and pastures.

Thanks to the participation of a large number of representatives from indigenous livestock-breeding communities, the workshop was successful in showcasing the significance of traditional knowledge and social systems for upholding farm animal genetic diversity. The papers by the resource persons also emphasized the need to safeguard the rights of these communities as laid down in the Convention on Biological Diversity.

This workshop was an important step toward the overall objective of official recognition of the enormous contribution of indigenous livestock-breeding communities to future food security. We would like to express our sincere thanks and enormous appreciations to both donors and participants for their contributions and dedication to the cause.

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ITDG–East Africa
 PO Box 39493, 00623 Nairobi, Kenya
 Tel: +254 2 2713540, 2715299, 2719313,
 2719413
 Fax: +254 2 2710083
 Email: itdgEA@itdg.or.ke
 www.itdg.org



LEAGUE FOR
 PASTORAL PEOPLES

League for Pastoral Peoples
 Prigelatostrasse 20, 64372 Ober-Ramstadt,
 Germany
 Tel/fax: +49 6154 53642
 Email: info@pastoralpeoples.org
 www.pastoralpeoples.org

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The Karen Commitment on pastoralist/indigenous livestock keepers' rights

We call on governments and relevant international bodies to commit themselves to the formal recognition of the historical and current contribution of pastoralists and pastoralism to food and livelihood security, environmental services and domestic animal diversity.

We also demand that they recognize the contributions of pastoralists and other livestock keepers, over millennia, to the conservation and sustainable use of animal genetic resources for food and agriculture (AnGRFA) including associated species and the genes they contain.

Furthermore, we insist that there is international legally-binding recognition of inalienable Livestock Keepers' Rights and the rights of their communities to:

- **Continue to use their knowledge** concerning the conservation and sustainable use of AnGRFA, without fears of its appropriation.
- **Participate democratically in making decisions** on matters related to the conservation and sustainable use of AnGRFA.
- **Access, save, use, exchange, sell their AnGRFA**, unrestricted by intellectual property rights (IPRs) and (modification through) genetic engineering technologies that we believe will disrupt the in-

tegrity of these genetic resources.

- **Have their breeds recognized** as products of their communities and indigenous knowledge, and therefore remain in the public domain.
- **Benefit equitably** from the use of AnGRFA in their own communities and by others.

We call on the Food and Agriculture Organization of the UN (FAO) to start negotiating such a legally binding agreement, without delay, ensuring that it will be in harmony with the Convention on Biological Diversity.

We further call on FAO to develop a **global plan for the conservation and sustainable use of AnGRFA** by pastoralists, other livestock keeping communities and relevant public institutions.

Finally, we insist that AnGRFA be **excluded from intellectual property rights** claims and that there should be a moratorium on the release of genetically modified livestock until biosafety is proven, in accordance with the precautionary principle. We call on relevant institutions concerned with food, agriculture, trade, intellectual property and animal research to provide assurances and such legal protection as are necessary to sustain the free flow and integrity of AnGRFA, vital to global food security and the environment.

Workshop insights and recommendations

Pastoralism makes an important contribution to

- Sustainable use of arid lands and other challenging environments
- Food security
- Creation of rural income opportunities and employment.

Furthermore, pastoralists fulfil a crucial, and so far overlooked, role for the future of humanity by conserving animal genetic diversity which is endangered by the expansion of industrial livestock production. Since pastoralists value and love animals beyond narrow economic considerations and have a deep knowledge about animal breeding and environmental management, they represent custodians of indigenous breeds with important genetic traits of value for all of humanity. This role needs to be widely recognized among governments, policymakers, and international bodies.

However, the continuity of pastoralism is threatened by governments' neglect or inadequate policies as well as the low status of this way of life, leading many young people to abandon this lifestyle, resulting in rural–urban migration.

The participants of the workshop which include representatives of pastoral communities from 12 countries from Africa, Asia and Europe recommend that:

Governments and regional bodies:

- Strengthen the quality of FAO's State-of-the-World Report by involvement of pastoralists and NGOs in the documentation and including an indigenous knowledge dimension.
- Incorporate traditional knowledge into the education system, especially at the primary level.
- Develop regional frameworks to contribute to the Africa (and Asian) position at international negotiations.

Scientists and research institutes:

- Modify scientific techniques to improve their understanding by local communities, respect indigenous knowledge and regard communities as equal partners in research.
- Cease research conducted without prior informed consent of the community concerned.

Pastoralists and civil society:

- Translate results of this workshop and issue of Livestock Keepers' Rights into local languages and disseminate them to communities.
- Set up pastoral forums or umbrella organizations in each country and promote networking between them.

- Continue efforts to establish environmental, grazing, and conflict-resolution committees at local levels.
- Coordinate lobbying with respect to decision makers, opinion leaders and media.

Donors:

- Consider their funding priorities with respect to scientific research not involving local communities.
 - Support pastoralist networks and institutions to create a global common identity.
- Support a financing mechanism for pastoralist representation in national, regional and international meetings with relevance to the conservation of animal genetic resources for food and agriculture (Convention on Biological Diversity/ Conference of the Parties, Food and Agriculture Organization, World Intellectual Property Organization, World Trade Organization, etc.).
 - Support research on indigenous knowledge about animal breeding to strengthen the case for pastoralists.

Part 1 Setting the scene

Elijah Agevi
ITDG–East Africa

ITDG is committed to working in partnership with like-minded organizations in pursuit of its principles and in the development and use of practices that benefit the poor. All of ITDG's work is geared towards a singular vision – a world free of poverty in which technology is used equitably for the benefit of all.

This workshop is a timely event on a very important issue, the recognition of and protection of the rights of livestock keepers, which hitherto have been ignored. The Conference of the Parties to the Convention on Biodiversity (COP V) calls upon all humanity to realize that '...we need each other, to protect the world's rich and wonderful life forms'. Livestock breeding is an

important sector in the economy and in the livelihoods of a huge number of people and as such has to be mainstreamed to harness its potential on poverty reduction. Some of the most pressing inadequacies in the sector relate to poor infrastructure, neglect of arid lands management, policy development, and environmental degradation.

Recent developments carry the risk of biodiversity loss and the appropriation of animal genetics by a few parties. The participants should critically examine these issues and develop a comprehensive strategy to deal with them. Special appreciation is due to the EED (Evangelischer Entwicklungsdienst) of Germany, CTA, GTZ, FAO, and Misereor of Germany, for generously supporting the workshop.

Opening

Hon. Joseph K Munyao MP

Minister for Livestock and Fisheries Development, Kenya

(read by Mr Kiptarus)

It gives me great pleasure to be invited here today to officiate at this international meeting of indigenous livestock breeding communities from the region. May I also take this opportunity to welcome all visitors to Kenya and wish you a pleasant stay here.

I am delighted that facilitators of this workshop, namely, the Intermediate Technology Development Group (ITDG) – East Africa and the League for Pastoral Peoples have selected Kenya as the venue for this crucial meeting. May I take this early opportunity to thank you for your continued support for livestock farmers in the marginalized areas of this country.

Kenya's policy objective for the livestock sector seeks to increase productivity in order to attain self-sufficiency in milk, meat, livestock production and fisheries. Additionally, it is our objective to generate a surplus for the export market. Kenya has a diverse population of animals that are traditionally our resource of food and income, and provide various sociocultural functions. The farm animal genetic resources comprise of indigenous, exotic and crossbred types. The Ministry of Livestock and Fisheries Development continues to encourage the development of emerging livestock.

These are livestock species that have until recently failed to receive adequate attention, most notably, the crocodile, ostrich, guinea fowl, quail, donkey and snakes for venom and skins.

The population of the various livestock species in Kenya constitutes over 9 million zebu cattle, 3.2 grade dairy cattle, 8 million sheep, 10 million goats, 800,000 camels, 330,000 pigs, 400,000 rabbits and over 27 million poultry.

Agriculture is the base for Kenya's economy, contributing directly an estimated 25% of the gross domestic product. An additional 30% is derived indirectly, through linkages with manufacturing and other economic activities.

The livestock sector accounts for approximately 30% of the farm-gate value of our agricultural produce. The livestock sector also contributes 10% of our national export earnings and employs over 50% of the agricultural labour force. I need not therefore underscore the significance of this sector to our pastoral communities as the sector impinges directly on their livelihood.

I am informed that this workshop targets representatives of indigenous livestock breeding communities and non-governmental organizations (NGOs) working with these groups. These communities continue to play a most significant role in the management and conservation of animal genetic resources. Any efforts geared at improving their performance are therefore deeply appreciated.

The indigenous livestock breeds are known to possess many desirable genetic traits such as disease resistance, fertility and

general fitness, which are nonexistent in the genetic make-up of high-performance animals.

In Kenya over 50% of livestock inhabit the arid and semi-arid lands, which have harsh climatic conditions. The government, in liaison with relevant stakeholders, intends to implement programmes designed to address problems relating to the conservation, management and utilization of indigenous livestock species and breeds.

I note that despite a growing global awareness of the importance of animal genetic resources, little attention has been paid to the role of communities in managing these resources. It is in this regard that I commend the organizers of this workshop for bringing all the stakeholders in animal

genetic resources together to provide recommendations which encompass:

- Official recognition of the enormous contribution of indigenous livestock breeding communities for future food security.
- Acknowledgement of the significance of their traditional knowledge for upholding animal genetic diversity.
- Safeguarding their property rights as well as privileges according to the Convention on Biological Diversity in the interest of global justice.

I am certain that by sharing experiences of the different participants at the workshop, you will have fruitful deliberations and that you will be able to meet the specified goals.

Indigenous livestock breeding communities and farm animal genetic resources in the context of global development trends

*Ilse Köhler-Rollefson, League for Pastoral Peoples
Isabella Masinde, ITDG-East Africa*

Indigenous livestock breeding communities are communities which have a tradition of livestock breeding and for whom their animals have social and cultural meaning. This is reflected in:

- An identity based on the community's association with animals.
- Often a myth of origin linking community to a particular breed or species.
- Animals represent social currency (are given as dowry or bride wealth).
- Often animals are shared within the community, while exchange with outsiders is restricted.
- Animals have a ritual function.

Types of indigenous livestock breeding communities

Pastoralists Pastoralists depend on livestock as the main source of their livelihood. They generally do not own land, but rely on common property resources. Pastoralism is a predominant livelihood strategy in areas unsuitable for crop cultivation (deserts, steppes, high altitude zones, tundra).

Examples Raika, Maasai, Mongolian people, Bedouin, Saami.

People with traditional lifestyles These are people who lead lifestyles such as shifting cultivation, for whom livestock is significant source of livelihood.

Examples Adivasi in India (chicken and goat breeders), Mithan keepers in north-east India, buffalo-keeping groups in Southeast Asia.

Indigenous livestock breeding communities act as custodians to many unique breeds (farm animal genetic resources), because they have retained traditional lifestyles, adhere to their cultural values, and often have not been integrated into the wider or market economy.

Global trends in livestock production and research

The Livestock Revolution The demand for livestock products in developing countries is predicted to double by 2020. Intensive and industrial livestock production systems are expanding. This will reduce prices for livestock products and push smallholder livestock keepers and pastoralists out of the market.

Technological advances After artificial insemination and embryo transfer, scientists now look to genome analysis and genetic engineering in order to create genetically modified animals with novel traits.

Genome analysis enables scientists to correlate parts ('sequences') of the genome with specific genetic traits.

Scientists envision that by means of genetic engineering, animals can be created

that combine high productivity with disease resistance. An example is the transfer of worm resistance from Red Maasai sheep into Merino.

Is this realistic?

No: 'There are many technical difficulties, and genetically modified animals have defects.'

Yes: 'Techniques are well advanced, but companies fear backlash of public opinion.'

In the 21st century, 'sequenced genomes, transgenic livestock and cloned animals will possibly become the norm' (Rothschild, 2002).

With respect to the Fayoumi chicken: 'We can pinpoint traits at the DNA level and use genetic engineering methods to transfer the traits to other chickens without all the bad baggage.'

Indigenous breeds

Renewed interest in indigenous livestock breeds is due to:

- Rapid extinction of domestic animal diversity/breeds.
- Indigenous breeds have traits which have disappeared from high performance breeds.
- Breeding for disease resistance – a new trend.

A large number of breeds can be found in remote areas: 'When the number of breeds is expressed per million people, it becomes clear that peripheral and remote countries and provinces have disproportionately large numbers of breeds' (Hall and Ruan, p. 820 in Conservation Biology 7(4), 1993).

Intellectual property rights

Genetically engineered animals may be patentable in some countries. The patent

also extends to all offspring of patented animals.

Indigenous breeds which have developed over centuries and as a result of indigenous knowledge about animal breeding are not protected against biopiracy.

Convention on Biological Diversity

Article 8j of the Convention on Biodiversity calls for recognition of the vast amount of *in-situ* conservation carried out by traditional communities.

The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) established the concept of 'Farmers' Rights', which is based on the past, present and future contributions of farmers in conserving crop genetic diversity.

Farmers Rights entitle farmers to:

- Protection of traditional knowledge relevant to plant genetic resources.
- Save, use, exchange and sell farm-saved seed.
- Participate in decision-making and in the fair and equitable sharing of benefits arising from the use of plant genetic resources.

Key questions

- Should (and can) indigenous livestock breeders protect their breeds against biopiracy?
- What conditions must obtain so that pastoralists can continue to manage their breeds sustainably?
- Do we need an equivalent to Farmers' Rights – 'Livestock Breeders Rights'? What should they entail?
- Is genomics research going to benefit pastoralists and indigenous livestock breeders? Should it be supported with public money?
- Should we develop an alternative vision for livestock development?

Industrialized animal production

Positive impacts Cheap supply of animal products (meat, eggs, milk).

Negative impacts Loss of rural employment opportunities, dependence on grain imports, pollution, lack of animal welfare, loss of genetic diversity.

Alternative vision

Endogenous livestock development, building on:

- Local genetic resources.
- Local institutions and knowledge.
- Local feed supplies.

Comments and discussion

FAO has published a report on diversity in breeds and on conservation, which clearly documents alarming trends in the status of the world's FAnGR.

The new Kenyan government is committed to educating the people on the importance of biodiversity and to collect, analyse, categorize and document indigenous knowledge. It is also committed to redressing the problems facing indigenous breeding communities and realizes the need to stem the loss of local breeds.

Indigenous knowledge about animal breeding

Ilse Köhler-Rollefson
League for Pastoral Peoples

More than 7000 farm animal breeds are registered in FAO's global database. The vast majority of these breeds have been developed by rural communities, without any help from animal scientists. How did the communities do it? Or was it only the environment?

Indigenous knowledge

Indigenous knowledge about animal breeding and breeds refers to the knowledge that traditionally animal breeding communities apply to manipulate the genetic composition of their livestock holdings. It includes knowledge and experience about genetic attributes of livestock and inheritance, as well as conscious strategies and social mechanisms that influence the gene pool. This form of indigenous knowledge includes:

- Cultural identity
- Social mechanisms
- Breeding decisions
- Breeding management
- Cognitive processes.

Sense of stewardship and identity Some traditional cultures, especially pastoralists, have an identity based on their relationship with a particular species. They have a feeling of responsibility for the welfare of their animals. Examples include the Raika in India (camels and cattle), and the Fulani and Maasai in Africa (cattle).

Social breeding mechanisms Socially embedded customs influencing the gene-pool include:

- Taboos on selling female animals to anybody outside the community.
- Fixed rules for passing on animals from one generation to the next.
- Sharing mechanisms.

Socio-religious practices These include:

- Devoting male animals to the memory of an ancestor (for example, the 'Surajka-sant' and Brahmini bull in India).
- Devoting animals to gods.

Breeding decisions Breeding decisions include the objective and goal:

- **Breeding objectives** are traits that are necessary for a breed to fulfil its role in the overall production system. They are usually multifaceted.
- **Breeding goals** include the personal preferences of the owner, which do not necessarily relate to the functionality of the animal.

Selection criteria These include factors such as the ability to put on fat, good maternal behaviour, walking ability, drought resistance, love of the owner, and manageability.

Breeding management Management methods include castration, culling, the testing of offspring, maintenance of a 'community bull, and crossbreeding.

Cognitive processes These include the identification of individual animals and the keeping of pedigrees.

Documenting indigenous knowledge

Documenting indigenous knowledge of livestock breeding and breeds has several benefits:

- It acts as a source of information about existing breeds that have escaped attention of scientists.
- It records the intellectual contribution of livestock-breeding communities.
- It is a source of empowerment and pride for those communities.

A documentation method must:

- Be efficient, reliable and practical.
- Serve as foundation for a community-based management of animal genetic resources project.
- Safeguard the breed against possible biopiracy.

The LIFE framework

The LIFE (Local Livestock For Empowerment of Rural People) approach is a way to document this indigenous knowledge.

- It understands breeds as products of social networks.
- It is not a fixed method, but a conceptual framework.
- It uses participatory methods and is flexible rather than being based on predetermined questionnaires.

The LIFE approach covers five aspects:

1 Social and cultural context

- Is this breed associated with a particular community? What is the nature of the underlying social network?
- Are there any breeding institutions, such as communally kept male animals? Are

animals bought from outside or born in the herd?

- Cultural significance: is there a myth of origin?
- Social meaning: Are animals given as dowry, as bride wealth, or as gifts during life-cycle events?

2 Ecological and production context

- What is the breeding area?

3 Livelihood significance (types of products)

- What purposes do animals fulfil in peoples' lives ?

4 Management of the gene pool

- Social mechanisms: are there taboos on selling female animals? Are animals devoted to gods?
- Breeding goals: what are the selection criteria for male animals? For females?
- Other strategies: what other strategies are used: castration, offspring testing, avoidance of inbreeding?
- Do the livestock breeders keep (mental) records of their animals' pedigrees?

5 Population

- Size: how many animals are there?
- Trends: are the numbers constant, rising or falling?

Comments and discussion

- The erosion of taboos, such as that on selling of camels in the Borana community, is threatening the conservation of genetic diversity.
- The influence of modern values on traditional communities is threatening animal breeding practices. In India, the low status of the castrator's job has led to a large number of uncastrated bulls. This is limiting the ability of breeders to se-

- lect sires and to trace the pedigree of their animals.
- The sale of female animals to people outside the community is now prevalent among the Maasai and can be used as a channel for biopiracy (Lengisugi).
 - The sale of female animals is a dangerous development as their presence is central to the survival of the herd. This has always been a way of ensuring genetic continuity, and females would never be sold even in the harshest of times.
 - Communities generally sell only the poor pedigree animals (especially females). The finer specimens are closely guarded for the improvement of the herd. Within some communities a person receiving a gift of a heifer must give back the first female offspring to his benefactor to allow him retain the bloodline.
 - The trade in animals such as camels to the Arab world is an emerging avenue by which genes may be appropriated. It is of paramount importance to trace the origin and spread of breeds.
 - Molecular genetic research has made it possible to trace the origin of a certain breed (Köhler-Rollefson).
 - So important is the female that discerning breeders are known to travel up to a hundred kilometres in search of females with a particular trait.
 - Pastoralists have a strong cognitive ability and a keen eye for traits in their animals, so that they can easily identify a specific animal in a big herd, and realize when it is lost. This gives them an edge in selecting the best pedigree and preserving it.
 - Proper documentation of breeds is of no benefit to the communities until the people on the ground are aware of their rights. Until then there is no guarantee that such documentation will play a role in the preservation of the community's rights to the breeds (Mpoke).
 - Communities are not totally ignorant or naive, but there is a problem of information flows. National governments are not allocating resources for information dissemination and as such are unwilling to hold in trust the rights of the communities. Documentation puts information about genetic assets into the public domain. This makes it hard for people to lay exclusive claim over the resources, since they are then regarded as 'prior art' (Ekpere).
 - Moving and sharing desirable sires is not a problem per se, but documentation and dissemination of this information may make its progeny attractive to biopirates and corporations who would want to appropriate genetic resources (Mulvaney).
 - KIPi supports the documentation of breeds but not down to the genome level. A blanket moratorium on patents is best way forward on ensuring free flow (Otswong'o).
 - There is a need to take steps for stemming the erosion of indigenous knowledge and the need to conserve rather than change indigenous knowledge. But access to new technologies is also needed (Njoro).
 - It is necessary to adopt new approaches for conserving local knowledge. As the issue of patents becomes more critical, these new approaches will be needed even more (Vivekanandan).

Part 2 The role of livestock and breeding: Community presentations

Before the workshop, community participants were requested to prepare presentations about the role of indigenous livestock breeds for their livelihoods. They were asked to follow specific guidelines (below). This Part summarizes their presentations.

- Give a **short overview** about your community, its size, and geographical location.
- What **types of animals** does your community breed? Rank them in the order of prestige and status.
- For what **purposes** are the animals used?
- What is the **social significance** of these animals for your community? Are they given as dowry, bride wealth, at the time of birth, used for funeral feasts?
- Are animals used for certain **rituals**?
- What is **special** about the animals owned by your community? How do they differ from those of other communities?
- Describe what **qualities are important** in your animals and how male breeding animals are selected.
- Do you **distinguish different breeds** or types of animals within the species?
- Are there any **myths or stories** about the origin of your animals and the relationship between your community and these animals?
- Is any **crossbreeding** going on between your local animals and other breeds?
- What is the attitude of **younger people** in your community about a life based on livestock keeping?

Kawahla Eastern Sudan

Adam Elhag Musa
Pastoral Union, Sudan

In some parts of Sudan, one cannot talk at a public gathering unless one owns a camel as status in the community depends on the number of camels one has. Camels from the community are sold to markets in Egypt and Libya where they are valued for their strong, large bodies. Camels bred by the community also have a colour that is pleasant and well adapted to the Kawahla people's environment.

In the selection of sires for breeding, the following issues are considered:

- Milk production of the mother
- Size
- Colour
- Known progeny of the bull.

Among the Kawahla people, the continuity of livestock breeding is threatened by the exodus of the younger people to other livelihood strategies. This is leaving a rapidly shrinking older generation to sustain the animal breeding way of life.

Somali

Kenya and Somalia

The most valuable and prestigious animal is the camel. To the Somali, keeping animals is the main livelihood support strategy. Animals are used for milk production, cash income generation, agricultural activities and transportation. But beyond this, the animals have social significance and functions. They are used in the payment of fines (*diya*), for instance 100 camels are fined for killing a community member. They are also used in other ceremonies and social transactions, such as dowry payment.

In the selection of breeding animals, the community places emphasis on the male animal. Unsuitable males are castrated while young to exclude them from breeding. Within the community, there is a strong tradition of borrowing animals from other herds for breeding to improve the herd in terms of milk yield and meat quality.

The harsh terrain and difficulties associated with herding are discouraging young people from participating in the pastoral way of life. In addition, there is a threat from relief food, which in some localities is creating a disincentive for pastoralism as people settle around relief centres and become dependent on the free food. Certain policies inhibit trade and thereby hinder development of the livestock economy. Land tenure is another problem as all the land is held in trust by the government, which inhibits the development of robust rangeland management strategies.

Karamojong cluster

Kenya, Ethiopia, Uganda and Sudan

Ebenyo Godwin
CEC Chairman Oropoi

The Karamoja cluster comprises 13 tribes speaking in a language known as Ngakaramojong. They include:

- The Nyangatom and Merille of Ethiopia
- The Topotha and Didinga of southern Sudan
- The Pokot and Turkana of Kenya
- The Jie, Pian, Matheniko, Tepeth, Dodoth, Nyaakwa, Bakora, and Pokot of Uganda.

Animal types

The communities within the cluster breed animals for the following purposes:

Cattle

- Provision of milk and beef
- Payment of dowry
- Hides for shelter and bedding
- Blood as food
- Traditional sandals
- Bedding
- Manure
- Skins for clothing (calves).

Camels

- Meat and milk for food
- Payment of dowry
- Hides for shelter
- Traditional sandals
- Bedding.

Sheep and goats

- Direct source of income for the family
- Provision of milk, blood and meat
- Payment of dowry
- Sheep's fat for medicine
- Skins for clothing.

Donkeys

- Cheapest means of transport
- Bride price
- Milk for medicines to treat tuberculosis and general chest infections

Social significance

The social significance of the livestock among the Karamojong cluster includes but is not limited to the following:

- For sacrifices as per the community's cultural beliefs
- As a source of life, without which life has no meaning
- Recognition as a member of the community
- As a measure of wealth
- Use in bull dances
- Social sharing of livestock breeds by exchanging males and females to enhance social links
- Source of dowry, bride wealth, at time of birth and other life cycle ceremonies such as funeral feasts.

The Karamojong cluster uses livestock for other rituals such as:

- Rainmaking ceremonies
- Cleansing of families, communities or livestock
- Protection against curses or disease outbreaks
- Treating sick persons
- Naming ceremonies
- Initiation ceremonies.

Unique characteristics

The animals have the following unique characteristics:

- Drought resistance and hardiness
- Disease resistance
- Meat is generally tender and tastier than that of other communities' animals
- They do not require a lot of forage
- They can survive for many days without water
- They are small in size, strong and can graze in rough terrain.

