Country report

supporting the preparation of *The Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture*, including sector-specific data contributing to *The State of the World's Biodiversity for Food and Agriculture* - 2013 -

Country: Kenya

I. EXECUTIVE SUMMARY

Please provide an executive summary (not more than two pages) that will allow national and international stakeholders to gain a quick overview of the content of the country report.
The executive summary should contain information on:

- key trends and driving forces affecting animal genetic resources management in your country;
- strengths, weaknesses and gaps in capacity to manage animal genetic resources in your country;
- key constraints and challenges with respect to animal genetic resources management in your country;
- priorities and strategic directions for future action (focusing particularly on the next ten years).

The objective of the report is to review the Kenya's first country report on the State of management of AnGR that contributed to the First State of the World's Animal Genetic Resources. It therefore highlights the key changes in the management of AnGR that have occurred over the last ten years. The report is therefore intended to: promote the wise use and development of locally adapted AnGR, improve food security, strengthen environmental protection, reduce poverty, protect traditional livestock practices of small holder farmers and pastoralists and strengthen country's ability to manage its AnGR.

In Kenya, Agriculture continues to play a very important role in the economy as it contributes about 25% of the national GDP out of which livestock contribute about 10% and it thus has the key role of providing food security. But due to the unreliable rainfall patterns caused by global warming, it has been difficult for Kenya to achieve consistently sustainable food security.

The rapid human population growth in the last three decades has exerted pressure on the limited arable land, leading to loss of grazing land through human settlement and food production. As a result farmers' preference has also changed to the high yielding exotic breeds of livestock, the outcome of which is risk of loss of the indigenous breeds through, crossing, replacement and neglect. Currently there is a growing demand for quality livestock products in the market thus prompting animal producers to adopt some specific genetic resources to meet specific consumer demands. This has been witnessed in beef and chicken production where consumers have demanded products from certain breeds. Economic attractiveness in livestock enterprises especially dairy, beef, poultry and quails have contributed to increase in the number of keepers and therein numbers of AnGR. In addition Zoo-sanitary and animal welfare measures have been put in place in AnGR management units as measures is to address changing demands in international trade in animal products (exports) and thus providing incentives for livestock keeping. This coupled with improved marketing infrastructure and access to the same has led to improved profitability of AnGR and their products. Adoption of modern technologies has resulted in improved animal husbandry and management practices, hence increased productivity of the AnGR.

In order to support the livestock sub sector, the government of Kenya has embarked on formulation of policies to guide the management of AnGR Some of these policies include the National Livestock, Dairy development, Poultry development, Feeds Policies among others. Animal Breeding Policy and Bill formulation has been completed and the documents are in their final draft form waiting for parliamentary approval.

On the other hand, grazing land degradation especially in the **Arid and Semi-Arid Lands (ASAL)** has continuously resulted in depressed animal feed resources and hence severe effects on less adaptable breeds. However, the government has taken measures by undertaking reseeding of the denuded lands in semi-arid lands in order to avail feed resources for AnGR maintenance. Livestock in the country like any other do experience occasional disease outbreaks which result in Animal losses. The government has continued to put in place measures to control most of the diseases in the country in order to minimize losses.

Implementation of the national AnGR management plans requires access to appropriate technical skills and facilities. Many of the technologies involved in AnGR utilization and conservation are also critical to sustainable livestock development, and capacity in these areas will benefit Kenya's entire livestock sub-sector. Although the country has institutional framework to support capacity building through training, it still requires specialised technical capacity building and development of facilities to allow successful management of the national AnGR. The ongoing socio-economic and political changes in Kenya have focused attention on information and knowledge as critical levers for the needed transformative growth and development in the livestock sub sector. The government and stakeholders have over the years created awareness on the importance of AnGR for economic growth through mass media and livestock extension services. However there is still need for more awareness creation on conservation. Infrastructure for sustainable development of breeding programmes has been sub-optimal mainly due to huge investments required.

In terms of policy, some general policies have been developed for the management of AnGR. However specific policies for sustainable use and development of AnGR are still under development including the animal breeding policy. Where policies and laws guiding the management of AnGR exist, there are challenges on their implementation.

Despite the positive achievements realized in recent years in the management of Animal genetic resources the country has faced some constraints and challenges which needs to be addressed. There is generally lack of coordination and harmonization of the several organisations that are involved in the management of AnGR. The government has made attempts to formulate and review policies guiding the management of AnGR in the country, however this is still inadequate. There is still need for comprehensive resource inventory, characterisation and documentation to provide adequate data. Kenya further needs improvement in AnGR management technologies through capacity building. In addition infrastructure such as roads, communication and markets need to be improved. Finally funding of AnGR Management is ineffective as no funds are allocated for the same.

In order to enhance the management of AnGR in the country there is need to Improve understanding of the state of animal genetic diversity which should be realized through their inventory and characterization; Identification, synthesis and documentation of indigenous knowledge; Genetic evaluation, breed comparisons and design of appropriate breeding plans for indigenous AnGR and animal recording. In addition there is urgent need to develop and implement conservation programmes; train/create awareness on conservation in all stakeholders and to improve technical skills in certain specialised areas of AnGR management. In addition there will be need to restructure and strengthen institutions involved in AnGR development and conservation. For indigenous AnGR management to be attractive to the livestock keepers the country will have to create niche markets for their products.

II. DATA FOR UPDATING THE PARTS AND SECTIONS OF *THE STATE OF THE WORLD'S ANIMAL GENETIC RESOURCES FOR FOOD AND AGRICULTURE*

FLOWS OF ANIMAL GENETIC RESOURCES

1. Studies of gene flow in animal genetic resources have generally concluded that most gene flow occurs either between developed countries or from developed countries to developing countries. Does this correspond to the pattern of gene flow into and out of your country?

For developed countries, exceptions to the usual pattern would include significant imports of genetic resources from developing countries. For developing countries, exceptions would include significant exports of genetic resources to developed countries, and/or significant imports and/or exports of genetic resources to/from other developing countries.

- (•) yes

- ○ no
- ○ yes but with some significant exceptions

1.1. If you answer “no” or “yes but with some significant exceptions”, please provide further details. Please include information on: which species are exceptions and which regions of the world are the sources and/or destinations of the respective genetic material.

N/A

2. Have there been any significant changes in patterns of geneflow in and out of your country in the last ten years?

- ◉ yes
- ○ no

2.1. If yes, please indicate whether this view is based on quantified data (e.g. import and export statistics collected by the government).

- ◉ yes
- ○ no

2.2. If yes, please provide references (preferably including web links) (if relevant, indicate which types of animal genetic resources are covered).

Artificial Insemination annual reports at the Director of Veterinary services and Kenya Revenue Authority (KRA)

2.3. Please also describe the changes, indicating the species involved, the direction of the changes, and the regions of the world to and from which the patterns of imports and exports have changed.

In the last ten years there has been significant increase in imported germplasm for example use of imported dairy germplasm has increased from below 2% to around 30% while importation of goat semen from nothing to some substantial amounts in recent years. There has been an increase in imports of cattle genetics through semen and embryos (Ayrshire, Friesians, Jersey, Guernsey, Brown Swiss, Fleckvieh, Girr, Charolais, Angus etc.) from Europe, Australia, North and South America there is a shift towards the imported breeds lines. There has also been an increase in imports of Goat genetics through semen (Toggenburg, Alpine) from Europe and live animal (Saanen) from South Africa. There has been an increase in number of imported sheep genetics (Dorper) from South Africa as well Rabbits genetics from South Africa. Kenya imports Ankole cattle from Uganda. Kenya has extensively increased exports of Kenya Boran and Sahiwal live cattle,semen and embryos to other African countries (South Africa, Uganda and Tanzania). There has been an increase in exports of Galla, Alpine and Toggenburg goats to Uganda and Rwanda.

3. Please describe how the patterns of geneflow described under Questions 1 and 2 affect animal genetic resources and their management in your country.

Note: Please answer this question even if the pattern of geneflow into and out of your country corresponds to the “usual” pattern described in the first sentence of Question 1 and/or has not changed significantly in the last ten years.

Geneflow into the country has increased productivity and commercial aspect of management of animal genetic resources. It has also led to genetic erosion of indigenous animal genetic resources. The demand for Kenyan animal genetic resources in the African region has led to increased stud registration and farmers joining breed societies. Exports has encouraged breeding, multiplication and conservation of the Kenyan breeds like Kenyan Boran and Sahiwal cattle.

