AFRICAN UNION

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REGIONAL MODEL POLICY/LEGAL FRAMEWORK FOR CONSERVATION, SUSTAINABLE UTILIZATION AND ACCESS AND BENEFIT SHARING OF FARM ANIMAL GENETIC RESOURCES

ICPALD

IGAD CENTRE FOR PASTORAL AREAS AND LIVESTOCK DEVELOPMENT

Contents

Abbreviations

ABS	Access and Benefit Sharing
AnGR	Animal Genetic Resources
ARP	Agricultural Revival Program
ASAL	Arid and Semi-Arid Areas
AU-IBAR	African Union-Inter-African Bureau for Animal Resources
CBD	Convention on Biological Diversity
FAO	Food and Agriculture Organisation
GDP	Gross Domestic Product
GPA	Global Plan of Action
IGAD	Intergovernmental Authority on Development
ICPALD	IGAD Centre for Pastoral Areas and Livestock Development
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
MOA	Ministry of Agriculture
MS	Member States
NBSAP	National Biodiversity Strategy and Action Plan
NGOs	Non-Governmental Organizations
NPA	National Plan of Action
SDG	Sustainable Development Goals
TRIPS	Trade-Related Aspects of Intellectual Property Rights
UNCCD	United Nations Convention on Combating Desertification
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
WIPO	World Intellectual Property Organization

Preface

The outcome of a study undertaken to explore the existing situation in relation to policies and regulatory frameworks for animal genetic resources in the IGAD region formed the basis for this document. It is a practical guide to develop model policy and legal frameworks related to conservation and sustainable utilization of animal genetic resources.

Specifically, the framework addresses issues of access to, and equitable distribution of benefits accrued from the use of those genetic resources. The model policy and legal frameworks are expected to be adopted by member states.

Indigenous livestock in the IGAD region are vital to the economies of its members and the livelihood of livestock keepers. The significant diversity in the region's animal genetic resources and its importance to animal agriculture cannot be ignored or over emphasized.

In mostly arid and semi-arid area where crop production is limited, indigenous animal genetic resources remain the main means of utilizing land and feed resources. Within the IGAD member states, the way indigenous animals are kept is of low input and low output system. For instance, for generations, animals were subjected to natural and human selection for adaptability, and were not adequately responsive to intensive type of production.

It's against this background that policies in all countries in the region support the introduction of exotic animals for the simple reason that they are less adapted yet greatly suited to high input intensive production system.

It is important to note that success with the introduction of exotic animals is limited because over the years, the indiscriminate use of exotic animals has become a threat to indigenous animals due to dilution. This challenge affects mostly cattle and chicken breeds. Because of the diversity indigenous animals have, they can be treated as reservoir of genetic variability that can be tapped at the present and in the future.

What's more, there is a significant amount of indigenous knowledge accumulated over time when it comes to managing indigenous animals. Conservation, sustainable use and protecting the resources from bio-piracy and preventing the unwarranted use of indigenous knowledge of communities, are actions which need to be given priority.

In this regard, policy and legal considerations are critically important. This document is intended to contribute to the fulfilment of this objective in the IGAD region.

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Executive Summary

The IGAD region is endowed with both natural and human resources that include different climatic conditions, landscapes, ecosystems, agro-ecological zones and diverse cultures that can economically work for the best of its members.

In the past, the region has served as a gateway for entry into Africa for a large number of domesticated animals from their geographic areas of taming.

As a result, the region has a wealth of indigenous farm animal genetic resources which are highly adapted to local environmental conditions and to the type of management practiced by farmers and pastoralists in the region.

Ideally, resources from livestock are important components of the livelihood of the people in the region and the national economies of member states of the IGAD.

As such, growth in livestock production and productivity have the potential of providing huge opportunities for improved livelihood of producers and by extension the overall growth of the national economy. The genetic diversity of the various species and breeds make the region a reservoir of important genetic variations (genes) which may help improve what we have presently as well as address possible challenges in future.

For instance climate change, new emerging diseases and exploit opportunities like biotechnology, change in market preference among others.

Indigenous farm animal genetic resources in the region result from natural selection and meticulous breeding management practices by generations of farmers and pastoralists. The use of animals as genetic resources should therefore give credit to farmers and pastoralists.

As such, there is an urgent need to come up with appropriate framework and mechanisms that specifically address issues of;

a) Access to such resources, and

b) Guidelines on how custodian communities can receive any benefits that accrues from the use of genetic resources.

Currently, indigenous animal genetic resources in the IGAD region are threatened by changes in production systems, population pressure, land

scarcity, climate change, and erroneous development policies which encourage an indiscriminate use of exotic animal breeds.

In view of this, there is an urgent need to introduce conservation and sustainable utilization measures that focuses specifically on animal genetic resources.

It is about time and as part of the global effort for IGAD member states to live up to their commitment towards conservation and sustainable utilization of biodiversity and access to and equitable sharing of benefits from genetic resources, for the good of the region and discharge their pledge to the international community.

So far, all member states signed, ratified and/or acceding to the instrument and hence are party to the Convention on Biological Diversity (CBD).

Countries have enacted important policies that have great relevance to the conservation and use of animal genetic resources. However, there is need for further development of policies and legal frameworks that specifically address farm animal genetic resources.

In view of this, the Global Plan of Action (GPA) agreed upon in 2007 – along with the 'Interlaken Declaration' – is of critical importance in implementing the stocktaking of the resources, conservation, sustainable use and access to and benefits sharing. It is a self-guiding plan, and all IGAD member states should urgently adopt it into their national plan of action for animal genetic resources.

1. Introduction

The Intergovernmental Authority on Development (IGAD) is a regional economic community in Eastern Africa. IGAD has three priority areas of cooperation among member states namely a) food security and environmental protection; (b) economic cooperation, regional integration and social development; and (c) peace, security and humanitarian affairs.

Like any multilateral institution, IGAD is not merely a total sum of individual states, but a coming together of distinct states that represent an expression of an overlapping regional norms, institutional and procedural framework that believe in a common development agenda that revolve around shared visions, missions and an overlapping consensus.

Among its many aims and objectives, IGAD offers opportunities to member states to influence, shape and exert an impact on regional and domestic conditions through believing in a common agenda that's anchored in shared challenges and opportunities, that are geared towards strengthening the capacity of African countries to conserve, and sustain the utilization and access and benefit sharing of farm animal genetic resources.

In the horn of Africa region, IGAD member state comprises Uganda, Sudan, South Sudan, Somalia, Kenya, Ethiopia, Eritrea and Djibouti stretching over an area of 5.2 million km^2. The region has about 6910 km of international borders with Egypt, Libya, Chad, Central Africa Republic, Democratic Republic of Congo, Rwanda and Tanzania. The rest of the region is well endowed with a variety of climates, landscapes, and swamp areas among others.

What's more, the region possesses diverse ecosystems and agro-ecological zones at different altitudes ranging from 150 meters below sea level (Dalul) to about 4600 meters above the sea level (Mount Kenya) (IGAD, 2016).

Socio-economically, most of the IGAD Member States belong to the world's Least Developed Countries (LDCs) and share similar economic growth rates and social ethnic groups across their borders, which could be a good opportunity for regional integration, if appropriately utilized. Farmlands account for 7 percent, forests 19 percent and permanent pastures 28 percent of the total land area. The remaining 46 percent is relatively unproductive

or marginal land. Additionally, this region also contains extensive mineral resources that have not yet been fully explored and exploited.

The region has also been gateway into Africa of a large number of domesticated animals and a centre of origin and/or diversity for a sizeable number of crop species and domesticated animals. Because of its agro-ecological and climatic settings and by virtue of its location, the region is rich in highly adapted indigenous plant and animal genetic resources.

About 70 percent of the IGAD region is made up of Arid and Semi-Arid Lands (ASALs), which receive less than 600 mm of rainfall annually. This makes it vulnerable to dry spells and recurrent droughts, and the presence of land and environmental degradation are serious threats to agricultural growth and biodiversity.

Food insecurity, famine, poverty, socio-economic and political tensions – often attended by conflicts – are not rare phenomena there. Sustainable management of natural resources is therefore indispensable if IGAD states are to make inroads in the three priority areas mentioned above.

Although, to a varying magnitude, animal genetic resources are important components of the livelihood of farmers and pastoralists in all member states of the IGAD region. The region owns 8 percent of the cattle, 10 percent of the small ruminants and 51 percent of the camel population in the world (IGAD, 2016). The ruminant population is estimated at 336 million head (ICPALD / IGAD, 2017). The animals are dominantly of indigenous type and there exist diverse breeds of cattle, camels, sheep, goats, chicken and equine.

These animals are greatly adapted to the existing environmental (mainly management and climatic) conditions. They are mostly maintained under low input system. Output from these indigenous animals is considered small. This is attributed to low reproduction performance and milk and meat productivity.

With these factors in mind, livestock contribution to food security and livelihood is not commensurate with the population size of the region. Apart from camels and to a lesser extent equines, the vision has been to import exotic breeds with the aim of raising production (performance) and productivity.

However, these exotic animals are not adaptable to existing environmental conditions. They generally require more inputs and better management than indigenous animals.

Consequently, exotic animals and their crosses fail to thrive under the traditional production systems. Apart from the vulnerability of the region to dry spells and recurrent droughts, exotic animals are also becoming a threat to the existence of indigenous animals because of genetic dilution and replacement.

There has been numerous efforts at the international level to change the above narrative and ensure the realization of the three pillars of the Convention on Biological Diversity (i.e., conservation, sustainable utilization and access and benefit sharing (ABS)).

In as far as animal genetic resources goes, two global reports on the State of the World's Animal Genetic Resources (AnGR) have already been developed along with a Global Plan of Action (GPA).

Appropriate policies and legal frameworks on indigenous animal genetic resources have also been developed, but, countries need to adopt the GPA in formulating national plans of action first.

As part of the effort to deliver, the African Union – Interafrican Bureau for Animal Resources (AU-IBAR) has embarked on an initiative to enhance the contribution of livestock to food security and economic growth in the continent with special emphasis on the IGAD region.

The livestock resources of the IGAD region make significant contribution to national economies of the countries and are very critical to the livelihood of a sizeable segment of the population. As such, growth in production and productivity from these livestock can make significant contribution to improve the livelihood of producers and the national economy at large.

Unlike exotic breeds and their crosses, these resources are predominantly of indigenous origin – especially in the Arid and Semi-Arid Areas (ASAL). They are well adapted to environmental (management and climatic) conditions of the existing production systems. Moreover, the resources are valuable assets in meeting future challenges that may happen due to changes in climate, market, technology etc.

That said, the conservation and improvement of animal genetic resources for higher production and productivity have not received the required levels of attention. Lack of appropriate policies and legal provisions are among the major causes for the absence of significant conservation and sustainable genetic improvement programs.

The AU-IBAR, in collaboration with IGAD, has taken the initiative to address policy and legal gaps in the animal genetic resources of the IGAD member states. Appropriate policy and legal provisions pertaining to conservation, sustainable use and access to and benefit sharing in relation to animal genetic resources are vital in guiding actions at the national and regional levels. They will also ensure the adoption and effective implementation of global action plans are aligned to regional and global movements.

This is why, this model legal framework has been developed to enable member states consider its uptake and adopt regional and international provisions as pertains to animal genetic resources. Also, to align to the Vision and Mission statements of IGAD by addressing the following overall and specific objectives.

Overall Objective

The overall objective of this study is to enhance the contribution of animal genetic resources to food security and economic growth by promoting genetic improvement and conservation efforts in the IGAD Region.

Specific Objectives

The specific objectives of this initiative are:

- Reviewing relevant policy and legal frameworks at the regional and global levels;
- Reviewing and consulting the status of policy and legal frameworks in the management of animal genetic resources at national level in IGAD member states;
- Developing and validating AnGR model regional policy and legal frameworks that regulate and enhance breed utilization, conservation, improvement and exchange of farm animal genetic materials at regional and national levels

Methodology

A total of 82 publications; reports, articles, policy and legal documents –

including six national reports that had been submitted to the Second State of the World Animal Genetic Resources (Djibouti, Eritrea, Ethiopia, Kenya, Uganda and Sudan), and national biodiversity strategies and action plans (NBSAP) of all IGAD member states, – were used in appraising the policy and legal issues.