Breeding

These characteristic have been developed by selective breeding for animals that:

- Can trek long distances in search of pasture and water
- Have low feed requirements (small size)
- Can graze in all types of terrain
- Are aggressive and can fight off attacks by predators
- Are disease-tolerant, especially against tick-borne diseases
- Do not experience difficulties in calving.

To achieve this, the community selects male animals (sires) according to the following criteria:

- From a well-known lineage
- Performance of the parent animals
- Ability of the lineage to resist disease
- A lineage with offspring that remains healthy from birth to maturity.

The Karamojong cluster does not have any myths or stories about the origin of their livestock. However, they believe that God gave them cattle, sheep, goats and donkeys at the time of creation. The camels were brought to Turkana from the Rendille community through the assistance of a great seer, Mr Lokerio, who was believed to work magic. Since then three-quarters of Turkana own camels. Some of the cattle come from the Arab communities of Egypt, with whom they used to barter animals for ivory.

At the moment, there is no known cross-breeding going on between the local live-

stock and foreign breeds. But in the late 1980s and early 1990s, small and localized crossbreeding programmes existed at Kaikor and Nakwamoru centres. At the Kaikor livestock training centre, youths were trained in livestock management. Here, the small East African goat was crossed with male Galla goats. At the Nakwamoru centre, Turkana sheep were crossed with Dorper male sheep from Kitale. Some traces of Dorsers can be seen in this centre.

At Oropoi parish, Fr Bernard Ruhnau had a small crossbreeding programme for camels. Local camels were crossed with Somali and Rendille male camels and vice-versa. Traces of these can be seen at Oropoi.

For younger Turkana people, whether they live in urban centres or rural areas, it is considered mandatory to acquire and keep livestock. The reason is that most of these youths were born at the kraals and only migrated to the urban centres.

A very small group of this community who were born and brought up in towns and have not been exposed to the rural areas have a slightly negative attitude towards livestock keeping. This is due to their attending formal education and subsequent securing of jobs in towns.

Comments and discussion

- What are the status and effects of cattle rustling in the area? This occurs between communities in Uganda, Kenya and Sudan, but there are efforts underway to build peace in the region. Nevertheless, rustling has reduced cattle ownership in the area owing to fear of raiders.
- Donkeys, which were also obtained from the Arab communities, are used for transport, meat, and as a source of medicine for some diseases.
- In terms of prestige, the animals are ranked as follows: (1) cattle, (2) camels, (3) sheep and goats, and (4) donkeys.
- Efforts to address rustling and livestock-related conflict need to also look at issues of poverty, small arms, unemployment and governance in the neighbouring countries.
- Turkana animals are not small – they only seem so in comparison with exotics.

Karamojong

Uganda

Thomas M Loquang

*Happy Cow Project, Karamoja Initiative
for Sustainable Peace*

KISP is an initiative of the council of elders from the Karamoja region, Uganda, with the main objective of attaining a sustainable peace within Karamoja and the neighbouring similar pastoral groups in Uganda, Kenya, Ethiopia and Sudan. KISP also advocates for the development of the technical capacity among the Karamojong in disciplines that strengthen agropastoral livelihoods.

KISP was founded in early 1996 and incorporated in September 2000. KISP emphasizes the use of dialogue and consultation with the Karamojong people through traditional cultural institutions that have existed over the years and have cumulated knowledge and experience in solving conflict.

The 'Happy Cow Project' aims at promoting peace and development in Karamoja by enhancing animal production methods. The project believes that if the cows in Karamoja are happy, then the people will also be happy.

Introduction

Karamoja covers an area of 27,900 km² in northeast Uganda and has a population of about 900 000 people (National and Housing Population Census, 2002). The districts of Nakapiripirit, Moroto and Kotido make up the Karamoja region. The area generally has low, unreliable rainfall, except for higher and more reliable amounts in its northern, southern and western highland fringes. The rainfall pattern is unimodal with a clearly defined dry season (October–March) and wet season (April–September). The dominant farming sys-

tem of the region is pastoralism, which is, however, undergoing transition to agropastoralism. Traditionally, the homesteads were generally established in the drier zones, while the wetter highland areas were used for grazing livestock, most importantly during the dry season. However the pattern has changed as many settlements have nucleated in the highland areas, notably for crop production as well. The basic unit in which the Karamojong lives is a village, made up of several households. Several villages form a parish, which is one of the units in a sub-county.

Despite the presence of vast natural resources in Karamoja (livestock, land, minerals, wildlife, etc.) the Karimojong remain among the poorest people in Uganda – they cannot even feed themselves. The literacy rate is only about 10%. The region has little or dilapidated infrastructure, and is grossly underdeveloped compared to the rest of the country.

The common currency and 'savings account' for the pastoral Karimojong is cattle (though the average Karimojong recognize the importance of money as an easily carried and convertible currency). The people of Karamoja are collectively called NgiKaramojong. There are some 20 main sub groups in the region (Table 1).

The Karamojong way of life

The Karamojong have a common way of life, traditions and culture. This community is a composite of many smaller communities identified not only by their common language, but also by the resources they share, namely their livestock (*ngibaren*). They regard livestock as community property to be taken care of by the community members (though each individual owns his or her own animals). This is because livestock and their products are shared in one way or another within the community; e.g., the milk when it is offered to a neighbour in need; the meat when an animal is slaughtered for elders in a given ritual or ceremony (which are not few in

number); the bride price paid in marriage, etc. The Karamojong also share settlements or villages (*ngirerya*), kraals (*ngawuiyoi*), taboos, customs (*ngitalio*), shrines (*ngakiriketa*), watering points, dams (*ngakare, namatatain*), pastures, farmland (*ngamanat*), and marriage ceremonies (*ekiitan*). The elders (*ngikasikou*), soothsayers (*ngimuruok*) and foretellers (*ngikadwuarak*) not only act as mediators or arbitrators on daily issues but also communicate with God on behalf of the community. Herdsboys (*ngikeyokok*) and warriors (*ngikarachuna*) defend the entire community and its resources.

All the subgroups except the NgiTobur/ Ngilabwuor and NgiTeuso (the Ik) share the same language and value animals in their daily lives. The latter groups, together with the Pokot, speak different languages, though most can also understand the Karamojong language.

Types of livestock and its uses

The Karamojong breed cattle, sheep, goats, donkeys and camels (camels are kept only by the Pokot in SW Karamoja). Livestock are one of the people's most important resources. They are used right from birth, throughout life, and at the time of death. At birth, a sheep is slaughtered to obtain a shawl to carry the baby. The animals are also meant for blessing the baby and the meat as part of the diet for the recuperating mother after labour.

Other uses of livestock include:

- **Food** Meat, milk, ghee, blood.
- **Savings account** Currency that is well known to most Karamojong and easily convertible to other forms of resources. The more animals one has the richer he /she is.
- **Bride pride** For marriage and related issues – e.g., payment for impregnating a girl.
- **Sacrifice** Slaughtered for various ceremonies e.g., cleansing ceremonies, initiation, funerals, etc. See details below

Table 1. Distribution of Ngikarimojong subgroups

District/County	Subgroup
Kotido: Dodoth	NgiMening
	NgiNyangia
	NgiDodotho
Jie	NgiTeuso ¹
	NgiJie
Labwuor ²	NgiTobur/ Ngilabwuor
	NgiNyakwae
Moroto: Bokora	NgiBokora
	NgiMogoth
	NgiPeei
	NgiTome
	Ngimuno
	NgiMosthingoo
	NgiKosowua
	NgiKaleeso
	NgiTepeth ³
Matheniko	NgiMatheniko
	NgiTepeth ⁴
	NgiMogoth
Nakapiripirit: Pian	NgiMuno
	NgiPian
Chekwii / Kadam	NgiPian
	NgiKadama ⁵
Pokot	NgiPokot

¹ Predominantly gatherers

² Predominantly crop producers

³ Live on the Napak mountain

⁴ Live on Moroto mountain

⁵ Live on Kadam mountain

Some subgroups live in more than one county; eg NgiTepeth, NgiPian and NgiMogoth.

under the different types of livestock.

- **Compensation** e.g. a community member injured or killed by a fellow member; 60–100 cattle are charged for compensation of a slain clansman.
- **Settling serious disputes** e.g., rape, adultery, etc.
- **Disease treatment** Slaughtering livestock on the instructions of a witch doctor.
- **Dress** Skirts for girls and women, aprons for married women, belts, sandals, blankets.

- **Bedding and mats** Skin for sleeping, sitting on during ceremonies, at meals, or while drinking traditional brew.
- **Manure** For cultivation, especially tobacco and maize.
- **Traction** For cultivation, transport, haulage.
- **Others** Fasteners (string, rope from hides), sheaths for knives and spears, containers for tobacco made from cattle horns, and flywhisks made from tails.

Cattle

Cattle are the most important type of animal kept by the Karamojong community. The uses of cattle include:

- **Food**, milk, blood, ghee, meat
- **Marriage** and related needs.
- **Wealth store** or 'bank account' that can be converted to cash, exchanged for other items, used to pay a debt, or as compensation for an injury or death of a fellow clansman.
- **Ceremonies and rituals** These include:
 - Initiation (*asapan*).
 - Feast for elders (*akitochol*).
 - A ceremony for twins (*lorotin*, see below).
 - A feast for elders and soothsayers sponsored by the combatants for blessings prior to a cattle-rustling expedition, particularly a large and important one (*akimwaimwakin*).
 - A bull slaughtered for elders after a successful cattle raid (*lookwa*).
 - A ceremony for gathering cattle together prior to transhumance (*akiwudakin*).
 - A few bulls slaughtered as a feast for elders (*akipeyokin*).
 - A feast for elders made by an individual in his own home (*akipeyokin tamanawi*) and not at shrine, for the elders to mediate with God to solve a particular problem faced by the person offering the animal.
 - A bull slaughtered at the demand of a foreteller to foretell (*akiereor*) the situation of the land.
 - A bull slaughtered to avert a pre-

dicted bad event (*akiretakin eronet*).

- A bull slaughtered if the bride's older sister is not married (*lodepar*).
- A bull slaughtered at the behest of a witch doctor to cure a particular ailment (*adyak*).
- **Skins** are used for bedding, sandals, belts, ropes, bell straps, etc.
- **Status** Someone who has many cattle is respected.

Calves

Calves are rarely slaughtered for their products. However skins are taken from calves that die from disease. The skins are used to make items such as skirts for women, leather sheets or blankets, sitting mats, bags for carrying grain, flour or honey, strings, ropes, and straps to tie bells around the necks of favourite animals.

Goats

Goats are used in similar ways to cattle: for food (milk, blood, meat, ghee), bride price, sacrifices for ceremonies (e.g. initiation of young men), and in times of sickness. Goat skins are used as mats, aprons for women, and bags for carrying grain, flour or honey. Goats can be sold for cash or exchanged with other types of livestock, e.g. 10 goats for 1 head of cattle.

For some ceremonies, e.g., for a feast for elders or one particular elder, sheep and cattle are preferred over goats.

Sheep

Sheep have the same uses as cattle and goats: they provide food, meat, milk and blood. However sheep are used predominantly in cleansing ceremonies, most particularly when something strange happens in the community.

- When some mistake is made in execution of a given ritual, a sheep is slaughtered to amend the situation – for example if the milk teeth of a baby start growing from the left jaw.

- When a woman forgets her ancestral stick somewhere and spends the night without it.
- When the tongue meat of a sacrificial animal chokes an elder.
- When a combatant has kill an enemy or wild dog, to cleanse him.

Sheep skins are used for girls' skirts, sitting mats, shawls for carrying babies, or thread for other leather goods.

Sheep are slaughtered in sacrifices, e.g. at funerals, initiation of young men, or the *akitocol* ceremony (elders' feast). To approach an elder for a need, a ram is the main choice.

Sheep are also used to pay bride price, to exchange with other livestock, or to sell for cash.

Donkeys

Donkeys are predominantly used for transport e.g. to move kraal gear, to carry elderly people, children or the sick between the kraal and village using a rack (*athaja*), and to transport crops. They are also used for ploughing. They provide food, meat, and milk, though not frequently. Donkey milk is specifically used for feeding baby orphans, as the community thinks the milk has similar viscosity nutritional value to breast milk. The only time donkeys are used for sacrifice is to treat tetanus (*natelo*). The skin is used for bell straps.

Camels

The Pokot keep camels due to contact with their kin across the border in Kenya who keep camels. A few camels have been sighted in Matheniko too. Camels provide similar products to those provided by cattle. However the camels in Matheniko are not used for sacrifices. Some Karamojong think camel meat is a delicacy. Most Karamojong have shied away from keeping camels because they think camels bring drought.

Social significance of animals

As animals are regarded as a source of life, the more animals one owns the better. Cattle can be converted to acquire the necessities for a good life. A person with a lot of animals is rich, and his family is large; he has many children and dependants. Such a person may have several wives and households.

Every male Karamojong strives to own as many animals as possible so that his family is assured a good, happy, long life.

Karamojong men usually base their own name on the colour of their favourite bulls. Such names have the prefix *Apa...* (the owner of...). *ApaLongor* means 'the man with a brownish bull'; *ApaLongatuny* means 'the man with the bull coloured like a lion'; *ApaLoris* means 'the man with the bull coloured like a leopard', etc. The man's inferiors and colleagues use such names to refer to him. The favourite bull enjoys privileges from the owner like being adorned with a bell, getting prompt veterinary attention, clean water, etc.

A male Karamojong with a lot of cattle acquires an elephant tusk bangle that he wears on his left wrist as a sign of wealth and recognition by others. A man without animals is considered poor, and is not able to found a family. He would rarely address a gathering or comment on issues to do with livestock.

Ritual uses of animals

- **Dowry** The Karamojong do not offer dowry for marriages.
- **Bridewealth** Animals are exchanged for the bride during marriages, which is anything between 30 and 200 animals, depending on the strength of the bridegroom's family and competition for the bride. If the bride's older sister is not married, the bridegroom offers an extra bull for slaughter at the bride's home for a *lodepar* ceremony to appease the spirits.

- **Births** A (usually white) sheep is slaughtered and the skin used as strap for carrying the baby. The meat is given to the baby's mother. If a woman gives birth to twins, two sheep are killed and another animal (usually a bull) is killed at the crossroads to enable the twins to follow different paths in their later life. This ceremony is called *lorotin*.
- **Funerals** An animal is killed at the burial. Another ram is killed at the time the mourners' hair is shaved and to enable the family to open the food stores donated by neighbours.

Livestock characteristics

The Karamojong see animals as 'life', as they obtain their entire social, economic and religion benefits from them. Their animals are accustomed to the environment as they have survived the harsh climate and rough terrain over the years. The Karamojong know each animal individually. Other communities probably consider animals only in the economic context (for example, they keep animals to sell them so they can acquire other items). They seldom know each animal's individual characteristics.

The Karamojong appreciate animals of reasonable size and body weight, with good milk yield, high calf production, certain colours, and disease resistance.

Selection of males

The following characteristics are considered when selecting males for breeding.

- **Physical features** Large, good shape.
- **Active** Able to serve many cows.
- **Pedigree** The qualities of the parent in terms of resistance to diseases, milk yields, survival of calves and body size.

Breeds

The Karamojong recognize different breeds within their herds, although they do not give them specific names.

Cattle The Karamojong cattle are of the same type. Some Karamojong groups call their animals *ngalok'i*, though most describe them as 'Karamojong cattle'. The cattle are all zebu, with upward-pointing humps, large body size and weight, blunt snouts, resistance to heat, some tolerance to cold, well-developed dewlap very prominent in bulls. Their colours include white/cream, grey, roan, dark/dirty brown. Black colour is a recent development from interbreeding. The Karamojong herds have undergone a lot of interbreeding with cattle from neighbouring pastoral groups such as the Teso in the west, Sabinu in the south and Pokot in the east. Teso cattle are smaller, have pointed snouts, etc. – not desirable to the Karamojong.

The Karamojong try to maintain their breeds by some controlled breeding. Undesirable males are castrated, sold off or even used to pay a debt. It is not uncommon for one herder to borrow a desirable bull from his neighbour for breeding purposes for a few weeks.

Goats The Karamojong do not have special names for their goats. The animals have large body size and are reasonably tall. Colours include white, cream, grey, pink-brown and black. The females have high milk yields and are prolific, often delivering twins.

Sheep There are no special names for types of sheep. Karamojong sheep are fat-tailed (a quality that is much appreciated), have a reasonable body weight, and are prolific breeders. The body is white, while the head (or only the mouth and eyes) are black (East African Black Head or Persian). In contrast breeds from Teso are long and thin-legged, with poorly developed tails, low weight and frequently hornless.

Donkeys There seems to be only one type of donkey in Karamoja.

Camels The camels kept by the Pokot and Matheniko in Karamoja originate from the Pokot and Turkana in Kenya.

Origin stories

The Karamojong are said to have obtained cattle from Arabs by bartering them for elephant tusks. The Karamojong were hunters and gathers before acquiring livestock. Groups known as Teuso in northern Karamoja still value gathering.

Crossbreeding

There is crossbreeding between local animals and other breeds. This occurs through the continual mixing of animals through interaction between the Karamojong and their neighbours. This interaction includes cattle rustling, transhumance into the neighbouring districts for pasture and water in the dry season, trade, intermarriage, friendship, and return of stolen animals. The Karamojong do not enclose their animals in paddocks; communal grazing leaves room for interbreeding.

Young people

While the youths love animals and actively participate in acquiring them, they are getting reluctant to herd them. There is a growing tendency to leave active herding to the younger members of the community (boys) while warriors devote themselves to leisure, especially during peaceful times.

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References

- Novelli, Bruno. 1988. *Aspects of Karimojong ethnosociology*. Museum Comboniam 44, Kampala. Comboni Missionaries, Verona.
- Novelli, B. 2000. *Karimojong traditional religion: A contribution*. Camboni Missionaries, Kampala, Uganda.

Maasai

Kenya and Tanzania

Vincent Yiapan

on behalf of Maa livestock keepers in Samburu, Kajiado and Tanzania

The Maa community keeps cattle, sheep and goats, donkeys, and camels (ranked in descending order of prestige). The community keeps livestock for a number of reasons, primarily as a source of livelihood but also for prestige, bartering, medicinal uses, clothing and attire, bedding and socioeconomic security.

Social and ritual functions

In terms of social and ritual functions, animals are used for the following purposes:

- Blood to help a mother recover after delivery of a newborn
- Paying bride price
- Gifts to children as they go through the rites of passage (for instance a newly married woman must be given eight head of cattle and a bull on the morning after reaching her marital home).

Livestock are slaughtered during ceremonies, for convalescents and also for cleansing for various crimes. For instance for murder the fine ranges from 49 to 449 head of cattle, depending on the community and circumstances. Animals are also used to carry luggage, invalids and old people.

Livestock play a central role in certain prominent rituals, such as:

- When an elder has conjugal relations with his wife before their infant child has started walking (or if he sleeps with her when she is pregnant and she aborts), the neighbouring womenfolk forcefully slaughter a cow or ox. The large intes-

tines of the ox are tied around the offending husband's neck and then are pierced by women so that the contents spill out over his body.

- He-goats are slaughtered in the ceremony of *Olkiteng' 100 mbenek*.
- Oxen are slaughtered and the hide is made into a long string during the boyhood ceremony of *Enkipaaita*. The string will be safely kept by the ox-donor boy's mother, whose son is named *Olororu Enkeene*. This hide string will be securely kept until that ceremony, eight years later when the age group goes for a rite called *Enkang'e nkeene*.
- During the rite of *Olketeng' Lool baa*, a blemished ox is slaughtered. *Enkiyieu (Kidari)* is shared in the ritual between the two elders of the same age-group, after which two elders call each other *Enkiyieu ai*. These two elders exchange heifers and shall never disagree for whatever reason.
- During the *Eunoto* ceremony when warrior-hood is terminated.
- Also when the rains fail for long, an unblemished sheep is slaughtered to make a burnt offering to God to come to the community's rescue with rains.
- During initiation of children, in some families women slaughter a sheep at the door of the initiate's hamlet or hut.

Among the Maa community, livestock and their products play a huge role in social relations. One can hardly speak of ones 'own livestock', since these are accessible to all community members. For instance, one is obliged to contribute livestock for slaughter at one or another ceremony or ritual. When an animal is slaughtered, the meat is allotted according to a predetermined pattern for consumption by boys, girls, women, fire-stick elders, age set, intruders, the slaughtering group, the neighbours, etc. Even milk is for everyone's consumption – all for free. Food and accommodation are supposed to be offered free of charge to visitors. Each clan has predetermined clan brand marks and earmarks which they use to identify their cattle. This helps mitigate inter-clan conflicts

Breeding and selection

The Maa are well aware of the different animal breeds, among cattle notably the Ankole, Sukuma, Kamba, Kerio Valley, Sahiwal, and different European breeds. The Maa community has a special type of the African zebu, and discerning breeders cannot only recognize animals belonging to this strain but also trace out the animals' lineage. Maa breeders have over time bred strains of livestock with attributes which the community values specifically:

- Maasai zebu cattle are resistant to drought and tropical livestock diseases in general.
- Maasai zebu livestock can stand walking long distances to watering points – in some cases 20 km.
- In drought, the livestock can survive for 15 days or more without drinking water.
- Maasai livestock are aesthetically coloured, without a single coloration predominating.
- The quality of milk is sweeter and has a much higher butterfat content than that of exotic breeds. While the quantity is lower, the quality far exceeds that of most exotic breeds.
- Red Maasai sheep are resistant to long spells of drought and to tick-borne diseases. They require little attention. The Maasai have learnt how to treat animals themselves with herbal medicine.

The Maa believe that cattle mirror the behaviour of their owner. Indeed, they hold that one can learn more about a man by looking at his livestock than by looking at the man himself, i.e. whether he is given to humility, cruelty, empathy, etc.

In the selection of breeding animals, certain qualities are sought after. The Maasai have a saying: *Meetai Olaisinani le Muleeni* (one is never poor simply because the livestock he owns are small).

A good bull must be in good physical health, have a good size, come from a

good lineage (in terms of milking, survival, drought resistance, and fast growth), be docile and have a good colour.

Myths and stories

According to Maa mythology, the first man prayed for livestock at night, and God granted his wish by making animals come into his compound. God asked the man to take as many as would come in. Out of curiosity, the man tried to count the number of livestock coming into his kraal and was so amazed by the numbers that he shrieked in sheer wonderment. There and then, the flow of livestock ceased. It is not known how many more livestock he stopped from 'flowing' from nowhere into his kraal by shrieking. That is why Maasai herds are limited in size. The Maasai have an adage, *Midol Kimanya*, which means one is never really conscious of his state and his possessions. (Only others know of the state of one's wealth, never oneself.)

The Maasai and cattle are inseparable. They say, *tenenyamalu inkishu nenyamalu iltung'ana* (if livestock are in trouble, so is man) and *tenenyamalu Oltung'ani nenyamalu inkishu* (if man is distressed, so are livestock). In essence, the Maasai and livestock fates are intertwined and both are bestowed with a common fate; in distress and in time of abundance, both rise and fall together.

Crossbreeding

There is a good deal of crossbreeding between indigenous Maa breeds and exotic cattle varieties such as the Sahiwal, Simmental, Friesian, Jersey, Guernsey, Kamba, Sukuma and Luo. Nevertheless, there appears to obtain a state of genetic atavism that always throws the breed back to where it came from after a few generations. This crossbreeding is not widespread, as the Maasai's critical consideration in breeding is drought resistance, which is already well inculcated in indigenous breeds.

The red Maasai sheep has also been crossed with the Dorper, and as a result the sheep are bigger and produce more meat and fat.

Young people

Young people in the community have an ambivalent attitude towards livestock keeping. Some find livestock keeping a very hard life, especially those who have gone to school. Those who never ventured into western education in general have no qualms about maintaining the livestock breeding way of life.

Other problems

Other problems faced by contemporary Maa breeders include:

- Water shortages
- Long spells of drought
- Uncontrolled livestock diseases
- Insufficient veterinary services
- Counterfeit veterinary products
- Reduction of rangeland for pastoralists
- Poor marketing channels for livestock
- Uncontrolled Tsetse fly menace
- Emerging new livestock diseases.

Boran

Southern Ethiopia and Marsabit district, Kenya

Philip Boru Halake

Pastoralist, Marsabit, Kenya

There are four major communities in this region: Rendille, Gabra, Boran and Burji. All these communities are pastoralists except the Burji, who are agro-pastoralists.

These communities reside in the northern tip of Kenya's Eastern Province, covering the region that lies between Lake Turkana to the west, and Moyale to the east. To the north, the region extends to southern Ethiopia, as far as Yavelo and Nageka. The total population in Marsabit district is estimated at 130,000 persons.

Animal breeds

- **Camels** Gabra and Rendille breeds
- **Goats** Black Headed Persian, Galla, and Small East African varieties
- **Donkeys** Breeds of Turkana origin.
- **Dogs** Shanzi dogs.

Livestock uses

- **Camels** Valued as pack animals and for tehir meat and milk; they are also used to pay dowry. The butter from camel milk is also highly valued.
- **Goats** Can be easily sold for cash as they reproduce fast; also valued for their milk, meat and hides.
- **Sheep** Valued for their fat and meat; also used for religious ceremonies.
- **Donkeys** Mainly used as pack animals; also sold for cash and bartered for other commodities.
- **Dogs** Kept for security purposes.

