Part 3 Views of government, scientists, experts and NGOs

Status of indigenous livestock breeds in Kenya

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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 Shorthorn zebu cattle. They are characterized by a well developed hump in the cervicothoracic 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 the large zebu and are found in the drier

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

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.

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

With regard to sheep breeds, there is a 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 specific production systems should be carried out simultaneously so that productive breeds can be identified. It is on this basis that rational decisions with 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

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Traditional livestock keepers and breeders in Africa have a rich tradi tional 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 domesticated animals globally are already extinct (Hall and Ruane 1993) and in Subsaharan 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 organizations 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 though 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 tradition 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.

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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

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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

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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 generate 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 my 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 knowledge[1]

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 art 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 application 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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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 is 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)

ILRI'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 (molecular 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 Makarere 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 biopiracy 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

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 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.