LIVESTOCK SECTOR TRENDS

4. Please indicate the extent to which the following trends or drivers of change have affected or are predicted to affect animal genetic resources and their management in your country and describe these effects.

Note: Relevant impacts on animal genetic resources and their management might include, for example, changes in the type of animal genetic resources kept (e.g. different breeds or species), changes in the uses to which animal genetic resources are put, changes in the geographical distribution of different types of animal genetic resources, increases or decreases in the number of breeds at risk of extinction, changes in the objectives of breeding programmes, changes in the number or type of conservation programmes being implemented, etc. In the text sections, please briefly describe the changes. If possible, provide some concrete examples of the challenges or opportunities presented by the respective drivers and the actions taken to address these challenges or opportunities. If relevant, you may also indicate why a given driver is not affecting animal genetic resources and their management in your country. For a general discussion of drivers of change, please see The State of the World's Animal Genetic Resources for Food and Agriculture (Part 2, Section A) (http://www.fao.org/docrep/010/a1250e/a1250e00.htm).

Drivers of change	Impact on animal genetic resources and their management over last ten years	Future impact on animal genetic resources and their management (predicted for the next ten years)	Describe the effects on animal genetic resources and their management
Changing demand for livestock products (quantity)	high	high	Shift towards high producing genetic resources and improvement of existing genetic resource. There is also a shift towards intensive production systems. These results to systemic replacement of indigenous genetic resources with exotic genotypes.
Changing demand for livestock products (quality)	low	high	Few producers have adopted some specific genetic resources to meet specific consumer preferences. This has the effect of slowly changing the breeding objectives. e.g. rearing of indigenous chicken for organic poultry meat production.
Changes in marketing infrastructure and access	medium	high	Increased returns from keeping of animal genetic resources will favour increase in numbers of high producing breeds
Changes in retailing	medium	high	Increased availability of animal genetic resource products will favour a general increase in corresponding population.
Changes in international trade in animal products (imports)	low	low	Imports are to meet occasional deficits, this encourages future local production, improvements and management under different production systems.
Changes in international trade in animal products (exports)	medium	medium	Strict zoo-sanitary and animal welfare measures put in place in animal genetic resource management units. this has provided incentives for livestock keeping and lead to changes in the production systems.
Climatic changes	high	high	AnGR losses especially in ASALs, depressed animal feed resources, changes in disease patterns leading to depressed AnGR productivity.
Degradation or improvement of grazing land	high	high	Depressed animal feed resources, severe effects on less adaptable breeds due to land degradation. Where improvement is done, feed resources abundance increase the productivity and population of AnGR.
Loss of, or loss of access to, grazing land and other natural resources	high	high	Depressed numbers of animal genetic resources, with a consequence of changes in management systems. Decreased indigenous breeds and increase in exotic breeds.

Drivers of change	Impact on animal genetic resources and their management over last ten years	Future impact on animal genetic resources and their management (predicted for the next ten years)	Describe the effects on animal genetic resources and their management
Economic, livelihood or lifestyle factors affecting the popularity of livestock keeping	high	high	Economic attractiveness in livestock enterprises pushing up number of keepers and therein numbers of animal genetic resources. Land tenure and ownership systems affect enterprise developments.
Replacement of livestock functions	low	low	There is less use of improved animal genetic resources for traction.
Changing cultural roles of livestock	low	low	No major changes.
Changes in technology	high	high	Improved animal husbandry and management practices towards intensification therefore more exotic breeds utilized in the systems.
Policy factors	medium	high	Will provide guidelines in the management and conservation programmes of AnGR (e.g., National Livestock, Dairy development, Poultry development, Feeds Policies etc).
Disease epidemics	low	low	Occasional outbreaks affecting AnGR performance and reducing population and variability of AnGR.

OVERVIEW OF ANIMAL GENETIC RESOURCES

5. Please provide the number of locally adapted and exotic breeds kept in your country.

Data on the number of breeds is needed in order to calculate the percentage of breeds subject to the various management activities that are covered in this questionnaire. In line with the request of the Commission on Genetic Resources for Food and Agriculture at its Fourteenth Regular Session (CGRFA-14/13/Report, paragraph 31), FAO will implement the "locally adapted" vs. "exotic breed" classification system in the Domestic Animal Diversity Information System (DAD-IS). Once countries have fully updated their breed lists and classified all breeds in DAD-IS, it will be possible to use these data to obtain the numbers of breeds in each category.

Species	Locally adapted breeds	Exotic breeds
Cattle (specialized dairy)	0	4
Cattle (specialized beef)	1	6
Cattle (multipurpose)	16	5
Sheep	3	9
Goats	2	6
Pigs	0	3
Chickens	1	4
Dromedaries	4	1
Llamas	0	1
Rabbits	1	5
Quails	1	2
Asses	1	0
Ostriches	2	0

Species	Locally adapted breeds	Exotic breeds
Turkeys	1	1
Guinea fowls	0	2
Ducks	1	1

CHARACTERIZATION

To provide further details of your country's activities in the field of characterization, surveying and monitoring, please go to Strategic Priority Area 1 of the "Progress report on the implementation of the Global Plan of Action for Animal Genetic Resources 2007–2013" (below).

6. Please provide an overview of the current state of characterization in your country by indicating the extent to which the activities shown in the following table have been carried out.

Note: Please focus on characterization studies that have been conducted within the last ten years (baseline surveys of population size may have been conducted in the more distant past). Recall that some types of characterization study on your country's breeds may have been conducted outside your country. For the first two columns, please insert the number of breeds; for columns 3 to 8 please choose one of the following categories: none; low (approximately <33%); medium (approximately 33–67%); high (approximately >67%).

Species	Baseline survey of population size	Regular monitoring of population size	Phenotypic characterization	Molecular genetic diversity studies – within breed	Genetic diversity studies based on pedigree	Molecular genetic diversity studies – between breed	Genetic variance component estimation	Molecular genetic evaluation
Cattle (specialized dairy)	0	0	medium	low	low	none	medium	none
Cattle (specialized beef)	0	0	medium	low	low	none	low	none
Cattle (multipurpose)	0	0	low	none	none	none	low	none
Sheep	1	0	low	low	none	none	low	none
Goats	1	0	low	none	none	none	none	none
Pigs	1	0	low	none	none	none	none	none
Chickens	1	0	low	low	none	low	low	none
Rabbits	1	0	none	none	none	none	none	none
Dromedaries	1	0	medium	low	low	low	none	none
Asses	1	0	none	none	none	none	none	none

INSTITUTIONS AND STAKEHOLDERS

To provide further details of your country's activities in the field of institutions and stakeholders, please go to Strategic Priority Area 4 of the "Progress report on the implementation of the Global Plan of Action for Animal Genetic Resources 2007–2013" (below).

7. Please indicate the state of your country's capacities and provisions in the following areas of animal genetic resources management.

	Score
Education	medium
Research	medium
Knowledge	medium
Awareness	medium
Infrastructure	medium
Stakeholder participation	medium
Policies	medium
Policy implementation	low
Laws	medium
Implementation of laws	low

8. Please provide further information regarding your country's capacities in each of the above-mentioned areas of management. If relevant, please indicate what obstacles or constraints your country faces in each of these areas and what needs to be done to address these constraints. You may also provide information on any particular successes achieved in your country in any of these areas and on the reasons for these successes.

	Description
Education	The country has institutions offering Certificate and Diploma Courses on management of AnGR especially animal production, animal health and dairy technology. Development and inclusion of curriculum on animal genetic resources in various national universities is necessary. The main challenge is the increasingly low enrollment in agricultural-related programmes in the institutions of higher learning.
Research	Kenya has embarked on economic reforms that encourage the beginning of an era of greater dependence on market forces for economic growth and enhanced food security. Therefore, R&D has been prioritized and strengthened although budgetary provisions have been low.
Knowledge	The Stakeholders in the management of AnGR generally have adequate knowledge. The ongoing socio-economic and political changes in Kenya have focused attention on information and knowledge as critical levers for the needed transformative growth and development in the livestock sub sector.
Awareness	The government and various development partners have over the years created awareness on the importance of animal genetic resources for economic growth. Mass media, livestock extension services have been used in the recent past. There is still need for more awareness creation on conservation.
Infrastructure	Infrastructure for sustainable development of breeding programmes have been sub-optimal. This is partially due to huge investments required.
Stakeholder participation	There is stakeholder participation, though low, especially the farmer organisations and even the livestock keepers at local and national levels.
Policies	Some general policies have been developed for the management of AnGR. However specific policies for sustainable use and development of AnGR are still under development including the animal breeding policy.