Social significance

To be recognized as a Gabra or Rendille, one must be the legitimate owner of a camel; each household must have a camel. To the Boran, however, camel keeping is a newly acquired practice. In Ethiopia, bush encroachment on pasturelands has reduced pasture for the cattle, and raised the importance of camels as they are hardier and more resistant to drought. They are also used for ploughing. Sheep are used by all communities in the region for various rituals such as Sorio and at the sighting of the new moon.

Male goats are slaughtered by age sets at prayers for rain, blessings, and during circumcisions.

A true Borana must have been given a few cattle by his father, eg Some Handura.

Donkeys and dogs have no social significance.

Rituals

Camels are slaughtered when a prominent old person dies in the society. No major ceremony can be conducted without camels.

Goats and sheep are slaughtered at the circumcision of age sets, prayers for peace, at the sighting of the new moon and for Sorios .

Cattle have a variety of ritual uses:

- The naming of a child
- Gadamoja ceremonies
- Payment of dowry
- Slaughtered at Gumi Gaayo conferences
- Weather prediction (by looking at the intestines of slaughtered cattle)
- Butter is used to make ointments and for anointing.

Special attributes of animals

Camels are good pack animals. They are very hardy, especially the Rendile variety. The Somali camel is less hardy.

Gabra Galla goats are very hardy and good for milk and meat production. They are able to go for five days without water as opposed to the weaker Somali Galla. The Small East Africa goat is valued for its faster breeding rate. The Black Head Persian goat is valued for its fat accumulations in the tail.

Cattle varieties such as the Boran are drought- and tick-resistant. They also have a high body conversion rate as opposed to the East African zebu.

Donkeys are very hardy. As pack animals they are able to tread where camels are unable to.

Dogs kept by the communities are also very hardy and can go for days without food.

Selection of breeding animals

The following qualities are sought in the selection of breeding animals.

- High growth rate
- High milk yield
- Adaptability to harsh conditions
- Big body size and good body structure
- In camels, the ability to carry a lot of baggage.

In the selection of the male, the following additional qualities are also sought;

- High survival rate of offspring
- Good body structure and large mature size in the offspring
- Hardiness
- High milk yield in female offspring.

The communities distinguish different types of animals, based on characteristics

such as milk yield, body structure, colour, hardiness, strength, etc. There is also a good degree of crossbreeding between local and 'foreign' breeds of animals.

Young people

While livestock is the lifeline of these communities, and they cannot live without them, there is a problem of young people moving away to towns, threatening this way of life.

The communities also have varied opinions on policy matters, such as land demarcation and herd sizes, which have great implications for the viability of pastoralism. Within the community, the young people are shying away from pastoralism, leaving the old and those who have retired, to carry on.

Bahima

Uganda

Helen N Nakimbugwe

*National Animal Genetic Resources
Centre and Data Bank, Uganda*

Charles Muchunguzi

*Mbarara University of Science and Tech-
nology, Mbarara, Uganda*

Indiscriminate crossbreeding of cattle in Uganda calls for an urgent need to conserve our local genetics, among which is the Ankole longhorned cattle breed. *In situ* conservation of this breed can only be successful in collaboration with the hereditary keepers of this breed viz. the Bahima pastoralists. It is therefore imperative that their rights as inherent breeders of the present day Ankole cattle are protected.

The Ankole cattle belong to the Sanga group of cattle that is indigenous to the central and eastern regions of Africa, and in Uganda to the western and southwestern parts of the country. It is classified as an intermediate *Bos indicus* / *Bos taurus* breed type, with a small cervicothoracic hump. It has a relatively large body frame and characteristically long and large horns that curve outwards and upwards and finally inwards. About 2% of the members of this breed type are thought to be polled (Sacker et.al., 1966; Kiwuwa, 1995).

The Bahima are ethnic pastoralist cattle keepers within the Banyankore tribe. They are found in the southwestern part of Uganda, in part of the cattle corridor that traverses Uganda from the northeast to the southwest. This corridor was used by pastoralists (the Bahima and Karamajong tribes) in their search for both water and pasture. The increasing pressure on land has, however, highly restricted pastoral movements within the corridor, and is forcing the Bahima to a sedentary lifestyle.

Bahima's relationship with cattle

Ankole cattle play a central role in the lives of the Bahima. Anthropologists have described the relationship between man and cattle in cattle-herding societies as the 'cattle complex' (an extensive ritual usage of cattle with an emotional attachment to or identification with cattle). One can speak of a cattle complex as being 'strongly' or 'weakly' developed on the basis of whether there is an intensive and extensive use of cattle in the promotion and satisfaction of the biological and social life of a people (Klima, 1970). Based on this description, the Bahima can be described as having a strong cattle complex.

Museveni (1997), the current President of the Republic of Uganda and a renowned Ankole cattle breeder, describes the relationship of his tribesmen with cattle as follows:

'They are like members of our families and we treat them intimately. For instance, we have a brush called enkuyo, which we use to clean and massage the cow, a process we call okuragaza. This is done for most of the milking cows, but also for favourites amongst them. It is a form of communicating with them and they enjoy it very much. A cow will follow you everywhere if you massage it with that brush. I have a great personal feeling for my cows, especially the ones whose ancestors have been in our family for a very long time. They are like cousins and sisters to me. I think if I acquired other cows they would not mean as much to me. I do not have the same feeling for the exotic breeds from Europe, but perhaps over time they will become like adopted children and we shall like them.'

Herd management

To ease management of herds and as a form of herd recording, animals are given individual names, which precisely describe them. These descriptions are based on phenotypic characteristics (coat colour and

patterns, sex, shape of the horns, special marks or distinguishing features), behaviour, and others characteristics, including ancestry, association with a special event and mode of acquisition (e.g. a gift).

This precise description (Infield, 2003) enables a single animal in the herd to be picked out with ease. A name's prefix indicates whether an animal is a heifer, a cow or a bull. For heifers, names start with *Ka*, for bulls whether young or old with an *R*, and for cows any other letter, except for the brown-white coloured cow called *Ruhuzumu* (Table 1).

Cognition of coat colour among the Bahima is very fine. For example, names of coat colour patterns (e.g., spots or patches) are given according to size, concentration, prominence, distribution and locality. Infield (2003) notes that being able to distinguish between the light brown (*siina*) and the dark brown (*mbindi*), makes it possible for breeders to select the right cows and bulls to produce animals of the favoured dark reddish brown colour (*bihogo*).

This fine description of an individual animal makes it possible for the Bahima to trace back the genealogical relationships of their cattle as far back as ten generations.

Breeding qualities

Great care is taken in selecting the bull of the herd (*engundu*). Museveni (1997) points out that eating of male calves is in effect a method of breeding control as only the best males are preserved for breeding purposes. There is hardly any selection pressure on female animals. Table 2 outlines the qualities which are generally considered in selecting of a breeder bull.

Social-economic significance

The strong cattle complex of the Bahima is reflected in the various components of their social economic life.

Uses

Nutrition Cattle products play a very important role in the nutrition of the Bahima. Museveni (1997) recalls the eating habits of the Bahima during his childhood:

'Before my family became Christian, we did not eat any non-cattle products. The main staple of our diet was various types of milk – fresh milk, soured milk, and, once in a while, a kind of thick cream called eshabwe which we would eat with steamed bananas. We also ate cattle blood – we would bleed the cattle and bake the blood into a type of cake. In my culture at that time, eating non-cattle food was considered shameful. Sometimes you could eat solid food, but you would have to wait until it was out of your digestive system before you were allowed to drink milk again. Mixing the two was supposed to be very bad for the cows! We would also eat veal once in a while, especially if the cows produced male calves. Adult cows would only be killed for a big ceremony, never for regular food.'

Although the eating habits of the Bahima are changing, remnants of such habits are still very strong within the community.

Wealth and prestige A man who at his time of death has less than 100 animals is not accorded due respect at his burial. For every 100 animals one has, an iron bell (*omurebe*) is tied around one of the favourite animals in the herd. More bells in the herd mean more animals and therefore more wealth and prestige.

Social security To avert risk, especially during epidemics, owners give animals to friends and relatives, or lend them the animals to raise. If the owner's herd faces problems, the friends and relatives help him rebuild his herd.

Loans Cattle are used as loans. The lender can often later demand another cow in return.

Table 1. Examples of descriptive names of the Ankole cattle

Feature	Description	Heifer (name begins with <i>Ka</i>)	Bull (young or adult, begins with <i>R</i>)	Cow (begins with other letter)
Phenotypic description				
Colour	Dark reddish brown (favourite colour)	<i>Kahogo</i>	<i>Ruhogo</i>	<i>Bihogo</i>
	Light brown with black and brown stripes (associated with taboos in some clans e.g. Abasingo)	<i>Kagoobe</i>	<i>Rugoobe</i>	<i>Ngoobe</i>
	White	<i>Kasa</i>	<i>Rusa</i>	<i>Kisa</i>
	Very black (least favourite)	<i>Kozi</i>	<i>Rwozi</i>	<i>Kyozi</i>
Colour patterns	White patch/spot on forehead	<i>Kaasha</i>	<i>Rwaasha</i>	<i>Kyaasha</i>
	White patch over mouth	<i>Kashomero</i>	<i>Rushomero</i>	<i>Kishomero</i>
	Single white patch on udder	<i>Kahuuga</i>	<i>Ruhuuga</i>	<i>Mpuuga</i>
	Small spots distributed all over the body	<i>Kayenje</i>	<i>Ruyenje</i>	<i>Mayenje</i>
Form	Big hump	<i>Kabango</i>	<i>Rubango</i>	<i>Ibango</i>
	Long umbilical flap	<i>Karomba</i>	<i>Ruromba</i>	<i>Kiromba</i>
	Wide head like of a buffalo	<i>Kabogo</i>	<i>Rubogo</i>	<i>Mbogo</i>
Shape of horns	Large white horns from base to tips	<i>Kashunga</i>	<i>Rushunga</i>	<i>Bishunga</i>
	Horns curve in tightly	<i>Kakome</i>	<i>Rukome</i>	<i>Kikome</i>
	Loose horns falling downwards	<i>Kashara</i>	<i>Rushara</i>	<i>Nshara</i>
	Small, slightly protruding horns	<i>Kakurura</i>	<i>Rukurura</i>	<i>Bukurura</i>
Marks – natural or man made	Polled – no horns	<i>Kakungu</i>	<i>Rukungu</i>	<i>Nkungu</i>
	Horns broken at the tips	<i>Kachweka</i>	<i>Ruchweka</i>	<i>Kichweka</i>
	Branded on side of face	<i>Karanga</i>	<i>Ruranga</i>	<i>Kiranga</i>
Character or behaviour				
	Animal with many desired traits, e.g. good temperament, graceful gait, good fertility etc.– almost perfect	<i>Kashemeza</i>	<i>Rushemeza</i>	<i>Ishemeza</i>
Feature	Example of name	Meaning		
Ancestry	<i>Kahogo ka Ibango</i>	<i>Kahogo</i> (dark red brown heifer), <i>ka</i> (from/of/born to), <i>Ibango</i> (cow with big hump) (ie, Dark red brown heifer born to cow with a big hump)		
Mode of acquisition	<i>Kahogo ka Nuwenkunda</i>	<i>Kahogo</i> (dark red brown heifer), <i>ka</i> (from/of), <i>Nuwenkunda</i> (name of a person) ie, Dark red brown heifer from Nuwenkunda. This heifer might have been given to the owner by Nuwenkunda as a present, on a loan, etc.)		
Event	<i>Gaaju ga kyarwenkuba</i>	<i>Gaaju</i> (light brown), <i>ga</i> (of), <i>kyarwenkuba</i> (heavy rainfall/ thunderstorm) (ie, Light brown cow born or acquired during times of heavy rainfall or thunderstorm)		

Table 2. Selection criteria of breeding bulls

Feature	Desirable characteristics	Remarks
Horns	Large, long, heavy, well balanced, wet glow on them, white all the way to the tips, graceful curving (outwards and upwards and finally inwards – <i>Orukondo</i>)	However perfect a cow may be in other regards, if it does not have good horns it cannot be considered beautiful. Black cows are avoided because it is almost impossible for them to have glowing white horns
Colour	Varies but the favourite one is dark reddish brown – <i>bihogo</i>	Ideal is a single, unbroken colour
Body	Big and tall	
Neck	Big	
Dewlap	Big	
Chest	Wide, straight, firm	
Hump	Small	Belief is that the bigger the hump the more feed is wasted by being stored there
Coat colour	Not dry, smooth, shiny	
Rump	Wide and beefy	
Hooves	Big	Belief that animals with big hooves give high milk producing offspring
Legs	Long and big	Able to move long distances
Testicles	Big and equal in size	Bull with one testicle highly valued because of belief it will have many female offspring
Penile sheath	Big	
Rudimentary teats of the bull	Big	Believed to produce offspring with high milk production
Temperament	Good	
Milk production	High	On basis of pedigree
Milk quality	High butterfat	On basis of pedigree

Building materials Cow dung and hides are used in building of huts.

Feasts and recreation Animals, especially bulls, are slaughtered during feasts or celebrations. It is believed that when the head of the family dies he must die with his big bull in the kraal. So during the funeral feast the bull is slaughtered and feasted on by the mourners.

Songs, recitals and dances depicting love for Ankole cattle are a must. The most popular song is the *Akahogo* (*Kahogo* is the favourite dark reddish brown animal). Singers sit in a linear form facing in one direction with arms raised upwards and slowly moving them forward in a movement which depicts the preferred shape of horns of the Ankole animal (*Orukondo*).

Poetry recitations always depict the value and significance of the cow to the Bahima. In a rhyme tone one recites the lineage of the cow that brought wealth to his family or a cow that was got from a true or close friend. The art of wrestling is also an imitation of bull fighting.

Medicine and detergent Various concoctions of cattle products are used as medicine for man. For example cow urine mixed with milk (*kashumba*) is used as a laxative. Morning urine (*amaganga*) from cattle is used as a detergent to clean milk pots, in conjunction with herbs as a mouth wash, for skin infections, etc.

Clothing and bedding Use of hides as clothing has completely died out. Their use as beddings, however, is not uncommon.

Settling disputes Cattle is used as a form of compensation to the offended party (*empongano*).

Gifts Most gifts given out to friends and relatives, or at special occasions like birth of a child and marriage, revolve around cattle. For example *Omugamba* – a special marriage present – which is given to the bride by her parents must include a wooden bucket for fetching water from the well to the cattle trough, a large calabash for storing fermented milk which is churned to produce ghee, milk pots equivalent to the number of cows paid as bride price, and a ceramic pot with a special type of grass (*obwitizo*) whose smoke when burnt gives a good aroma to the milk pot.

Bride price Bride price is paid in form of in-calf heifers or cows which have had at least one calving. This is to ensure that the animals received are fertile. Bulls are not accepted.

Rituals and religion Examples of rituals associated with cattle include a spiritual ceremony comparable to baptizing babies. A baby boy sits on a cow with a bow, arrow and a rope (*okuta aha mugongo*). It is believed that this imparts warrior qualities in the boy.

Communication with ancestors to give blessings to the family herd is very important. Milk from the cow of a family's deceased father is put in the household shrine built next to the main house. The following is recited: 'See the milk of the cow, father. You should give your cows a chance to produce, multiply and become many.'

Myths

There are numerous myths related to cattle. One is the story of the creation of Lake Nyabihoko. There once lived a man called Mutomo who had many herds of cattle. An epidemic struck and killed all his cattle except one of his heifers called Kayenje. Mutomo walked it to distant places so that it could conceive. Kayenje, whose name

later became Mayenje, had many offspring, which restored Mutomo's wealth. One day Mayenje called Mutomo and told him that if she were to die, she should be buried and not eaten. But Mayenje died when Mutomo was away visiting his friend, Mwamba. Mutomo's family never heeded Mayenje's instructions, and started to eat her. Suddenly the whole of Mutomo's land turned into Lake Nyabihoko and his family and all his property drowned.

Customarily it is not considered right to slaughter and eat an animal which has given many offspring. Such animals are left to die of old age and are just buried.

Future of the Bahima

The rising pressure on land due to growing populations, coupled with government policies which advocate sedentarization and conservation of wildlife in traditional pastoral areas, are a great threat to nomadic pastoral production systems. The general apathy of the youths towards this form of lifestyle aggravates the situation. Infield (2003) notes that it is sad but perhaps inevitable, that young Banyankore/Bahima today are less interested in the beauty of their famed longhorned cows than their parents are. Many cattle keepers are worried that the loss of their pastoral culture will eventually lead to the loss of the longhorned Ankole itself.

The cow in Runyankore is called *ente*. The interpretation of the word is synonymous with a Runyankore word *Entahabi* ('it takes me to difficult places/situations'). This refers to the demands the cow puts on its owner. Today's chips-and-chicken generation that has been exposed to city life in pursuit of formal education cannot accept to be subjected to the demands of looking after the Ankole cow.

Internationally, the Bahima are not accorded much attention as pastoralists in comparison to their contemporaries the Karamajong. This is reflected in the lack of comprehensive pastoral development pro-

grammes in the part of the cattle corridor in which they live in.

Breeding rights

The Bahima by ancestry identify themselves with the Ankole cattle and have contributed a lot in developing this breed. But how should their rights be protected? Who should protect them? Section 35(1) of the Animal Breeding Act (2001) states that

'Any person who sells for breeding, any breed or genetic material under a description other than its patent name, commits an offence.

Section 35(2) defines *patent name* as the name given to a specific variety of breed or genetic material by its originator or discoverer. In the case of the Bahima, can they be considered as the originator of the breed? If a scientist discovers a unique gene in the Ankole, can he/she claim rights to this gene alone? What legal options would best protect the rights of indigenous livestock keepers and breeders? Is it through an intellectual property rights regime or a *sui generis* system? Although Uganda has moved further than its neighbours in regard to genetic material rights in by having an Animal Breeding Act in place, there are still a lot of unanswered questions and issues to be addressed.

Collaboration with institutions

In the face of neo-liberal policies like privatization, the Ugandan government in conjunction with other stakeholders deemed it necessary to entrust an institution (the National Animal Genetic Resources Centre and Data Bank, or NAGRC&DB) with protecting and guarding the national interest in animal breeding. This is more so especially as regards the conservation and utilization of local genetics which in the short term are not profitable and so are not attractive to the private sector.

Through its Ankole Open Nucleus Breeding programme, which is to involve

Bahima pastoralists, NAGRC&DB is spearheading efforts to conserve the Ankole cattle which are under threat from massive crossbreeding with exotic breeds. The programme involves the multiplication of superior animals at a central farm, the Nshaara Ranch. These animals will then be distributed to farmers. The farmers' best animals are to be brought back to the central farm for further breeding. The best bulls will then be recruited for semen production in the bull stud. *Ex-situ* conservation of Ankole cattle in form of semen storage is already going on at the Centre.

Conclusion

As with many other indigenous livestock breeders, there is an urgent need to safeguard the rights of the Bahima people whose essence in life revolves around the Ankole. Their contribution to the development of the Ankole cattle is undisputed, and they are major stakeholders in the conservation of this breed. However, market forces are forcing the Bahima to look beyond the beauty of their cattle, prompting them to allow into their herds more productive exotic genes in terms of meat and milk. Unfortunately, this on-going indiscriminate crossbreeding with exotic breeds poses a major threat to the revered longhorned cattle. Through NAGRC&DB, the government of Uganda is making efforts to cater for all interests related to the conservation, utilization and profitability of the Ankole cattle.

References

- Acts Supplement (2001) The Animal Breeding Act. *The Uganda Gazette* 94: No.36.
- Ainomugisha, A (2001) 'Traditional forms and use of snuff among Bahima in Nyabushozi Uganda'. BA Thesis, Mbarara University of Science and Technology.
- Infield, M, Rubagyema, P, Muchunguzi, C (2003) *The names of Ankole cows*. Fountain Publishers, Kampala, Uganda.

- Kisamba Mugerwa. W. (1992) *Rangeland tenure and resource management: An overview of pastoralism in Uganda*, Makerere Institute of Social Research.
- Klima (1970) *The Barabaig: East African cattle herders*. Holt, Rinehart and Winston, USA.
- Kiwuwa GH (1995). 'Dairy cattle breeding activities in Sub-saharan Africa: An interpretive review'. Paper presented at the first workshop of the National Cattle Breeding Policy Committee, Makerere University.
- Muchunguzi, C (2002) 'The challenges of integrating indigenous people in protected area management: A case study of Bahima pastoralists and Lake Mbuho National Park in Nyabushozi, Uganda', MA Thesis, Mbarara University of Science and Technology.
- Muhereza, EF (2001) 'Ranches restructuring and changing gender relations in pastoral households in the former Ankole Ranching Scheme, Uganda'. *Working Paper 70/2001*, Center for Basic Research Kampala.
- Museveni, YK (1997) *Sowing the mustard seed*. Macmillan.
- Sacker, GD, Trail, JCM (1966) 'A note on milk production of the Ankole cattle in Uganda'. *Trop. Agric. Trin.* 43: 247–50.

Comments and discussion

- Land tenure within the community is communal, but more and more is being surveyed and individual title deeds granted. Within this process, some community members have been given small plots because they have under-reported the size of their herds.
- Those animals not eaten by the community are kept for food for visitors from communities with no objection to eating them.
- President Museveni's love for cattle has aided the cause of the pastoral communities, but they still face problems associated with sedentarization.

Orog Nuur

Mongolia

*Mendbaatar Osorjin and
Dashdamba Damdin*

Mongolia's 1 565 000 km² are home to 2.6 million people and 26 million livestock. From an early point in history Mongolian herders have been mobile and herding five kinds of animals (horses, cattle, camels, sheep and goats), according to natural conditions (pasture growth, drinking water and climate).

The Orog Nuur herders' community is located in Bogd soum, Bayankhongor aimag. This region is desert and mountain steppe. The community has 35 members. The community's objectives are to protect nature and improve their habitat, improve their livestock quality, livelihoods and work together, and to improve their skills and knowledge about nature protection.

The community's main problems include:

- Lack of information, cooperation and coordination, local institutions
- Lack of opportunities for processing and value addition
- Lack of access to services, credit, and markets

Community members work together to prepare for the winter, hay making and fodder gathering, the selective use and protection of pasture land, and the repair of wells and protection of the water supplies and springs .

There have been five recent historical periods in livestock development:

- Pre-1921 revolution
- Revolutionary period and the development of animal breeding until the Second World War (1921–40)

- Collectivization movement (1941–59)
- Collective and state farm period (1960–90)
- Present and future status of animal breeding after privatization.

Breeding and selection

The herders use both crossbreeding (horse–donkey, cattle–yak) and pure breeding methods. Selection criteria for males include the following:

Local Mongolian bulls

- **Hair** Dark brown and very dark in some body parts
- **Tail** Long and thick
- **Skin** Thick
- Short **body** and wide **muzzle**
- **Horns** Thick, strong and short
- **Neck** Strong, wide and with very well developed muscles
- **Breast** Wide, deeply positioned
- **Crest** Structured, straight and long
- **Head** Straight and high
- **Thigh** Thick shaped
- **Abdomen** Strong and well-muscled
- **Testicles** Well positioned.

Stallions

- **Skin** Dark black, dark brown is most suitable
- **Tail** Wide and hair long and thick
- Top of the **head** wide and wide **nostrils**
- **Ears** Long, eyelashes thickened
- **Eyes** Open, bright and dark
- **Neck** Thick, sternum lifted
- **Chest** Well muscled and strong
- **Withers** High positioned and strong muscled
- **Ribs** Round shaped
- **Rump** Well muscled and a bit bulging, not flat
- Wide **hips**, long **penis**.

Camels

- **Hair** Deep reddish or dark brown hair
- Good, muscular **body**
- Long thick **body hair**, strongly developed **knees**

The body shape and general outlook play important role too. The main characteristics are:

- **Breast** Wider than the general body shape
- **Head** Strong and carried high
- **Teeth** Strong and well presented
- **Neck** Strong and wide, strong muscles on front side of neck
- **Eyes** Big, round shaped and with a soft outlook
- **Tracks** Should be equal and have clear and clean outline
- **Hooves** Strong, thick structured and have a dark colour
- **Front legs** Strong and wide, shaped straight with well developed muscles
- **Testicles** Well developed and positioned
- Base of **hump** should be wide, humps should be far apart, and proportionately not too high, strong abdominal muscles.

Goat bucks

Adult males must be at least 1.5 years old before they are used for breeding. Old animals, or new animals without a breeding history, should not be selected. The main reason is because such animals are slow to gain weight and grow, so they weaken the herd structure. Young males to be selected for future breeding must receive the full amount of the mother's milk, so the mothers are not milked. Male goats cannot be used in breeding in one herd for more than 3 years.

Sheep

The wool structure of selected sheep must be fine, evenly distributed and curled. Mongolian sheep have fat tails. The tail has to be wide, big and long (almost reaching the hollow behind the knee joint). The animal must be healthy and strong so it has good chances of survival.

Environmental changes

- Degrading pasture
- Sand movement
- Falling lake levels
- Rivers drying up
- Change in local weather patterns.