Additional documents and information were collected from South Sudan and Somaliland through field visits. Responses to questionnaires were also obtained from Puntland and South central State of Somalia. Additionally, a review of policy and legal frameworks documents relating to animal genetic resources at international, regional or national levels was carried out to extract information on existing provisions and the state of their implementation before evaluating commitments under international conventions and frameworks and the member states' practice of compliance with the commitments.

All IGAD member states are parties to the Convention on Biological Diversity (CBD). They all have either ratified or acceded to the Cartagena Protocol on Biosafety and the Nagoya Protocol for Access and Benefit Sharing. Except for South Sudan, all IGAD member states are also parties to the Kyoto Protocol on Climate Change (*Table 1*). Measures taken in relation to the development of policies and legal frameworks to implement these international commitments were therefore evaluated to identify gaps in policy and legal frameworks. Existing international provisions, the experience of other countries, and other pertinent documents were likewise used to develop the model policy and legal frameworks.

Table 1: Compliance matrix of IGAD member states towards international conventions/protocols of relevance to AnGR and reporting requirements

Name of Relevant International Instrument	Djibouti	Eritrea	Ethiopia	Sudan	S. Sudan	Somalia	Kenya	Uganda
Convention on Biological Diversity	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
The Nagoya Protocol	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
The Cartagena Protocol	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5th Country Report on CBD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2nd Country Report on State of AnGR	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Finalize National Plan of Action on AnGR	No	No	Yes	No	No	No	No	No

2. Status and Trends of Animal Genetic Resources in the IGAD Region

The Total human population of IGAD member states is 230 million (IGAD, 2017). Agriculture and livestock play a significant role in the livelihood of people in this region. Despite differences among member states, IGAD countries have a sizeable population of farm animal genetic resources *(Table 2*). Except in cattle, chicken and pig where exotic breeds account for considerable proportion of the population, indigenous breeds are vastly dominant.

However, with uncontrolled breeding of farm animals, there is a high likelihood of genetic dilution of indigenous animals through cross-breeding with the exotic species. This has so far affected chicken and cattle population. As for pigs, the dominant breeds are the exotic animals which makes the concern grave.

In the meantime, no focus has been given to indigenous genetic resources.

Key drivers of change that significantly threaten indigenous farm AnGR include:

- Rapid human population growth and decrease in grazing land.
- Changes in farmers' preference – inclining towards high yielding exotic breeds.
- The absence of breeding programs and policy.
- Lack of systematic monitoring of AnGR.
- Change in production systems.
- Climate change, and
- Cross-border trade.

In addition, there is an apparent misunderstanding of the comparative advantage of indigenous breeds of animals over exotic ones in terms of total economic performance. As a result, there has been an increasing trend on the part of public and private livestock development actors to adopt exotic animals.

Table 2. Farm animal population in the IGAD member states (millions)

	Cattle	Sheep	Goats	Camel	Chicken	Donkey	Horse	Pig
South Sudan#	17.7	11.71	12.3	0.024	0.014	0.22		0.0014
Sudan	29.4	39.1	30.5	4.6	47**		0.085	
Ethiopia	56.7	29.3	29.1	1.2	56.9	7.4	2	
Eritrea	1.9	2.1	4.6	0.1	2.5			
Djibouti	0.05	0.3	0.4	0.04	0.01	0.0065		
Kenya	17.5	17.1	27.4	3	31.8*	1.8*		0.33*
Somalia*	5.1	22	26.7	8.5				
Uganda	11.4	3.4	12.5		37.4			3.2

Source: Second Country Reports on the State of Animal Genetic Resources
* ICPALD, 2013; Too et al. 2015; Onyango et al., 2015
** Khalifa et al., 2013

2.1. Djibouti

The Republic of Djibouti has a surface area of 23,200 km² and 370 km of sea-coast. It is the smallest member state in the IGAD region. The country boarders Somalia to the South, Ethiopia to the West and Eritrea to the North. Of the 23,200 km², about 200,000 ha is covered by natural rangelands.

October to April are the cools seasons oscillating between 22°C and 30°C. The warm seasons last from May to September. During this time, average temperature range between 35°C and 40°C.

The County's total human population is estimated at one million with a per-capita GDP of 2007 USD.

Currently, intensive livestock farming in Djibouti represents about 20% of the total number of national livestock – situated around towns and villages. These are mainly private farms who keep livestock for milk production and fattening of small ruminants for meat production. Indigenous farm animal genetic resources are characterized by their rusticity and adaptation to climatic conditions of the country, but their productivity rate is low. They represent 90% of the total number of animal species used throughout the country. About 10% are exotic breeds (Friesian, Holstein, Black Pied and Red-footed) and are generally selected for their performance in dairy production by Djiboutian breeders or cooperative associations in peri-urban areas.

The indigenous livestock breeds are much closer to those living in similar

agro-ecological zones in neighbouring countries like Ethiopia, Somalia and Eritrea. Currently, there exist two cattle, two sheep (one a cross between Black Head Somali and Afar Sheep), two goat, two camel and one donkey breeds.

Livestock production accounts for 3-5% of the GNP and 10% of the food requirements, and yet it is the main or sole source of livelihood for one-half to one-third of the country's population and 90% of the rural populace (Brass and Leonard, 2007).

Djibouti is a party to the CBD and has already submitted the 5th Report to the Secretariat and they have also developed a National Biodiversity Strategy and Action Plan. The report has already been submitted to the State of the World Animal Genetic Resources. With regard to adoption of the Global Plan of Action for Animal Genetic Resources, Djibouti has not yet developed a National Plan of Action for this sector.

There are no *in-situ* or *ex-situ* conservation programs in Djibouti. Lack of human resource and expertise in AnGR, lack of capacity within institutions involved, lack of coordination both between institutions and with pastoralist communities, and lack of appropriate policy, strategy and action plan in the field of animal breeding continue to affect the state of conservation and utilization of farm animal genetic resources in Djibouti.

2.2. Eritrea

Eritrea covers a total land area of about 124,320 km² with a varied topography, rainfall and climate. Its altitude ranges from 120 meters below sea level to over 3,000 meters above sea level. The human population is 3.5 million, 70-80% of whom live in rural areas and derive their livelihood from agricultural activities, both crop and livestock production (MoLWE, 2015). The per-capita GDP is 1093 USD.

When it comes to farm animal genetic diversity, Eritrea has two breeds of cattle, three breeds of sheep, one breed of goat and one ecotype of chicken. All of which are indigenous. Livestock contribute about 25% of the agricultural GDP and represents a major part of the export earnings (SoW-ANGR: Eritrea, 2013). Over 98% of Eritrean farmers raise livestock of some form – although the level of dependence on livestock varies considerably across populations and regions (Government of Eritrea, 2006).

Rangeland in Eritrea is estimated to be 6 million ha (49% of the total land mass of the country). ; 75% of the total population depends on livestock and livestock production (MoLWE, 2015).

Eritrea is signatory to the CBD and has prepared and revised its National Biodiversity Strategy and Action Plan.

The country has kept its commitment to the Convention by submitting reports which describe and update on the status, trends and threats of biodiversity, measures undertaken in achieving the objectives of the Convention and progresses made towards the Achi targets of 2020, since the submission of the Fourth National Report of 2010.

They have however not developed its own National Plan of Action for Animal Genetic Resources by adopting the Global Plan of Action. The country has a National Advisory Committee for Animal Genetic Resources.

Despite its establishment before the GPA, it fits in well with the strategic priority of the GPA. Still, the coverage under the National Biodiversity Strategy and Action Plan would not be adequate to address the conservation, sustainable use and access and benefit sharing aspects of animal genetic resources.

To date, Eritrea has submitted reports to the State of the World Animal Genetic Resources. While policy and legal frameworks that have indirect bearing on animal genetic resources exist, policies and laws directly regulating animal genetic resources are still lacking (Second Country Report on Animal Genetic Resources).

2.3. Ethiopia

Ethiopia has a land area of 1,127,127 km² with altitude variations ranging from 126 meter below sea level in the Danakil Depression of the Afar to 4,620 meters above sea level at Mount Ras Dejen. The country has 10 ecosystems, and 18 major and 49 minor agro-ecologies that are inhabited by flora and fauna and microbial genetic resources. The population of the country is estimated at 100 million with a per capita GDP of 687 USD.

In terms of species diversity, 28 breeds of cattle, nine breeds of sheep, eight breeds of goat, seven breeds of camel, six breeds of donkey, eight breeds of horse, two breeds of mule and seven ecotypes of chicken, have been identified so far.

Domestic farm animals or livestock play important roles in providing food, household income, drought-power, manure/fuel, and ecological and social functions. Livestock also serve as sources of export commodities in the form of live animals, hides and skins, meat and meat products, honey and bees. Earning foreign exchange for the country.

Ethiopia is a party to the CBD and has discharged its obligation of developing a national strategy for conservation and sustainable use of its biodiversity, and for integrating conservation into relevant sectoral and cross-sectoral plans by developing and revising its National Biodiversity Strategy and Action Plan. The country has accepted the Nagoya Protocol and the Cartagena Protocol.

They have since developed a National Strategy and Plan of Action for conservation and sustainable utilization of AnGR by adopting the Global Plan of Action, in line with the spirit of the Interlaken Declaration. They have also submitted reports for the First and Second State of the World's Animal Genetic Resources.

Despite inadequate implementation, Ethiopia has developed several policies and legal frameworks and institutionalized biodiversity. These measures include the proclamation on ABS, the institutionalization of biodiversity, the establishment of animal genetic resources directorate within the institution, recognition of breeder's rights, the enactment of animal breeding policy, and the establishment of the Ministry of Livestock and Fisheries. These instruments have direct and indirect impact on conservation, sustainable utilization and access and benefit sharing of AnGR.

2.4. Kenya

The total geographical area of Kenya is approximately 583,000 km^2. 28% of this space belongs to marine ecosystems while the remaining 72% is terrestrial. The total human population stands at about 40 million currently. Kenya has 17 cattle, three sheep, two goat, four camel and one chicken, locally adapted breeds.

Livestock contributes an estimated 5.6% to the GDP. (Kenya National Bureau of Statistics, 2015) while agriculture contributes about 42% (FAO STAT, 2005).

The sector earns the country substantial foreign exchange through exporting livestock and livestock products. It employs close to 50% of Kenya's agricultural

labour force (Ministry of Agriculture, Livestock and Fisheries, 2017). The per-capita GDP is 1455 USD.

Kenya is a signatory to the CBD. The country is committed to its implementation and the promotion of all the three pillar objectives stipulated in the CBD. The country has complied with requirements of the Convention.

It has submitted report for the fifth time in relation to implementation of provisions of the CBD and provided an overview of recent governmental and non-governmental activities on biodiversity in Kenya in relation to the Aichi targets. The Fifth Country Report on CBD indicated that significant progress has been made in the implementation of the Convention, strategic plan and the Aichi targets.

However, speedy implementation is heavily affected by the country's incapacity with respect to financial, human, scientific, technical and technological needs.

Kenya has ratified the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits arising from their utilization. Meanwhile, the process of revising and updating the National Biodiversity Strategy and Action Plan of Kenya is already underway and has been very inclusive – involving participation of key stakeholders such as policy makers, local communities, academic institutions, civil society and NGOs. The revised document is expected to be launched soon.

A draft National Action Plan on Animal Genetic Resources of Kenya, an adoption of the Global Plan of Action, has already been drafted and is under discussion. The draft has 21 strategic priorities structured under four priority areas.

Kenya has submitted reports to the first two State of the World Animal Genetic Resources to FAO. The reports indicate the presence of gaps with regard to the implementation of the three pillar principles of the CBD: conservation, sustainable utilization and access and benefit sharing.

In order to support the livestock sub-sector, Kenya has embarked on the formulation of policies that guide the management of AnGR. They include the national livestock policy, dairy development policy, poultry development policy and the feeds policy.

The formulation of Animal Breeding Policy and bill has been completed and the documents are in their final draft forms waiting for parliamentary approval. It appears that the enactment of the Breeding Policy has been procrastinated and would need to be finalized.

While policies and laws relevant to AnGR exist, there are still challenges relating to implementation – largely attributed to the insufficient focus given to the management strategies of AnGR (Ministry of Agriculture, Livestock and Fisheries, 2016).

2.5. Somalia

Somalia is on the far eastern side of Africa. It has a total area of 637,657 km2, with a coastline of about 3,025 km. The longest in continental Africa. Its human population is estimated at 10.5 million. The country's GDP is projected to be 1.06 Billion USD with a per capita income of 187 USD.