	Description
Policy implementation	There are challenges on implementation of policies guiding the management of animal genetic resources. These include long time it takes to implement t some items within the policy, failure in the establishment of necessary institutions for monitoring and enforcement of the policy.
Laws	Few laws are available for the management of AnGR. However, the animal breeding bill is under development.
Implementation of laws	There are challenges on implementation of laws guiding the management of animal genetic resources.

9. What steps have been taken in your country to engage or empower the various stakeholders in animal genetic resources management (e.g. establishment of livestock keepers' organizations, development of biocultural community protocols)?

Note: Biocultural community protocol: a document that is developed after a community undertakes a consultative process to outline their core cultural and spiritual values and customary laws relating to their traditional knowledge and resources. For a discussion of the potential role of biocultural community protocols in the conservation of animal genetic resources, please see the guidelines In vivo conservation of animal genetic resources (http://www.fao.org/docrep/018/i3327e/i3327e.pdf).

The country has developed and supported livestock breeders organizations like breed societies, associations and advocacy group. The country has developed bio-cultural community protocol like Samburu bio-cultural community protocol.

BREEDING PROGRAMMES

Note: Breeding programmes: systematic and structured programmes for changing the genetic composition of a population towards a defined breeding goal (objective) to realize genetic gain (response to selection), based on objective performance criteria. Breeding programmes typically contain the following elements: definition of breeding goal; identification of animals; performance testing; estimation of breeding values; selection; mating; genetic gain and transfer of genetic gain. Breeding programmes are usually operated either by a group of livestock breeders organized in a breeders' association, community-based entity or other collective body; by a large commercial breeding company; or by the government.

To provide further details of your country's activities in the field of breeding programmes, please go to Strategic Priority Area 2 of the "Progress report on the implementation of the Global Plan of Action for Animal Genetic Resources 2007–2013" (below).

10. Who operates breeding programmes in your country?

Note: the objective of this question is to identify which stakeholders lead or organize the breeding programmes that exist in your country. Stakeholder participation in the implementation of the various elements of breeding programmes is covered under Question 15. If you wish to provide further information on the activities of the various stakeholder groups (including collaborative activities on an international scale), please provide it in the text section of Question 15.

Species	Government	Livestock keepers organized at community level	Breeders' associations or cooperatives	National commercial companies	External commercial companies	Non-governmental organizations	Others
Cattle (specialized dairy)	yes	no	yes	no	no	no	no
Cattle (specialized beef)	yes	no	yes	no	no	no	no
Cattle (multipurpose)	yes	no	yes	yes	no	no	no
Sheep	no	yes	no	no	no	no	no
Goats	yes	yes	yes	no	no	yes	no
Pigs	no	no	no	yes	no	no	no
Chickens	no	no	no	no	no	no	no
Dromedaries	no	no	no	no	no	no	no
Rabbits	no	no	no	no	no	no	no
Quails	no	no	no	no	no	no	no

10.1. If you choose the option "others", please indicate what kind of operator(s) this refers to.

N/A

11. For how many breeds in your country are the following activities undertaken?

Note: Please do not include activities that are only undertaken for experimental purposes, i.e. include only activities that directly serve or involve livestock keepers. However, please include activities even if they do not at present form part of a breeding programme. The intention is to obtain an indication of whether the "building blocks" of a breeding programme are available or being developed in your country. Loc = Locally adapted breeds; Ex = Exotic breeds.

Species	Tools															
	Animal identification		Breeding goal defined		Performance recording		Pedigree recording		Genetic evaluation (classic approach)		Genetic evaluation including genomic information		Management of genetic variation (by maximizing effective population size or minimizing rate of inbreeding)		Artificial insemination	
	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex
Cattle (specialized dairy)	0	4	0	4	0	4	0	4	0	4	0	0	0	4	0	4
Cattle (specialized beef)	1	6	1	0	1	0	1	6	0	0	0	0	0	0	1	6
Cattle (multipurpose)	1	5	1	1	1	2	1	5	1	0	0	0	1	5	1	5
Sheep	0	1	0	0	0	1	0	1	0	0	0	0	0	1	0	0
Goats	1	1	1	1	1	1	1	1	0	0	0	0	1	1	0	1
Pigs	0	3	0	3	0	3	0	3	0	0	0	0	0	3	0	3
Chickens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dromedaries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabbits	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quails	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ostriches	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turkeys	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

12. Please indicate how many of the breeds in your country are subject to breeding programmes applying the following breeding methods.

Note: Loc = Locally adapted breeds; Ex = Exotic breeds.

Species	Breeding method			
	Straight/pure-breeding only		Straight/pure-breeding and cross-breeding	
	Loc	Ex	Loc	Ex
Cattle (specialized dairy)	0	0	0	4
Cattle (specialized beef)	0	0	1	0
Cattle (multipurpose)	0	0	0	2
Sheep	0	0	2	0
Goats	0	0	1	1
Pigs	0	0	0	3
Chickens	0	0	0	0
Dromedaries	0	0	0	0
Llamas	0	0	0	0
Rabbits	0	0	0	0
Quails	0	0	0	0
Asses	0	0	0	0
Ostriches	0	0	0	0
Turkeys	0	0	0	0
Guinea fowls	0	0	0	0
Ducks	0	0	0	0

13. Please indicate the state of research and training in the field of animal breeding in your country.

Species	Training	Research
Cattle (specialized dairy)	medium	medium
Cattle (specialized beef)	medium	medium
Cattle (multipurpose)	medium	medium
Sheep	medium	low
Goats	medium	medium
Pigs	medium	low
Chickens	medium	medium
Dromedaries	medium	low
Llamas	medium	low
Rabbits	medium	low
Quails	medium	low
Ostriches	medium	low
Turkeys	medium	none
Ducks	medium	none
Asses	medium	none
Guinea fowls	medium	none

14. Please indicate the extent to which livestock keepers in your country are organized for the purposes of animal breeding.

Species	Organization of livestock keepers
Cattle (specialized dairy)	medium
Cattle (specialized beef)	medium
Cattle (multipurpose)	low
Sheep	low
Goats	low
Pigs	none
Chickens	medium
Dromedaries	low

15. Please indicate the level of stakeholder involvement in the various elements of breeding programmes in your country.

Note: If your country has different types of breeding programme, the level of involvement of the various stakeholders may vary from one type of programme to another. In answering this question please try to indicate the overall degree of involvement of the various stakeholder groups.

Cattle (specialized dairy)	Government	Research organizations	Breeders' associations or cooperatives	Individual breeders/livestock keepers	National commercial companies	External commercial companies	Non-governmental organizations	Others
Setting breeding goals	medium	medium	high	high	low	none	low	none
Animal identification	medium	medium	high	high	low	none	medium	none
Recording	medium	low	high	high	low	none	medium	none
Provision of artificial insemination services	low	low	medium	medium	low	low	low	high
Genetic evaluation	high	low	none	none	none	none	none	none

Cattle (specialized beef)	Government	Research organizations	Breeders' associations or cooperatives	Individual breeders/livestock keepers	National commercial companies	External commercial companies	Non-governmental organizations	Others
Setting breeding goals	low	medium	high	medium	low	none	low	none
Animal identification	low	low	high	medium	low	none	low	none
Recording	low	low	high	low	low	none	low	none
Provision of artificial insemination services	low	none	none	none	low	none	none	none
Genetic evaluation	medium	low	none	none	none	none	none	none

Cattle (multipurpose)	Government	Research organizations	Breeders' associations or cooperatives	Individual breeders/livestock keepers	National commercial companies	External commercial companies	Non-governmental organizations	Others
Setting breeding goals	low	low	medium	medium	medium	none	medium	none
Animal identification	low	low	medium	low	low	none	low	none
Recording	low	low	medium	low	none	none	low	none
Provision of artificial insemination services	low	low	low	none	none	none	low	none
Genetic evaluation	medium	low	none	none	none	none	none	none

Sheep	Government	Research organizations	Breeders' associations or cooperatives	Individual breeders/livestock keepers	National commercial companies	External commercial companies	Non-governmental organizations	Others
Setting breeding goals	medium	medium	high	high	medium	none	low	none
Animal identification	low	low	low	low	low	none	low	none
Recording	low	low	low	low	low	none	low	none
Provision of artificial insemination services	none	none	none	none	none	none	none	none
Genetic evaluation	none	none	none	none	none	none	none	none