Strengths and weaknesses of livestock

- Breeding methods
- Low inputs
- Ecologically pure products
- Livestock raw materials
- Selective use of pasture
- Dependence on nature and vulnerable to disaster
- Limited possibility to increase livestock productivity
- Pasture degradation.

Government and other support

The government recently took the initiative in livestock breeding, organizing breeding programmes, making investments, passing resolutions and laws, and so on. In April 1993, the parliament passed a law on the 'Protection of the health of Mongolian livestock and its gene-bank'. This sets down key points for the regulation and organization of animal breeding in Mongolia. According to this law, existing highly productive nucleus herds are to be kept under government control, and nucleus herds of indigenous livestock are to be restored.

National government programmes aim to protect livestock health and improve the quality of livestock and breeding services. The government implements many projects for improving livestock quality and livelihoods.

Our project uses a participatory, people-centred, process-oriented approach to empower local communities to build sustainable livelihoods, and to develop stakeholder consensus on sustainable, collaborative management of natural resources.

Raika

Western India

Hanwant Singh Rathore

Lokhit Pashu-Palak Sansthan, India

The Raika/Rebari are the largest pastoral group in western India (about 1.5 million people in Rajasthan). They breed camels, sheep, goats and cattle. They are largely landless, relying on short- and long-term migration to seek pasture for their animals. They live mostly in Rajasthan and Gujarat, but also migrate into other states (Madhya Pradesh, Uttar Pradesh, Punjab).

Our research is mostly with Godwar subgroup in Pali and Sirohi district, Rajasthan.

Livestock

Camels The Raika originally looked after the camel breeding herds of the Maharajahs. They believe they were created by Lord Shiva to take care of the first camel.

The Raika in Sirohi district have developed the 'Nari', cattle which had not been documented by scientists. Nari cattle defend their calves against leopards and know practically no diseases.

Sheep The Raika are breeders of the Boti sheep (scientific name: Marwari breed) which can endure droughts and always keep walking (even on three legs).

Goats The Sirohi goat (locally called Majetti) is also associated with the Raika community. It was recognized as more productive than exotic goats from Switzerland in the Indo-Swiss goat project.

Social and ritual meaning

The Raika give animals as dowry (*dhamini*). Traditionally, female animals were never sold, only exchanged at the time of mar-

riages or during crises. Male breeding animals are often shared. During marriage ceremonies, the bridegroom has to sit on a camel.

Crossbreeding

Nari cattle are kept pure. It is felt that crossbreeding (with other local breeds) will affect their drought resistance.

There is a lot of crossbreeding of sheep between local breeds, but it is recognized that higher productivity is at the expense of drought resistance and makes the herd more vulnerable.

Young people

Many young men are attracted by the city, but they have problems finding employment. They sometimes come back and start a herd. There are also some very dedicated breeders among the young people.

Activities of LPPS

LPPS's activities include:

- Standing up against corruption.
- Public interest litigation against the Forest Department (the camel is becoming a threatened species).
- Linking issue of wildlife conservation to conservation of indigenous livestock.

Problems

Because they have no land, the Raika are most dependent on forests for grazing. But foresters see the Raika's sheep, goats and camels as destructive – although it is the two-legged animal that causes most damage. According to the management plan, the Forestry Department wants to prohibit grazing during the rainy season, when the Raika have no other place to go.

External benefits of pastoralism

Local non-pastoralists benefit from the Raika in various ways:

- Camels are important means of transportation for many of the most marginalized social groups, and an ecologically friendly source of draught power.
- The agricultural productivity of the area outside sanctuary depends on dung from pastoralists' herds.
- Nari cows and bulls are sought after by small farmers.

Making life difficult or impossible for pastoralists will have negative effects beyond the boundaries of the pastoralist society, and will have a negative impact on other rural people, on domestic biodiversity, and on national economies.

Alsipura Statement

Issued by the Indian Pastoralists and Herders Association on 23 March 2002

Members of pastoral communities from all over India, including Changpa, Raika/ Rebari, Gujjar, Toda, Dhangar, Malaimadu cattle breeders, Kurma sheep breeders, Vembur sheep breeders, Andhra Pradesh Sheep and Goat Rearers' Association as well as national and international NGOs seeking to protect the interests of pastoralists and other livestock rearers, met at the Training centre of Lokhit Pashu Palak Sansthan in Alsipura (near Sadri, District Pali, Rajasthan, India) on 22–23 March, 2002 to discuss their mutual problems and exchange experiences about their situations.

Pastoralists play an important role in the ecology of India. Their production of organic manure contributes to the maintenance of soil fertility. Their grazing controls invasive exotic species. Contrary to their reputation, pastoralists have many traditional practices for conserving vegetation, for instance by rotational grazing.

Pastoralists play an important role on the conservation of indigenous livestock breeds (such as one humped camel, Toda buffalo, Nari and Malaimadu cattle, Deccani sheep), while Adivasis conserve valuable poultry genetic resources (Aseel chicken). These breeds harbour a wide variety of adaptive traits, being able to cope with harsh climates and landscapes and resisting diseases that affect crossbred animals. It is imperative to conserve them.

Livestock breeders

Tamil Nadu, southern India

P. Vivekanandan
SEVA, India

This paper describes four local breeds of cattle, two sheep breeds and a buffalo breed in Tamil Nadu.

Umbalacherry cattle

Umbalacherry cattle are spread throughout Nagapattinam, Thiruvavur and Thanjavur districts of Tamil Nadu. This breed has four district biotypes: Attukkari madu, Ganapathiyam madu, Venna madu and Sorriyankattu madu. These names reflect the person or families' maintaining the purity of these breeds over 3–4 generations. The estimated population is 20,000.

Origin myths Once upon a time a yogi was in deep meditation. A farmer of that village had a cattle, and he had coolies to look after the cattle. One day when the cattle were brought to the shed for the night one, cow was missing. This cow usually came to the shed an hour late. The coolie was concerned about what the cow did in this hour and the next day he followed it to find out. The cow went straight to the yogi in meditation and fed the yogi with its milk. The coolie who saw this was frightened. On noticing this, the yogi caught hold of the cow's forehead and blessed the cow saying, 'Since you have fed me with your milk and taken care of my hunger, from today your breed will spread from Umbalacherry. The world will speak of your name and fame.' That is why the cattle of Umbalacherry have a white mark on the forehead, the place where the yogi blessed the cow.

Characteristics This breed has white forehead, curved horns, short tail, white hooves and large stomach. It is noted for its

strength and sturdiness. This breed is suitable for marshy rice fields of the Cauvery Delta region. It has a medium sized bullock with compact body and short legs. The udder is not well developed. The animal yields up to 3 litres of milk per milking with a lactation period of 6–10 months. The animal requires minimal maintenance and it thrives on paddy straw. It is a hardy, drought- and disease-resistant animal.

Uses Umbalacherry bullocks are used for wetland ploughing and transport of material through bullock carts. The animals are allowed to graze on paddy stubbles in harvested fields. During the off-season (when there is no crop in the field) the animals are herded in open pasture and penned at night to gather manure for the fields. Typically, a herdsman will look after a herd of 400–500 animals on terms mutually agreed between the animal owner and the herdsman. The owner also pays a charge of about 1 rupee to the landowner for use of his pastures and pens.

Factors affecting cattle population Access to drinking water and grazing lands are major problems. For example, in the Thalaigayiru block of Nagapattinam district, cattle ponds that were created for watering animals are uncared for or have been encroached on.

Grazing land is being encroached by local farmers. Mechanization of tilling, the cost of maintaining bullocks and high wages threaten the existence of the breed.

Kangeyam cattle

Kangeyam cattle are a well-known draught breed from Tamil Nadu. The breed was developed by crossing local cattle with Amrith Mahal and Hilari breeds from Mysore. This was a systematic breeding effort during the 1900s by an individual family, the Pattagar of Palayamkottai (Nallathambi Sarkarai Mandradiar) near Kangeyam village. Later, the breed became popular with farmers belonging to the Gounder community in Kangeyam, Dharapuram, Vellakoil,

Kangeyam Thirupur, Palani, Karur, Perunthurai and Aravakurichi areas of Tamil Nadu. Many of these farmers have now switched to sheep and goats.

Only about 60 breeding bulls true to type are left now, compared with 2000 bulls during the 1950s. These bulls are maintained in Nathakadayur village by Pattayakar families. The total Kangeyam cattle population is estimated to be 470 000.

Special qualities Kangeyam bullocks were used earlier for drawing water from open wells for irrigating garden crops. They are now used for ploughing and carting farm produce. Since the cows are low milk yielders, they are invariably crossed with Jersey to improve milk yields. A pure Kangeyam cow yields less than 2 litres of milk per day. It is usually culled after 12 lactations. This breed is allowed to graze in *korangadu* pasture land.

Korangadu is a silvipasture system that covers thousands of acres and has existed for centuries. It is a typical grass+legume pasture of mixed annuals and trees. It has the following species:

- *Velamaram* tree (*Acacia leucophloea*)
- *Kolukottai* grass (*Cenchrus ciliaris*)
- *Vennampul* (*Trachys muricata*)
- *Ottanpul* (*Seltaria vericulata*)
- *Kurutupul* (*Cholris barbata*)
- *Cholapul* (*Chrysopogon montanus*)
- *Naripayathankodi* (*Phaseolus trilobus*)
- *Seppunerinji* (*Indigofera enneaphylla*)
- *Savarikodi* (*Merremia tridentate*)
- *Poonapudukukodi* (*Crotalaria globosa*)
- *Dadara* (*Borreria hispida*)
- *Hariali* (*Cynodon dactylon*)

The entire *korangadu* pasture land is fenced with thorny shrub *mullukiluvai* (*Commiphora berryi*). The land is ploughed only every 3 years. The seeds of annuals are not sown each year, but only once when the land is newly converted into *korangadu*. Four acres of *korangadu* is enough to maintain two adult cows and four calves

or 20 sheep. Animals kept on this land will not have infertility problems. The *korangadu* pasture land provides grazing from November to January due to growth of grass during the northeast monsoon showers. When there is no grass in the pasture land during March to June, the cattle feed on the pods of *Acacia leucophloea*.

Social significance The cattle are gifted as *Achi koduthal* during the wedding of sisters' daughters. During the time of *Poo Pongal* festivals, milk and curd are taken in new pots, and during *Pattipongal* festival, cattle, goat, grains, sugarcane and new pots are exchanged among relatives.

Rituals Local people worship the cows at the time of giving birth of young ones. Cattle shandy (*Mattuthavany*) is held annually once in Kannapuram village. It coincides with the 'temple car festival' (*Therthiruvila*) of Mariamman Temple on *Chithrapournami* day – the full moon day of the Tamil month of *Chithirai* (April–May).

Selection Selection of bulls is based on the pedigree and phenotype of animals. When they are born, calves are red in colour, but they later change to grey. The horns are long and curve outwards and backwards. One pair of bullocks can pull a cart loaded with about 2 tons of agricultural produce.

In males selected for breeding, the tail should reach below the hock of the hind legs, the horns should be long, and the testicles located close together.

Male calves from cows in their 5th and 6th lactations are preferred for breeding. Only calves with good growth rate are allowed to become bulls; others are castrated. Castration will be performed in the Tamil month of *Karthikai* (November–December) when the *korangadu* pasture land is green with grasses and pods of *Acacia leucophloea*.

Crossbreeding For higher milk yields, farmers have their cows inseminated with

Jersey/ Holstein Friesian semen. Due to increasing use of tractors and farm mechanization, draught bullocks are rarely used.

Young people The younger generation is not interested in maintaining traditional breeds of cattle. Some are using their pasture to rear sheep and crossbred milch animals.

Role of government The announcement of a land ceiling has discouraged farmers from keeping large areas of grazing land, crucial for sustaining the cattle breed. A calf-rearing scheme for providing young calves at subsidized rates has also been withdrawn.

Toda buffaloes

The Toda buffalo breed is associated with the Toda tribal community in the Nilgiri Hills of Tamil Nadu. There are 1200 Toda families living in the Nilgiris, and they keep about 1500 Toda buffaloes. This breed survives the cold climate with temperatures of 0–20°C at an altitude over 1500 m above sea level.

Toda buffaloes are medium-sized animals with short legs and long horns. The horns are usually set wide apart and are curved inwards to form a semicircle. Females yield 2–3 litres of milk per day.

Social significance Buffaloes are given as a gift to brides. Buffaloes are treated as family wealth and are passed on to sons and daughters. At funerals, buffaloes were sacrificed as a gift to the dead person. It is believed that the soul of the buffaloes would accompany the dead person to the next world.

Rituals Buffalo ghee (clarified butter) is used as oil for lighting temple lamps. At the first new moon after childbirth, during the child's naming ceremony, and during the salt-giving ceremony to children, the presence of buffaloes is auspicious. Buffaloes are essential for the spiritual world and the social life of the Toda people.

Selection Male animals for breeding should have stout and short legs, thick hair, a wide forehead, long curved horns, long tail, and display wild behaviour.

Origin myths The goddess Tickirse created Toda buffaloes with a stick. When people were praying, buffaloes emerged out of ponds. According to the legend, only buffaloes with a certain horn form were domesticated, while other types were left in the forest.

Crossbreeding Crossbreeding with the semen of Murrah is practised, although the Toda are not convinced that the crossbred animals can perform adequately in the Nilgiri climate with its low temperatures and high rainfall.

Young people Young people show little interest in buffalo rearing due to their preference for modern lifestyles, shrinking pasture land, and lack of income from buffalo rearing.

Role of government The Forest Department has promoted plantations of eucalyptus trees, which have encroached on about 25 000 ha of pasture land. Wild animals prey upon buffaloes, and heavy mortality has been recorded due to conservation project for wild animals in the Nilgiris (Mudumalai wildlife sanctuary and Mukurthi National Park). The government has opened milk-procurement centres in a few locations. The mortality of young calves and non-availability of breeding bulls cause difficulties for the Todas.

Malaimadu cattle

The Malaimadu or Hill cattle breed is reared by the Konar, Thevar, Naickers and Moopar communities in Madurai, Virudhunagar, Theni, Dindigul and Karur districts of Tamil Nadu. Around 1200 families maintain about 30 000 cattle in a tropical zone where the temperatures range from 25 to 40°C and annual rainfall amounts to 800 mm.

Table 1. Malaimadu body colour and vegetation type

Type of terrain and vegetation	Body colour of animal
Nagarai river forest	Reddish brown (<i>Sembarai</i>)
Uduppu Parai forest	Grey (<i>Mayilai</i>)
Pullipathi forest	Red/brown spots (<i>Sembor</i>)
Kovilmalai forest	Light black spots (<i>Kadukkai por</i>)

Table 2. Rotational grazing for Malaimadu cattle

January–March	Plains
April–June	Hills
July–September	Plains
October–December	Hills

Population About 30 years ago, the cattle population was said to be more than 300 000. This reduction is due to various factors, including the non-issue of grazing permit by forest officials, and a lack of labour and tractorization which have decreased the demand for draught animals.

Use and characteristics Animals of the Malaimadu breed are small, sturdy and resistant to many diseases. The bullocks are useful for ploughing in the wetlands. The main reason for keeping these cattle is to pen them so they manure the fields. During the northeast monsoon in October–December, the cattle are sent to the forest for grazing. In the off-season, after harvesting of the paddy crop, the cattle are let into the fallow lands for penning and grazing.

Malaimadu draught bullocks are known for their strength, stamina and loyalty to their owner. The animals are said to attack enemies or thieves ferociously.

Cows and calves are given as dowry to brides. The dowry animals are identified

by cutting or shaping the ears with a 'moon' or semicircle.

Cattle owners are respected because their animals supply manure. The manure sustains soil fertility for 3 years. Dung is also used in bone-setting.

Selection Male calves for breeding are preferably obtained from the third lactation. The bull's mother should be a high milk yielder. Other desirable traits include:

- **Horns** Straight or tilted forward.
- **Skin colour** *Vellai* (bright white), *mayilai* (milk white), *sembor* (red dots on white background or white dots on brown or red) or *karumbor* (black dots on white or white dots on black).
- **Tail** Short and thin and end above the hock.
- **Dewlap** Small in the neck region.
- **Chest** Wide and the body frame long.
- **Face and ears** Short, with projected eyes to add the attraction of the face.
- **Testicles** Small.
- **Skin** Pliable, soft and thin.

In addition, the bull must be ferocious in nature and taller than all other animals in the herd. It must have leadership capacity, able to lead the herd while grazing in the forest, and to save the herd from the attack of wild animals. The parents, especially the mother, should have bright skin colour, such as *vellai*, *mayilai*, *karumbor*, *sembor* and even *karumayilai* (grey).

Crossbreeding Malaimadu bulls are mated with local Jersey and Holstein Friesian crossbreeds. The offspring will be less prone to mastitis and able to withstand hot temperature and rains. The fat content of milk will also be improved.

Kachakatty Black sheep

Kachakatty Black is a sheep breed conserved by pastoral communities, including Konar, Mooppar, Pallar and Panyan, in Vadipatti block, Madurai District, Tamil Nadu. It is a completely black sheep known

for sheep fighting and amenable for penning to provide manure for local farmers. This breed has been maintained by 13 families. The sheep population is 538 animals. About 25 years ago, the population was about 3000, but it has now fallen drastically due to problems with forest grazing and occurrence of disease.

These villages are situated around the Vaguthumalai Hills in Vadipatti Block, Madurai District. The sheep are taken to the hills to graze. The families also raise a few goats along with their sheep flock.

The communities maintain the sheep flocks to support their livelihood. They earn income by the selling female and male lambs, and by penning the animals and providing manure to the fields.

The rams are known for sheep fighting. This is a sport practised during temple festivals. For sheep fighting, Kachakatty rams are preferred. Three-month-old rams are sold for approximately Rs 2000. From penning, the income is Rs 0.50 per sheep per day. To manure a 1-acre field, 100 sheep must be penned for 5 days. A jute-bag filled with manure produced by one sheep during a month sells at Rs 6 per bag.

Social significance Farmers give sheep as dowry. People from Thevar community are proud of giving black sheep as dowry. The society respects owners of black sheep because the animals are good for penning in the fields. Black sheep are also considered auspicious.

Black sheep with horns are preferred by Muslims for slaughter for the *Ramzan* feast. Black males are preferred for dedication to folk gods or as 'temple sheep' (*koil kida* in Tamil).

Characteristics The skin is completely black. The ears are small and appear underdeveloped or a vestiges ($\frac{3}{4}$ –1" in length). Females have horns in 10–15% of cases. The forehead should have a shallow cavity-like depression.

Selection Breeding rams are selected from the offspring of females in their third lactation. The rams should have short, stout legs, elongated horns, a wide head and elongated body. For a herd of 35 sheep, farmers maintain one ram.

Origin About 4 generations ago, different types of sheep were kept in Kachakatty village. Farmers at that time preferred black sheep as they are amenable for penning. The sheep have the habit of staying put for a longer time after sunrise. Other breeds will get restless after sunrise and have to be taken for grazing. However the Kachakatty black sheep will sit for 2–3 hours longer at this time in the morning. This characteristic increases the dung quantity during penning. After noticing this, herders selected for black colour. In Tamil, *karuppu* means black, so the breed is named 'Kachakatty Karuppu'.

Crossbreeding To ensure the purity of the breed, crossbreeding is discouraged. Breeding occurs with the sheep of migratory pastoral communities who regularly visit during certain periods of the year.

Young people Uneducated youths or school dropouts in the same communities are interested in continuing their traditional lifestyle as sheep herders. However, they feel that officials insist on the herders' obtaining permission to graze animals in Vaguthumalai Forest.

Role of government The Department of Animal Husbandry has organized animal health camps (under pressure from SEVA and herders). Tamil Nadu Veterinary University is showing interest in *ex-situ* conservation of this breed.

Pulikulam cattle

Pulikulam cattle live mainly in the Sivagangai, Virudhunagar and Ramnad districts of Tamil Nadu. The cattle are maintained by local communities belonging to Thevar and Konar.

Origin myth The existence of the breed can be traced back 500 years. The present village of Pulikulam was once full of jungle. One day, a tiger came to a pond to quench its thirst. It was trapped by bushes on the banks of pond, so people named the pond the 'Tiger Pond' The cattle found in that village became synonymous with Pulikulam breed. The cattle are also known as Palingu Madu, Nattumadu or Manimadu.

Characteristics Pulikulam cattle have moderately long face and fine muzzle. The forehead is fairly broad, and the horns narrow and 2–2.5 feet long. The animal has a short, stout neck. The hump is short in the female and well-developed in the male. The body is compact and well-ribbed. The tail is long and has a tuft of black hair. The legs are strong, short and set well apart. The colour is usually grey and white.

Uses These cattle are usually used for penning in farmland. A herd usually contains 300–400 cattle. The bullocks are used for ploughing. The herders earn income by selling 6-month-old male calves at over Rs 2000 each. The Pulikulam breed is known for bull riding (*jallikattu*).

Problems The drinking water ponds in Manankathan and Pulikulam villages need to be desilted to provide drinking water for the cattle. During the months of lyppasi and Karthigai (October–November) there is no space for penning the cattle in the Koomapatti area due to planting of paddy in the plains. Forest officials have prevented cattle from entering the forests since it was declared a sanctuary area. Those caught grazing there are threatened or fined heavily.

Forest officials are restricting access to pasturelands without considering the herders' need for pasture. Pathways that provide access to drinking water and grazing that cross the lower lands and the adjoining Western Ghats are also problematic. Sites such as the eastern part of Thaniparai

up to Mavutru, which were pastureland, have been blocked by the Forest Department. Ponds in the foothills (Nagamma Dorani, Papparathan oorani, Sevittukilavan koil oorani, Tharmamkathavar ootru, Thaniparai otru, Karukkupathai oorani, Thottichi oorani) are also out of bounds for cattle. Forest guards impose fines if they catch animals watering at ponds in the forest.

Vembur sheep

We have identified 22 villages around Vembur, Pudhur block in Thoothukudi District where this breed is found. The estimated population of Vembur sheep is 2000.

Factors affecting population During the dry months there is acute water scarcity, while the rainy season brings torrential rains that make the herds vulnerable to diseases such as foot-and-mouth and rinderpest. The mortality rate rises as high as 12% in the wet months. The sheep require dry shelter during the nights in the wet season.

Comments and discussion

- The afforestation policy has greatly contributed to lack of interest among the youth in animal breeding.
- There has been a decline in the number of indigenous livestock breeds due to changing breeding practices, policy changes, education, climate, globalization, etc.

Fulani

Burkina Faso

Hedy Bühlmann

World Herders Council, Switzerland

The Fulani have an estimated population of between 6 and 14 million. Many centuries ago, the vast number of Fulani tribes migrated from northern Africa and the Middle East into Central and West Africa. There are various suggestions of the origin of the Fulani, such as being descendants of a prehistoric pastoral people of the Sahara before 1800 BC, who are thought to have initially migrated first to northern and eastern Senegal, and then spread out eastwards along the Niger around 1000 AD, looking for pasture for their large herds. The Fulani could be of mixed Caucasian and Negroid or Tukulor and Berber origin. The cultural concept of *pulaaku* is maintained till today.

Today, many of them are semi-nomadic cowherds who travel with their flocks, always searching for better grazing land and water. Over the years, some of them have moved from being exclusively shepherds, to being scholarly, influential leaders in their communities.

The Liptako Fulani of Burkina Faso

Normally the Fulani identify themselves with their local lineages that also have a territorial connotation. The Liptako Fulani are a branch of Fulani living in the Macina district of central Mali and northern Burkina Faso. Their herds are a very important asset to the Liptako.

Milk from cattle and goats provides the main portion of their diet. Butter is made and also sold at the markets. Meat is eaten only at important festivals or ceremonies.

Breeds

Fulani are rearing cows, ovine, goats. They use **donkeys** and **camels** as animals of transport. **Horses** have a social and symbolic value and traditional chiefs are their owners.

In the north of Burkina are found both long-horned and short-horned **zebu cattle**, and also Azawak cattle from Niger. Mostly red, the Azawak is lightly built with medium-length horns and is considered the race with the highest milk yields in the Sahelian region. Sometimes they are cross-bred with lyre-horned White Fulani cattle from Nigeria (Gudali) or with local zebu. The White Fulani has good milk and beef yields. Local crossbreeding depends on preferences of the cattle owners. In Burkina Faso crossbreeding between local and exotic races from Europe is rare.

Two types of **sheep** are also raised: one with hair and one with wool. The wool sheep are important for trade, and indicate the economic status of their owners.

Many Fulani keep **goats** for many reasons. Embouche caprine require less water and care. They are easily conveyed and sold in the market. Goats mature and reproduce quickly, and produce high-quality protein from low-quality feed.

Significance of animals

The Fulani group is so large and scattered across West Africa that their attitudes and sense of identity vary considerably from place to place. But one thing is common to all of them: they treat their cattle like an extended family rather than just an economic asset, and perceive the cow as the mother of humankind.

In Fulani society animals have a very important symbolic dimension and are linked to the cosmos. They believe that one can read information on future events such

as danger, economic wealth or harsh weather ahead from certain signs (hair, colour) on the animals.