According to World Bank, livestock is the mainstay of the economy in Somalia. 60% of the population derives its livelihood from pastoralism-based livestock production. Export of livestock and meat generates 80% of Somalia's foreign currency earning.

Other sources report that pastoralism accounts for over 50% of the population, 40% of the GDP, 65% of the export earnings (Federal Republic of Somalia, 2015), and is the basis of the economy founded on wet and dry season grazing/browsing of natural resources (grasses, herbs, browse, trees and shrubs).

Although highly adapted breeds of livestock are kept under the pastoral production system, the characterization of these animal genetic resources is still lacking.

Somalia acceded to the CBD in Aichi in September 2009 and became the 193rd party to the CBD. The country has developed its first national Biodiversity Strategy and Action Plan (NBSAP) and also reported on the state of CBD. What's more, the country has developed a large number of policies, regulations and legal frameworks in each of the three parts of Somalia (the Federal Somalia, Somaliland and Puntland).

However, the country has not adopted the Global Plan of Action for Animal Genetic Resources. It has also not developed a national plan of action neither has it reported to the State of the World Animal Genetic Resources.

2.6. South Sudan

South Sudan has a land area of 647,181 km2. Potential arable land in South Sudan covers 30% of the total land surface, grazing land 40%, forests 23% and swamps and open water 7%. The total contribution of livestock and livestock products to the national economy is estimated to be between 2.48 and 9.362 Billion USD. Oil exports account for virtually all the exports, and for around 80% of the GDP (World Bank, 2014). South Sudan has a population of 11,296,000 of which 83% live in rural areas. Pastoralism contributes for about 15% of the GDP of South Sudan. The per-capita GDP is 534 USD.

The cattle population of South Sudan is estimated to be 17.7 million. Goat, sheep, camel, pig and chicken population is 12.3 million, 11.7 million, 23.6 thousand, 14.4 thousand and 5 million, respectively. The characterization of animal genetic resources of South Sudan has not yet been undertaken; there is no dependable information on the number of breeds of the various livestock species in the country.

In South Sudan, cattle are not just kept for food, they signify social status and wealth. They also serve as the main livelihood asset for pastoralist communities. Livestock is sold for cash, slaughtered for cultural practices, bartered for grain, used as payment for penalties, and given for dowry.

South Sudan acceded to CBD on 17 February 2014 and is already filling national report on CBD as of the fifth report period. The NBSAP on the other hand is still under preparation.

With respect to adopting the Global Plan of Action for Animal Genetic Resources into national plan of action, no measure has been taken by South Sudan so far. Also, the country hasn't submitted any report for the State of the World Animal Genetic Resources.

Despite this, South Sudan has developed important policies and legal frameworks which have implications on the conservation and sustainable utilization of animal genetic resources. They include the National Agricultural and Livestock Extension Policy (NALEP), the Comprehensive Agricultural Master Plan (CAMP), the Irrigation Development Master Plan (IDMP), the draft Veterinary Legislation, and the Livestock Production Policy documents are just a few of such instruments that have a bearing on livestock resources.

2.7. Sudan

Sudan's land area of 1,886,068 km² is home to a population of about 37 million people and 130 million livestock. Most of the land is an arid area. But it keeps an immense and diversified wealth of domesticated livestock species – including cattle, sheep, goats and camels.

The per-capita GDP is 2094 USD.

There are different types and breeds of livestock in the country. Majority of which are raised within tribal groups and often carry the names of the tribes or localities. Other domesticated local types of animals include horses, donkeys, pigs and poultry.

According to the Second Country Report of Sudan on the State of Animal Genetic Resources, the country has five indigenous cattle breeds, five sheep breeds, three goat breeds, three chicken ecotypes, three ass breeds, one duck ecotype, three dromedaries, one buffalo and two Guinea fowls breeds. Earlier reports indicate that Sudan, before the split, had 5 camel, 5 horse and 5 ass breeds (Sudan, 2006 as cited by Fahey and Leonardo, 2007).

Livestock plays a huge role as a food system, store of value, wealth, and means of access to power and authority in places where the banking system and market economy do not reach or function properly. Livestock has consistently provided more than 60% of the estimated value add to the agricultural sector in the years 2007-2010. Livestock is by value the largest sub-sector of Sudan's domestic economy. Larger than petroleum. Livestock's share of exports in Sudan is considerable, and is growing; since 1997, exports have averaged 27% of the agricultural exports (rising up to 47% in 2009).

So far, Sudan signed and ratified the CBD in 1992 and 1995. The Higher Council for Environment and Natural Resources (HCENR) is Sudan's focal point for the CBD. Sudan has reported up to the fifth country report on CBD and has also developed and revised a National Biodiversity Strategy and Action Plan.

However, they have not adopted the Global Plan of Action for Animal Genetic Resources into its national plan of action, even though it has been reported on for the First and Second State of the World Animal Genetic Resources.

Other policies that have been developed in the country include;

- The Breeding Policy which is still at a draft stage;
- A draft Strategy for range management titled *'Pastoral Strategic Action Plans for Semi Desert and Low Rainfall Savannah in Sudan 2014-2024'* prepared in 2013 with the objective of building the resilience of pastoral communities to climate change in two ecosystems in Sudan.
- A National Bio-safety Law dealing with the application of modern biotechnology, in accordance with the national, regional and international commitments was issued in 2010.

2.8. Uganda

The total land area of Uganda is 241,559 km² holding a population of over 34 million. Per capita GDP is about 610 USD. Uganda has three cattle, two sheep, two goat, one pig and three locally adapted breeds.

The National chicken population is estimated to be 37.4 million – with the largest proportion (87.7%) being of indigenous type of chicken.

The contribution of agriculture to the GDP is around 23% and the sector employs about 70% of the population. Livestock production in Uganda contributes 3.2% of the total GDP (Behnke and Nakirya, 2012).

For the past decade, agricultural GDP growth has averaged about 1% per annum while that of the livestock sub-sector remained steady – at 3% per annum. This makes the livestock industry to remain one of the major contributors to agricultural GDP growth.

Uganda ratified the CBD on 8th September 1993. It is a Party to the Cartagena Protocol on Bio-safety, the Nagoya Protocol on Access to Genetic Resources and Benefit Sharing (ABS) and the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress to Cartagena Protocol on Bio-safety.

Uganda developed its First and Second National Biodiversity Strategy and Action Plan (NBSAPI & NBSAPII) in 2002 and 2016 respectively. NBSAPII has national biodiversity targets in accordance with the guidance in decision X/2 and similarly using the Strategic Plan for the Cartagena Protocol on Bio-safety 2011-2020.

The national biodiversity targets provide a framework for measuring progress in the implementation of NBSAPII. It will be executed by target champions.

The NBSAPII has incorporated the government's priority development agenda under the National Vision 2040.

As a result, the NBSAPII has been mainstreamed in the National Development Plan II. The NBSAPII has also been aligned with the Sustainable Development Goals (SDGs) and has integrated gender issues to comply with requirements of gender-responsiveness.

That said, the country has not developed its own National Plan of Action for Animal Genetic Resources by adopting the Global Plan of Action. However, issues of animal genetic resources have been incorporated in limited forms under the National Biodiversity Strategy Action Plan (NPSAP).

Uganda has submitted reports for the First and Second State of the World's Animal Genetic Resources. In addition, the country has already established a National Advisory Committee for Animal Genetic Resources.

3. Policy and Legal Frameworks

3.1. International Conventions and Legal Frameworks on AnGR

3.1.1. The World Conservation Strategy (Living Resource Conservation for Sustainable Development 1980)

Long before the CBD, a global instrument addressing the conservation and sustainable use of genetic resources was developed – the 1980 World Conservation Strategy had been initiated by the International Union for the Conservation of Nature and Natural Resources (IUCN), the United Nations Environment Program (UNEP) and the Worldwide Fund for Nature (WWF).

One of the objectives of the Strategy was to preserve genetic diversity on which breeding programs necessary for the protection and improvement of cultivated plants and domesticated animals, as well as much of the scientific advance, technical innovation, and the security of industries that use living resources depend (Richard, Undated). The Strategy was not legally binding, but has served as one of the precursors of the CBD.

Chapter 9 of the Strategy (on policy making and integration of conservation and development) requests the policy goals of agriculture to include;

- Supply of food and other agricultural products in sufficient quantity and of acceptable quality,
- Consistent with the maintenance of the resource base particularly soils, water, habitats of organisms necessary for pollination and integrated pest control, and
- The genetic diversity of crops, domestic animals and their wild relatives.

3.1.2. Convention on Biological Diversity

The International Convention on Biological Diversity (CBD) come about from the need for a stronger commitment to safeguard the global wealth of biodiversity against threats.. Unlike the previous legal frameworks and agreements which focused on specific component of biodiversity (e.g. plant, wildlife etc.), the CBD considers all forms of biodiversity (plant, animal and microbial) and the indigenous knowledge associated with biodiversity.

It is the only international instrument that comprehensively addresses biological diversity (Secretariat of the Convention on Biological Diversity, 2011).

The CBD was opened for signature on 5th June 1992 – on the occasion of the United Nations Conference on Environment and Development (the Rio "Earth Summit") and enforced on 29th December 1993.

In its preamble, the CBD stipulates that conservation of biological diversity is a common concern of humankind and that states having sovereign rights over biological resources are responsible for conserving biological diversity and for using biological resources in a sustainable manner.

The key objectives of the CBD are;

- Conservation of biological diversity.
- Sustainable use of its components and
- Fair and equitable sharing of benefits arising out of the utilization of genetic resources, through appropriate access to genetic resources and appropriate transfer of relevant technologies, taking into account all rights over the resources and technologies.

The need for periodic reporting on the state of biodiversity (Article 26) and the development of National Biodiversity Strategy and Action Plans (Article 6) are among the major commitments state parties undertook under the CBD.

Subsequent to the CBD, other provisions, guidelines and action plans have been developed with the objective of implementing the CBD. The periodic reports aim at monitoring the countries' commitment in implementing the CBD. As components of biodiversity, animal genetic resources are covered by the CBD.

However, there is need for specific provisions and institutional arrangements to be in place to facilitate implementation and address the specific needs of conservation and sustainable utilization of animal genetic resources.

Hence, an Intergovernmental Technical Working Group on Animal Genetic Resources for Food and Agriculture (ITWG-AnGR) was established under United Nations Food and Agriculture Organization's Commission on Genetic Resources for Food and Agriculture (CGRFA). At the International Technical Conference on Animal Genetic Resources for Food and Agriculture held in Interlaken, Switzerland in 2007, the parties adopted the Global Plan of Action (GPA) for Animal Genetic Resources.

The GPA has four strategic priority areas, namely;

- Characterization, inventory and monitoring of trend and associated risks;
- Sustainable use and development;
- Conservation; and
- Policies, institutions and capacity building.

Under the four strategic areas, 23 strategic priorities which are applicable at national, regional or international levels have been identified. Along with the GPA, state parties also issued the Interlaken Declaration which specifically addressed animal genetic resources.

3.1.3. The Nagoya Protocol

At the 10th Conference of Parties (COP) held in Nagoya, Japan in October 2010, agreements were reached on a range of objectives relating to implementation of the CBD provisions during the period of 2011-2020.

Among the decisions taken at Nagoya was the COP10 Decision X/34 on Agricultural Biodiversity, which includes the following paragraphs: "Recognizes the importance of the processes led by the Food and Agriculture Organization of the United Nations such as implementation of the Global Plan of Action on Animal Genetic Resources for Food and Agriculture".

In decision X/2, the Conference of Parties adopted a revised and updated Strategic Plan for Biodiversity, including the Aichi Biodiversity Targets, for the 2011-2020 period.

The Nagoya Protocol, which entered into force on 12th October 2014, significantly advanced the CBD's third objective – the fair and equitable sharing of benefits arising out of the utilization of genetic resources. It provided a strong basis for greater legal certainty and transparency for both the providers and users of genetic resources.

Significant innovations of the Protocol include specific obligations to support compliance with domestic legislations of the party providing genetic resources and contractual obligations reflected in mutually agreed terms.