Goats	Government	Research organizations	Breeders' associations or cooperatives	Individual breeders/livestock keepers	National commercial companies	External commercial companies	Non-governmental organizations	Others
Setting breeding goals	medium	low	high	high	medium	none	medium	none
Animal identification	medium	low	high	medium	medium	none	low	none
Recording	medium	low	medium	low	low	none	low	none
Provision of artificial insemination services	low	none	low	none	none	none	none	none
Genetic evaluation	low	low	none	none	none	none	none	none

Pigs	Government	Research organizations	Breeders' associations or cooperatives	Individual breeders/livestock keepers	National commercial companies	External commercial companies	Non-governmental organizations	Others
Setting breeding goals	low	low	none	medium	medium	none	low	none
Animal identification	low	low	none	low	low	none	none	none
Recording	none	none	none	none	low	none	none	none
Provision of artificial insemination services	none	low	none	low	low	none	none	none
Genetic evaluation	none	none	none	none	none	none	none	none

Chickens	Government	Research organizations	Breeders' associations or cooperatives	Individual breeders/livestock keepers	National commercial companies	External commercial companies	Non-governmental organizations	Others
Setting breeding goals	low	low	none	none	none	none	none	none
Animal identification	none	low	none	none	low	none	none	none
Recording	none	low	none	none	none	none	none	none
Provision of artificial insemination services	none	none	none	none	low	none	none	none
Genetic evaluation	none	low	none	none	none	none	none	none

Dromedaries	Government	Research organizations	Breeders' associations or cooperatives	Individual breeders/livestock keepers	National commercial companies	External commercial companies	Non-governmental organizations	Others
Setting breeding goals	low	low	low	low	low	none	low	none
Animal identification	low	low	low	none	low	none	low	none
Recording	none	low	none	none	none	none	none	none
Provision of artificial insemination services	none	none	none	none	none	none	none	none
Genetic evaluation	none	none	none	none	none	none	none	none

15.1. If you choose the option "others", please indicate what kind of operator(s) this refers to.

Private AI technicians do the bulk of inseminations in the country.

15.2. Please provide further information on the roles that the stakeholders identified in the table play in the implementation of the various activities. If relevant, please also provide further information on the organizational roles played by the stakeholders identified in Question 10.

The Kenya Stud Book carries out livestock registration, and maintains authentic ancestral and identification registers. The Dairy Recording Service of Kenya (DRSK) carries out all the official milk recording and collation of butterfat test results from farmers who raise animals for milk. The livestock recording centre undertakes genetic evaluation of the animals.

16. Does your country implement any policies or programmes aimed at supporting breeding programmes or influencing their objectives?

Species	Policies or programmes
Cattle (specialized dairy)	yes
Cattle (specialized beef)	yes
Cattle (multipurpose)	yes
Sheep	no
Goats	yes
Pigs	no
Chickens	yes

16.1. Please describe these policies or programmes, indicating whether or not they include any measures specifically aimed at supporting breeding programmes for locally adapted breeds or any measures specifically aimed at supporting breeding programmes for exotic breeds (including breed-replacement programmes). Please indicate whether different types of programme are promoted in different production systems (and describe the differences).

Species	Description of policies or programmes
Cattle (specialized dairy)	The National Livestock Policy in its implementation framework enhances productivity through establishment of key institutions to coordinate breeding activities. The national dairy cattle breeding program (NDCBP) supports exotic dairy cattle through breeding interventions towards increasing their productivity.
Cattle (specialized beef)	Kenya beef records (KBR) facilitates performance evaluation for Kenya Boran cattle and the facilities are available for all specialised beef. The National Beef Research Centre conducts research on the Kenya Boran cattle and beef production systems.
Cattle (multipurpose)	There is a National Sahiwal stud which has a breeding programme for Sahiwal cattle.
Sheep	The National Livestock Policy in its implementation framework focuses on enhancing productivity through the products chain.
Goats	Government support to dairy goats association of Kenya and Meru dairy goats breeders association. These Associations have community based breeding programmes for breed improvement of Alpine and Toggenburg breeds.
Pigs	The National Livestock Policy in its implementation framework focuses on enhancing productivity through the products chain.
Chickens	The National Poultry Policy envisions promotion, characterization and conservation of indigenous poultry.

17. Please describe the consequences of your country's breeding policies and programmes, or lack of breeding policies and programmes, for your country's animal genetic resources and their management.

Species	Description of consequences
Cattle (specialized dairy)	There is increased milk productivity amongst dairy breeds and their crosses. Some indigenous genetic resources are extinct like the Kikuyu Zebu. The extinction of the Kikuyu Zebu cattle was occasioned by upgrading of these cattle with exotic breeds to increase milk production for commercial purposes.
Cattle (specialized beef)	There is increased beef productivity among the Improved Kenya Boran and their crosses.
Cattle (multipurpose)	The Sahiwal population has increased. However the Zebu is increasingly getting eroded genetically
Sheep	Sheep productivity has gone down due to inbreeding and lack breed enhancement programmes.
Goats	The milk productivity of indigenous breeds has increased due to cross breeding. Replacement of the small East African goat by exotic dairy.
Pigs	Over-reliance on imported germplasm.
Chickens	Over-reliance on imported germplasm. Increase in chicken productivity due to cross breeding of indigenous chicken with exotic.

18. Please describe the main constraints to the implementation of breeding programmes in your country and what needs to be done to address these constraints. You may also provide information on any particular successes achieved in your country with respect to the establishment and operation of breeding programmes and on the factors that have contributed to these successes.

Inadequate policies and implementation framework on breeding livestock species.

Inadequate financial resources

19. Please describe future objectives, priorities and plans for the establishment or further development of breeding programmes in your country.

Species	Description of future objectives, priorities and plans
Cattle (specialized dairy)	Breed for quality traits and environmental adaptability.
Cattle (specialized beef)	Breed for quality traits and environmental adaptability.
Cattle (multipurpose)	Develop breeding objectives and upscale breeding for traits of economic importance considering environmental adaptability (characterisation).
Sheep	Initiate the sheep breeding programme . Breed for quality products , disease tolerance and environmental suitability. Encourage and strengthen community based breeding programmes.
Goats	Breed for quality products , disease tolerance and environmental suitability, Encourage and strengthen community based breeding programmes.
Pigs	Developing Interest in Pig industry through community advocacy groups. Develop a breeding programme for pigs with emphasis on adaptability and productivity.
Chickens	Develop a breeding programme with emphasis on Indigenous chicken. Promote commercial interest in chicken.

CONSERVATION

To provide further details of your country's activities in the field of conservation, please go to Strategic Priority Area 3 of the "Progress report on the implementation of the Global Plan of Action for Animal Genetic Resources 2007–2013" (below).

20. Please provide an indication of the extent to which your country's breeds are covered by conservation programmes.

Please focus on at-risk breeds and breeds for which there are serious grounds for concern about their potential to fall into the at-risk category in the near future. Countries should not reduce their scores because of a lack of conservation programmes for breeds that are clearly not at risk. The main purpose of this question is to obtain an indication of the extent to which your country's conservation programmes meet the objective of protecting breeds from extinction. If your country has no official national criteria for classifying breed risk status or lacks the relevant data for identifying which breeds are at risk, please base your answers on estimations. Please also note that Question 8 of the "Progress report on the implementation of the Global Plan of Action for Animal Genetic Resources – 2007 to 2013" (below) requests countries to provide information on the criteria they use to assess the risk status of animal genetic resources.

Note: n/a = no programmes implemented because all breeds of this species present in the country are secure.

Species	In situ conservation	Ex situ in vivo conservation	Ex situ in vitro conservation
Cattle (specialized dairy)	n/a	n/a	n/a
Cattle (specialized beef)	n/a	n/a	n/a
Cattle (multipurpose)	low	low	none
Sheep	low	low	none
Goats	low	low	none
Pigs	low	none	none
Chickens	low	low	none

21. Does your country use formal approaches to prioritize breeds for conservation?

- (●) yes
- ( ) no

21.1. If so, which of the following factors are considered?

Note: See Sections 2 and 3 of the FAO guidelines In vivo conservation of animal genetic resources (http://www.fao.org/docrep/018/i3327e/i3327e.pdf).