Fulani herders think that their reason for existence is to help the animal fulfil its function. This function is to provide mankind with material and psychical benefits such as confidence, friendship, beauty/harmony, prestige, audacity and knowledge. These benefits predominate and stimulate material products as milk, dung, energy, offspring and meat.

The Fulani are good breeders and they have a strong breeding tradition, which gives emphasis on good colour and on forms of the horns. The animal owners keep much of their breeding knowledge secret. For example they have more than a hundred different colours to indicate names of cattle, and each colour has a symbolic signification.

The Fulani maintain a balanced, functional stock composition, consisting of beef animals, milkers, breeders, carriers, labourers, cash generators, and stock beautifiers. Most Fulani livestock in the same ecological region are genotypically identical.

“Universal positive cow”: A breeding innovation by traditional herders

In northern Burkina Faso, traditional herders – members of the Association for the Promotion of Livestock in the Sahel and the Savannah (APESS) – have created the concept of the “universal positive cow” for breeding.

A universal positive cow, or *vache positive planétaire*, VPP in French, is an animal with certain ideal qualities. Herders desire large numbers of such animals.

These ideal qualities are based on traditional and modern knowledge. They include morphology, behaviour, and the ob-

server’s own feelings and impressions about the animal:

- **Size of the veins** Indicate abundance of blood, so the potential to produce a lot of milk.
- **Teats and their positioning** Show the size and yield of the “factory” that filters milk from the blood.
- **Stomach size** Indicates the size of the “storehouse” where food is stored, sorted, and processed.
- **Skin** A fine, supple, clean skin shows the general finesse of the body as well as its longevity.
- **Docility** A sign of confidence and lack of fear.
- **Aesthetics** Harmony in the structure and colour show the animal’s tendency to harmonize things.
- **Bones** Solid bones are another sign of blood abundance, because they are where the blood is constantly renewed from the marrow.
- **Legs** Flat legs indicate an aptitude for milk production. Round legs show an aptitude for slaughter.
- **Pelvis** A wide pelvis extends the stomach and the uterus – an indication of large offspring.
- **Tail** Together with its skin, shows the quality and longevity of the animal.
- **Gait** The forward gait is a sign of progress.
- **Markings** The solar marks (tuft on the forehead and the back) show the animal’s future.
- **Testicles** Big, long testicles, the left one lower than the right, indicate a potential to sire many females.
- **Chest** A wide breast reflects strength and power.
- **Feet** Straight feet, and wide and black hooves reveal great stability for traction.
- **Neck** A large, curved neck means strength.

The symbolic measures receive more consideration than the animal’s material performance.

Traditional experts who act as trainers and advisers to APESS read these signs. Their involvement enables APESS to utilize traditional knowledge in stockbreeding.

Myths

For Fulani cowherds in the Sahel, the world was created from a drop of milk.

In the beginning, there was Guéno, the Almighty. Wrapped in infinite knowledge, he lived in a timeless space. He was everywhere and nowhere. One day he created a stick, hollowed it out and filled it with a fluid that later became milk. A drop escaped the stick and started turning around itself in the void. Guéno saw how thick the drop of milk had become and created fire and air and the three movements: up and down and around.

Then he made a "Sirgal", a stick with four arms at its top. The fire now had to warm the curdled milk, the air had to receive the heated milk and Sirgal had to perform its movements: up, down, around and around, up, down, ... and the stars and the earth came into being.

The rest of the curdled milk became water and from this water finally emerged a cow, a sheep and a goat. The animals had been entrusted to the snake Tyanaba.

Then Guéno created people and assigned a certain function to every group. Suddenly he realized that he had not entrusted the domestic animals to anybody. Upon that he created the Fulani cowherds. Since that day their lives are closely linked with the cattle.

References

Association for the Promotion of Livestock in the Sahel and the Savannah (APESS), www.apess.org/english.html

Conseil Mondiale des Eleveurs. 2000. *Milk south-north*. CME Dossier 2. Conseil Mondiale des Eleveurs, Lucerne, Switzerland.

Herders Magazine. 1999. Conseil Mondiale des Eleveurs, Lucerne, Switzerland.

Ismail Iro. Undated. *Fulani Herding System*. www.gamji.com/fulani4.htm

Akamba

Kenya

Rebecca Musyoka

Kenya Small Farmers Union

The Akamba people live in the districts of Machakos, Mwingi, Kitui and Makueni in Kenya's Eastern Province. They depend mainly on livestock since crop farming is risky because of harsh climatic conditions in the area.

Main types of livestock

- **Cattle** Zebus, Orma Boran, Sahiwal and crosses.
- **Goats** East African goats, Galla and crosses.
- **Sheep** Red Maasai and Black Persian.
- **Chickens**
- **Donkeys**

Uses

- **Cattle** Used for ploughing, transport, food, milk, dowry, hides and skins, manure and cash.
- **Sheep and goats** Used for milk, cash, food, feasts, festivals and dowry.
- **Chicken** Used for food, cash and gifts.
- **Donkeys** Used for transport and ploughing.

Special characteristics

Zebu cattle are resistant to tick-borne diseases. Orma Boran cattle yield a lot of milk, grow fast, have a high mature weight, and tolerate trypanosomiasis. They can withstand harsh conditions, prolonged heat, poor pastures and scarce water.

Selection

The Akamba select against black colour because this attracts pests and tsetse flies. They select male breeding animals for size, strength, new blood (i.e. animals from

other herds), white and brown colour, and a lineage that frequently gives birth to twins. They select female breeding animals for their twinning ability, milk, colour size and conformation. The distinguish types and breeds through the animals' colour, shape, conformity, growth rate, ears and horns.

Crossbreeding

The following crossbreeding is practised:

- Between Zebu, Sahiwal, Oroma Boran and exotic breeds.
- East African goat and Galla, and soon the Toggenberg.
- Red Maasai and Black Headed Persian sheep.

Myths

- You cannot mix milk from a mother and daughter in the same container.
- If your sheep gives birth to twins, you have to give one to your nephew.
- You cannot sell an animal with physical deformities.

Attitudes to livestock

The Akamba value livestock as their main source of income. The animals also provide status and a pastime.

Government policies

The government has neglected dry areas in its breeding support programmes. The focus of the government is on production, and there is no biodiversity conservation policy. There is a shortage of grazing land.

Mbororo

Cameroon

Ali Aii Shatu

Mboscuda, Cameroon

The Mbororo are originally a nomadic and pastoralist people. They are ethnically diversified into three major subgroups (the Jafun, Aku and Wodaabe), who are found in Cameroon. The majority of the Jafun and many Aku are semi-sedentary, but still principally grazers. They entered Cameroon through Adamawa from northern Nigeria in the early 20th century, and some settled in Sabga in North West Province of Cameroon by early 1905.

The Mbororo are a significant minority in Cameroon. They are found in Adamawa, East, North West, North and West provinces, and in almost all divisions in these provinces. In the Centre Province they are in Mbam and Inoubou divisions. In the Littoral Province they are in Mongo Division. In the South West Province they are found in Akwaya and Maga in Lebialem.

With a population of 1 920 000 people they compose almost 12% of Cameroon's inhabitants. In the North West Province their population is estimated at above 250 000 people. The Mbororo rear cattle, and to a lesser extent horses, sheep, chickens and goats.

Social significance

Their animals are a form of prestige to the Mbororo. They are also needed for the community's livelihood and survival. They are the source of milk, meat and family income, and are used for social aspects. Cattle are of great social importance in the Mbororo community whose whole lives revolve around cattle. These animals are used for dowry, bride wealth, child naming at birth, religious feasts, gifts, entertainment of guests, and during traditional ceremonies.

The Mbororo see their animals as clean, pure and upright, with dignity, and confering status on the owners (compared to livestock such as pigs raised by other communities). The animals are regarded as members of the family and are treated as such, even though they also provide economic sustenance. Other communities, on the other hand perceive their animals merely as a source of family income and protein.

Selection and breeding

Criteria for selecting male breeding animals include:

- Progeny with good milk and beef production
- Body conformation
- Colour
- Type of breed
- Calm and gentle behaviour
- Health status.

Cattle breeds kept by the Mbororo community include:

- **Red Fulani** (Mbororoji) Red in colour, long horns and very beautiful.
- **White Fulani** (Akaji) Smaller in size, white in colour, most often with a black nose. This breed is very resistant and adaptable to poor grazing areas.
- **Gudli** Multicolored (reddish, black, white, spotted, etc.), large in size and produces a lot of milk.

Origin myths

The sea god summoned the leader of the Mbororo and taught him a song. After the leader sang the song, cattle started coming out of the sea towards him. The god instructed him to lead the cattle without looking back. Along the way, the man was terrified by the large herd behind him. He defied the god's instruction and looked behind just as a very big bull was coming out of the sea. At this, the bull moored and retreated to the sea. Thus cattle are part of the Mbororo person's life, and much time

is devoted to cattle. Prestige and honour lies in the number of cattle one has in one's herd. The nomadic nature of the Mbororo is caused by their allegiance to cattle.

Crossbreeding

Crossbreeding is done between local breeds and exotic breeds. The local breeds are bred with exotic breeds from Europe and America such as Holstein Friesians, Jersey, Brahma and Boran.

Young people

Most youths in the Mbororo community tend to divest from cattle and invest in other businesses, though they reinvest profits from such enterprises in cattle rearing.

Comments and discussion

Pastoralists share many similarities:

- They have a strong attachment to their livestock.
- They have similar uses for their animals, and keep them for similar reasons.
- They have similar criteria for selection for breeding.
- They suffer similar threats.

The initial recognition of the group should assist livestock keepers and safeguard them from risks.

Interest among young people in livestock is dwindling because of urbanization and modernization.

Government policy neglects pastoralists. They should assess impacts of donors – counterproductive objectives.

Nevertheless, it should be possible to sustain the pastoralist lifestyle. Pastoralists are a group that deserves recognition, since they have a place in the future. Middle-aged people have experienced both lifestyles and should be able to sustain the pastoralist lifestyle.

Part 3 Views of government, scientists, experts and NGOs

Status of indigenous livestock breeds in Kenya

Cleopas Okore

*Livestock Production Department,
Ministry of Livestock and Fisheries Development, Kenya*

Kenya has diversified topographic conditions with altitudes up to Mt Kenya's 5199 m. Climatic conditions range from arid and semi-arid to the humid highlands. Kenya has an estimated millions of zebu cattle, hair sheep and goats, and significant numbers of other livestock (Table 1). The different types of livestock have evolved over time and become adapted to the ecological conditions of their habitat. Smallholder farmers and pastoralists prefer to keep several livestock species, and they depend on them for their livelihoods.

Emerging livestock are species that until recently have not been utilized by the communities. They include crocodiles, ostriches, guinea fowls, quails, termites and grasshoppers. These species are used as food, so there is a need to study their ecology to understand the requirements for their successful domestication.

Livestock breeds

Cattle In Kenya the indigenous zebu cattle belong to the Small East Africa Short-horn zebu cattle. They are characterized

by a well developed hump in the cervico-thoracic position. These zebu populations and strains include the Kikuyu zebu, Coastal zebu, Maasai zebu of the Maasai tribe, Winam or Kavirondo zebu in the Lake Victoria Basin in Nyanza and Western provinces, the Nandi zebu, Samburu zebu, Turkana and Teso zebu.

The Boran cattle have been derived from

Table 1 Estimated livestock population in Kenya

Livestock type	Number ('000)
Zebu cattle	9000
Sheep	7000
Goats (local)	10000
Pigs	332
Rabbits	404
Indigenous chickens	19072
Camels	819
Donkeys	478

Source: Ministry of Livestock & Fisheries Development, Animal Production Division Annual Report, 2001

the large zebu and are found in the drier parts of Eastern and North Eastern provinces. The Sahiwal is not indigenous to Kenya and was imported from India and Pakistan in the 1930s and 40s. The Sahiwal was used to upgrade the indigenous zebu cattle.

The indigenous zebu cattle play a very important role in the lives of Kenyans, especially of the pastoralists who depend entirely on these animals for their livelihood. These animals are multipurpose and are used traditionally to provide food and draught power and to serve numerous social functions.

Sheep The two different types of hair sheep found in Kenya are the fat-rumped Somali sheep, which resembles the black head Persian sheep, and the red Maasai which is fat-tailed and dark brown. These breeds of sheep are found in virtually every part of the country. Their products are acceptable to all communities in the country. The sheep are kept for meat but also serve other social functions such as paying dowry.

Goats There are two main types of indigenous goats in Kenya: the Small East African and the Galla. The Small East African goat is predominant and is distributed throughout the country. The Galla goat is dominant in the Eastern and North Eastern provinces. The goats' population is generally higher than that of sheep in all areas of the country. This may be due to the fact that goat meat is more popular than mutton. Indigenous goat breeds are kept primarily for meat, but they also play other roles, e.g., in social functions such as payment of dowry, and as a ready source of cash. Their droppings are good source of manure.

Pigs Wild pigs are indigenous to Kenya. The non-indigenous pigs are the Large White, Landrace and the Large Black. Pig production in Kenya is limited in some provinces like Coast and North Eastern provinces due to religious beliefs.

Poultry The main poultry species are chickens. Indigenous chickens are the most abundant and form over 70% of the total poultry population. They supply the bulk of the national requirement for eggs and poultry meat. The indigenous chickens are named after the area they occupy. Other indigenous poultry that are emerging include guinea fowls and quails.

Camels The Somali camel is found in the drier parts of Eastern and North Eastern provinces. Camels are kept for meat and milk. They also play an important role as a means of transport in the traditional rural sector. Very little information is available on camel productivity.

Rabbits The common rabbit breeds used in commercial production are California White, Flemish Giant, New Zealand White, and crosses. Farmers keep very few indigenous rabbits. The rabbits are kept mainly by institutions such as youth clubs, self-help groups, women groups and schools. They are normally kept for meat or sale.

Donkeys Donkeys are used mainly to transport goods.

Distribution of livestock

Knowing the distribution of livestock species by province enables the allocation of resources for characterization and conservation. Rift Valley Province has the highest number of zebu cattle (34% of the total), followed by Nyanza and Eastern provinces. Nairobi with less than 0.1%, and Central province with 1%, have the lowest number of zebu because their herds have been upgraded to dairy breeds to produce milk for the urban markets. Loss of the zebu genotype is high in the two provinces, so conservation measures should be undertaken urgently. Rift Valley, Eastern and North Eastern provinces have a large number of zebu cattle because a large portion of these provinces is arid and semi-arid, and it is only zebu which are adapted to the harsh conditions – limited water,

Table 2 Estimated indigenous livestock population by province (000)

Province	Zebu cattle	Sheep	Goats	Chickens	Camels	Donkeys
Rift Valley	2730	3893	5557	4700	168	231
Western	756	189	150	2534	0	0
Nyanza	1332	625	824	4533	0	34
Central	91	239	224	1492	0	24
Eastern	1385	956	2156	3715	90	129
Coast	961	451	998	2006	58	26
North Eastern	927	475	759	–	503	31
Nairobi	6	2	20	95	0	0

Source: Ministry of Livestock & Fisheries Development, Animal Production Division Annual Report, 2001

scarce feed, and endemic diseases. The relatively high proportion of zebu cattle in Nyanza and Western provinces is partly due to the semi-arid conditions on the shores of Lake Victoria, the hot and humid conditions, and the prevalence of tick-borne diseases, to which the zebu show varying degrees of resistance. These conditions are severe for exotic dairy cattle breeds.

Sheep and goats are predominant in Rift Valley and Eastern provinces. Pigs are widely kept in Central and Nairobi provinces. Similarly, the rabbit population is high in Central Province. Pigs and rabbits are not kept in North Eastern because of the Islamic culture. Nyanza province, with 28% of the total indigenous chicken population, has the largest number of chickens. North Eastern has the highest number of camels. Rift Valley and Eastern provinces keep a large number of donkeys.

Threat to livestock species

In the densely populated provinces of Central, Western and Nyanza, population pressure on land has led to limited forage, and livestock keeping has been abandoned in some areas. There is stiff competition with more productive breeds introduced from other countries. Prolonged drought and disease outbreaks decimate livestock. Insecurity and cattle rustling have resulted in the loss of livestock. Reproductive diseases such as brucellosis adversely affect productivity.

Production systems

Livestock in Kenya are kept in a broad range of production systems that vary from smallholder mixed-farming systems in high- and medium-potential areas, to communal pastoral systems in semi-arid and arid areas. Products from livestock vary with the production system. Smallholder farmers and communal pastoralists keep a diversity of livestock to minimize risks in case there is a disease outbreak or severe drought.

Characterization of livestock genetic resources

The livestock population is of local origin and has not been characterized as belonging to specific breeds. Local breeds are named after the area they occupy, and there have been interbreeding resulting in the dilution of breed characteristics.

Attempts have been made to characterize indigenous cattle breeds in their production environment (Mosi et al., 1996; Okeyo et al, 1996). There is no on-farm and on-station breed evaluation and improvement programme for the Small East African zebu cattle. However there are such programmes for the Sahiwal and Boran, and their respective breed societies have formulated breeds standards for registration of animals with the Kenya Stud Book.

With regard to sheep breeds, there is a

Table 3 Livestock production systems and products

Livestock species	Production system	Products
Zebu	Smallholder mixed farming	Milk, meat, hides and skins, traction, manure
	Beef ranching	Milk, meat, hides and skins, manure
	Communal pastoralism	Meat, hides and skins, manure
Sheep and goats	Smallholder mixed farming	Meat, hides and skins, manure
	Communal pastoralism	Meat, hides and skins, manure
Pigs and rabbits	Smallholder mixed farming	Meat, manure
Chickens	Smallholder mixed farming (semi-confined and confined)	Eggs, meat, manure
Donkeys	Smallholder mixed farming	Traction, transport
	Communal pastoralism	Transport
Camels	Dairy ranching	Milk, meat
	Communal pastoralism	Milk, meat, transport

breed evaluation and improvement programme for the Red Maasai. No effort has been made to characterize other local breeds.

Small East African goats are kept in diverse production systems. Indetie et al., (1999) has characterized Small East African goats in Kajiado and Baringo districts. There has been no characterization of indigenous pigs, chicken, camels or donkeys.

Phenotyping and genotyping

From the ongoing work it is evident that phenotypic data has been collected on the indigenous zebu cattle. ILRI has initiated research work to genotype the indigenous zebu cattle (Table 4). However, genotyping of other livestock species has not been attempted.

Conclusion

Since farmers utilize a diversity of livestock species in their production systems it is important that comprehensive characterization is undertaken to generate phenotypic and genotypic data. Information should be obtained on the cultural values associated with certain phenotypic characteristics. If resources are available, characterization of livestock species used in spe-

cific production systems should be carried out simultaneously so that productive breeds can be identified. It is on this basis that rational decisions will be made with regard to conservation, development and utilization of the different livestock species. As it is evident that organizations are interested in characterization of livestock species, coordination of this work by a national body is imperative.

Table 4 Characterization status of indigenous livestock

Livestock species	Characterization status
Zebu cattle	Phenotyping and genotyping
Sheep and goats	Phenotyping
Pigs and rabbits	Phenotyping
Chickens	Phenotyping
Donkeys	–
Camels	Phenotyping

Regulatory and legal options for the protection of the rights of traditional livestock keepers and breeders

JA Ekpere

University of Ibadan, Nigeria

Traditional livestock keepers and breeders in Africa have a rich traditional knowledge base and have developed a multiple-use approach to animal husbandry, including a working knowledge of genetics and genetic resources. Many livestock keepers and breeders keep detailed mental and oral livestock records. This is because an animal's ancestry is often and typically encoded in its name, and the names are never changed, even when the animal is sold or exchanged. These names often reflect natural ancestry, and pedigrees can be traced back several generations.

Societies that keep and breed livestock have usually developed a number of distinct breeds to suit their unique environment and livestock product needs. In this sense livestock breeds are a community assets whose importance and relevance transcend economic value. Livestock has social and cultural value and in some cases it is held in high spiritual significance. It could be sacred and its purity maintained through a careful selection and breeding process. Like their counterparts in crop agriculture, these societies are the custodians of local animal genetic resources.

Africa's local livestock breeds and their associated genetic resources and traditional knowledge represent an important asset for economic development. However, not enough consideration is accorded to it and the need to deal with the accelerating loss of animal biodiversity. There is evidence that 618 known breeds of domesti-

cated animals globally are already extinct (Hall and Ruane 1993) and in Sub-Saharan Africa, 47 of the 145 known breeds of cattle are at risk of extinction, and 22 are already extinct (Rege 1999).

The protection, preservation and conservation of farm animal genetic resources is thus of the essence. There is need to stem the rapid erosion of the narrow genetic base of these resources, on which the world depends. The reality of international agreements in trade and commerce, the conservation of biological resources and intellectual property rights require appropriate regulations and legal instruments.

This paper discusses some regulatory and legal options for the protection of the rights of traditional livestock keepers and breeders. It is assumed that the concept of Farmer's Rights in crops agriculture as enunciated in the FAO International Treaty on Plant Genetic Resources in Food and Agriculture applies in equivalence to indigenous livestock keepers and breeders.

The context

This paper focuses on 'local breeds' and/or 'indigenous breeds' which connote breeds as products of a specific community, society or culture. They are the results of centuries of selection and use by ethnic and social groups living in a confined habitat. In this process, cultural needs and preferences, traditional knowledge and environmental factors determine and influence the traits and characteristics of the local

breeds. The element of ownership is therefore self-evident.

Traditional livestock keepers, breeders and pastoralists usually keep a mix of breeds through natural selection, breeding and management in order to enhance the ability of their indigenous animals to cope with different challenges – long distance treks, fodder and water shortages, pest and disease resistance, climatic and environmental stress, etc. Local breeds are of great importance in traditional societies. They are a source of a wide variety of products and provide several nonmonetary benefits, such as:

- Food, fibre, fertilizer and fuel.
- Cash income
- Transportation and draught power
- Savings
- Security against crop failure and other hazards
- Rural employment and poverty alleviation – support for social and cultural networks
- Enhanced community survival strategy
- Community assets and common property.

The problem

The development of an endogenous livestock initiative with due cognizance to traditional knowledge of local livestock keepers/breeders and genetic resources has become more important since the adoption of the FAO International Treaty on Plant Genetic Resources for Food and Agriculture. So also has been the desire to evolve an intellectual property regime similar to 'Farmers' Rights'. This is because while industrial livestock breeders, research institutes and companies guard their 'inventions' of new breeds through trade secrets and other intellectual property regimes, local livestock keepers and breeders are expected to share their knowledge without restriction or reward. The benefits accruing from access to local animal genetic resources by international livestock research institutes and private sector organi-

zations are hardly shared with local communities in a systematic manner. Rather research is undertaken and access sought with the principal object to save, preserve and rescue breeds as carriers of desirable genetic materials with economic potential and future value. International multinational corporations and research institutions are frantically prospecting for livestock breeds (poultry, pigs and cattle) with desirable genetic characteristics.

The problem is how to stimulate the necessary awareness and create the capacity for advocacy on access and benefit sharing issues with particular attention to the rights of local livestock keepers and breeders over their farm animal genetic resources. What strategies can be adopted and implemented to give volume, relevance and influence to the voice of local livestock keepers and pastoralists in the crafting of an appropriate regulatory framework and legal system that ensures ownership and control of animal genetic resources by the community or the livestock keeper, access and benefit sharing? The erosion of farm genetic resources and diversity is relatively more severe in livestock compared with plant genetic resources. The gene pool is smaller, and only a few wild and local breeds remain in the public domain. The call for urgent action has therefore become very important.

Why protect?

The protection of farm animal genetic resources emphasize both *in-situ* and *ex-situ* conservation. However, it is more meaningful and sustainable to protect and maintain relevant breeds as a functional part of the local production system. Local communities and livestock keepers should be enabled to exercise ownership and continue to develop and improve their breeds through:

- Supportive and relevant policies and that ensure access to health facilities, pasture, water and market outlet.
- Appropriate land use planning.

- Documentation and retention of the traditional knowledge that livestock keepers have accumulated about their breeds, their management and other relevant aspects.

More specifically, the protection of animal genetic resources has become necessary in order to:

- Comply with the basic tenets of the Convention on Biological Diversity, which confers sovereign rights over genetic resources on States and Communities.
- Prevent the erosion of animal genetic resources and unauthorized exploitation the traditional knowledge associated with genetic resources.
- Protect traditional knowledge from distortion and misuse.
- Protect social, cultural and spiritual identity and thereby preserve the dignity and moral rights of local livestock keepers and pastoralists.
- Not destroy the capacity of the custodians of animal genetic resources.
- Stimulate creativity and innovativeness in the development of new breeds.

It is gratifying to note some ongoing initiatives on the conservation of farm animal genetic resources, though they are not adequately focused on protection, issues of ownership, access and benefit sharing.

FAO has played a lead role in this process. The International Livestock Research Institute (ILRI) in Nairobi has been relevant. These efforts have emphasized community-based management approaches with a view to achieving:

- Sustainable use of livestock breeds, empowering local communities to integrate poverty alleviation and rural welfare issues into livestock keeping and pastoral livelihoods.
- Enhance the capacity of livestock keepers and pastoralists in community-based natural resource management through traditional knowledge and cultural values.