The Nagoya Protocol builds on and expands a set of voluntary guidelines on access to genetic resources and benefit-sharing adopted by the Convention in 2002 as the *Bonn Guidelines on Access to Genetic Resources and Fair and*

Equitable Sharing of the Benefits Arising out of their Utilization. The Protocol elaborates on, and gives force to the key articles of the Convention on access and benefit-sharing and makes the connection between genetic resources and traditional knowledge on indigenous and local communities very explicit.

The Protocol intends to create conditions of legal certainty and transparency for providers and users of genetic resources and traditional knowledge in the context of longstanding concern by developing countries about the problem of bio-piracy or misappropriation of genetic resources and traditional knowledge.

The Nagoya Protocol requires that:

1. Parties introduce legislation on access and benefit-sharing;
2. That access to genetic resources and associated traditional knowledge is subject to the prior informed consent of the Contracting Party, and where relevant, of indigenous and local communities providing traditional knowledge associated with genetic resources;
3. That benefit-sharing shall be on mutually agreed terms between the providers and users of genetic resources and associated traditional knowledge;
4. That access and benefit-sharing agreements are supported by permits and/or an international certificate of compliance;
5. That Contracting Parties' standing in the position of "users" of genetic resources and associated traditional knowledge will ensure compliance with the legislation of provider countries by users (subject to the existence of national legislation in the provider country);
6. That the Protocol will not prevent Contracting Parties from "developing and implementing other relevant international agreements, including other specialized access and benefit-sharing agreements, provided that they are supportive of and do not run counter to the objectives of the Convention and this Protocol." (Article 4.2).

Article 17 on Monitoring the Utilization of Genetic Resources refers to the designation of one or more checkpoints to monitor the utilization of genetic resources.

During the negotiations on the Nagoya Protocol, there was extensive debate about the inclusion of Intellectual Property (IP) offices as checkpoints. While no specific reference is made to intellectual property offices, it is possible that some countries will include IP offices in their checkpoints (WIPO, 2014).

3.1.4. The Cartagena Protocol

As indicated under article 8(g) and paragraph 3 and 4 of Article 19 of the CBD, bio-safety is one of the issues addressed under the CBD. This concept refers to the need for protecting human health and the environment from possible adverse effects of products of modern biotechnology. At the same time, modern biotechnology is recognized as having great potential for the promotion of human well-being, particularly in meeting critical needs for food, agriculture and health care. The Convention clearly recognizes these twin aspects of modern biotechnology.

The Protocol, formally known as the Cartagena Protocol on Bio-safety to the Convention on Biological Diversity, was adopted in Montreal on 29 January 2000 at the extraordinary meeting of the Conference of Parties. The Protocol thus creates an enabling atmosphere for environmentally sound application of biotechnology, making it possible to derive maximum benefit from the potential biotechnology offers, while minimizing the possible risks to the environment and human health. Article 8(g) deals with measures that the Parties should take at the national level, while Article 19 paragraph 3 sets the stage for the development of legally binding international instrument to address the issue of bio-safety (Secretariat of the Convention on Biological Diversity, 2000).

3.2. Regional Policy and Legal Frameworks

3.2.1. The IGAD Regional Biodiversity Policy

The IGAD Region is facing challenges arising from high levels of poverty, climate change and environmental degradation. To protect the region's biodiversity, member states agreed to develop a new policy that specifically addresses biodiversity. This policy will complement the existing national policies as well as the many international and regional (EAC, COMESA etc.) policies and frameworks such as the IGAD Regional Environment Policy, IGAD Regional Environmental Impact Assessment Policy Framework and Protocol, the IGAD Regional Climate Change Policy, and the IGAD Regional Environment and Resources Management Strategy.

The overall objective of the IGAD Regional Biodiversity Policy is to foster socio-economic development for sustainable livelihoods, environmental

sustenance, peaceful and secure coexistence, and regional integration through sustainable management of biodiversity resources in the region.

It has 53 policy statements that fall under four major areas namely: safeguarding, conserving and restoring biodiversity; governance and mainstreaming of biodiversity; technology capacity development, awareness-creation and information management; and biodiversity for economic and benefit sharing.

3.2.2. Regional Livestock Policy Framework (COMESA)

Despite the importance of the livestock sector to regional food and nutrition security, development of the Regional Livestock Policy Framework (COMESA) has not been supported by a harmonized livestock development policy and strategy. Breeding policy – including conservation of animal genetic resources – was among the six identified thematic areas in the Livestock Policy Framework and directly relates to animal genetic resources, while the other five thematic areas have indirect implication. The suggested policy objectives of the Policy Framework listed below have direct relevance to farm animal genetic resources in the IGAD region.

1. Encourage the creation of breed societies;
2. Engage farmers and pastoralists in a more market-oriented livestock production;
3. Development of strategies for national livestock development in line with the guidelines set out under broader national strategic frameworks that aim at reducing poverty, supporting livelihoods and increasing livestock contribution to GDP;
4. Creation of national Natural Resource Management (NRM) agency that supports the livestock sector by regulating the use of natural resources on a sustainable basis for the benefit of all.
5. Rational utilization and protection of existing genotypes from genetic erosion.

3.2.3. African Model Law

The African Model Law for the Protection of the Rights of Local Communities, Farmers and Breeders and for the Regulation of Access to Biological Resources was inspired by the CBD and prepared in 1997 by Organization of African Unity (OAU) Task Force. The OAU Ministerial

Session, followed by the OAU Summit of Heads of State and Government, adopted this Model Law in 1998 in Ouagadougou. They recommended that it serves as a basis for African national laws.

The Model Law has four general chapters on Objectives, Definitions and Scope, Institutional Arrangements, and Enabling Provision, and four specific thematic chapters (on Access to Biological Resources, Community Rights, Farmers' Rights, and Plant Breeders' Rights).

While focusing on plant genetic resources, provisions of the African Model Law have aspects which can be adapted for animal genetic resources e.g. on access to biological resources, community rights etc.

After the adoption of the Nagoya Protocol by the African Union (AU), there was need tohave a fresh look at the African Model Law and to analyze any gaps that may have resulted from subsequent developments relevant to access and benefit-sharing (ABS) at the global, continental and regional levels. A comparative analysis of the African Model Law against the Nagoya Protocol and other instruments and developments was accomplished – highlighting important gaps and variances relating to multiple facets of the African Model Law. This is particularly true in relation to the scope; intellectual property rights; farmers' rights; benefit sharing; trans-boundary cooperation and trans-boundary genetic resources; traditional knowledge associated with genetic resources; and special considerations for research, emergencies and plant genetic resources for food and agriculture.

The report found that these issues needed to be reconsidered in the light of recent developments – partly because the Nagoya Protocol introduces new concepts, such as the definition of utilization of genetic resources, provisions on trans-boundary cooperation, the role of community protocols and procedures, and special considerations for basic research, situations of health emergencies and plant genetic resources for food and agriculture.

3.2.4. IGAD Environment and Natural Resources Strategy

The IGAD Environment and Natural Resources Strategy provides a comprehensive and coherent framework aimed at guiding IGAD programs in the area of environment and natural resources. The strategy is divided

into four chapters. **Chapter 1** covers the introduction. Analysis of the environment and natural resources situation in the region is summarized in **Chapter 2** – derived from the continental and regional environment outlook reports. The strategy itself is presented in **Chapter 3** and contains the overall goals, guiding principles, strategic objectives, outcomes and activities. **Chapter 4** details the implementation framework – necessary to operationalize the strategy.

Despite the comprehensive nature of the strategy and its consideration of wildlife, it has not addressed farm animal genetic resources, and the only time the term 'animal' is used is when referring to alien organisms.

4. National Policies and Legal Frameworks on Animal Genetic Resources

4.1. Existing and Previous National Policies and Legal Frameworks

4.1.1. Djibouti

The Republic of Djibouti, in addition to Constitutional provisions, has enacted several policies, regulatory and legal frameworks which are, directly or indirectly relevant to animal genetic resources.

These include the National Action Plan for the Environment, the National Desertification Program, the National Strategy and Action Plan for the Biological Diversity, the Environment Code, law on the establishment of protected areas, and, a decree on the regulation of substances that deplete the ozone layer.

In formulating the policy, legal and environmental frameworks, Djibouti focuses on the following themes;

- Desertification control
- Biodiversity conservation.
- Improvement of the population's life, and,
- Management of water supply (Geographic Environmental Solutions/ Cortec 2008).

The Animal breeding policy is conspicuously lacking.

4.1.2. Eritrea

Article 6 of the Constitution of the State of Eritrea stipulates 'unity in diversity' as the basic guiding principle of national development objectives. Article 8 of the same Constitution mandates the State to work for sustainable development and to 'manage land, air, water and natural resources in a balanced and sustainable manner' and to 'secure the participation of people in safeguarding the environment'.

The Constitution therefore provides the foundation principles for a national development policy based on sustainable ideologies and the maintenance of diversity.

The country has also adopted policies and laws that have relevance to the

conservation and use of biodiversity resources. These include the Macro-Policy (1994); the Land Proclamation No.58/1994 and Land Use Policy (2007); the National Environmental Management Plan (NEMP-E) for Eritrea (DOE, 1995); Renewable Energy Sub-Sector Policy (1997); the Eritrean National Environmental Assessment Procedures and Guidelines (NEAPG) (1999); the National Action Program to Combat Desertification and Mitigate the Effects of Drought (NAP, 2002); the Poverty Reduction Strategy Paper (PRSP 2004); the National Agricultural Development Strategy and Policy Document (2005); the National Adaptation Program of Action (NAPA/2007); the National Bio-safety Framework (NBF 2007); the National Biodiversity Strategy and Action Plan (NBSAP); and the Draft Environmental Law Proclamation (2012). Despite all these policies, there is lack of a breeding policy.

4.1.3. Ethiopia

Ethiopia has taken several measures towards conserving biodiversity and the promotion of sustainable utilization. Some of the measures include putting in place domestic legislations and institutional upgrading of the former Plant Genetic Resource to the Ethiopian Biodiversity Institute. The aim is so that it can deal with plant, animal and microbial biodiversity and their respective ecosystems as well as associated community knowledge.

Ethiopia is a signatory to the CBD and other multilateral biodiversity related agreements and conventions. These include the Cartagena and Nagoya protocols and CITES. Its Constitution also states that environmental rights are to be protected, and furthermore requires that human, animal and the environmental health of the country should be safeguarded.

Other pertinent policies and legal frameworks include the Climate Resilient Green Economy Strategy (CRGE); the Growth and Transformation Plan (2015); the National Economic Development Plan; the Conservation Strategy of Ethiopia; Economic Policy; Proclamation on Environmental Impact Assessment; Rural Land Administration and Use Proclamation; Development, Conservation and Utilization of Wild Life of Ethiopia; National Policy on Biodiversity Conservation and Research; Access to Genetic Resources and Community Knowledge, and Community Rights Proclamation and Regulation; Animal Breeding Policy; and Proclamation on Bio-safety.

Further, the country has developed and revised the National Biodiversity

Strategy and Action Plan, a National Strategy and Plan of Action for conservation and sustainable utilization of AnGR .

The Animal disease control proclamations, legislation and strategies, the climate resilient green economy strategy and the livestock master plan as well as the SLM program will certainly contribute to AnGR management efforts in the country.

4.1.4. Kenya

Article 69 of the National Constitution of Kenya (COK 2010) has provisions that address biodiversity issues fairly well. Other relevant instruments to animal genetic resources include the Environmental Management and Coordination Act (EMCA 1999); the National Land Commission Act (2012); the Wildlife Conservation and Management Act (2013); the Land Registration Act (2012); the Agriculture Act (2014); Noxious Weeds Act (1983); Forest Act (2005); Bio-safety Act (2009); the National Policy on Traditional Knowledge, Genetic Resources and Traditional Cultural Expressions; Kenya Agriculture and Livestock Research Act (2013); and the National Livestock Policy.

Kenya has other laws that enable implementation of the Nagoya Protocol and the Kyoto Protocol – both of which are relevant to the conservation and sustainable utilization of animal genetic resources.

4.1.5. Somalia

Article 25 of Somalia's Constitution states that 'every person has the right to an environment that is not harmful to health and wellbeing, and to be protected from pollution and harmful materials; and that every person has the right to have a share of the natural resources of the country, whilst being protected from excessive and damaging exploitation of these natural resources'.