	Considered in formal prioritization approaches
Risk of extinction	yes
Genetic uniqueness	yes
Genetic variation within the breed	no
Production traits	no
Non-production traits	yes
Cultural or historical importance	yes
Probability of success	no

22. Please indicate which of the following methods are used as elements of in situ conservation programmes in your country and which operators are managing them.

Note: Operators: the sector(s) that initiate(s) and manage(s) the respective activities. If both sectors undertake the respective activity, please answer "yes" in both rows. Please answer "yes" if the respective sector only works with some of the species targeted. If necessary, details of which sector addresses which species can be provided in the textual response. Information on what kinds of public- or private-sector organizations undertake the activities can also be provided, if necessary, in the textual response. Species targeted: Please answer "yes" if there are any such activities targeting the respective species, whether they are undertaken by the public sector, private sector or both.

Operators / Species targeted	Promotion of niche marketing or other market differentiation	Community-based conservation programmes	Incentive or subsidy payment schemes for keeping at-risk breeds	Development of biocultural community protocols	Recognition/award programmes for breeders	Conservation breeding programmes	Selection programmes for increased production or productivity in at-risk breeds	Promotion of at-risk breeds as tourist attractions	Use of at-risk breeds in the management of wildlife habitats and landscapes	Promotion of breed-related cultural activities	Extension programmes to improve the management of at-risk breeds	Awareness-raising activities providing information on the potential of specific at-risk breeds
Public sector	yes	yes	no	yes	no	yes	no	no	no	yes	no	no
Private sector	yes	no	no	no	yes	no	no	no	no	yes	no	no
Cattle (specialized dairy)	no	no	no	no	no	no	no	no	no	no	no	no
Cattle (specialized beef)	no	no	no	no	no	no	no	no	no	no	no	no
Cattle (multipurpose)	no	no	no	yes	no	yes	no	no	no	yes	no	no
Sheep	no	yes	no	yes	no	no	no	no	no	yes	no	no
Goats	yes	no	no	yes	no	yes	no	no	no	yes	no	no
Pigs	no	no	no	no	no	no	no	no	no	no	no	no
Chickens	yes	no	no	no	no	no	no	no	no	no	no	no

22.1. Please provide further details of the activities recorded in the table and any other in situ conservation activities or programmes being implemented in your country.

The Samburu Biocultural protocol covers mainly the Zebu cattle, Red Maasai Sheep and the goats. The community based conservation programme in Samburu is for the Red Maasai sheep. The community organizes shows, competitions among the farmers to showcase their animals.

23. Does your country have an operational in vitro gene bank for animal genetic resources?

In vitro gene bank: a collection of documented cryoconserved genetic material, primarily stored for the purpose of medium- to long-term conservation, with agreed protocols and procedures for acquisition and use of the genetic material.

- ○ yes
- ◉ no

23.1. If your country has no in vitro gene bank for animal genetic resources, does it have plans to develop one?

- ◉ yes
- ○ no

23.2. If yes, please describe the plans.

The Kenya Animal Genetic Resources Centre (KAGRC) has been given a mandate to develop a gene bank for animal genetic resources through a legal notice.

24. If your country has an in vitro gene bank for animal genetic resources, please indicate what kind of material is stored there.

	Stored in national genebank
Semen	
Embryos	
Oocytes	
Somatic cells (tissue or cultured cells)	
Isolated DNA	

25. If your country has an in vitro gene bank for animal genetic resources, please complete the following table.

Species	Number of breeds for which material is stored	Number of breeds for which sufficient material is stored	Does the collection include material from not-at-risk breeds?	Have any extinct populations been reconstituted using material from the gene bank?	Have the gene bank collections been used to introduce genetic variability into an in situ population?	Have the gene bank collections been used to introduce genetic variability into an ex situ population?	Do livestock keepers or breeders' associations participate in the planning of the gene banking activities?
Cattle (specialized dairy)							

Species	Number of breeds for which material is stored	Number of breeds for which sufficient material is stored	Does the collection include material from not-at-risk breeds?	Have any extinct populations been reconstituted using material from the gene bank?	Have the gene bank collections been used to introduce genetic variability into an in situ population?	Have the gene bank collections been used to introduce genetic variability into an ex situ population?	Do livestock keepers or breeders' associations participate in the planning of the gene banking activities?
Cattle (specialized beef)							
Cattle (multipurpose)							
Sheep							
Goats							
Pigs							
Chickens							

25.1. Please provide further details of the activities recorded in the table (including any examples of the use of gene bank material to reconstitute populations or introduce genetic variability) and any other in vitro conservation activities or programmes being implemented in your country.

26. Does your country have plans to enter into collaboration with other countries to set up a regional or subregional in vitro gene bank for animal genetic resources?

- ○ yes
- ◉ no

26.1. If yes, please describe the plans, including a list of the countries involved.

N/A

27. If there have been any cases in your country in which breeds that were formerly classified as at risk of extinction have recovered to a position in which they are no longer at risk, please list the breeds and describe how the recovery was achieved.

N/A

REPRODUCTIVE AND MOLECULAR BIOTECHNOLOGIES

28. Please indicate the level of availability of reproductive and molecular biotechnologies for use in livestock production in your country.

Note: low = at experimental level only; medium = available to livestock keepers in some locations or production systems; high = widely available to livestock keepers.

Species	Biotechnologies								
	Artificial insemination	Embryo transfer	Multiple ovulation and embryo transfer	Semen sexing	In vitro fertilization	Cloning	Genetic modification	Molecular genetic or genomic information	Transplantation of gonadal tissue
Cattle (specialized dairy)	medium	low	low	low	low	none	none	low	none
Cattle (specialized beef)	low	none	none	none	low	none	none	none	none
Cattle (multipurpose)	low	low	none	none	low	none	none	low	none
Goats	low	none	none	none	none	none	none	low	none
Pigs	low	none	none	none	none	none	none	none	none
Asses	none	none	none	none	none	none	none	none	none
Dromedaries	none	none	none	none	none	none	none	none	none
Chickens	low	none	none	none	none	none	none	low	none

28.1. Please provide additional information on the use of these biotechnologies in your country.

Artificial insemination is widely used in dairy cattle breeds and very minimal in beef breeds. Embryo transfer technology was introduced in Kenya more that 30 years ago but the adoption has been very low.

29. If the reproductive and/or molecular technologies are available for use by livestock keepers in your country, please indicate which stakeholders are involved in providing the respective services to the livestock keepers.

	Stakeholders					
	Public sector	Breeders' associations or cooperatives	National non-governmental organizations	Donors and development agencies	National commercial companies	External commercial companies
Artificial insemination	yes	yes	yes	no	no	no
Embryo transfer	yes	no	yes	no	no	no

29.1. Please provide additional information on the roles that the providers identified in the table play in the provision of biotechnology services in your country.

AI service is mainly provided by private service providers including cooperatives. Public sector only offers service where there are no private sector service providers. ET service is provided by members of the East African semen and Embryo Transfer Association whose members include government organisations.

30. Please indicate which biotechnologies your country is undertaking research on.

Biotechnologies	Public or private research at national level	Research undertaken as part of international collaboration
Artificial insemination	yes	no
Embryo transfer or MOET	yes	yes
Semen sexing	no	no
In vitro fertilization	yes	yes
Cloning	no	no
Genetic modification	no	no
Use of molecular genetic or genomic information for estimation of genetic diversity	yes	yes
Use of molecular genetic or genomic information for prediction of breeding values	no	no
Research on adaptedness based on molecular genetic or genomic information	yes	yes

30.1. Please briefly describe the research.

Comparison of different super-ovulation protocols in dairy cattle.
Determination of best estrus synchronization protocols in goats.

31. Please estimate the extent to which artificial insemination (using semen from exotic and/or locally adapted breeds) and/or natural mating is used in your country's various production systems.

Note: low = approximately <33% of matings; medium = approximately 33–67% of matings; high = approximately >67% of mating; n/a = production system not present in this country.