- Community participation integrating institutional support, stakeholder involvement and critical success factors.
- Policy framework and mechanisms that support economic and sociocultural valuation of local breeds.
- Documentation and capacity building.

Raising the profile of indigenous livestock breeders

There is currently increasing recognition and acceptance that:

- Local livestock keepers and breeders play a very important role in protecting, conserving and safeguarding local livestock diversity through their animal husbandry practices, associated traditional knowledge and technologies.
- Local breeds possess a vast array of genetic resources which local livestock keepers and breeders have developed through generations of expert selection.
- There is the threat of drastic erosion of genetic resources/biodiversity as well as the traditional knowledge, culture and spirituality associated with livestock husbandry.
- The advent of bioprospecting for genetic materials by multinational corporations and individuals has become a source of concern.
- Local breeds provide transportation and draught power in most communities. Local breeds are a source of cash income, savings and wealth.

In order to encourage and empower local livestock keepers and pastoralists to sustain their unique genetic livestock resources in the current ecologically fragile global environment, it is necessary to raise their profile to a new level of societal awareness. The problem has to be studied and better understood.

A coalition of like-minded NGOs, national/regional livestock scientists and international livestock research institutions (like this meeting) needs to acquire the necessary legitimacy to galvanize a com-

mon position and strategy to express the wishes and aspirations of livestock keepers and pastoralists at all levels of society. Notwithstanding the arguments of modernization and change and the need to adjust to such change, it is essential to ensure that if pastoralist culture, tradition and practice of livestock husbandry and ownership have to be modified, such a transition should be orderly, and evolve with limited trauma and stress. Europe still has its gypsies; Africa should eulogize its Maasai.

As part of this process, it is relevant to address such issues as:

- The misconception of local breeds as inferior.
- The economic argument that technical (technology shift), genetic, economic and modernization trends generate change, and that the livestock keepers/breeders and animal genetic resources process should be accommodated in a linear perspective, should be revisited.
- Policy and World Trade Organization arguments of cheaper meat and meat products from improved herds should be addressed.
- Drastic shifts in production technology with apparent negative impact and demise of local livestock industry should be reviewed.
- The argument that the gene may be valuable for the development of future breeds, but the animal may not be economically viable because its productivity is low, calls attention to issues of 'valuation' parameters.

An operational strategy that puts these and other issues on the national, regional and international agenda will no doubt raise the stakes and profile of indigenous livestock keepers and breeders to a new level of awareness.

Legal options

Africa is lucky at this point in time in the discussion of legal options that ascribe ownership rights, control and protection of

animal genetic resources. This is because several acceptable options now exist. But the problem of a 'best fit' option still prevails. In the most classical usage, the legal options that exist may be classified into intellectual property rights (IPR) regime, and *sui generis* system.

However, either system has optional subsets which makes a thorough analysis of either option necessary before a 'best fit' decision is taken. There is substantial evidence that existing IPR systems do not adequately protect local genetic resources (animal and plant) and associated traditional knowledge. This is because:

- IPRs protect mainly the economic interest of the patent holder.
- IPRs emphasize private ownership, while animal genetic resources embedded in a specific breed may be communally owned, even though cases of family and individual ownership may exist.
- IPRs are time-bound, while animal genetic resources have been preserved through careful selection over generations, and the concept of ownership and use is held in perpetuity.
- The development of animal genetic resources by livestock keepers and breeders is incremental and informal, and does not seem to fit the definition of 'invention' postulated by the IPR system.
- The right of livestock keepers and breeders to exchange have access to and use animal genetic materials may be impaired by IPRs.

It has been argued that the rights of local communities (here, livestock keepers and breeders) can best be protected through a *sui generis* option, and I also recommend this. Such a system should emphasize as minimum prerequisites:

- Disclosure of the country of origin of genetic resources.
- Access and benefit sharing arrangements.
- Prior informed consent, etc.

There is currently a wide array of *sui generis* regulations and legal instruments from which to craft an appropriate international treaty similar to the FAO International Treaty on Plant Genetic Resources for Food and Agriculture. However, such a *sui generis* instrument should possess the legal sanctity of binding legislation and ensure enforceability, compatibility and compliance with other international treaties and conventions, particularly the Convention on Biological Diversity and the Treaty on Plant Genetic Resources.

The role of Africa

Africa is already playing a lead role at various global fora, and in the presentation of a common African position on issues of global importance. Africa is well represented at FAO and was an active participant in the discussions and decisions leading to the adoption of the Treaty on Plant Genetic Resources. Africa's contribution to the decisions that informed the ratification of the Convention on Biodiversity, the coming into force of the Biosafety Protocol and several issues at the Conference of Parties is well documented. Africa's positive role in policy formulation and implementation monitoring at the World Trade Organization and the World Intellectual Property Organization has never been in doubt.

Africa's voice has always been loud and clear and supportive of issues and decisions that are in the best interest of Africa. What is required is a firm mandate that the voice of local livestock keepers and breeders be heard and more forcefully and convincingly articulated and presented by Africa's representatives and negotiators at these fora. This requires the crafting of a common position at national and regional levels which expresses the common aspiration of livestock keepers and breeders in Africa for presentation at the international level.

This meeting can be reconstituted into an African Expert Group to draft such a common position and develop model *sui*

generis legislation that will provide a basis for regional dialogue and adoption by Africa's regional organizations such as the African Union. The Africa case should emphasize the rights of traditional livestock keepers and breeders over their genetic resources, as enunciated in the Convention on Biological Diversity and as already implemented for crop agriculture through the Treaty on Plant Genetic Resources.

The expectation following all preceding discussions and expert meetings should be the development and adoption of an International Treaty on Animal Genetic Resources. The Sadri Declaration (www.lifeinitiative.net/Sadridecl.htm) provides a desirable, adequate, necessary and sufficient basis for the formulation of a *sui generis* rights and protection regime.

Summary and conclusion

The protection of the rights of traditional livestock keepers and breeders has become a topical issue since the adoption of the Treaty on Plant Genetic Resources. This treaty seems to protect farmer's rights over their genetic resources. Unfortunately coverage was not extended to local livestock keepers and breeders. The problems of genetic erosion and unauthorized exploitation of farmers genetic resources in crop agriculture are even more severe under livestock production system where the genetic pool is narrower and loss of diversity is occurring at a faster rate. In Africa, livestock production is still predominantly undertaken by local livestock keepers, pastoralists and breeders. They are the preponderant holders and custodians of the livestock genetic diversity that can be found in Africa. Unfortunately, unlike the case of agriculture, their rights are not protected.

This paper discusses some of the various issues associated with regulation and legal options for the protection of livestock holders' rights. It is envisaged that a *sui generis* system of protection will be developed for discussion and adoption through the African Union and other similar re-

gional organizations to enable the formulation of an African common position on the protection of the rights of local livestock keepers and breeders in Africa. The common position should provide the mandate and basis for Africa's negotiators and representatives at various international fora to argue for the development and adoption of an International Treaty on Animal Genetic Resources with safeguards for the rights of local livestock keepers and breeders over their genetic resources.

References

- Hall, SJG and Ruane, J. 1993. Livestock breeds and their conservation: A global review. *Conservation Biology* 7(4), pp. 815–25.
- Rege, JEO. 1999. The state of the African cattle genetic resources: Classification framework and identification of threatened and extinct breeds. *Animal Genetic Resources Information Bulletin* 25: 1–26.

Comments and discussion

- Q Were animal genetic resources specifically considered during the drafting of the African Model Law?
- A The African Model Law should have included animal genetic resources, but the topic was regarded as too complex, therefore it was agreed to drop them.
- Q Is the Convention on Biological Diversity (CBD) not an obstacle to safeguarding animal genetic resources, since it puts the responsibility on national governments, whereas many breeds occur across several countries?
- A If the CBD were properly implemented it should provide a framework for animal breeds. When the CBD was drafted, people were not aware of some situations facing pastoralists. None of this legislation is sacrosanct. Until we implement it we will not know where the problems lie. It will cast for itself the best of options.
- Q If the Maasai want to push for a *sui generis* law, how should they go about it?
- A The paper emphasizes that everything should be done through the OAU and recommendations be channelled to the country government and the minister to propose the recommendations at the OAU meeting. The OAU then pushes it to FAO and other bodies.
- Q What does *sui generis* law mean? Not everybody knows this (Nakimbugwe).
- A *Sui generis* basically means legislation drafted to suit your own interests, to address your needs and to protect what you want. The key criterion is that the rules do not infringe on anyone. They should meet the desires of the country, livestock keepers, etc. (specific interests). They do not need to be acceptable to anyone else apart from the people they are designed for (own primary interests). They fall under the national legislation.
- Q Have any standards for the documentation of animal breeds and indigenous knowledge been established?
- A In India, draft guidelines for documentation have been developed. Ilse Köhler-Rollefson is happy to make these available to anybody interested. Governments are not following up the adoption and implementation of the model law at national levels. Nobody knows about the model law, and the governments do not lobby for it at the regional level (Njoro).
- A It is not sure whether any African country has a *sui generis* law in place. Maybe there are a few lines or paragraphs in protection acts. There is a need for legal instrument and it is the responsibility of the government to put these laws in place. Africa lacks such committed governments, for instance military governments are interested in survival only.

Promotion of livestock genetic resource diversity in Kenya

Jacob Wanyama
ITDG–East Africa

Kenya is a tropical country with a diversified climate. Seventy percent of the area is arid. Livestock are an important contributor to livelihoods and the economy, accounting for 10% of the country's gross domestic product.

Policy context

- Sourcing genetic mate from outside to improve our breeds.
- This approach is so successful in high-potential areas that pure local animals are hard to find there.
- Diversity can be found in arid areas because they have not fully weaned and crossbred their animals.

- Is this right, though? These people are still poor, suffering from hunger. Do we maintain diversity at the expense of livelihoods?

Action

- Understand pastoralists.
- Shift focus of programmes from high-potential areas to arid areas.
- Cultural shows – exhibit best breeds of indigenous animals.
- Local organizations should pick on these breeds and propagate them.

Indigenous livestock breeds and intellectual property rights

Fredrick Omukubi Otswong'o

Kenya Industrial Property Institute

With the emergence of modern biotechnologies, genetic resources have assumed increasing economic, scientific and commercial value to a wide range of stakeholders. Traditional knowledge associated with those resources has, in consequence, attracted widespread attention from an enlarged audience. Other tradition-based creations, such as expressions of folklore, have at the same time taken on new economic and cultural significance within a globalized information society.

Conservation, management, sustainable utilizations and benefit sharing in respect of genetic resources and associated traditional knowledge are addressed within a range of different policy areas, including food and agriculture, biological diversity and the environment, biotechnology innovation and regulation, human rights, cultural policies, and trade and economic development. Within all these areas intellectual property issues have arisen and are assuming increasing importance.

The first century of this millennium will probably be remembered as the new age in the life sciences. Modern biotechnology applications have created a new era in agricultural productivity, especially in genetic engineering, where both access and manipulation of genetic data is prohibited by proprietary ownership. Intellectual property rights (IPRs) issues are at the centre of this revolution, especially given the substantial investments that are needed to gener-

ate and use this technology. Intellectual property issues related to traditional knowledge, access to genetic resources and benefit-sharing, and expression of folklore are also taking root in international fora.

Intellectual property rights

Background 'Intellectual property rights' are exclusive rights accorded to the creator or inventor by government for his effort. Such rights are temporary and are granted in exchange for disclosure. Upon expiry, the invention or creation is in the public domain for use by anybody. These rights are exempted for research or other non-commercial ventures. Any new idea coming out of the human mind is regarded as an 'intellectual asset'. When the idea is registered or expressed under various intellectual property (IP) regimes the same converts to an 'intellectual property asset'. IPRs can be protected under the following regimes.

Copyright Copyrights are used for expressed artistic and literary works (e.g., music, books). Copyrights can be used to protect the artistic manifestations for the holders of traditional knowledge, especially artists who belong to indigenous and native communities, against unauthorized reproduction and exploitation of those manifestations, which could include works such as the following:

- Literary works Tales, legends and myths, traditions, poems.

- Theatrical works Plays, dances.
- Pictorial works Paintings, drawings.
- Textile works fabrics, garments, textile compositions, tapestries, carpets.
- Musical works songs, typical musical compositions.
- Three-dimensional works Pottery and ceramics, sculptures, wood and stone carvings, artifacts of various kinds.

Related rights to copyright protect performers, among others. This route could be used for the protection of the performances of singers and dancers and presentations of stage plays, puppet shows and other comparable performances.

Industrial property rights These include the following.

- **Patents for inventions** These protect technical solutions that are industrially applicable and universally novel and involve an inventive step. With regard to genetic resources and traditional knowledge, patents may be taken out for instance for products isolated, synthesized or developed from genetic structures, microorganisms and plant or animal organisms existing in nature. Patent protection may also be obtained for processes associated with the use and exploitation of those resources, and also processes known to the native communities that meet the same conditions. All the **results of biotechnology** applied to genetic and biological resources, and also undisclosed techniques for obtaining practical results, could in principle be protected with patents.
- **Industrial designs** Designs and shapes of utilitarian craft products, such as furniture, receptacles, garments and articles of ceramics, leather, wood and other materials, are protected under industrial designs.
- **Utility models** Small patents.
- **Trademarks/service marks** All goods manufactured and services offered by manufacturers, craftsmen, professionals and traders in native and indigenous

communities, or by the bodies that represent them, or in which they are grouped (cooperatives, etc.) may be differentiated from each other with trademarks and service marks. The trademark is an essential element in the commercial promotion of goods and services both within and beyond the borders of the country of origin.

- **Integrated layout designs** For electric circuits.
- **Trade secrets** The protection of undisclosed information is achieved by the repression of unfair competition. The provisions against unfair competition may also be used to protect undisclosed traditional knowledge, e.g., traditional secrets kept by native and indigenous communities that may be of technological and economic value.
- **Geographical indications** These, especially appellation of origin, may be used to enhance the commercial value of natural, traditional and craft products of all kinds insofar as their particular characteristics may be attributed to their geographical origin. A number of products that come from various regions are the result of traditional processes and knowledge implemented by one or more communities in a given area.

Plant Breeders' Rights These are used for new plant variety protection.

All these types of rights are governed by various international treaties and conventions which countries must ratify.

- World Trade Organization Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)
- Paris Convention
- Berne Convention
- Convention on Biodiversity
- International Treaty on Plant Genetic Resources for Food and Agriculture
- Madrid System
- Cartagena Protocol on biodiversity
- Budapest Treaty.

TRIPS Agreement

Under Article 27 of the TRIPS Agreement, inventions in all fields of technology are patentable. There may be no discrimination among nationals of member states. Members may provide for protection of new plant or animal varieties either by patents or by an effective *sui generis* system. Patents on new microorganism and non-essentially biological and microbiological processes are a must. Although the definition of microorganism is not given under TRIPs, it is interpreted to mean small organisms or parts of organisms that cannot be seen by the naked eye, including biotechnological products and processes.

A *sui generis* system for new plant varieties is interpreted to refer to the Plant Variety Protection system under the Union for Protection of New Varieties of Plants (UPOV). Kenya has acceded to the *sui generis* system compliant to UPOV 78. In this system, farm-saved seeds are included indirectly. However, there are plans to amend the law to comply with UPOV 1991, which is stricter to the indigenous farmers and which does not give the farmers rights, but rather privileges.

An invention must fulfil three criteria for patentability: novelty, inventive step, and industrial application. It may not be contrary to public order, human and animal health and safety, and environmental conservation. Patent rights can be licensed to a third party or can be acquired by the government through compulsory licensing.

Patents

A patent is a certificate or a document granted to the inventor to give him or her temporary exclusive rights (usually 20 years from the date of filing) over an invention. He or she can use the rights to bar others from selling, marketing or using this intellectual property asset to sell or market without his or her authority.

Whereas invention is limited to patents, innovation is broader and includes any protection under regimes such as utility models and technovation certificates, industrial design registration, trademarks and any other non-patentable creations or improvements that may deserve specified IPRs. In Kenya, modern biotechnological applications (process and products), especially genetic engineering, are regarded as inventions and are protectable under patents so long as they meet other requirements of patentability such as public order morality, health, safety and principles of humanity and environmental conservation. They must also meet substantive criteria for patentability:

- **Novelty** An invention may not be anticipated by prior art (i.e., both written and non-written) disclosures so long as the disclosure was done more than 12 months from the filing or priority date. The invention must be new.
- **Inventive step** An invention is regarded to involve an inventive step if it would not have been obvious to a person skilled in the art on the filing date.
- **Industrial application** An invention is considered to be industrially applicable if, according to its nature, it can be made or used in any kind of industry, including agriculture, livestock, engineering, medicine, fishery, etc.

Excluded from patentability

Although new plant varieties protectable under the Kenyan Seed and Plant Varieties Act, Cap. 326 are not covered under patents in Kenya, their parts or products of biotechnological processes **are** patentable. Novel microorganisms (including algae and bacteria) are patentable in Kenya so long as their samples are deposited with recognized international depository institution.

‘Non-inventions’ include:

- **Discoveries**, scientific theories and mathematical methods.

- **Schemes**, rules or methods for doing business, performing purely mental acts or playing games.
- **Methods for treatment** of the human or animal body by therapy or surgery.
- **Diagnostic methods** practised in relation to the treatment methods, except products for use in any such methods.
- Mere **presentation of information**
- **Public health-related methods** or uses for therapeutic purposes of a known product.

Utility Model Certificate

‘Utility models’ mean any form, configuration or deposition of elements of some appliance, utensil, tool, electrical and electronic circuitry, instruments, handicraft, herbal concoction, mechanism or other object or any part of the same, allowing a better or different functioning, use or manufacture of the subject matter which gives some technical effect not available in Kenya before. It includes microorganisms or other self-replicable material, herbal as well as nutritional formulations which gives new effect.

Industrial Design Certificate

‘Industrial design’ means any composition of lines or colours or any three-dimensional form, whether or not associated with lines or colours provided that such compositions or forms give a special appearance to a product of industry or handicraft and serve as a pattern for a product or industry handicraft.

Fees

To enable KIPI deal with an application for grant and or registration of industrial property rights, the applicant has to pay certain fees – essentially the filing, search, examinations, renewals, maintenance and amendments assignment fee. The schedule of fees is to be found in the implementing regulations of the Kenya Industrial Property Act and the Trade Marks Act.

Intellectual property rights and indigenous livestock breeders

Intellectual property rights regimes are not in favour of indigenous livestock breeders

There is a dire need to recognize the intellectual property rights of pastoralists and other traditional domestic animal raisers in the light of the growing interest in making use of the genetic traits of indigenous livestock breeds.

Intellectual property rights such as patents and copyright have traditionally been offered to inventors and creators as rewards for innovation, and as incentives for them to share information with the public to promote more innovation by others. Patents are the main mechanism most countries use to allocate rights over inventions. They give their owners monopoly control over their inventions for a fixed term of (20) years. During that time, owners may restrict or control the commercial use and sale of the invention. Society as a whole benefits by gaining access (for a price) to new and useful products, and by acquiring new knowledge that can be used as a basis for additional research and the creation of new inventions. Patent protection has historically been strongest in the industrialized countries and much weaker (or nonexistent) in developing countries.

A patent is issued to invention that is new, not quite obvious to people in the same field and which has some industrial utility. **Indigenous knowledge cannot meet these requirements simply because the knowledge is already in the public domain.**

In recent years, many patent offices have begun issuing patents not only for inventions, but also for discoveries of information already existing in the natural world, such as the genetic sequences of living organisms. They have further extended patent rights to plants, animals and microorganisms containing genes that have been modified in the laboratory.

The Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) – one of the new trade agreements administered by the World Trade Organization (WTO) – incorporates these trends, so that all WTO members may be required to offer patent protection or similar alternatives for a broad range of discoveries and inventions involving genetic resources. This trend towards privatization and modification of biological and genetic information has led countries in both the North and South to increasingly view such information as a proprietary asset having monetary value, instead of as part of humankind's common heritage. That view has, in turn, led countries to agree that they should be able to regulate the access to, and sharing of benefits for their genetic resources.

The current intellectual property regimes may not protect indigenous livestock raisers interests effectively.

The need for 'access and benefit-sharing' (ABS) agreements can thus be seen in large part as a response to trends in national and international IPR systems. Nevertheless, IPR systems, as they currently exist, will be of little use to – and could even hinder – the development of ABS agreements in at least three ways: lack of protection, lack of reward, and lack of IPR systems.

Lack of protection IPRs such as patents protect and reward some types of innovation, but not others. Individuals or firms may obtain patents for specific innovations made at a particular moment in time. But traditional innovations are often developed over a long time and involve mental contributions of many individuals. Much indigenous livestock breeders and local knowledge of medicinal plants and food crops stems from this type of **collective innovation**, making it difficult to point to a particular person or even community who can be identified as the 'inventor'. Traditional patent law considers such knowledge to be part of the public domain. Consequently, present patent systems cannot protect it.

This leads to a natural imbalance of power under IPR systems between those who want access to genetic resources and those who provide it. Biotechnology and pharmaceutical companies who market 'new' medicines or genetically modified animals, crops and microorganisms based on genetic resources obtained from indigenous and local communities can receive worldwide patent protection for their products. The knowledge, innovations and practices that made the 'discovery' of those resources possible, however, is not patentable.

Lack of reward The present IPR systems do not reward indigenous and local communities for their traditional knowledge and they do not provide incentives for them to preserve their biodiversity. Governments and local communities may have invested a great deal of capital and labour in conserving an area where, for instance, a plant microorganism is discovered that provides the basis for a promising new drug. They may have foregone other uses of their land, such as logging or mining, that could yield them immediate financial returns. Or, they may have forgone lucrative opportunities by adhering to lifestyles that preserve their traditional knowledge, innovations and practices. Patents are intended, in part, to provide incentives to people who invest their time, effort and money in the process of innovation. They are effective in rewarding the efforts of companies who develop products from naturally occurring genetic resources. However, because they do not recognize traditional knowledge or practices as innovation, they do nothing to provide incentives to owners and stewards of lands where the greatest wealth of genetic resources resides to conserve their knowledge or biodiversity.

Lack of well-developed intellectual property systems Developing countries which do not have well-developed, enforceable intellectual property systems may have difficulty in satisfactorily negotiating with firms for benefit-sharing of new products and technologies based upon their genetic resources. These firms may have invested a

great deal of capital in particular technology. Consequently, they may be reluctant to share it with developing country partners who do not provide the same level of intellectual property protection that they receive in their home countries.

This observation implies that developing countries that wish to obtain new technologies through ABS agreements may first need to adopt and implement enforceable intellectual property systems. The TRIPs agreement requires its developing country members to put in place in such systems by the year 2000. The challenge facing East African countries is to create intellectual property systems that are strong enough to give firms confidence that their technologies will be protected, while adequately tailoring the systems to their national circumstances and the needs of their indigenous and local communities. Enforcing IPRs to prevent infringement and counterfeiting activities is the biggest challenge facing us today. Yet, many other countries are developing apparently effective national measures on genetic resources for ABS legislation without reference to IPRs.

Recommendations

- IPRs will likely remain the most powerful vehicle for allocating wealth created from the exploitation of genetic resources. Developing countries and their indigenous and local communities may best maximize their ability to share in that wealth if their contributions to innovation are recognized under IPR systems.
- This will require cooperative and imaginative collaboration among many diverse constituencies, including the Convention on Biological Diversity, the TRIPs council, FAO and other international institutions, legislators and IPR offices in developed and developing countries, and indigenous and local communities and their national governments.
- At the international level, countries could collectively define guidelines for ABS agreements to discourage weak rules that might lead to a 'race to the bottom', stressing immediate, short-term financial gains over long-term, equitably shared benefits.
- Establishing national and international registries of traditional knowledge could protect the intellectual property interests of indigenous peoples by helping to further the recognition of their knowledge by patent offices.
- Patent offices could require that applicants disclose the country of origin from which any biological materials or traditional knowledge were obtained:
 - State what part traditional knowledge played in identifying the properties and location of materials used in developing the invention.
 - Affirm that, to the best of their knowledge, they complied with all applicable laws of the source country.
 - Supply evidence that the knowledge was obtained with the prior informed consent of the providers.
 - Require notification to designated authorities or communities identified in the application as sources of the genetic resource.

Industrial property applications in Kenya

Industrial property	Applications	Granted	Rejected	Pending
Patents	830	210	54	586
Trademarks	65,876	48,905	2,471	14,500
Industrial designs	432	367	25	40
Utility models	56	41	-	15
Technovations	-	-	-	-
Total	68,024	49,513	2,550	15,141

Source: KPI Registry, 2003

Challenges

Intellectual property rights controlling access and transfer of livestock genetic resources, indigenous knowledge and information will be an increasingly important issue for actors in developing countries involved in the use and development of genetic resources. IPRs are important because they:

- Provide incentives for private research and development.
- Offer incentives to inventors and creators through royalties and increased funding for their effort and research.
- Encourage access to inventions produced elsewhere, thereby spinning off industrial growth.

However, IPRs can also impose a cost burden.