Several policies, legal frameworks and regulations have been developed by different regions in Somalia which have direct and indirect relevance to conservation of farm animal genetic resources. These include Animal Welfare By-Law No.34/2006; Somaliland Livestock Policy (2006); Somaliland Meat Inspection and Control Act (undated); Somaliland Veterinary Code (2004); National Policy on Environment (2011); National Animal Welfare Strategy and Implementation Plan (2017); and the National Biodiversity Strategy and Action Plan (NBSAP 2015).

4.1.6. South Sudan

The Transitional Constitution of the Republic commits all levels of government to sustainable development with a view to ensuring that the environment is protected, for the benefit of both present and future generations through reasonable legislative actions and other measures.

The key national legislations for biodiversity management and sustainable utilization in South Sudan include the Environmental Protection Bill of 2013 (Ministry of Environment, 2015); the Comprehensive Agricultural Master Plan (CAMP); the National Agricultural and Livestock Extension Plan (NALEP); the Agriculture Sector Policy Framework (2012); Animal Production Policy (2016); and the National Veterinary Policy (2016). In terms of mainstreaming biodiversity, most of the pertinent policies, laws and plans acknowledge the importance of biodiversity, and therefore have adequately integrated the same in their plans and programs. However, most of these instruments are not being implemented due to inadequate funding and lack of capacity (Ministry of Environment, 2015).

4.1.7. Sudan

Article 11(1) of the Interim National Constitution of Sudan states that 'the people of Sudan shall have the right to a clean and diverse environment; the State and the citizens have the duty to preserve and promote the country's biodiversity'.

In addition, there are policies, strategies, plans and legislations that have direct and indirect relationship with the conservation of biodiversity in general and animal genetic resources in particular. These include the Agricultural Revival Program (ARP 2012-2016); Forest Policy (2006); Wildlife Conservation and National Parks Act (2003); Pastoral Strategic Action Plans, and the Agriculture Sector Investment Plan (2012).

Sudan has integrated provisions of the international regimes of the Nagoya and Cartagena protocols into national legislations and policies.

4.1.8. Uganda

Objective XIII of the Constitution of Uganda calls on the State to protect important natural resources, including land, water, wetlands, minerals, oils, fauna and flora on behalf of the people of Uganda. Article 245 provides for Parliament to enact laws intended to protect the environment from

abuse, pollution, degradation as well as for managing the environment for sustainable development.

National and sectoral laws enacted for the management of the environment and having bearing on biodiversity include the National Environment Act (1995); the Land Act (1998); the Wildlife Act (1996); Animal Breeding Act (2001), and the amended Animal Diseases Act (2006).

Uganda is also a signatory to several international conventions, protocols and agreements relating to biodiversity management. The country is committed the implementation of those treaties. These include the CBD; the Cartagena Protocol on Bio-safety and the Nagoya Protocol on Access and Benefit Sharing.

4.2. Impacts of Past and Current Policies and Legal Frameworks

All IGAD member states have provisions in their constitutions and legislations that have direct bearing on the conservation, sustainable utilization and ABS of animal genetic resources.

Moreover, policies and legislations that address other matters that have also played a role in the conservation and sustainable utilization of animal genetic resources (e.g. policies and legislations on land, veterinary services, feed provision, and breeding) are available in most IGAD member states.

While there is always the need for specific policies and legal provisions on animal genetic resources, if properly applied, the existing regimes too can meaningfully contribute to the implementation of the underlying spirits of the respective national constitutions and international instruments.

However, review of the Second Country Reports on the State of Animal Genetic Resources of Djibouti, Eritrea, Ethiopia, Kenya, Sudan and Uganda and other related documents from Somalia and South Sudan revealed that there is a serious threat to animal genetic resources in all countries and a decrease in the size of population of the various indigenous farm animal genetic breeds. Therefore, in addition to policies and legal frameworks adopted, there is need for action plans that would enable all stakeholders to act synergistically and to monitor progress. The adoption of the Global Plan of Action into national plan of action is absolutely crucial in this regard.

4.3. State of Adoption of the Global Plan of Action

Ten years have passed since the development of the Global Plan of Action (GPA) and the adoption of the Interlaken Declaration. IGAD member states are well behind in adopting the GPA into national plan of actions (NPA) and implementation.

Right now, several countries have either finalized the NPA or are at the drafting stage. Others haven't started the task at all. This makes implementation thus far very minimal in all IGAD countries. Except for limitation of resources, Ethiopia has developed and implemented a National Strategy and Plan of Action for conservation and sustainable utilization of AnGR.

Certainly, the adoption and implementation of the action plan would have significant impact on the conservation, sustainable utilization, access and equitable sharing of benefits arising from use of animal genetic resources. As a regional organization therefore, the IGAD intend to, in collaboration with other relevant institutions, support member states in the adoption of the GPA. This may imply mobilizing technical and financial supports. The future of animal genetic resources in the region is highly dependent on having a NPA in each member state and on the level of diligence exercised in the implementation of NPAs.

5. Policy, Regulatory and Legislative Gaps: IGAD and National Levels

5.1. Utilization

The sustainable use of farm animal genetic resources requires, *inter alia*, the development and implementation of breeding programs. Breeding programs should be guided by a breeding policy.

IGAD member states like Somalia, South Sudan, Djibouti, Eritrea, Kenya, Sudan either don't have breeding policy or their breeding policy lacks some basic aspects on the development of indigenous farm animals. For instance, the way breeds with unique traits such as trypan-tolerance can be utilized and tilted to the use of exotic animals (Uganda and Ethiopia).

So far we do not know the level of implementation and subsequent legislation and guidelines to be developed. But the Ethiopian breeding policy emphasises on indigenous genetic resources through selection and improvement as well as conservation.

Despite those indications in policies and strategies on the utilization of indigenous farm animals, implementation measures focusing on sustainable use of animal genetic resources are fraught with several constraints. These include:

a) Lack of breed societies that can lead to animal identification, recording, evaluation and improvement on breed basis.

   In most cases, conducive conditions for the development of breed societies have not been created. What is more, no evidence could be adduced within the existing policy and legal frameworks that demonstrate efforts to realize coherence between the initiatives of neighbouring countries leading to a harmonized regional policy framework. Such harmonization is particularly crucial in dealing with trans-boundary animal genetic resources i.e joint breeding program.

b) The policies also lack clear direction on development of sustainable breeding programs. In light of this, revising breeding policies where they exist and developing new ones where there is none should be the primary focus of member states. The Model Policy (depicted in Section

8 below) and the Model Policy/Legal Framework (appended as Annex I) of this document are developed to assist member states in this regard.

5.2. Conservation

The state of *in situ* conservation of farm animal genetic resources is highly related to their sustainable utilization. Despite the presence of diverse resources in the IGAD region, several breeds of unique genotypes are becoming threatened. The Sheko cattle of Ethiopia (a trypano-tolerant breed), the Red Massai sheep of Kenya (a breed resistant to internal parasites), and the indigenous chicken resources with diverse genes of importance in all member states, are just a few examples.

In addition to actions that need to be taken as indicated above, provisions for *ex-situ* conservation should be put in place. In the same regard, none of the IGAD countries has built the capacity to undertake *ex situ* (particularly in vitro) conservation. A significant development towards addressing this is the initiative of AU-IBAR towards establishment of a regional gene bank in Uganda and a continental backup gene bank in Ethiopia.

5.3. Improvement

The improvement of indigenous farm animal genetic resources can mainly be achieved through selective breeding. The success of selective breeding programs depend largely on the right breeding policy, the implementation strategy (including the breeding program), and the human and infrastructural capacity.

Except for Kenya where there have been momentous improvements on the Boran cattle, no other IGAD member state has developed and successfully implemented a selective breeding program of meaningful magnitude. Undeniably, there is need for a concerted effort by IGAD member states and development partners to come up with breeding programs on prioritized breeds. During prioritization, members should considered;

- Risk of extinction;
- Genetic variability;
- Phenotypic performance;
- Unique traits;
- Historical and cultural importance; and other practical considerations.

6. Experiences of Benchmark Countries

Conservation and sustainable utilization of indigenous breeds in most developed countries happens largely because of incentives offered to those who keep the animals. Currently, various incentive schemes have been implemented in this regard. They include direct financial benefits, the creation of niche markets, and the provision of payments for ecosystem services.

Financial benefits may be considered where livestock keepers incur opportunity cost by maintaining less productive indigenous breeds instead of other exotic breeds which are economically attractive (Zander et al., 2009). Where high priority breeds exist (e.g. trypano-tolerant) and the magnitude of threat is high, the promotion of products from such breeds by creating niche markets can serve the purpose of incentivizing livestock keepers. IGAD member states need to consider such incentives. . Countries such as India, Brazil and South Africa have developed breeds which are highly competitive in terms of adaptation and production. The Sahiwal cattle of India, the Boer goat of South Africa and the Gir cattle of Brazil are good examples.

In the IGAD region, Kenya's Boran Improvement Program and the establishment of the Boran Cattle Breeders Society since 1951 could be cited as one of the few successful selective breeding programs. Success in these countries is attributed to meticulously develop sustainable breeding programs. The involvement of the public and private sectors was also critical to the success of these conservation and sustainable use programs. Such exemplary approaches could be adopted by the IGAD member states in their efforts to conserve and sustainably utilize their genetic resources.

7. Institutional Needs of AnGR in IGAD Member States

The role of well-organized governance schemes and institutional set up is paramount in realizing the conservation, sustainable use, access to genetic resources and the equitable sharing of benefits obtained from the use of genetic resources.

This creates the need for providing appropriate institutional arrangements that address the issue of AnGR through the implementation of relevant policies and the enforcement of legal provisions. As stated in FAO's guideline (FAO, 2011), establishing a national focal point is critical. The role of the focal point in the general framework of CBD is shown in CBD (2009).

All IGAD members have national focal points – mostly situated within ministries having mandates on livestock, agriculture or environment. In the case of Ethiopia, the Ethiopian Biodiversity Institute serves as the focal point, while the National Animal Genetic Resources Centre of Uganda serves as the country's focal point for AnGR.

However, the establishment or proper functioning of national Steering/ Advisory Committee, with the exception of Ethiopia, is still lacking in all of the IGAD countries. Synergy among institutions working on trade, customs, foreign affairs, livestock, pastoral development and the environment is required to realize the conservation and sustainable use of AnGR. Mainstreaming AnGR in education systems and strengthening research in terms of AnGR (particularly the genetic improvement of indigenous animals) are areas which have not yet received adequate attention within IGAD member states.

8. Model Policy Framework

Major Policy Objectives

Policy Objective 1: Ensure the conservation of indigenous farm animal genetic resources and significantly improve their contribution to the livelihood of livestock keepers and the national economy.

Policy Objective 2: Ensure the national actions and multi-national collaboration of countries in the conservation and use of trans-boundary indigenous farm animal genetic resources.

Policy Objective 3: Develop a mechanism for sustainable utilization and development of indigenous animal genetic resources in tandem with the larger global community.

Policy Objective 4: Ensure mainstreaming of conservation and sustainable utilization of animal genetic resources in the various sectors and within and without the continent's borders.

Policy Objective 5: Ensure that global commitments are met and agreements are kept in the implementation of indigenous farm animal genetic resources conservation, sustainable use and access and equitable benefit sharing.

The development and implementation of appropriate policies and legal frameworks are of crucial importance to achieve the stated policy objectives in optimal way.

Policy Needs and Strategies

Policy Objective 1: Ensure the conservation of indigenous farm animal genetic resources and improve significantly their contribution to livelihood of livestock keepers and the national economy.

1.1. *Improve the knowledge base on indigenous farm animal genetic resources and their status*

Despite variations across countries regarding the level of past actions to build the knowledge base of available resources, incomplete characterization of farm animal genetic resources is common feature in IGAD member states.

Inventory of the resources and systematic monitoring of the trends and associated risks to determine the status of the resources are lacking.

Understanding the diversity, distribution, basic characteristics, comparative performance and status of each country's animal genetic resources is essential for their efficient and sustainable use, development and conservation. Complete national inventories supported by periodic monitoring of trends and associated risks, are basic requirement for the effective management of animal genetic resources. Without such information, some breed populations and the unique characteristics they contain may decline significantly, or be lost all together before their value is recognized and measures are taken to conserve them (FAO, 2007).