Cattle (specialized dairy)	Ranching or similar grassland -based production systems	Pastoralist systems	Mixed farming systems (rural areas)	Industrial systems	Small-scale urban or peri-urban systems
Artificial insemination using semen from locally adapted breeds	low	low	low	none	low
Artificial insemination using nationally produced semen from exotic breeds	low	low	medium	medium	medium
Artificial insemination using imported semen from exotic breeds	low	none	medium	medium	medium
Natural mating	high	high	medium	low	medium

Cattle (specialized beef)	Ranching or similar grassland -based production systems	Pastoralist systems	Mixed farming systems (rural areas)	Industrial systems	Small-scale urban or peri-urban systems
Artificial insemination using semen from locally adapted breeds	none	none	none	none	none
Artificial insemination using nationally produced semen from exotic breeds	low	none	none	low	none
Artificial insemination using imported semen from exotic breeds	low	none	none	low	none
Natural mating	high	high	high	high	high

Cattle (multipurpose)	Ranching or similar grassland -based production systems	Pastoralist systems	Mixed farming systems (rural areas)	Industrial systems	Small-scale urban or peri-urban systems
Artificial insemination using semen from locally adapted breeds	low	none	low	low	none
Artificial insemination using nationally produced semen from exotic breeds	low	none	low	low	none
Artificial insemination using imported semen from exotic breeds	low	none	low	low	none
Natural mating	high	high	high	high	high

Sheep	Ranching or similar grassland -based production systems	Pastoralist systems	Mixed farming systems (rural areas)	Industrial systems	Small-scale urban or peri-urban systems
Artificial insemination using semen from locally adapted breeds	n/a	n/a	n/a	n/a	n/a
Artificial insemination using nationally produced semen from exotic breeds	n/a	n/a	n/a	n/a	n/a
Artificial insemination using imported semen from exotic breeds	n/a	n/a	n/a	n/a	n/a
Natural mating	high	high	high	high	high

Goats	Ranching or similar grassland -based production systems	Pastoralist systems	Mixed farming systems (rural areas)	Industrial systems	Small-scale urban or peri-urban systems
Artificial insemination using semen from locally adapted breeds	n/a	n/a	n/a	n/a	n/a
Artificial insemination using nationally produced semen from exotic breeds	none	none	low	none	low
Artificial insemination using imported semen from exotic breeds	low	none	low	none	low
Natural mating	high	high	high	high	high

Pigs	Ranching or similar grassland -based production systems	Pastoralist systems	Mixed farming systems (rural areas)	Industrial systems	Small-scale urban or peri-urban systems
Artificial insemination using semen from locally adapted breeds	n/a	n/a	n/a	n/a	n/a
Artificial insemination using nationally produced semen from exotic breeds	n/a	n/a	low	low	low
Artificial insemination using imported semen from exotic breeds	n/a	n/a	low	low	low
Natural mating	n/a	n/a	high	high	high

Chickens	Ranching or similar grassland -based production systems	Pastoralist systems	Mixed farming systems (rural areas)	Industrial systems	Small-scale urban or peri-urban systems
Artificial insemination using semen from locally adapted breeds	n/a	n/a	n/a	n/a	n/a
Artificial insemination using nationally produced semen from exotic breeds	none	none	none	low	none
Artificial insemination using imported semen from exotic breeds	none	none	none	low	none
Natural mating	high	high	high	high	high

Dromedaries	Ranching or similar grassland -based production systems	Pastoralist systems	Mixed farming systems (rural areas)	Industrial systems	Small-scale urban or peri-urban systems
Artificial insemination using semen from locally adapted breeds	n/a	n/a	n/a	n/a	n/a
Artificial insemination using nationally produced semen from exotic breeds	n/a	n/a	n/a	n/a	n/a
Artificial insemination using imported semen from exotic breeds	n/a	n/a	n/a	n/a	n/a
Natural mating	high	high	high	n/a	n/a

32. Please provide further details on the use of reproductive and molecular biotechnologies in animal genetic resources management in your country. Please note any particular constraints to implementing these activities and any problems associated with their use. Please indicate what needs to be done to address these constraints and/or problems. You may also provide information on any particular successes achieved in your country in the use of biotechnologies in animal genetic resources management and on the factors that have contributed to these successes.

N/A

III. DATA CONTRIBUTING TO THE PREPARATION OF *THE STATE OF THE WORLD'S BIODIVERSITY FOR FOOD AND AGRICULTURE*

INTEGRATION OF THE MANAGEMENT OF ANIMAL GENETIC RESOURCES WITH THE MANAGEMENT OF PLANT, FORESTRY AND AQUATIC GENETIC RESOURCES

1. Please indicate the extent to which the management of animal genetic resources in your country is integrated with the management of plant, forestry and aquatic genetic resources. Please describe the collaboration, including, if relevant, a description of the benefits gained by pursuing a collaborative approach.

	Extent of collaboration	Description
Development of joint national strategies or action plans	none	N/A
Collaboration in the characterization, surveying or monitoring of genetic resources, production environments or ecosystems	none	N/A
Collaboration related to genetic improvement	none	N/A
Collaboration related to product development and/or marketing	none	N/A
Collaboration in conservation strategies, programmes or projects	none	N/A
Collaboration in awareness-raising on the roles and values of genetic resources	none	N/A
Training activities and/or educational curricula that address genetic resources in an integrated manner	none	N/A
Collaboration in the mobilization of resources for the management of genetic resources	none	N/A

2. Please describe any other types of collaboration.

N/A

3. If relevant, please describe the benefits that could be achieved by strengthening collaboration in the management of genetic resources in the animal, plant, forest and aquatic sectors in your country. If specific plans to increase collaboration are in place, please describe them and the benefits foreseen

N/A

4. Please describe any factors that facilitate or constrain collaborative approaches to the management of genetic resources in your country.

N/A

5. If there are constraints, please indicate what needs to be done to overcome them.

N/A

ANIMAL GENETIC RESOURCES MANAGEMENT AND THE PROVISION OF REGULATING AND SUPPORTING ECOSYSTEM SERVICES

6. Do your country's policies, plans or strategies for animal genetic resources management include measures specifically addressing the roles of livestock in the provision of regulating ecosystem services and/or supporting ecosystem services?

Regulating ecosystem services: "Benefits obtained from the regulation of ecosystem processes" – Millennium Ecosystem Assessment. 2005. Ecosystems and human well-being: synthesis. Washington D.C., Island Press (available at http://millenniumassessment.org/documents/document.356.aspx.pdf), page 40. Supporting ecosystem services: "Services necessary for the production of all other ecosystem services" – Millennium Ecosystem Assessment. 2005. Ecosystems and human well-being: synthesis. Washington D.C., Island Press (available at http://millenniumassessment.org/documents/document.356.aspx.pdf), page 40.

- ○ yes
- ◉ no

6.1. If yes, please describe these measures and indicate which supporting and/or regulating ecosystem services are targeted, and in which production systems.

Examples of supporting and regulatory ecosystem services provided by livestock might include the following: provision or maintenance of wildlife habitats (e.g. via grazing); seed dispersal (e.g. in dung or on animals' coats); promoting plant growth (e.g. stimulating growth via grazing or browsing); soil formation (e.g. via the supply of manure); soil nutrient cycling (e.g. via supply of manure); soil quality regulation (e.g. affecting soil structure and water-holding capacity via trampling or dunging); control of weeds and invasive species (e.g. via grazing or browsing invasive plants); climate regulation (e.g. by promoting carbon sequestration through dunging); enhancing pollination levels (e.g. by creating habitats for pollinators); fire control (e.g. by removal of biomass that may fuel fires); avalanche control (e.g. grazing to keep vegetation short to reduce the probability that snow will slide); erosion regulation (e.g. indirect via fire control services); maintenance of water quality and quantity (e.g. indirect effect via erosion control); management of crop residues (e.g. consumption of unwanted crop residues by animals); pest regulation (e.g. by destruction of pests or pest habitats); disease regulation (e.g. by destruction of disease vectors or their habitats); buffering of water quantities – flood regulation (e.g. indirect effect via fire and erosion control).

N/A

6.1.1 Please describe what the outcome of these measures has been in terms of the supply of the respective ecosystem services (including an indication of the scale on which these outcomes have been obtained).

N/A

6.1.2 Please describe what the outcome of these measures has been in terms of the state of animal genetic resources and their management (including an indication of the scale on which these outcomes have been obtained).

N/A

7. Do your country's policies, plans or strategies for animal genetic resources management include measures specifically addressing environmental problems associated with livestock production?

Examples might include choosing to use particular species or breeds because they are less environmentally damaging in a given ecosystem or adapting breeding goals to produce animals that have some characteristic that makes them more environmentally friendly.

- ○ yes
- ◉ no

7.1. If yes, please describe these measures and indicate the environmental problems that are targeted, and in which production systems.

N/A

7.1.1 Please describe what the outcome of these measures has been in terms of the reduction of the respective environmental problem (including an indication of the scale on which these outcomes have been obtained).

N/A

7.1.2 Please describe what the outcome of these measures has been in terms of the state of animal genetic resources and their management (including an indication of the scale on which these outcomes have been obtained).