Concerns have been voiced over private-sector monopolies of technologies, germplasm and seeds. A controversial issue is how to compensate indigenous livestock communities and small-scale farmers in developing countries for their work in developing and maintaining plant genetic diversity. Considering that a local absence of IPR systems might deter investments in research and development, there are no easy answers to this problem. It is, however, clear that more awareness, knowledge and strategic planning is needed in most developing countries.

For actors in developing countries, there are many questions:

- How can East African countries rich in livestock genetic resources best manage, transfer of genetic resources, knowledge and information, making optimal use of IPR regulations?
- How can the various sectors these countries be strengthened in the process of safeguarding national interests and securing access to livestock genetic resources, knowledge and innovations?
- How can they optimize benefits from

trade with valuable genetic resources and be part of value adding processes?

- How can public R&D institutions (e.g., universities and national agricultural research institutions) involved in proprietary science strengthen internal intellectual property policies, guidelines and practices?
- How could countries in the South optimize their IPR systems to suit their agro-economy in the context of TRIPs, especially the problems of patenting of genes, animals and crops and the protection of traditional varieties?
- How can we best make use of agreements governing third party use of proprietary biology/technology products and methods?
- How should countries in the South implement and benefit from information sharing mechanisms under the Cartagena Biosafety Protocol?

There are no immediate answers to these questions, except that individual governments must act now and put something on the table for the poor indigenous livestock breeders.

The role of WIPO

As the specialized UN agency responsible for the promotion of intellectual property worldwide, the World Intellectual Property Organization (WIPO) based in Geneva, was requested by its member states in 1999 to undertake exploratory groundwork and facilitate discussions for a better understanding of the often interrelated intellectual property issues regarding genetic resources, traditional knowledge and folklore.

The following are intellectual property issues that need discussion:

Access to genetic resources and benefit-sharing This issue arises in four main contexts, and relies upon a shared understanding of certain terms such as 'genetic resources'. The four main contexts concern the role of intellectual property rights in:

WIPO member states agree to fast-track work on traditional knowledge¹

Member states of the World Intellectual Property Organization (WIPO) decided today to push forward with work relating to the intellectual property aspects of traditional knowledge, folklore and genetic resources. The General Assembly, meeting from September 22 to October 1, 2003, decided on an extended mandate for the WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC). The mandate requires the IGC to accelerate its work, and to focus in particular on the international dimension of intellectual property (IP) and genetic resources, traditional knowledge (TK) and folklore. The new mandate excludes no outcome for the IGC's work, including the possible development of an international instrument or instruments in this field.

The IGC first met in April 2001 with a mandate to discuss a range of pressing issues in the field of intellectual property (IP). Since then, the IGC has concentrated on how IP systems can work more effectively to protect TK and traditional cultural expressions (TCEs - also termed 'expressions of folklore'), and to deal with IP aspects of genetic resources. It has tackled these issues at several, interlocking levels:

- debating broad policy and legal questions, including how IP rights can operate to promote the interests of holders and custodians of TK and TCEs, ranging over conventional IP rights, extension and adaptation of IP rights, and specific or *sui generis* legal systems that have been created in a number of countries;
- sharing practical experience by surveying, documenting and analysing TK and TCE protection in many countries and several regions, to give practical input into the policy debate, and
- developing practical tools and mechanisms to support TK holders, custodians of TCEs, and indigenous and local communities in identifying and promoting their interests in relation to the IP system.

Many comments at the current General Assembly highlighted that the IGC's work to date has already led to a much greater understanding of the concepts and issues it has addressed, and has clarified how to deal with concerns about inadequate recognition and protection of TK and TCEs. The discussions highlighted the expectation of a number of countries that specific steps should be taken to strengthen protection, including the development of specific new international instruments; others pointed out that the significance of the issues, and their complexity, meant that further analysis and clarification was needed before crystallizing formal outcomes; there is also a view that more work needs to be done to explore the full potential of existing IP rights and systems to protect TK and TCEs. The program and budget approved by the current session of the General Assembly included a range of complementary activities, including continuing capacity-building, legislative assistance and cooperation with a range of national, regional and international initiatives.

The WIPO Assembly also approved the transmission of a technical study (document WO/GA/30/7) prepared by WIPO to the secretariat of the Convention on Biological Diversity (CBD). The study concerns patent disclosure requirements that are relevant to genetic resources and TK that are used in patented inventions. The study is

¹ Adapted from a WIPO press release, 29 September 2003

set to be considered by various working groups under the CBD, as well as the Conference of Parties of the CBD when it next meets early next year.

The IGC has fostered exchange of practical understanding of the approaches available for legal protection of traditional knowledge and cultural expressions. A composite study on TK protection as prepared for the IGC has reviewed definitions of TK, policy issues in protecting TK as intellectual property, and options for specific, or *sui generis*, protection of TK. A parallel analysis of the protection of TCEs (or expressions of folklore) was debated at length by the IGC at its last session. Along with an extensive series of surveys, case studies and analysis of legislation, these documents provide a strong basis for the new phase of WIPO's work in this area, and ensure that it is based on a rich understanding of existing approaches and the costs and benefits of different policy options.

The IGC has also considered defensive approaches to ensuring that TK and genetic resource material are not the subject of illegitimate patent claims. This has led to moves to modify core elements of the patent system, such as the International Patent Classification and the information basis of international search and examination under the Patent Cooperation Treaty.

The IGC's mandate is to discuss IP issues relating to access to genetic resources and benefit-sharing, TK, and innovations; and traditional creativity and cultural expressions (expressions of folklore). A detailed overview of the work of the IGC is provided. In the IGC's work, the terms 'traditional cultural expressions' and 'expressions of folklore' are used synonymously.

The IGC, established by the WIPO General Assembly in October 2000, is open to all member states of WIPO. Other United Nations member states, intergovernmental organizations and accredited non-governmental organizations (NGOs) may participate as observers. Some 175 accredited NGOs can take part in the IGC, including 83 NGOs especially accredited by the IGC, many of which represent the specific interests of indigenous communities and TK holders.

At the IGC's request, the secretariat is developing specific ways of further enhancing the participation of local and indigenous communities in the IGC's work.

- **Contractual agreements for access to genetic resources** Access agreements for genetic resources (such as 'material transfer agreements', MTAs) raise questions on the role of intellectual property rights in respect of ensuring control over *ex-situ* use of genetic resources, technology transfer and joint research and development, the exploration of the possibility of joint ownership of IPRs; ensuring continued customary use of genetic resources, etc.
- **Multilateral systems for facilitated access to genetic resources and benefit sharing** These systems raise numerous intellectual property issues, including possible intellectual property-based benefit-sharing mechanisms, acquisition of intellectual property rights over genetic resources placed in the multilateral system, etc.
- **Legislative, administrative and policy measures to regulate access to genetic resources and benefit-sharing** These include the role of intellectual property rights regarding prior informed consent procedures, ensuring the recording of ownership interests in inventions that arise from access to (or use of) genetic resources, etc.

IPR and biodiversity in Peru

Below is a community policy statement to protect collective intellectual property rights of indigenous peoples related to biodiversity in Peru.

There is need come up with draft policy on the protection of the collective knowledge of indigenous peoples relating to biological diversity. Peru for example was the first country to propose a law establishing a regime to regulate access to, and use of, the collective intellectual property rights of indigenous peoples relating to biological resources. The law is intended to serve three broad purposes, to:

- Protect the respect, protection, preservation, wider application and development of collective knowledge of indigenous peoples;
 - Promote fair and equitable distribution of benefits derived from use of collective knowledge;
 - Promote the use of this knowledge to the benefit of mankind.
- The proposed law is based on a number of underlying principles:
- Indigenous peoples' rights over their traditional knowledge exist without the need for action on the part of the state;
 - Access to the collective knowledge of indigenous peoples for scientific or commercial purposes required their prior informed consent (PIC), where such knowledge is not in the public domain. Where use is for a commercial purpose, it is necessary for the parties to enter into a licensing agreement for its use;
 - Even where knowledge is in the public domain, indigenous peoples are entitled to share in the benefits derived from its use;
 - Traditional knowledge is the collective property and cultural patrimony of indigenous people, and as such is inalienable and must be administered by present generations to the benefit of future generations;
 - Any community is entitled to grant exclusive licenses for the use of knowledge, without the need for the approval of other custodians. However, a percentage of all transactions must be paid into an indigenous fund for development purposes;
 - There is need to create a balance between the rights of indigenous peoples and the interests of potential users, in order to establish a functional regime to regulate the trade in traditional knowledge

A working group including representatives of relevant state bodies and the Permanent Commission of Indigenous Peoples of Peru (COPPIP) – a forum bringing together indigenous people's and campesino communities' representative organizations – has been established to promote wider participation of indigenous peoples in the revision of the proposed law.

- **The protection of biotechnological inventions, including certain related administrative and procedural issues** Intellectual property issues in the field of biotechnology include licensing and other issues related to the use of rights in biotechnological inventions, administrative and procedural issues related to examination of patent appli-

cation directed at biotechnological inventions, etc.

Protection of traditional knowledge

Based on WIPO's previous work, intellectual property issues regarding the protection of traditional knowledge related to genetic resources (and traditional knowledge, innovations and creativity in general) can be grouped into:

- **Terminological and conceptual issues** These issues include the selection of appropriate terms to describe the subject matter for which protection is sought, a clear definition or description of what is meant (and not meant) for intellectual property purposes by the selected terms, etc.
- **Standards concerning the availability, scope and use of intellectual property rights in traditional knowledge** Issues include, in the short term, facilitating access to the intellectual property system to enable traditional knowledge holders to acquire and use IPRs where available under current standards. In the longer term are the possible development of new standards to protect traditional knowledge not protected by existing intellectual property tools, the elaboration of an international framework for traditional knowledge as searchable prior art, where so desired by the relevant traditional knowledge holders, etc.
- **Criteria for the application of technical elements of standards** These are legal criteria for the definition of 'prior art' and administrative and procedural issues related to the examination of applicable patents. Issues in this category include the integration of traditional knowledge into the procedures of intellectual property offices for filing examination, publication and granting of intellectual property titles through the documentation and publication and of traditional knowledge as searchable prior art, where so desired by the relevant traditional knowledge holders, etc.
- **The enforcement of rights in traditional knowledge** This involves facilitating access to the intellectual property system to enable traditional knowledge holders to use and enforce rights under the intellectual property system.

Protection of expressions of folklore It is recommended that WIPO should increase and intensify its work in the field of folklore protection.

Acknowledgements

This paper draws heavily on material published on the WIPO website, www.wipo.int/tk/en/index.html.

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References

- Copyright Act, 2001.
FAO. 1999. *The global strategy for the management of farm animal genetic resources. Executive brief*. FAO, Rome.
Industrial Property Act, 2001.
Njoro, J and J Wanyama. 2000. Indigenous livestock breeds of Kenya: What is the future for them? Paper presented at the international conference 'Local livestock breeds for sustainable rural livelihoods', 1–4 November 2000 in Udaipur and Sadri, India.
Seed and New Plant Varieties Act Cap. 326, Laws of Kenya.
WIPO. 2000. *Matters concerning intellectual property and genetic resources, traditional knowledge and folklore*. WIPO General Assembly, 26th session. World Intellectual Property Organization, Geneva.
WIPO. 2000. *Traditional knowledge and the need to give it adequate intellectual property protection*. WIPO Committee on the Relationship between Intellectual Property, Genetic Resources and Traditional Knowledge. World Intellectual Property Organization, Geneva.

Comments and discussion

- Q Does the Kenya Plant Health Inspectorate Services have a facility for the protection of plant varieties, and if so, is this compatible with the other national legislation. Are there any bills pending in parliament to deal with the issue? (Ekpere)

- A Kenya has been compliant to the requirements of WTO 78 since 1998. These requirements relate to *sui generis*, but the provisions of WTO 98 are more strict. The Kenya Plant Health Inspectorate Service is in the process of developing an African model of *sui generis*.
- Q How does KIPI ensure compliance with patent right protection for the period (20 years) that a patent is in force? How does the government protect the public from quacks and cheats who would patent herbal remedies? (Tafesse)
- A Herbal remedies are protected under utility innovations legislation. Traditional healers are difficult to monitor but the Kenya Medical Research Institute has a herbalist association to which applicants for patents to herbal remedies are referred. As none of them ever come back with the accreditation needed, it is hard for quacks to patent remedies without the approval of the herbalist association.
- Q In India, the government has established an institute for the registration and protection of indigenous and grassroots technologies, the National Innovation Foundation, which encourages the documentation and dissemination of grassroots technologies. More information on the institute can be found at www.nifindia.org (Vivekanandan).
- Q It is clear that plant and animals cannot be patented as yet. But patenting may become a reality in the foreseeable future, yet indigenous community's knowledge is taken and used by researchers. What is KIPI doing to prevent that some of these researchers later claim to have invented this knowledge? Applicants for patents over herbal remedies may be taken for a ride by KEMRI researchers who may later use information for an applicant for further research and 'innovation' (Masinde).
- A All countries that are signatories to the WIPO treaty are seeking ways for the incorporation of traditional knowledge in patents. It is hoped that this will develop into an international law which will be adopted by national governments. But for the short term, Kenyans can only look for an appropriate *sui generis* system.
- Q The WIPO treaty is working on a new model for the incorporation and protection of traditional knowledge into patent law, so that they can be patented. This is a very dangerous development. By definition, patents implicitly assume stability, distinctiveness and uniformity. Furthermore, traditional knowledge does not necessarily satisfy the requirements for novelty, industrial application and innovation required for patents. The solution being sought by WIPO would just add to the confusion by developing a system with very low probability of working. Governments should not walk blindly into such treaties as they may later realize the problems in them during the operational phase, 'our hands will be tied' (Ekpere).
- A It is always possible to withdraw from a treaty. Maybe WIPO will withdraw from the route to patent-tied system, in favour of the more appropriate *sui generis* system. African countries are dependent on initiatives like African Growth and Opportunity Act (AGOA) and the New Partnership for African Development (NEPAD), which are influenced by the West. This makes it difficult for them to go the way of *sui generis* (Otswong'o).
- Q Developing countries should cease to follow blindly the initiatives of the West and take a leadership role in international negotiations (Martyniuk).

Global status of research in indigenous livestock breeds

Olivier Hanotte

International Livestock Research Institute (ILRI)

LRI's mandate is to do research in animal agriculture to reduce hunger, poverty and environmental degradation. This translates into the following themes:

- 1 Current and future roles of livestock in poverty reduction.
- 2 Adapting and delivering technology and information.
- 3 Opportunities and threats from globalization and the livestock revolution.
- 4 Better livelihoods through the application of biotechnology.
- 5 Improved human and environmental health.

Under Theme 4 (biotechnology), the following projects are operating:

- Improving livestock disease control and product safety (Evans Taracha e.taracha@cgiar.org)
- Improving utilization of the genetic diversity in livestock and feed resources (John Gibson, j.gibson@cgiar.org)
- Characterization and conservation of animal genetic resources (Olivier Hanotte, o.hanotte@cgiar.org)

This presentation focuses on the third of these projects. Activities under this project include:

- Quantitative estimates of the distribution and variability of global livestock populations, including relationships amongst populations and identification of unique livestock gene pools (molecu-

lar characterization).

- Development of tools for economic analysis including valuation of animal genetic resources.
- Development of databases and decision support tools for in situ conservation, including sustainable use (DAGRIS, <http://dagris.ilri.cgiar.org/>).

The goal is to provide a molecular genetic framework for the conservation, utilization and improvement of productivity of indigenous animal genetic resources.

African cattle

The 180 million cattle include more than 150 indigenous breeds with unique genetic resources:

- Adaptation to heat and drought.
- Tolerance to diseases.
- Utilization of low-quality indigenous forage.

Many of these breeds are endangered:

- 22 breeds are extinct (13%)
- 47 (32%) are at risk of loss.

Country studies

ILRI and national agricultural research institutions have conducted various studies:

- Genetic diversity of Kenyan zebu cattle and dromedary populations (with the Kenya Agricultural Research Institute).

- Genetic characterization of Mongolian cattle.
- Pedigree and parentage analysis of Ankole cattle herd (with Makerere University).
- Phenotypic and molecular characterization of Ethiopian goats (with the Ethiopian Agricultural Research Organization).

Autosomal microsatellites

- Initial dispersal of the earliest cattle from a likely single African indigenous domestication centre.
- Secondary influx of taurines from the Near East and Europe.
- Two separate phases of Asian *Bos indicus* introgression, one which probably originates with early East African sea-borne introductions, and a second which is associated with more recent pastoralist migrations.
- The relatively late introduction of cattle pastoralism to the southern part of the continent occurred from East Africa rather than following a Western Bantu-associated route.

The history of African pastoralism explains the contemporary genetic composition of African cattle. Domesticated within the continent but genetically influenced by the centres of cattle domestication in the Near East and the Indus Valley, modern African cattle represent a unique genetic resource at a juncture when there is an urgent need to improve livestock productivity for the benefit of present and future human generations.

An international farm animal genetic resources treaty?

Lessons from negotiating the seed treaty

Patrick Mulvany
ITDG

During the 1896 drought and famine in Gujarat, India, Lord Northcourt, the 'Governor' of Gujarat, recognized the value of the Kankrej cow. This cow is used for both milk and draft power. He set up an emergency breeding herd in Chharodi Farm, from which Gujarati farms were restocked after the drought.

What was needed to conserve the Kankrej cow?

- **Vision** – To see beyond the crisis.
- **Power** – To take decisive action.
- **Money** – To finance the process.
- **Commitment to public goods** – Equitable restocking of all Gujarati farmers

Development of the seed crisis

Since the 19th century, the rise of industrial farming has led to a rapid loss of varieties – identified by Nikolei Vavilov, Jack Harlan, Erna Bennett, Lawrence Hills and others. The Green Revolution accelerated these losses. Famine relief spreads inappropriate seeds. Patents and Plant Breeders' Rights fuel biopiracy. Genetically modified organisms threaten genetic integrity.

Agricultural biodiversity

Agricultural biodiversity has been developed by farmers, pastoralists and fisherfolk over 10 000 years. It provides our food, fibre, fodder, fuel and pharmaceuticals. It also provides biological support and

ecosystem services, so is part of the basis of life on earth.

But crop varieties disappearing:

- 95% lost from farmers' fields in the past century
- Animal breeds are dying out – 5% are lost each year
- Fields are becoming sterile, with soil loss, salination, degraded pastures, polluted rivers, ponds, lakes and seas.

Actions to save our seeds

- **Vavilov Institute**, St Petersburg, Russia: 330,000 accessions
- **International gene banks** (CGIAR): 600,000 accessions
- **HDRA Heritage Seed Library**, UK: 850 varieties of 'illegal' vegetable seeds
- **Mihaela Cerna**, Slovenia: 130 Lettuce varieties
- **Dr Richharia**, Raipur, India, rescued 22,972 rice accessions...but threatened by Syngenta

History of seed treaty

- **1970s** Official recognition of losses
- **1983** FAO agrees a voluntary 'International Undertaking' on plant genetic resources
- **1989** Recognition of 'farmers' rights'
- **1992** Convention on Biological Diversity (CBD)
- **1995** FAO Commission on Genetic Resources for Food and Agriculture (CGRFA) starts renegotiations

'Food security is one of the great concerns of humanity... [for] eliminating the hunger of 800 million poor people. Food security is only possible if there is sufficient support for agricultural biodiversity, whose conservation and sustainable use we farmers have achieved through generations of implementing Farmers' Rights. Now, all that remains is to recognize them.'

—Via Campesina, 1996

- **1996** Leipzig Conference on Plant Genetic Resources for Food and Agriculture (PGRFA)
- **2000** CBD Decision V on agricultural biodiversity
- **2001** Treaty adopted by FAO (3/11/2001)

Purposes of seed treaty

- **Conserve** – *ex situ*, *in situ* and on-farm
- **Promote sustainable use** and recognize interdependence
- Fair and equitable **sharing** of benefits
- Germplasm, Information, Funds, Technologies, and Systems (**GIFTS**)
- Farmers' Rights
- 'Free flow' of seeds unrestricted by monopoly ownership.

Obstacles

- **1995** WTO agreement on Trade Related Aspects of Intellectual Property Rights (TRIPs)/Plant Breeders Rights (UPOV) and/or patents on plant varieties
- **1999** Review of TRIPs 27.3(b) African position: 'ban patents on life'
- **2000** Biosafety protocol

Expected outcomes

- International legally-recognized 'farmers' rights'.

- No IPRs on plant genetic resources for food and agriculture.
- All plant genetic resources for food and agriculture to be covered by treaty.

Achieved

- 'Farmers' rights' subject to national law e.g., patents.
- Ambiguous wording.
- The treaty's multilateral system has only 35 crop genera and 29 forages and covers public collections only (the rest are voluntary).

International farm animal genetic resources treaty?

Worthwhile if it achieves...

- International recognition of Livestock Keepers' Rights to all the agricultural biodiversity required for conservation and sustainable use of farm animal genetic resources – production and environmental services.
- Coverage of all farm animal genetic resources, associated species and the genes they contain.
- Ban on patents and privatization of farm animal genetic resources.
- Increased attention on farm animal genetic resource issues and provides a forum for negotiation.

Steps to a farm animal genetic resources treaty

- **2004** Intergovernmental Technical Working Group on Animal Genetic Resources at FAO: focus on livestock.
- **2004** FAO Commission on Genetic Resources: resolution on Livestock Keepers' Rights.
- **2005** FAO Conference: adoption of principle of Livestock Keepers' Rights.
- **2006** Convention on Biological Diversity Conference of the Parties (COP) 8: Recognition of farm animal genetic resources and Livestock Keepers' Rights as negotiated in FAO.

'There should be a prohibition on bio-piracy and patents on living organisms, including the development of sterile varieties through genetic engineering processes. Seeds are the patrimony of all of humanity.'

—Final Declaration of the World Forum on Food Sovereignty, Havana, Cuba, September 7, 2001

in a statement being reached at COP VII as opposed to COP 8

Some key countries, notably the USA, are not very cooperative. For instance, the USA has been a very reluctant player in the CBD process and withdrew from the process at one juncture. Nevertheless, the USA still retains a lot of influence within the CBD via proxies and through its membership in FAO.

Comments and discussion

The farm animal genetic resources treaty should cover all animals, not only farm animals, as in the future some wild animals may be domesticated.

The treaty should be designed to ensure free flow of genetic material rather than confer ownership to any party.

The exclusion of animals from the seed treaty was because of the numerous interest groups and institutions such an inclusion would have required. Furthermore, the attention of the international community was at the time focused on plants as they were perceived to have a critical role in food security, while livestock production was not viewed as an important issue of rural development and sustainable livelihoods. This perception must be challenged if meaningful progress is to be made towards a farm animal genetic resources treaty. Furthermore, the plant interest groups have a huge lobby within the FAO and CBD and have used this to embark on the 2nd Global State of Plant Genetic Resources, while animal interest groups don't yet have the first! (Martyniuk).

It is possible to reduce the time frame for the farm animal genetic resources treaty by truncating some of the processes by being very aggressive which would result

Part 4 Working groups

Four workshop groups discussed and refined the four sets of recommendations that emanated from the international workshop on 'Farm Animal Genetic Resources from the Perspective of Rural Communities' held in Sadri, India on 12th to 16th October 2003 (see next page).

Questions for discussion

1. Do you agree that all governments should give high priority to an internationally-binding agreement on pastoralism, farm animal genetic resources and the recognition of Livestock Keepers' Rights? Such an agreement could:
 - Consider the role and needs of pastoralists.
 - Recognition of Livestock Keepers' Rights.
 - Include all farm animal genetic resources and associated agricultural biodiversity.
- 2 Do you agree with the set of principles embodied in the recommendations from SADRI on Farm Animal Genetic Resources?
- 3 Do you agree with the FOUR sections?
- 4 What could be added or deleted?
- 5 How can you improve the statement?
- 6 What could be added or deleted? How can you improve the section?

Group 1

A 'No' to Question 1 would have negative implications, especially in the face of globalization.

With a 'Yes' we should then use regional organizations like SADC, COMESA, IGAD, AU-IBAR to represent our case at international forums.

Such an agreement could:

- Consider the role and needs of pastoralists.
 - Needs for voluntary sedentary rights.
 - Recognition of Livestock Keepers' Rights.
- Include animal genetic resources for food and agriculture and associated agricultural biodiversity.

We should not restrict ourselves to farm animal genetic resources. Include wildlife as well.

Documentation of animal genetic resources (role of traditional communities)

- Strengthen and sustain the ongoing documentation process e.g. State of the World Animal Genetic Resources Report (FAO). Pastoralists should actively be involved in this. This process should be spearheaded by governments with the

Farm animal genetic resources from the perspective of rural communities

Asia Level Workshop hosted by Lokhit Pashu-Palak Sansthan in Sadri (Pali), Rajasthan, India, 12–16 October 2003

Recommendations

The actions recommended by the workshop for promoting the sustainable use of farm animal genetic resources in Asia related to four separate issues:

Documentation of animal genetic resources (role of traditional communities)

- Ongoing documentation of indigenous knowledge on animal genetic resources.
- Add indigenous knowledge dimension to Domestic Animal Diversity-Information System.
- Modify scientific techniques to level of understanding of traditional community with cooperation of extension services.
- Establish pilot technology demonstration units with participation of traditional communities.
- Incorporate traditional indigenous knowledge into education systems.
- Promotion of knowledge exchange between and within communities.
- Organisation of training in the LIFE approach.