Suggested interventions include:

- Conduct a complete inventories of the location, population status, trends and characteristics of animal genetic resources and associated indigenous knowledge at national or multinational level within a five year time;
- Resource inventory audit and evaluation through gradual resource monitoring exercises to assess state of resources and risk status;
- Expand monitoring to serve early warning and response systems ;
- Develop a national or multi-national database for indigenous farm animal genetic resources;
- Validate, update and complete the countries' information on Domestic Animal Diversity Information System (DAD-IS),
- Increase evidence based awareness of the community on the importance of indigenous farm animal genetic resources, and
- Promote knowledge on value addition (indigenous methods or modern) of the animal products

1.2. *Put in place appropriate conservation schemes for prioritized indigenous farm animal genetic resources*

The use of biodiversity is not limited to the present or the foreseeable future. The importance extends to the distant future where changes through time are likely to cause a different scenario from what we see now. This includes change in technology, climate, disease type and incidence, culture and consumption habits. Things that are likely to happen and the type of animal and animal product in demand today may be quite different from that of the future.

Therefore, the presence of sufficient diversity within the indigenous farm animal genetic resources is an important asset and aids in responding to the changes that may occur. However, maintaining or improving all animal genetic resources (all breeds) is costly and hence not economically viable.

Because of resource limitations, there is need to set priorities key among them is which populations/breeds to conserve. To date, a framework that incorporates both genetic diversity and non-genetic criteria such as cultural, economic and ecological values or merits for prioritizing breeds at the national level has been proposed (Ruane, 2000) and has already been used in the past (e.g. Gizaw *et al.*, 2008).

Other suggested activities include:

- Valuation of the available indigenous farm animal genetic resources;
- Setting priority of populations/breeds for conservation;
- Designing conservation programs that ensure response to emergency situations and appropriate restocking schemes post-emergency;
- Identifying and implementing appropriate conservation methods (in-situ, ex-situ, or complementary ex-situ and in-situ) and resources (e.g. regional and national gene banks, community based breeding programs)
- Developing pragmatic incentive schemes for conservation of indigenous farm animal genetic resources by farmers and/or pastoralists (e.g. niche markets).

1.3. *Develop genetic improvement programs for priority indigenous farm animal genetic resources in a participatory way*

Indigenous farm animal genetic resources are a result of natural and human selection. Because adaptive traits in those selections is important, production performance of the indigenous breeds has been low. Their conservation requires inter alia sustainable utilization and the primary objective of livestock conservation for developing countries is conservation for sustainable use (Simon, 2007; Ruane, 2000). Improving the productivity of the indigenous breeds is critical for their sustainable use.

Towards this end, suggested activities include:

- Building the human, institutional and infrastructure capacity towards sustainable genetic improvement of priority indigenous animal genetic resources;

- Designing and implement genetic improvement programs and schemes which are appropriate for particular species/breed, agro-ecology and production system; the major option is selective breeding, but other options (e.g. crossing between indigenous breeds) may also be applied under special conditions; and
- Periodically evaluating gains from genetic improvement programs and their impact on genetic diversity.

Policy Objective 2: Ensure national actions and multi-national collaboration of countries in the conservation and use of transboundary indigenous farm animal genetic resources and associated indigenous knowledge.

2.1. Identify and characterize indigenous farm animal genetic resources which are transboundary and beyond sovereign rights of the countries involved

Several animal breeds in the IGAD member states are known to be spread in more than one country (e.g. black head Somali sheep). All countries involved could be IGAD member states, or some may be found outside of the IGAD region. Some breeds would be found in a country temporarily (e.g. seasonal movement), while others are there permanently. What is more, there will likely exist difference in distribution and indigenous knowledge associated with the resources.

Member states should therefore:

- Identify at regional level breeds which belong to two or more countries;
- Implement a joint characterization of trans-boundary breeds along with their spatial distribution;
- Identify indigenous knowledge that pertains to animal genetic resources;
- Identify processes and activities which have or are likely to have significant adverse impacts on the conservation and sustainable use of animal genetic resources, and incorporate same as part of early warning and response systems;
- Institute mechanisms for systematic monitoring of animal genetic resources identified above, the trends and associated risks, especially to those requiring urgent conservation measures and those which offer the greatest potential for sustainable use; and
- Develop and maintain national or multi-national database on indigenous farm animal genetic resources derived from identification and monitoring activities above.

2.2. Develop and implement a conservation prioritization and sustainable use scheme that addresses both regional and national issues

The conservation of trans-boundary genetic resources may require joint actions of two or more countries. In prioritization of such breeds, multi-national issues need to be given consideration. There is also need to integrate regional conservation efforts with conservation practices at national levels.

Hence, cross-country inventory, monitoring of trends and status of the genetic resources involved is critically important to make conservation and utilization decisions. As transboundary breeds are beyond sovereign rights of countries, there is need for joint bi-or multi-national actions towards their conservation and utilization.

In light of this, member states should:

- Undertake collaborative inventory, monitoring of trends and status determination with disaggregation into production systems and geographic areas;
- Make a pragmatic and participatory prioritization of transboundary breeds;
- Undertake joint genetic conservation and improvement programs that benefit the countries involved; and
- Ensure coherence and harmonization of policies and legal frameworks among the states involved.

2.3. Develop Access and benefit sharing provisions for transboundary resources as per the provisions of Article 15 of the CBD, Article 25 of the African Model Law, the Bonn Guidelines and the Nagoya Protocol

One of the three pillars of the CBD IS Access to genetic resources and equitable sharing of benefits arising from their use. Despite the inclusion of AnGR in various legal frameworks on ABS of biodiversity, the implementation of ABS schemes for animal genetic resources has been fraught with diverse challenges. It is even more so when reference is made to trans-boundary breeds.

Modalities for applying ABS provisions to animal genetic resources have never been straight forward and the schemes are evolving (e.g. Koehler-Rollefson & Meyer, 2015). Approaches which include community bio-cultural

protocols may need to be considered (LPP and LIFE Network. 2010) as well to adopt ABS provisions and implementation at community levels.

In light of such considerations, member states should:

- Establish a regional focal point to address issues of ABS as pertains to transboundary breeds of indigenous farm animal resources in compliance with international provisions;
- Put in place regulations that govern access to transboundary genetic resources and equitable use of benefits and associated knowledge;
- Determine, through national procedures ordained for the purpose, modalities for accessing animal genetic resources, knowledge and/or technologies of local communities of which they are the origin or have acquired such resources in compliance with pertinent bilateral or international arrangements;
- Create conducive environment to facilitate access to animal genetic resources for environmentally sound and sustainable uses by other member states/countries beyond the IGAD jurisdiction, and not to impose restrictions that run counter to the objectives of this policy framework; and
- Take appropriate measures, including the adoption of regulations, to ensure sharing in fair and equitable manner the results of research and development and direct/indirect benefits arising from the commercial and other utilization of animal genetic resources collected by countries or entities within their jurisdictions – subject to mutually agreed terms and the accord of priority, whether or not such benefits or results were intended to accrue within the countries involved or outside.
- Mainstream considerations on access and equitable sharing of benefits from animal genetic resources in the various sectors and within and without the continent's borders.

Policy Objective 3: Develop a mechanism for sustainable utilization and development of indigenous animal genetic resources in tandem with the global community at large.

3.1. Promote recognition of indigenous farm animal resources as public good

With the development of improved breeds and expanded role of the market as a driving force in the choice of farm animal genotypes produced, indigenous farm animal genetic resources would be put at a disadvantage. The importance of the indigenous farm animals as reservoir of gene pool catering for future uncertainties may not be accorded enough emphasis.

In such practical setting, livestock keepers who maintain these genetic resources would need to be considered as custodians of the resources which should be labelled as 'public good' serving the interest of all mankind.

Based on these considerations, member states should:

- Identify important traits of farm animal genetic resources that can be utilized at the present and/or in the future;
- Mobilize financial resources from various sources for purposes of pursuing conservation schemes that incentivize livestock holders to continue keeping the animal genetic resources;
- Harmonize the public good concept with access and benefit sharing provisions; and
- Raise awareness of the community on the importance of indigenous farm animal genetic resources.

3.2. Develop an incentive system for the sustainable utilization and development of indigenous farm animal genetic resources

With a trend towards market-oriented and intensified animal production, continued use of indigenous farm animal genetic resources is likely to have the opportunity cost lost for not keeping other improved breeds. In most cases, livestock keepers can't bear such costs as most of them are poor and can't afford to do so.

This calls for introduction of a system of financing the conservation effort of livestock keepers. A variety of modalities can be used for this purpose including, inter alia, incentives, subsidies and development of niche markets for products from indigenous farm animals. For the system to be effective, the benefits livestock keepers get should be at par with the opportunity cost born by them.

In this light, member states should:

- Prioritize breeds that need to be conserved;
- Assess the opportunity costs (benefit lost) that are likely to be incurred as a result of keeping indigenous farm animal genetic resources – rather than the more productive exotic breeds under the prevailing production system; and
- Put in place incentive mechanism for the continued maintenance of prioritized indigenous farm animals.

- Establish market niches for the indigenous farm animal resources to promote their utilization and consequently conservation, and
- Develop sound value chains for indigenous breeds

Policy Objective 4: Ensure mainstreaming of conservation and sustainable utilization of animal genetic resources in various sectors and within and without the continent's borders.

Several sectors have relevance to the conservation, sustainable use and access and benefit sharing of indigenous farm animal genetic resources. These include environment, agriculture, health, trade, law enforcement, education etc. Proper mainstreaming of the conservation, sustainable use and access and benefit aspects into relevant sectors and sub-sectors is important to the realization of goals set in relation to indigenous farm animal genetic resources.

Hence, member states should:

- Identify sectors and sub-sectors with relevance to indigenous farm animal genetic resources;
- Establish feedback systems that are targeted to livestock keepers to offer management advise and networks for improved conservation and sustainable use of indigenous farm animal genetic resources;
- Mainstream the conservation and sustainable use of indigenous farm animal genetic resources into sectoral policies, strategies and plans; and
- Ensure harmonization among sectoral policies, strategies and plans as pertains to conservation and sustainable use of indigenous farm animal genetic resources.

Policy Objective 5: Ensure global commitments are met and agreements are kept in the implementation of indigenous farm animal genetic resources conservation, sustainable use and access and equitable sharing of benefits.

In the preamble of the CBD, it is indicated that the conservation of biological diversity is a common concern of humankind. The CBD also recognizes that states have sovereign rights over their own biological resources and are responsible for conserving their biological diversity and using their biological resources in a sustainable manner.

In addition to the CBD – which is applicable to all forms of biodiversity – provisions, protocols, agreements and guidelines which are directly relevant to animal genetic resources have been developed. The Interlaken Declaration and the Global Plan of Action for Animal Genetic Resources are among the most vital instruments in relation to animal genetic resources. Guidelines which support the implementation of actions relevant to the conservation of indigenous genetic resources have also been developed. They are handyin standardizing and maintaining uniformity in the implementation of various activities pertaining to animal genetic resources.

Obviously, meeting the global commitments and following international guidelines in implementing the various activities is very critical to achieving the conservation, sustainable use, and the fair and equitable sharing of benefits arising from access to genetic resources.

There are also requirements imposed on state parties to submit periodic reports to global bodies responsible for such provisions; the reports, if accurate and complete, can serve as means of evaluation and monitoring, eventually benefiting the reporting countries themselves.

Member states should:

- Abide by the reporting requirements of all relevant international provisions;
- Legalize the use of guidelines in the implementation of animal genetic resources related activities;
- Develop national action plan by adopting the Global Action Plan for Animal Genetic Resources; and
- Develop and regularly update National Biodiversity Strategy and Action Plan which also gives due emphasis to animal genetic resources.

9. Conclusion & Recommendations

Conclusions

It is no secret that IGAD member states are endowed with diverse farm animal genetic resources. Numerous indigenous farm animal breeds which are adapted to the agro-ecology and production system are bred in and found in the region.

However, because of challenges related to climate change, drought, emerging diseases, population pressure and the introduction of 'seemingly' more productive exotic animals, threaten indigenous animal genetic resources.

The overall population trend of indigenous farm animals show decrease in numbers, and in some cases, the degree of reduction can be termed as critical. Dilution from the use of exotic animals by crossing with indigenous animals is also affecting the magnitude of diversity, particularly in relation to chicken and cattle. With the change in climate, adaptability would be equally important to production and productivity. The use of the indigenous animal genetic resources in breeding programs, therefore, will be critically important and need policy support.