N/A

8. Please describe any constraints or problems encountered or foreseen in the implementation of measures in your country aimed at promoting the provision of regulating and supporting ecosystem services or reducing environmental problems.

N/A

9. Please provide examples of cases in which the role of livestock or specific animal genetic resources is particularly important in the provision of regulating and/or supporting ecosystem services in your country. Please also describe any examples in which diverse animal genetic resources are important in terms of reducing the adverse environmental effects of livestock production.

N/A

10. Please describe the potential steps that could be taken in your country to further expand or strengthen positive links between animal genetic resources management and the provision of regulating and/or supporting ecosystem services or the reduction of environmental problems. If your country has specific plans to take further action in this field, please describe them.

N/A

11. Please provide any further information on the links between animal genetic resources management in your country and the provision of supporting and/or regulating ecosystem services and/or the reduction of environmental problems.

N/A

IV. PROGRESS REPORT ON THE IMPLEMENTATION OF THE *GLOBAL PLAN OF ACTION FOR ANIMAL GENETIC RESOURCES* – 2007 TO 2013

Note: Please provide further details in the text boxes below each question, including, if relevant, information on why no action has been taken.

STRATEGIC PRIORITY AREA 1: CHARACTERIZATION, INVENTORY AND MONITORING OF TRENDS AND ASSOCIATED RISKS

- The state of inventory and characterization of animal genetic resources
- The state of monitoring programmes and country-based early warning and response systems
- The state of international technical standards and protocols for characterization, inventory, and monitoring

1. Which of the following options best describes your country's progress in building an inventory of its animal genetic resources covering all livestock species of economic importance (SP 1, Action 1)?

Glossary: An inventory is a complete list of all the different breeds present in a country.

- ○ a. Completed before the adoption of the GPA
- ○ b. Completed after the adoption of the GPA
- ◉ c. Partially completed (further progress since the adoption of the GPA)
- ○ d. Partially completed (no further progress since the adoption of the GPA)

Please provide further details:

The Livestock populations by species were captured during the human population census, however breed information was not captured.

2. Which of the following options best describes your country's progress in implementing phenotypic characterization studies covering morphology, performance, location, production environments and specific features in all livestock species of economic importance (SP 1, Actions 1 and 2)?

- ○ a. Comprehensive studies were undertaken before the adoption of the GPA
- ○ b. Sufficient information has been generated because of progress made since the adoption of the GPA
- ◉ c. Some information has been generated (further progress since the adoption of the GPA)
- ○ d. Some information has been generated (no further progress since the adoption of the GPA)
- ○ e. None, but action is planned and funding identified
- ○ f. None, but action is planned and funding is sought
- ○ g. None

Please provide further details:

Some characterization studies have been undertaken since the adoption of the GPA especially in Sahiwal cattle indigenous chicken, Alpine goat among others.

3. Which of the following options best describes your country's progress in molecular characterization of its animal genetic resources covering all livestock species of economic importance (SP 1)?

- ○ a. Comprehensive studies were undertaken before the adoption of the GPA
- ○ b. Sufficient information has been generated because of progress made since the adoption of the GPA
- ◉ c. Some information has been generated (further progress since the adoption of the GPA)
- ○ d. Some information has been generated (no further progress since the adoption of the GPA)
- ○ e. None, but action is planned and funding identified
- ○ f. None, but action is planned and funding is sought
- ○ g. None

Please provide further details:

The reports are available but scattered in the various institutions involved. Need to collate this information.

4. Has your country conducted a baseline survey of the population status of its animal genetic resources for all livestock species of economic importance (SP 1, Action 1)?

Glossary: A baseline provides a reference point for monitoring population trends. Population status refers to the total size of a national breed population (ideally, also the proportion that is actively used for breeding and the number of male and female breeding animals).

- ○ a. Yes, a baseline survey was undertaken before the adoption of the GPA
- ○ b. Yes, a baseline survey has been undertaken or has commenced after the adoption of the GPA
- ◉ c. Yes, a baseline survey has been undertaken for some species (coverage increased since the adoption of the GPA)
- ○ d. Yes, a baseline survey has been undertaken for some species (coverage not increased since the adoption of the GPA)
- ○ e. No, but action is planned and funding identified
- ○ f. No, but action is planned and funding is sought
- ○ g. No

Please provide further details:

The livestock populations by species were captured during the human population census held in 2009. The coverage included the major livestock species of economic importance i.e. cattle, camel, sheep, goats, pigs, chicken and donkeys.

5. Have institutional responsibilities for monitoring the status of animal genetic resources in your country been established (SP 1, Action 3)?

Glossary: Monitoring is a systematic set of activities undertaken to document changes in the population size and structure of animal genetic resources over time.

- ○ a. Yes, responsibilities established before the adoption of the GPA
- ○ b. Yes, responsibilities established after the adoption of the GPA
- ○ c. No, but action is planned and funding identified
- ◉ d. No, but action is planned and funding is sought
- ○ e. No

Please provide further details:

Currently the ministry in charge of animal genetic resources compiles populations by species, however there is no information to help in monitoring the breed populations.

6. Have protocols (details of schedules, objectives and methods) been established for a programme to monitor the status of animal genetic resources in your country (SP 2)?

- ○ a. Yes, protocols established before the adoption of the GPA
- ○ b. Yes, protocols established after the adoption of the GPA
- ○ c. No, but action is planned and funding identified
- ○ d. No, but action is planned and funding is sought
- ◉ e. No

Please provide further details:

N/A

7. Are the population status and trends of your country's animal genetic resources being monitored regularly for all livestock species of economic importance (SP 1, Action 2)?

- ○ a. Yes, regular monitoring commenced before the adoption of the GPA
- ○ b. Yes, regular monitoring commenced after the adoption of the GPA
- ○ c. Yes, regular monitoring is being undertaken for some species (coverage increased since the adoption of the GPA)
- ○ d. Yes, regular monitoring is being undertaken for some species (coverage not increased since the adoption of the GPA)
- ○ e. No, but action is planned and funding identified

- (●) f. No, but action is planned and funding is sought
- ( ) g. No

Please provide further details:

A national agriculture statistics is planned and plans to seek funding are underway.

8. Which criteria does your country use for assessing the risk status of its animal genetic resources (SP 1, Action 7)?

Glossary: FAO has developed criteria that it uses to allocate breeds to risk-status categories based on the size and structure of their populations (http://www.fao.org/docrep/010/a1250e/a1250e00.htm).

- ( ) a. FAO criteria
- ( ) b. National criteria that differ from the FAO criteria
- ( ) c. Other criteria (e.g. defined by international body such as European Union)
- (●) d. None

Please provide further details. If applicable, please describe (or provide a link to a web site that describes) your national criteria or those of the respective international body:

N/A

9. Has your country established an operational emergency response system (http://www.fao.org/docrep/meeting/021/K3812e.pdf) that provides for immediate action to safeguard breeds at risk in all important livestock species (SP 1, Action 7)?

- ( ) a. Yes, a comprehensive system was established before the adoption of the GPA
- ( ) b. Yes, a comprehensive system has been established since the adoption of the GPA
- ( ) c. For some species and breeds (coverage expanded since the adoption of the GPA)
- ( ) d. For some species and breeds (coverage not expanded since the adoption of the GPA)
- ( ) e. No, but action is planned and funding identified
- ( ) f. No, but action is planned and funding is sought
- (●) g. No

Please provide further details:

N/A

10. Is your country conducting research to develop methods, technical standards or protocols for phenotypic or molecular characterization, or breed evaluation, valuation or comparison? (SP 2, Action 2)

- ( ) a. Yes, research commenced before the adoption of the GPA
- ( ) b. Yes, research commenced after the adoption of the GPA
- ( ) c. No, but action is planned and funding identified
- ( ) d. No, but action is planned and funding is sought
- (●) e. No

Please provide further details:

N/A

11. Has your country identified the major barriers and obstacles to enhancing its inventory, characterization and monitoring programmes?

- (●) a. Yes
- ( ) b. No
- ( ) c. No major barriers and obstacles exist. Comprehensive inventory, characterization and monitoring programmes are in place.