Strengthening the role of traditional communities in conserving and managing sustainable animal genetic resources

- Promote traditional indigenous knowledge through folk songs and stories (cultural forms) representation.
- Promoting and organization of traditional communities.
- Support community initiatives to conserve their animal genetic resources.
- Strengthen community awareness on sustainable management of natural resources.
- Enhance linkages horizontally and vertically between relevant institutions and communities.
- Promote traditional management practices through people participation.
- Support traditional community to develop market linkages and channels and credit/saving schemes.

Support for traditional communities to maintain their role, lobbying for cultural diversity

- Initiate setting up village level resource management committee to defend local common grazing rights (actors NGOs and governments) and other issues.
- Raise awareness in other sectors (forest/agriculture/veterinary medicine) and other relevant departments to discuss access rights to grazing and water.
- Respond to pastoralists' need for fodder in reforestation programmes.
- Promote and support village self help group for credit and marketing.
- Research for low cost feed supplements for draught and adverse conditions.
- Provide services for families and their livestock.

Treaty and legal requirements for the conservation and protection of intellectual property rights (IPR)

- Ensure that work on IPR goes hand in hand with participation and benefit sharing.
- Canvass and consolidate national issues concerning conservation of farm animal genetic resources in March 2004.
- Stimulate formation of national working groups on farm animal genetic resources:
 - to study the lead-up process to the International Treaty on Plant Genetic Resources for Food and Agriculture.
 - to determine what can be replicated.
 - to indicate obstacles and challenges.
- Disseminate findings of workshop in international treaty on farm animal genetic resources.
- Sensitize stakeholders in the region on the issue.
- Ensure the inclusion of grass land genetic resources in both, plant and animal resource conservation programmes.

- backing up of other stakeholders, e.g. NGOs
- 2 Add the indigenous knowledge dimension to the Domestic Animal Diversity-Information System (DAD-IS) administered by FAO.
 - 3 Open up a common database at local, national, regional and international levels. DAD-IS may not be able to incorporate all interests.
 - 4 Form a pastoral forum in each country to act as a pressure group and represent pastoral interests.
 - 5 Promote networking amongst pastoral forums. Knowledge exchange between and within communities.
 - 6 Set up secretariats at local, national, regional, and international levels.
 7. Modify scientific techniques to the level of understanding of traditional communities with cooperation of extension services.
 - 8 Establish pilot technology demonstration units with participation of traditional communities.
 - 9 Incorporate indigenous knowledge into the education system, especially at the primary school level.

The group agreed with the Sadri Recommendations, but noted that:

- There is a need for an umbrella pastoralist organization for networking at local national and international levels. This should be done with the goal of creating awareness through education, training on rights, empowerment, markets, value addition (school of wisdom).
- In this, the role of pastoralists will be to maintain the balance of pastoral livelihoods in arid and semi-arid lands to ensure sustainability. Pastoralists will also endeavour to conserve indigenous breeds within their areas to maintain genetic diversity.

On Question 2, the group agrees to all the sections but added the following:

- Capacity-building efforts should concentrate on building on existing knowl-

edge rather than imposing new ideas.

- Environmental committees need to be established among pastoral communities.
- There is a need for capacity enhancement.
- There should be structures to maintain good relationships within and outside pastoral communities.
- There is a need to strengthen pastoral grazing committees for selective use and management of pasture and water points.
- There is a need to establish and strengthen appropriate health service delivery systems.
- Efforts to lobby influential persons, politicians, opinion leaders, administrators, religious leaders businesspersons and the media on for more action on the priorities of pastoral people should be enhanced.

In their reaction to Group 1's presentation, the workshop participants agreed that the statement from the Sadri Workshop contained issues and terminologies specific to India. Since all this is building up to a global-level action plan, broader, more encompassing phrasing was proposed.

Group 2

All governments should give high priority to an internationally binding agreement on pastoralism, farm animal genetic resources, and the recognition of Livestock Keepers' Rights. A policy should be established that takes into consideration the economic setting, the social framework, and political environment of pastoralists and which enhances and recognizes pastoralism as a viable livelihood system. The policy should make provisions for water, animal health, marketing, land tenure, security, and animal feed during droughts

Livestock keepers' entitlement to their lands and territories should be recognized through suitable legal instruments that en-

sure non-alienability of such lands out of livestock keepers' ownership without their informed consent and only in consultation with them. The group also called for the equal recognition of the citizen rights of livestock keepers as a people and of their culture and livelihood as derived from their livestock.

The group recommended the recognition of farm animal genetic resources owned by livestock keepers and their contribution to the national food security. This would support conservation of local animal breeds with unique gene pool derived from adaptation to arid and semi-arid rangelands, including associated and supportive rangeland biodiversity of grasslands, plant life, as well as wildlife resources.

The group was in total agreement with the four recommendations from the Sadri Workshop, adding the following points:

- Need for participatory planning and management of community-owned natural resources.
- Need for recognition and promotion of the cultural attachment and love held by livestock keepers for their farm animal's genetic resources.

In the open session to discuss the presentation, participants noted the following points:

- Tanzanite mining in Tanzania has precipitated a mass movement of young people to the mining areas. This is threatening the survival of traditional breeding knowledge which may lead to serious degradation of the genetic resources and the ecosystems that support the community.
- The importance of pastoralism is not fully appreciated by development practitioners and the rights of these groups are not respected. For instance when investors come to pastoral lands the interest of the indigenous communities are

not respected. The heavy emphasis placed on the government in pastoral development is not fruitful, partly because the term 'government' is used in its general form without reference to specific sections whose attention is being called.

- With respect to regional and international agreements, national governments should develop avenues for consent by local communities before committing the nation to a treaty.
- The Plant Genetic Resources Treaty process took from 1978 to 2001 to complete. It is important to develop and engage actors at the micro and intermediate levels in order to complement, and speed up macro level developments.

Group 3

The group agrees in principle to the proposal in Question 1, but notes that:

- There is a need for an umbrella pastoralist organization for networking at local, national and international levels. This will be done with a goal to create awareness through education, training on rights, empowerment, markets, and value addition (school of wisdom).
- In this, the role of pastoralists will be to maintain the balance of pastoral livelihoods in arid and semi-arid lands to ensure sustainability. Pastoralists will also endeavour to conserve indigenous breeds within their areas to maintain genetic diversity.

On Question 2, the group agrees to all the sections, but adds the following:

- Environmental committees need to be established among pastoral communities.
- There is a need for capacity enhancement.
- There should be structures to maintain good relationships within and outside

pastoral communities.

- There is a need to strengthen pastoral grazing committees for selective use and management of pasture and water points.
- There is a need to establish and strengthen appropriate health service delivery systems.
- Efforts are needed to lobby influential persons, politicians, opinion leaders, administrators, religious leaders, businesspersons and the media on pastoral issues.

Group 4

The group noted such an agreement should be geared towards the recognition of pastoral peoples and indigenous animal breeders and their role in providing sustainable livelihoods and the conservation of animal genetic resources through a treaty in line with FAO and the Convention on Biological Diversity.

To make progress towards such a treaty, the group noted the need for appropriate policy approaches. In particular, the group recommended the following approaches:

- Affirm and recognize the historical role of pastoralists and indigenous communities towards domestic animal diversity and environmental services.
- Recognize the rights of livestock keepers in terms of access to resources and their right to continue using their knowledge in this and to access, save, use, exchange and sell their animal genetic resources unrestricted by IPRs (genetic engineering).
- Ensure that benefits of the use of animal genetic resources are accessible equitably to all.
- Provide characterization, evaluation and documentation of animal genetic resources, possibly through an appropriate national register.
- Provide a legal framework for the implementation of a global strategy for

conservation and sustainable use of animal genetic resources.

- Inclusion of financing mechanisms for the necessary processes and institutions for a animal genetic resources treaty
- Provide for sustainable use of animal genetic resources.
- Establishments of linkages to the Convention on Biological Diversity through FAO.

The following steps and opportunities should be exploited in the development of an animal genetic resources treaty .

- **2004** Convention on Biological Diversity, Conference of the Parties (COP) VII, 9–24 Feb 2004.
- **2004** Intergovernmental Technical Working Group on Animal Genetic Resources for Food and Agriculture at FAO 29 Feb–1 Mar: include pastoralism concept in the treaty.
- **2004** FAO Commission on Genetic Resources for Food and Agriculture (CGRFA), 6 Oct: Push for the inclusion of the principle of Livestock Keepers' Rights.
- **2005** FAO, Nov 2005: Adoption of the rights of pastoralists.
- **2006** Convention on Biological Diversity–Conference of the Parties, 8 Mar: Recognition of farm animal genetic resources.

Comments and discussion

- There is a need to act swiftly on these recommendations as the first step is only a few months away. In particular, participants called for the delegation of the task of taking these recommendations to the FAO intergovernmental committee for action.
- The FAO can only act on these recommendations if the mandate to do so is provided by the relevant national governments. The most effective way for getting action at FAO is by lobbying the respective country representatives to

- raise these issues within FAO.
- The low levels of awareness at the grass-roots level on the legal implications relating to animal genetic resources are of concern. To create effective lobbying mechanisms, there is need to raise awareness among grassroots pastoral associations.
 - In discussions over pastoralists' issues, there is always confusion between pure pastoralists and agro-pastoralists. This has contributed to the exclusion of pure pastoral communities from the policy framework and the neglect of issues such as land tenure for nomadic pastoralists.
 - The recognition of the role of pastoralists will in itself raise awareness of their concerns and priorities.
 - The FAO animal genetics department has a broader approach to farm animal genetic resources. It would be easier and more appropriate to address cultural related issues of pastoral communities through conventions on human rights, rights of indigenous people and avenues such as UNESCO.
 - At the international level there are already too many commissions and the inclusion of cultural issues within farm animal genetic resources would just complicate progress. This meeting should agree to a single action plan and give it full support to expedite progress towards a farm animal genetic resources treaty. Pastoral associations in various forms should spearhead the diffusion of information on farm animal genetic resources at the grassroots level.
 - There is a need to recognize various livelihood strategies of animal breeders but at the same time come up with a single front for animal genetic resources. There is a need to act at the micro, meso, and macro levels and to engage different groups and, in particular, to involve the general public, youths, pastoral associations, NGOs and community service organizations.
 - Pastoralists are a subset of livestock keepers. Maximum attention should be given to the wider problem of free flow of genetic resources without too much focus on who owns them, as the focus is not on the ownership but on the free flow and access for all.
 - It was proposed there should be a statement to support communities' ownership over their farm animal genetic resources. In response it was noted that such a statement can be used to mean implicit approval of the imposition of IPR over farm animal genetic resources, which could quickly degenerate in favour of private entities.
 - However, there was insistence from the floor that the recognition the role of communities in the development of farm animal genetic resources can only be achieved via IPR.
 - It was noted it is a very fine line: the rejection of IPR over farm animal genetic resources will leave the question of ownership wide open, while its acceptance could also eventually lead to the exclusion of some communities from accessing farm animal genetic resources, which could be disastrous for food security.
 - A list of plants critical for food security is excluded from any IPR regime.
 - IPR regimes can only grant rights to legal persons. This necessitates the selection of a few persons in the community to own the IPR, which in itself a big risk.
 - Owing to the inherent complications on terminology, it was proposed that the term 'animal breeders' be used in the declaration to give the widest coverage possible.
 - This proposal was refined and it was agreed the term 'pastoralists/indigenous livestock breeders' be used.

Way forward

In the development of the way forward after the workshop, the following points were noted:

- Inadequate policy framework is one of the largest barriers to the farm animal genetic resources treaty. Participants were therefore in agreement that they

should, and would start lobbying their national governments by all means possible to redress this.

- It was proposed that a secretariat be elected to follow up on the recommendations of the workshop. This would be purported by regional subcommittees.
- It was also proposed that farm animal genetic resources issues to be included in various State of the World reports to raise their profile.
- It was resolved that all representatives from pastoral communities take the lead in diffusing awareness on farm animal genetic resources at their respective communities. The post-workshop steering committee was also charged with the responsibility of being a resource centre for these representatives.
- It was resolved that all organizations represented at the workshop will make all efforts to disseminate the proceedings and resolutions of the workshop to a wider audience.
- To gather the resources required for advocacy and pressure for farm animal genetic resources, it was resolved all present should develop and implement projects and project proposals to undertake the various steps needed for a farm animal genetic resources treaty.
- It was proposed that national working groups be formed to create awareness and participation in the process towards a farm animal genetic resources treaty.
- It was noted that representatives at the workshop were from pastoral communities with high visibility and presence within their countries. The need to involve less numerous and visible communities was noted.
- The need for follow-up meetings to monitor progress was noted.
- The use of district pastoral associations, and equivalent institutions for dissemination at grassroots level was proposed. It was also recommended that these organizations form peer networks that would help create a snowball effect and give them a presence at local and national development where they can agitate for animal genetic resources and related issues.
- Participants were challenged to define specific steps needed in capacity building and incorporate this in their action plans.
- The need to maintain the participation of grassroots communities in forums to address animal genetic resources issues was emphasized to ensure the process is continuously aware of the on-ground situation.
- It was also noted that a treaty on animal genetic resources is not the only (or necessarily the best) way to preserve farm animal genetic resources. Action in areas like land tenure, extension services and related areas also have an important contribution to make.
- Participants were encouraged to create links with institutions like IPGRI and CGIAR, which can greatly aid the cause of farm animal genetic resources. However, it was noted such organizations could only come on board if a certain critical mass of interest was present, so the first challenge is to create this interest.
- The Karen Commitment (page 8) henceforth will be the guide for participants and their respective organization and communities in contributing to the international, national and local debates on farm animal genetic resources. The central role in this debate will be played by FAO and the Convention on Biological Diversity, so it is very important to channel the views expressed in the workshop to these organizations.
- The organizers are committed to facilitating the opinions and contributions of participants to the subsequent debate and developments within FAO, the Convention on Biological Diversity and associated processes. Article 8j of the Convention on Biological Diversity will only be meaningful for animal breeding communities if they aggressively make demands to the Convention that their concerns be addressed.

The Karen Commitment

On the basis of these discussions, the workshop participants drafted a declaration about the contributions of pastoralists and other livestock keepers to developing animal genetic resources, and their rights to continue to do so. This declaration was named the 'Karen Commitment' after the venue of the workshop in Karen, Kenya. The full declaration is printed on page 8.

Participants

Mohamed Abass

Kenya Livestock Marketing Council
PO Box 2676, 00200 Nairobi, Kenya

Jecinta Abenyo

ITDG–East Africa
Turkana Office, PO Box 242, Lodwar, Kenya
Tel: +254 54 21451, 21443
Fax: +254 54 21451
Email: jecinta.abenyo@itdg.or.ke

Abdi Dakane Affey

District Pastoral Association–Wajir
PO Box 401, Wajir, Kenya

Elijah Agevi

ITDG–East Africa
PO Box 39493, 00623 Nairobi, Kenya
Tel: +254 2 2713540, 2715299, 2719313,
2719413
Fax: +254 2 2710083
Email: elijah.agevi@itdg.or.ke

Hedy Bühlmann

World Herders Council
PO Box 2453, 6002 Lucerne, Switzerland
Email: condial@bluewin.ch

Francis N Chabari

GTZ International Services
PO Box 41607, 00100 Nairobi, Kenya
Tel: +254 20 575088, 574751
Fax: +254 20 573228

Dashdamba Damdin

c/o GTZ, PO Box 46–107, Ulanbaatar 210646,
Mongolia
Tel: +976 11 9918 3752
Fax: +976 11 315 993

Prof JA Ekpere

University of Ibadan
PO Box 21824, Ibadan, Nigeria
Tel: +234 1 2629199, +234 080 3323 0430
Email: jekpere@hyperia.com

Maria Esipisu

ITDG–East Africa
PO Box 39493, 00623 Nairobi, Kenya
Tel: +254 2 2713540, 2715299, 2719313,
2719413
Fax: +254 2 2710083
Email: maria.esipisu@itdg.or.ke

Meso Galmagar

Pastoralist
c/o ITDG–East Africa, PO Box 202, Marsabit,
Kenya

Ebenyo Godwin

CEC Chairman Oropoi
ITDG–East Africa, PO Box 17, Lodwar, Kenya
Tel: +254 54 21451, 21443
Fax: +254 54 21451

Philip Boru Halake

Pastoralist
PO Box 3, Marsabit, Kenya

Olivier Hanotte

International Livestock Research Institute,
PO Box 30709, Nairobi 00100, Kenya
Tel: +254 20 630 743
Fax: +254 20 631 499
Email: o.hanotte@cgiar.org

Tura Isako

Kenya Agricultural Research Institute
PO Box 147, Marsabit, Kenya
Tel: +254 69 2040
Fax: +254 69 2220
Email: karimar@africaonline.co.ke

Martin Karimi

Email: martin.karimi@itdg.or.ke

Meshack Karithi

Email: meshack.karithi@itdg.or.ke

Ilse Köhler-Rollefson

League for Pastoral Peoples
Pragelatostrasse 20, 64372 Ober-Ramstadt,
Germany
Tel/fax: +49 6154 53642
Email: gorikr@t-online.de, ilsekr@rediffmail.com

Lily Langat

ITDG–East Africa
PO Box 39493, 00623 Nairobi, Kenya
Tel: +254 2 2713540, 2715299, 2719313,
2719413
Fax: +254 2 2710083
Email: cllangat@yahoo.com

Lucas Lolingoine

ITDG–East Africa
Box 325 Maralal, Kenya
Tel: +254 65 2236, 2227, 2229
Email: itmaralal@itdg.or.ke

Sharon Loorematta

ITDG–East Africa
PO Box 39493, 00623 Nairobi, Kenya
Tel: +254 2 2713540, 2715299, 2719313,
2719413
Fax: +254 2 2710083
Email: sharon.loorematta@itdg.or.ke

Thomas Loquang

Happy Cow Project, Karamoja Initiative for
Sustainable Peace
PO Box 26459, Kampala, Uganda
Email: tomloquang@yahoo.com
Tel: +256 77 224466
Fax: c/o Lily, +256 31 242500

Elzbieta Martyniuk

Ul. Ciszewskiego 8, O2-786 Warszawa, Poland
Tel: +48 22 8530934, 6231056
Email: martyniuk@alpha.sggw.waw.pl,
elzbieta.martyniuk@winrol.gov.pl

Isabella Masinde

ITDG–East Africa
PO Box 39493, 00623 Nairobi, Kenya
Tel: +254 2 2713540, 2715299, 2719313,
2719413
Fax: +254 2 2710083
Email: isabella.masinde@itdg.or.ke

Mbaabu Mathiu

University of Nairobi
PO Box 3659, 00100 Nairobi, Kenya

Thomas Mbeyela

National Artificial Insemination Centre
PO Box 557, Usa River, Tanzania
Tel: +255 27 2553850
Fax: +255 27 2553836
Email: naic@mstcdc.or.tz

Njuguna Mbogo

Ministry of Livestock & Fisheries Development
PO Box 34, Garissa, Kenya
Tel: +254 46 2056, 0722 241767

Duncan Mboyah

Biosafety News
PO Box 41992, Nairobi, Kenya
Tel: +254 2 253543
Fax: +254 2 316795
Email: duncanmboyah@yahoo.co.uk

Meghji N Meghji

Mwanza Rural Housing Programme
PO Box 2745, Mwanza, Tanzania
Tel: +255 744 888627
Email: mrhptz@yahoo.com

Taffese Mesfin

PENHA, Farm Africa
PO Box 5746, Addis Ababa, Ethiopia
Tel: +251 1 612424
Fax: +251 1 560526, 560527
Email: farm.ethiopia@teleco.net.et

Omar Sadik Mohammed

Garissa District Pastoral Association
PO Box 12 Dadaab, Garissa, Kenya
Tel: +254 46 3522, 2060
Fax: +254 46 3242
Email: aspectddb@hotmail.com

Charles Muchunguzi

Mbarara University of Science and Technology
PO Box 1410, Mbarara, Uganda
Tel: +256 77 559492
Fax: +256 485 20782
Email: muchunguzi2002@yahoo.co.uk

Patrick Mulvany

Intermediate Technology Development Group
Schumacher Centre for Technology & Develop-
ment, Bourton Hall, Bourton-on-Dunsmore,
Rugby, CV23 9QZ, United Kingdom
Tel: +44 1926 634400
Fax: +44 1926 634401
Email: patrickm@itdg.org.uk

Kimpei Munei

Dupoto-e-Maa, PO Box 264, Kajiado, Kenya
 Tel: +254 722 638899
 Email: kmunei@yahoo.com

Adam Elhag Musa

Chair of Pastoral Union
 PO Box 3182, Khartoum, Sudan
 Tel: +249 11763574
 Fax +249 11 787709

Rebecca Musyoka

Kenya Small Farmers Forum
 c/o Makanya, PELUM Country Desk, PO Box
 431, Matuu, Kenya

JN Mwangi

PO Box 25418, Nairobi, Kenya

Helen Nakimbugwe

National Animal Genetic Resources Centre and
 Data Bank, PO Box 183, Entebbe, Uganda
 Tel: +256 41 320 831
 Fax: +256 41 349 422
 Email: nakimbugwe@yahoo.com

Henry Neondo

All Africa News Agency (AANA)
 PO Box 2141, 05100 Nairobi, Kenya
 Tel: +254 733 655614
 Email: neondohenry@yahoo.com

James M Njau

Kenya National Federation of Agricultural
 Producers
 PO Box 62939, Nairobi, Kenya

Joyce Njoro

Community-Based Livestock Initiative Pro-
 gramme (CLIP)
 PO Box 1249, 00606 Nairobi, Kenya

Michael Ojiambo

Kenya Freedom From Hunger
 PO Box 30762, Nairobi, Kenya

Cleopas Okore

Ministry of Livestock and Fisheries
 PO Box 34188, Nairobi, Kenya
 Email: cleopasokore@yahoo.com

Nathan Ole-Lengisugi

Maasai Resource Centre for Indigenous Knowl-
 edge
 PO Box 3084, Arusha, Tanzania
 Tel: +255 027 8078 / 8002
 Email: olelengisugi@yahoo.co.uk

James Ombura

Veterinary Research Laboratories, Private Bag,
 00625 Kangemi, Nairobi, Kenya
 Tel: +254 20 632231
 Fax: +254 20 631273

Mendbaatar Osorjin

GTZ
 PO Box 46-107, Ulanbaatar 210646, Mongolia
 Tel: +976 11 99183752
 Fax: +976 11 315993
 Email: o_mendbaatar@yahoo.com

Fredrick O Otswong'o

Kenya Industrial Property Institute
 PO Box 51648, Nairobi, Kenya

Hanwant Singh Rathore

Lokhit Pashu-Palak Sansthan (LPPS)
 PO Box 1, Sadri, District Pali, Rajasthan, India
 Tel/fax: +91 29 3428 5086
 Email: lpps@sify.com

Yobo Rutin

Centre for Minority Rights Development
 PO Box 14692, Nairobi, Kenya

Adano Salesa

ITDG—East Africa Samburu Office
 PO Box 325, Maralal, Kenya
 Tel: +254 65 2236, 2227, 2229
 Email: itmaralal@itdg.or.ke

Ali Aii Shatu

Mbororo Social and Cultural Development
 Association
 PO Box 221, Bamenda, Cameroon
 Email: aliaishatu@yahoo.com

P Vivekanandan

Seva
 45, TPM Nagar, Virattipathu, Madurai 625 010,
 Tamil Nadu, India
 Tel: +254 452 238 0082
 Fax: +254 452 2300425
 Email: numvali@vsnl.com

Philip Walubengo

ITDG—East Africa
 PO Box 39493, 00623 Nairobi, Kenya
 Tel: +254 2 2713540, 2715299, 2719313,
 2719413
 Fax: +254 2 2710083
 Email: phillip.walubengo@itdg.or.ke
 phillip.singoro@itdg.or.ke

Kamwati Wango

ITDG–East Africa
PO Box 39493, 00623 Nairobi, Kenya
Tel: +254 2 2713540, 2715299, 2719313,
2719413
Fax: +254 2 2710083
Email: kamwati.wango@itdg.or.ke

Jacob Wanyama

ITDG–East Africa
PO Box 39493, 00623 Nairobi, Kenya
Tel: +254 2 2713540, 2715299, 2719313,
2719413
Fax: +254 2 2710083
Email: jacob.wanyama@itdg.or.ke

Molu Wato

Pastoralist
PO Box 257, Marsabit, Kenya

Vincent Wechabe

Ministry of Livestock & Fisheries Development
Box 314, Kapenguria, Kenya
Tel +254 5462460, 733 543287, 733 566730

Susan Yiapan

ITDG–East Africa
PO Box 39493, 00623 Nairobi, Kenya
Tel: +254 2 2713540, 2715299, 2719313,
2719413
Fax: +254 2 2710083
Email: susan.yiapan@itdg.or.ke

Vincent V Yiapan

Maa Herbal Practitioners & Conservation Club
PO Box 340, Narok, Kenya
Tel: +254 722 686718