A comprehensive review of policy and legal frameworks in IGAD member states as pertaining to animal genetic resources has revealed gaps mainly related to conservation and sustainable utilization. *In situ* conservation programs, along with selective breeding, appear to be the best option despite the demanding nature of such intervention in terms of human and infrastructural resources.

Adequate focus should be given to meet the technical capacity and the financial needs of the *in situ* conservation programs along with selective breeding. For priority breeds under critical conditions, *in situ* conservation with incentives and/or *ex-situ* conservation need to be applied. However, breeding policies that guide such actions are lacking in most of the IGAD member states. When such policies exist, implementation is not at par with the magnitude of the problem (e.g. Ethiopia) or need to be updated to address current developments at national, regional and international levels (e.g. Uganda).

The conservation of the animal genetic resources contributes to the diversity that may be required to tackle changes (e.g. new diseases, change in production system) likely to arise in future. As such, in addition to realize sustainable use of the resources, other ways of removing the burden of bearing the cost of conservation by livestock keepers (farmers/pastoralists) need to be sought and attract adequate policy focus.

In addition to the conservation and sustainable use, issues related to access to animal genetic resources and equitable sharing of benefits arising from their use have not been adequately addressed in national policies.

Recommendations

1. Put in place policy and legal provisions that specifically address animal genetic resources and compel member states to adopt the model policy and legal framework suggested in this document (annexed).
2. Encourage member states to adopt the Global Plan of Action for Animal Genetic Resources and develop a national plan of actions. The plan is sufficiently detailed and internationally agreed upon in the management of animal genetic resources. Encourage implementation of such provisions through proper regulation, institutionalization and capacity building so as to realise the objective of conservation and sustainable utilization of farm animal genetic resources..
3. Offer an appropriate incentive mechanisms to offset the loss they suffer in situations where keeping prioritized indigenous animals incurs opportunity costs to the farmers and pastoralists who keep them. Incentive as a form of creation of niche markets for the products from the genetic resources being conserved is the best approach to ensure conservation through sustainable utilization.
4. Develop policy and legal frameworks that address access to animal genetic resources and sharing of benefits that accrue from their use. Ensure the frameworks is aligned with the regional and international provisions as well as harmonised with neighbouring countries to address issues of transboundary breeds.

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Annex 1: Model National Legal Framework for Conservation, Sustainable Utilization, and Access and Benefit Sharing of Farm Animal Genetic Resources

Model National Legal Framework

For Conservation, Sustainable Utilization and Access and Benefit Sharing of Farm Animal Genetic Resources

PROCLAMATION No.000/0000

A PROCLAMATION TO PROVIDE FOR THE CONSERVATION, SUSTAINABLE UTILIZATION AND ACCESS AND BENEFIT SHARING OF ANIMAL GENETIC RESOURCES

DEMOCRATIC REPUBLIC OF XXX

Preamble

WHEREAS the inalienable and sovereign right of people and states over biological resources has been duly recognized under various international instruments including the United Nations Convention on Biological Diversity adopted in 1992;

REALIZING that indigenous animals and animal genetic resources constitute important components of our national economy and the livelihood of pastoral and farming communities within the national jurisdiction;

CONSCIOUS that the rich farm animal genetic resources in XXX have resulted from natural selection and traditional breeding management of generations;

BEING AWARE that indigenous farm animals in XXX are adapted to the low input management, harsh climatic conditions, disease prevalence and seasonal fluctuation in quality and quantity of available feed and are rich in terms of diversity and genetic variations that serve as input towards the development of breeds fitting current and future scenarios and in maintaining life sustaining systems of our communities;

CONCERNED that thus far the focus of contemporary research and development has been on the introduction of exotic breeds for use in their pure form or as crossbreds which hitherto raised challenges relating to environmental adaptation and has posed risks to biological diversity and survival of indigenous animals and animal genetic resources;

NOTING also that some breeds in our jurisdiction have been utilized in breeding programs elsewhere without due recognition of the original developers of the breeds;

AFFIRMING that the conservation and sustainable use of the varied animal genetic resources with which XXX has been endowed is a paramount concern of all states in the world and has critical importance for the present and future of mankind;

ACKNOWLEDGING that in this regard it is vital to anticipate, prevent and mitigate the causes of significant reduction or loss of animal genetic resources in XXX and adopt in-situ and ex-situ measures as appropriate;

NOTING FURTHER that the lifestyles of many local communities in XXX embodying traditional lives depend on such resources and the desirability of sharing equitably benefits arising from the use of traditional knowledge, innovations and practices relevant to the conservation of animal genetic resources and sustainable use of their components;

HIGHLIGHTING also that pursuing such causes through regional cooperation such as the IGAD plays paramount importance;

DESIRING to enhance the implementation of international conventions and agreements relevant to the conservation and sustainable use of animal genetic resources, and to which XXX is a party;

HAVING DETERMINED that ultimately a legal framework that identifies the key challenges and evolves from concrete settings of XXX must be adopted as critical intervention to set direction on the three pillars of the Convention on Biological Diversity, i.e., conservation, sustainable utilization and access to the animal genetic resources and fair and equitable sharing of benefits arising out of their utilization;

NOW, THEREFORE, in accordance with Article _____of the Constitution of the Democratic Republic of XXX, it is hereby proclaimed as follows.

PART I

GENERAL

1. Short Title

This Proclamation may be cited as 'Conservation, Sustainable Utilization and Access and Benefit Sharing of Animal Genetic Resources Proclamation No.000/0000'.

2. Definitions

Unless the context otherwise requires, the following terms shall have the meanings defined in this Proclamation.

Access: the acquisition of animal genetic resources, their derivatives and associated community knowledge, innovations, technologies or practices as authorised by the National Competent Authority in XXX.

Benefit Sharing: the sharing of whatever accrues from the utilisation of animal genetic resources per se, associated community knowledge, technologies, innovations and/or practices.

Bio-cultural community protocols: a protocol that is developed after a community undertakes a consultative process to outline their core ecological, cultural and spiritual values and customary laws relating to their TK and resources, based on which they provide clear terms and conditions to regulate access to their knowledge and resources.

Biodiversity (Biological Diversity): the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part - including diversity within species, between species and of ecosystems.

Biological Resources: include genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity.

Biotechnology: any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use.

Collector: any natural or legal person, entity or agent obtaining access to biological resources, local practices, innovations, knowledge or technologies under authority given by the National Competent Authority.

Community Intellectual Rights: rights held by local communities over their biological resources or parts or derivatives thereof, and over their practices, innovations, knowledge and technologies.

Community/Indigenous Knowledge: the accumulated knowledge that is vital for the conservation and sustainable use of animal genetic resources and/or which is of socio-economic value, and which has been developed over the years by indigenous/local communities.

Country of Origin of Genetic Resources: the country which possesses genetic resources in in-situ conditions.

Derivative: a naturally occurring biochemical compound resulting from genetic expression or metabolism of biological or genetic resources, even if it does not contain functional units of heredity.

Domestic Animal: animals belonging to cattle, sheep, goat, camel, donkey, horse, chicken, mule, pig and domesticated guinea fowl and buffalo.

Ex-situ Condition: the condition in which a biological resource is found outside its natural habitat, and excludes any lineage that is cultivated within its country of origin.

Ex-situ Conservation: conservation of components of biological diversity outside their natural habitats.

Genetic Material: any material of an animal genetic resource's origin containing functional units of heredity.

Animal Genetic Resource: domestic animal genetic material of actual or potential value.

Inbreeding: the mating of relatives which increases homozygosis.

Innovation: any generation of a new, or improvement of an existing, collective and/or cumulative knowledge or technology through alteration or modification, or the use of the properties, values or processes of any animal genetic material or any part thereof, whether documented, recorded, oral, written or in whatever manner otherwise existing.

In-situ Condition: conditions where animal genetic resources exist within the production systems they are kept and produced or where they have developed their distinctive properties.

In-situ Conservation: the conservation of the production system and natural habitats and the maintenance and recovery of viable populations of animal species in their production system and in the surroundings where they have developed their distinctive properties.

Local Community: human population in any geographical area of XXX with ownership over animal genetic resources, associated innovations, practices, knowledge and technologies governed partially or completely by its own customs, traditions or laws.

Local Breed: a breed of animal of a given species that occurs in only one country.

Population: a close mating community, i.e. groups of animals that regularly contribute to a common gene pool.

Prior Informed Consent: the giving by a collector of complete and accurate information, and, based on that information, the prior acceptance of that collector by XXX and the concerned local community to collect biological resources, indigenous knowledge or technologies.

Mate Selection: an approach in which genetic variation in a breed is managed by selecting the sire/dam combinations that will result in the greatest genetic diversity, rather than selecting the most genetically diverse parents in a first step and determining the mating in a second step.

Mutually Agreed Terms: refers to agreement between providers of genetic resources and users on the conditions of access and the use and benefits shared between both parties.

Material Transfer Agreement: a contract governing the transfer of tangible research materials between two organizations where the recipient intends to use it for own research purposes, including an instrument that defines the rights of the provider and the recipient with respect to the materials and any derivatives.

Public Good: a good that is both non-excludable and non-rivalrous in that individuals cannot be effectively excluded from use and where use by one individual does not reduce availability to others.

Sustainable Use: the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.

Transboundary Breed: a breed that occurs in more than one country.

3. Fundamental Objectives and Guiding Principles

3.1. This Proclamation shall regulate all matters relating to the protection of local community rights and the effective conservation and sustainable use of farm animal genetic resources in XXX so as to enhance their contribution to the livelihood of livestock keepers and the broader national economy.

3.2. For such purpose, appropriate institutions and mechanisms shall be established for conservation and sustainable use, and to regulate access to resources and fair and equitable sharing of benefits arising from their use.

3.3. All policy or programmatic measures or private actions designed, promoted or adopted nationally in pursuance of this Proclamation shall fundamentally be informed by an approach that treats indigenous farm animal genetic resources as public good.

4. Jurisdictional Scope

Subject to corresponding rights of other sovereign states, and except as otherwise expressly provided for in this Proclamation, the provisions of this legislation shall apply:

4.1. In the case of components of animal genetic resources, in areas within the limits of the national jurisdiction of XXX ; and

4.2. In the case of processes and activities relevant to animal genetic resources, regardless of where their effects occur, carried out under its jurisdiction or control.

4.3. Nothing in the present Proclamation shall be read as entailing limitations on XXX's sovereign right to exploit its own animal genetic resources pursuant to the Constitution and in accordance with international conventions and agreements to which it is a party.

5. Cooperation

In implementing the present Proclamation, the designated National Competent Authority shall, as far as possible and appropriate, cooperate with other countries and agencies, directly or where proper, through competent regional and international organizations, in respect of the conservation and sustainable use of animal genetic resources.

PART II

INSTITUTIONAL ARRANGEMENTS

6. Establishment of the National Competent Authority

The Ministry of _____ is hereby designated (established) as the National Competent Authority to implement and oversee the enforcement of provisions of this Proclamation.

7. Powers and Duties of the National Competent Authority

The particular mandates specified in subsequent provisions of this Proclamation notwithstanding, the National Competent Authority shall have the following generic powers and responsibilities.

7.1. To serve as focal point for all animal genetic resources related regional and international engagements;

7.2. To keep a National Registry of Animal Genetic Resources by drawing a complete inventory of location, population status and associated indigenous knowledge on animal genetic resources;

7.3. To develop or adapt national strategies, programmes or actions for the conservation and sustainable use of farm animal genetic resources and cultural practices and associated indigenous knowledge;

7.4. To establish a system for monitoring national trend and associated risks in animal genetic resources, including identifying processes and activities that are likely to have significant adverse impacts on the conservation and sustainable use of animal genetic resources;

7.5. To institute animal genetic resource centre(s), and as suitable, centre(s) for in vivo or in vitro storage and maintenance of animal germplasm material for the purpose of ex-situ conservation and use when the need arises;

7.6. To create, and in collaboration with other relevant authorities and line agencies, operate regulatory mechanisms that ensure the effective protection of national animal genetic resources and associated indigenous knowledge;

7.7. In line with regional and international protocols, to develop criteria and mechanisms on standardized procedures for the characterization and conservation of animal genetic resources;

7.8. To issue licenses, in accordance to national, regional and international provisions on access and benefit sharing, for the exploitation and commercialization of national animal genetic resources, including associated knowledge practices, and technologies; and,

7.9. To adopt measures relating to the use of animal genetic resources with a view to avoiding or minimizing adverse impacts on animal diversity.

7.10. To adopt measures that facilitate development of bio-cultural community protocols on Animal Genetic resources.

PART III

SUBSTANTIVE PROVISIONS

8. In-situ Conservation and Sustainable Use

8.1. The National Competent Authority shall develop specific national mechanisms, strategies, plans or programs for *in situ* conservation and sustainable use of animal genetic resources by adopting the Global Plan of Action for Animal Genetic Resources, the Interlaken Declaration and other relevant national, regional and international instruments.

8.2. The recovery of threatened animal genetic resources shall be promoted, *inter alia,* through the use of materials conserved *ex-situ* and the development and implementation of national plans or other management strategies.

8.3. In collaboration with other relevant authorities and in line with national, regional and international provisions, the National Competent Authority shall establish and maintain mechanisms to regulate, manage or control risks associated with the use and release of living modified organisms resulting from biotechnology which are likely to affect the conservation and sustainable use of animal genetic resources, taking also into account the risks to human health.

8.4. As far as practical and when appropriate, the conservation and sustainable use of animal genetic resources shall be integrated into relevant sectoral or cross-sectoral plans, programs and policies.

8.5. The National Competent Authority shall endeavour to provide conditions required for compatibility between present uses and the *in situ* conservation of animal genetic resources and their sustainable use.

8.6. The National Competent Authority shall set in place mechanisms to prevent or control the introduction and use of exotic animal breeds which threaten the conservation and sustainable use of the country's animal genetic resources through dilution or replacement.

8.7. Detailed procedures and institutional machinery shall be established through subsequent regulation to respect, preserve and maintain

knowledge, innovation and practice of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of animal genetic resources, to promote their wider application with approval of the holders of such knowledge, innovations and practices, and to encourage equitable sharing of benefits arising from the utilization of such knowledge, innovations and practices.

9. Ex-situ Conservation

As far as possible, as appropriate and predominantly for purposes of complementing *in-situ* measures, the National Competent Authority shall:

9.1. adopt measures for *ex-situ* conservation of animal genetic resources and/or their components either in national, regional or international facilities;

9.2. establish and maintain facilities for *ex-situ* conservation and research on animal genetic resources;

9.3. introduce measures for use of genetic resources conserved *ex-situ* for the rehabilitation of threatened breeds and for their reintroduction into the production system or agro-ecologies they are adapted to;

9.4. regulate and manage the collection of biological resources from animal genetic resources' origin for *ex-situ* conservation purposes so as not to threaten in-situ population of breeds;

9.5. seek or provide financial, technical and other support for *ex-situ* conservation activities, and for the establishment and maintenance of ex-situ conservation facilities.

10. Incentive Measures

The National Competent Authority shall:

10.1. identify and prioritize animal genetic resources conservation and sustainable utilization measures that require incentives; and,

10.2. as far as possible and as appropriate, adopt economically and socially sound measures that serve as incentives for the conservation and sustainable use of components of animal genetic diversity.

11. Research and Training

National programs and schemes shall be established and maintained providing a platform:

11.1. for scientific and technical education and training on measures focusing on the identification, characterization, conservation and sustainable use of animal genetic resources and their components;

11.2. for the promotion of research contributing to the conservation and sustainable use of animal genetic resources; and,

11.3. for promoting cooperation in the use of scientific advances in animal genetic diversity research.

12. Public Education and Awareness

The National Competent Authority shall:

12.1. promote and encourage understanding of the importance of and measures required for conservation and sustainable use of animal genetic resources, as well as its propagation through media, and the inclusion of these topics in educational programs; and

12.2. cooperate with other states, agencies and international organizations in developing educational and public awareness programs with respect to the conservation and sustainable use of animal genetic resources.

13. Impact Assessment and Minimizing Adverse Impacts

The National Competent Authority shall as far as possible and as appropriate:

13.1. introduce appropriate procedures requiring impact assessment of animal research and development activities that are likely to have significant adverse effects on animal genetic resources with a view to avoiding or minimizing such effects;

13.2. introduce appropriate arrangements to ensure that the consequences of programs and policies that are likely to have significant adverse impacts on animal genetic resources are duly taken into account;

13.3. promote, based on reciprocity, notification, exchange of information and consultation on activities within the national jurisdiction or

control which are likely to cause significant adverse effect on the animal genetic resources of other states or areas;

13.4. initiate national arrangements for emergency responses to activities or events, whether caused naturally or otherwise, which present grave and imminent danger to animal genetic resources, and encourage international cooperation to supplement such national efforts, and where appropriate and agreed by other IGAD States, to establish joint contingency plans.

14. Access and Benefit sharing of Animal Genetic Resources

14.1. The National Competent Authority shall institute a comprehensive institutional and regulatory regime to facilitate access to animal genetic resources for environmentally sound uses by other countries or parties; such mechanisms shall not impose restrictions that run counter to objectives of the United Nations Convention on Biological Diversity.

14.2. Access, where granted, shall be offered based on mutually agreed terms and subject to prior informed consent.

14.3. Capacity-building schemes shall be instituted at the national level to guarantee the effective negotiation and implementation of access and benefit-sharing arrangements.

14.4. In this regard, the National Competent Authority shall strengthen the clearing-house mechanism as machinery for cooperation with other countries and relevant institutions, and shall furthermore encourage contribution to regional and international discourse on development of mechanisms and access and benefit-sharing regimes that recognize the protection of traditional knowledge, innovations and practices of indigenous and local communities.

15. Application Procedures for Accessing Animal Genetic Resources

15.1. The National Competent Authority shall issue directives to determine specific procedures for accessing animal genetic resources, knowledge or technologies of local communities of which XXX is the origin or has acquired such resources in compliance with pertinent bilateral or international arrangements.

15.2. The National Competent Authority shall ensure sharing in fair and equitable manner the results of research and development and direct or indirect benefits arising from the commercial and other utilization of animal genetic resources collected by itself or another entity within the national jurisdiction subject to mutually agreed terms and the accord of priority.

15.3. Access to any animal genetic resources and knowledge of local communities shall be subject to formal application submitted with the National Competent Authority.

15.4. Applications for accessing animal genetic resources shall at the minimum provide particulars relating to:

a) identity and legal capacity of the applicant;
b) resources and sites to which access is sought;
c) the present and potential uses of the resources;
d) the sustainability and risks involved in accessing such resources;
e) the purposes for which access to the genetic resources is sought;
f) primary destination of the resource;
g) economic, social, scientific, environmental or other benefits that are intended to accrue to the country, local communities, the collector or a third party;
h) proposed mechanisms and arrangements for benefit sharing;
i) description of the innovation, practice, knowledge or technology associated with the animal genetic resource; and
j) environmental and socio-economic impact assessment covering a reasonable temporal dimension.

15.5. Access may be conditioned or restricted on commitment to contribute economically to the national interest or the interest of concerned local communities in the regeneration and conservation of the genetic resource.

15.6. Access may be denied or restricted when there is sufficient reason to believe that the grant will seriously imperil already endangered taxa, endemism, the environment, or entails adverse effects upon the animal genetic resources, human health, the quality of life or the cultural values of local communities.

16. Granting Access to Animal Genetic Resources

16.1. The National Competent Authority shall place the said application in a public registry or official gazette, or cause it to be published in a newspaper that is reasonably accessible to the public for a period of one month and allow interested persons to comment on the application.

16.2. Permit for accessing animal genetic resources shall be granted only upon payment of fees effected before commencement of collection the specifics of which shall be detailed under a subsequent regulation; the sum shall vary depending on whether the collection is to be used for commercial exploitation or non-commercial research purposes, the number of samples, the area covered, duration of collection and whether or not such access grants the collector exclusive rights.

16.3. Access permit shall be granted through a signed written agreement concluded between the National Competent Authority and the collector, and shall detail the commitments undertaken by each party. The agreement shall at the minimum include:

16.3.1. the quantity and specification of quality of the animal genetic resource the collector is granted to access or is allowed to export;

16.3.2. formal guarantee to deposit duplicates of each specimen of the animal genetic resource or records of community innovation, practice, knowledge or technology collected;

16.3.3. undertaking to inform immediately of all findings from research and development on the resource;

16.3.4. assurance not to transfer the genetic resource or any of its derivatives or the community knowledge to any third party without prior authorization;

16.3.5. commitment not to apply for any form of intellectual property protection over the animal genetic resource or parts or derivatives thereof or over community innovation, practice, knowledge or technology without the prior informed consent of the original providers;

16.3.6. guarantee for sharing from the benefits; and,

16.3.7. periodic reports as may be requested by the National Competent Authority in terms of research and development over the genetic resources.

17. Requirements of Consultation and Prior Informed Consent

17.1. Access to animal genetic resources, knowledge or technologies of local communities shall be subject to securing beforehand the prior informed consent of the National Competent Authority, and as appropriate, the local community providing such resources.

17.2. The National Competent Authority shall ensure that all concerned stakeholders, mainly including local communities, are genuinely involved in consultations and decision making processes.

17.3. Any access carried out without the prior informed consent of the National Competent Authority and/or without involving local communities in consultation and decision making processes shall be null and void.

18. Withdrawing Consent Granted

18.1. The National Competent Authority may at any time withdraw consent granted under an agreement and rescind the written permit following on non-compliance with requirements stated under Article 16 sub article 3 above or when it is proven that the permit holder has violated any one of the conditions stipulated under the contract or the minimum parameters included in this Proclamation, or in pursuance of overriding public or environmental interests.

18.2. Decisions on approval, disapproval or cancellation of agreements regarding access to animal genetic resources, community knowledge or technologies may be appealed through appropriate administrative procedures and platforms. A regulation shall detail the procedures, including the possibility of recourse to courts of law after exhaustion of administrative remedies.

19. Patents and Intellectual Property Rights

19.1. Subject to any international committment entered into in the context

of the World Trade Organization's Trade in Intellectual Property Related Rights and other regimes which require countries to make patents available for inventions, the National Competent Authority may initiate studies and proposals for consideration by the national legislative body to receive and approve requests for patents and intellectual property rights submitted by any party over life forms or biological processes relating to animal genetic resources in respect of the development of livestock germplasm, genetic markers or methods for genetic improvement stemming from efforts and investments made by the party.

19.2. The stipulation of Article 19 sub article 1 notwithstanding, the exclusive appropriation of any life form, part or derivative through patents and intellectual property regimes shall, in principle, be prohibited

20. Bio-Safety and Sanitary Measures

20.1. With regard to the development of transgenic livestock whose widespread introduction continues to produce implications for the management of animal genetic resources, the National Competent Authority, shall, in consultation with other governmental institutions, develop internationally-compliant regulatory protocol on bio-safety and sanitary measures.

20.2. Such protocol shall apply to the transboundary movement, transit, handling and use of all genetically modified organisms and living modified organisms or products derived there from that may have adverse effect on conservation and sustainable use of animal genetic resources and their diversity, or that may pose risks to the human health.

20.3. The stipulations of sub-articles 1 and 2 notwithstanding, any measure introduced to protect the diversity of animal genetic resources or to ensure public health and safety should not have the effect of disproportionately constraining export trade in livestock and livestock products which could have negative effects on motivations for conservation of indigenous animal genetic resources.

21. Financial Resources

21.1. The National Competent Authority shall solicit financial support

to enable implementing measures which fulfill the objectives and obligations specified in this legislation.

21.2. It shall provide, in accordance with its capabilities, schemes for financial support and incentives in respect of national activities which intend to achieve the objectives of this Proclamation, in accordance with the national plans, priorities and programs.

22. Relationship with other Laws and International Agreements

22.1. Any law or customary practice inconsistent with the provisions of this Proclamation shall be inapplicable regarding matters provided herein.

22.2. The provisions of this Proclamation shall not affect the rights and obligations of any party deriving from existing national, regional and international agreements, except where the exercise of such rights and obligations would cause serious damage or pose threat to animal genetic resources.

23. Power to Issue Regulation and Directives

23.1. The Council of Ministers shall issue a regulation necessary for the effective implementation of this Proclamation.

23.2. The National Competent Authority shall issue directives and guidelines necessary for the implementation of this Proclamation and Regulation issued under sub-article (1) of this Article.

24. Effective Date

This Proclamation shall come into force on the date of its publication in the official Gazette.

Done at _____, this ..... Day of ..... Month ..... Year.

H.E. .....

PRESIDENT OF THE DEMOCRATIC REPUBLIC OF XXX _

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