Please provide further details. If barriers and obstacles have been identified, please list them:

- Inadequate human resource capacity
- Lack of funding
- Lack of AnGR management strategies and action plans

12. If applicable, please list and describe the measures that need to be taken to address these barriers and obstacles and to enhance your country's inventory, characterization and monitoring programmes:

- Capacity building of human resource
- Mobilization of financial resources
- Development of AnGR management strategies and action plans

13. Please provide further comments on your country's activities related to Strategic Priority Area 1: Characterization, inventory and monitoring of trends and associated risks (including regional and international cooperation)

Note: It is not necessary to duplicate information provided in previous sections. Where relevant, please provide cross-references.

N/A

STRATEGIC PRIORITY AREA 2: SUSTAINABLE USE AND DEVELOPMENT

- The state of national sustainable use policies for animal genetic resources
- The state of national species and breed development strategies and programmes
- The state of efforts to promote agro-ecosystem approaches

14. Does your country have adequate national policies in place to promote the sustainable use of animal genetic resources (see also questions 46 and 54)?

- ( ) a. Yes, since before the adoption of the GPA
- (●) b. Yes, policies put in place or updated after the adoption of the GPA
- ( ) c. No, but action is planned and funding identified
- ( ) d. No, but action is planned and funding is sought
- ( ) e. No

Please provide further details. If available, please provide the text of the policies or a web link to the text:

Kenya has a National Livestock Policy, National Poultry Policy and the Draft Animal breeding policy which are all promoting sustainable use of animal genetic resources.

15. Do these policies address the integration of agro-ecosystem approaches into the management of animal genetic resources in your country (SP5) (see also questions 46 and 54)?

Glossary: The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way (for further information see http://www.cbd.int/ecosystem/description.shtml).

- ( ) a. Yes
- ( ) b. No, but a policy update is planned and funding identified
- ( ) c. No, but action is planned and funding is sought
- (●) d. No

Please provide further details:

N/A

16. Do breeding programmes exist in your country for all major species and breeds, and are these programmes regularly reviewed, and if necessary revised, with the aim of meeting foreseeable economic and social needs and market demands (SP4, Action 2)?

- ○ a. Yes, since before the adoption of the GPA
- ○ b. Yes, put in place after the adoption of the GPA
- ◉ c. For some species and breeds (coverage has increased since the adoption of the GPA)
- ○ d. For some species and breeds (coverage has not increased since the adoption of the GPA)
- ○ e. No, but action is planned and funding identified
- ○ f. No, but action is planned and funding is sought
- ○ g. No

Please provide further details:

The national dairy cattle breeding programme, the Kenya beef records have been going on in the country for over 30 years. However, other breeding programmes especially for Sahiwal cattle, Alpine goats and Toggenburg goats are also ongoing.

17. Is long-term sustainable use planning – including, if appropriate, strategic breeding programmes – in place for all major livestock species and breeds (SP4, Action 1)?

- ○ a. Yes, since before the adoption of the GPA
- ○ b. Yes, put in place after the adoption of the GPA
- ○ c. For some species and breeds (further progress made since the adoption of the GPA)
- ○ d. For some species and breeds (no further progress made since the adoption of the GPA)
- ○ e. No, but action is planned and funding identified
- ○ f. No, but action is planned and funding is sought
- ◉ g. No

Please provide further details:

N/A

18. Have the major barriers and obstacles to enhancing the sustainable use and development of animal genetic resources in your country been identified?

- ◉ a. Yes
- ○ b. No
- ○ c. No major barriers and obstacles exist. Comprehensive sustainable use and development measures are in place.

Please provide further details. If barriers and obstacles have been identified, please list them:

- Inadequate human resource capacity
- Lack of funding
- Lack of AnGR management strategies and action plans

19. Have the long-term impacts of the use of exotic breeds on locally adapted breeds (e.g. economic, environmental or genetic impacts) and on food security been assessed in your country (SP4, Action 1)?

Glossary:

Exotic breeds are breeds that are maintained in a different area from the one in which they were developed. Exotic breeds comprise both recently introduced breeds and continually imported breeds.

Locally adapted breeds are breeds that have been in the country for a sufficient time to be genetically adapted to one or more of traditional production systems or environments in the country. The phrase "sufficient time" refers to time present in one or more of the country's traditional production systems or environments. Taking cultural, social and genetic aspects into account, a period of 40 years and six generations of the respective species might be considered as a guiding value for "sufficient time", subject to specific national circumstances.

b. Yes, assessments were introduced before the adoption of the GPA

Please provide further details:

Over the years the country has realized increase in productivity of the dairy cattle through use of exotic breeds on locally adapted breeds. Such animals produce the highest amount of milk in the country.

20. Have recording systems and organizational structures for breeding programmes been established or strengthened (SP4, Action 3)?

- (●) a. Yes, sufficient recording systems and organizational structures for breeding programmes have existed since before the adoption of the GPA
- ( ) b. Yes, sufficient recording systems and organizational structures for breeding programmes exist because of progress made since the adoption of the GPA
- ( ) c. Yes, recording systems and organizational structures for breeding programmes are partially in place (and were established or strengthened after the adoption of the GPA)
- ( ) d. Yes, recording systems and organizational structures for breeding programmes are partially in place (but no progress has been made since the adoption of the GPA)
- ( ) e. No, but action is planned and funding identified
- ( ) f. No, but action is planned and funding is sought
- ( ) g. No

Please provide further details:

The Kenya stud book, which is a livestock registration body was established in 1920 and a recording body (Kenya milk records) was established in 1948.

21. Are mechanisms in place in your country to facilitate interactions among stakeholders, scientific disciplines and sectors as part of sustainable use development planning (SP5, Action 3)?

- ( ) a. Yes, comprehensive mechanisms have existed since before the adoption of the GPA
- (●) b. Yes, comprehensive mechanisms exist because of progress made since the adoption of the GPA
- ( ) c. Yes, mechanisms are partially in place (and were established or strengthened after the adoption of the GPA)
- ( ) d. Yes, mechanisms are partially in place (but no progress has been made since the adoption of the GPA)
- ( ) e. No, but action is planned and funding identified
- ( ) f. No, but action is planned and funding is sought
- ( ) g. No

Please provide further details:

The National Agricultural Sector Extension policy (NASEP) is in place and advocates for stakeholder interaction.

22. Have measures been implemented in your country to provide farmers and livestock keepers with information that facilitates their access to animal genetic resources (SP 4, Action 7)?

- (●) a. Yes, comprehensive measures have existed since before the adoption of the GPA
- ( ) b. Yes, comprehensive measures exist because of progress made since the adoption of the GPA
- ( ) c. Yes, measures partially implemented (and were established or strengthened after the adoption of the GPA)
- ( ) d. Yes, measures partially implemented (but no progress has been made since the adoption of the GPA)
- ( ) e. No, but action is planned and funding identified

- ○ f. No, but action is planned and funding is sought
- ○ g. No

Please provide further details:

Extension programmes have been used as a means of providing farmers and livestock keepers with AnGR information for a very long time in the country.

23. Has your country developed a national policy or entered specific contractual agreements for access to and the equitable sharing of benefits resulting from the use and development of animal genetic resources and associated traditional knowledge (SP3, Action 2)?

- ○ a. Yes, sufficient measures (policy and/or agreements) have been in place since before the adoption of the GPA
- ○ b. Yes, sufficient measures (policy and/or agreements) are in place because of progress made since the adoption of the GPA
- ◉ c. Yes, some measures (policy and/or agreements) are in place (progress has been made since the adoption of the GPA)
- ○ d. Yes, some measures (policy and/or agreements) are in place (but no progress has been made since the adoption of the GPA)
- ○ e. No, but a policy and/or agreements are in preparation
- ○ f. No, but a policy and/or agreements are planned
- ○ g. No

Please provide further details:

Kenya developed a policy on protection of genetic resources, traditional knowledge and folklore which addresses the issues of specific contractual agreements for access to and equitable sharing of benefits resulting from AnGR.

24. Have training and technical support programmes for the breeding activities of livestock-keepers been established or strengthened in your country (SP 4, Action 1)?

- ○ a. Yes, sufficient programmes have existed since before the adoption of the GPA
- ○ b. Yes, sufficient programmes exist because of progress made since the adoption of the GPA
- ◉ c. Yes, some programmes exist (progress has been made since the adoption of the GPA)
- ○ d. Yes, some programmes exist (but no progress has been made since the adoption of the GPA)
- ○ e. No, but action is planned and funding identified
- ○ f. No, but action is planned and funding is sought
- ○ g. No

Please provide further details:

Training of livestock keepers on breeding activities including livestock registration, recording and importance of artificial insemination (AI) has been undertaken in some parts of the country.

25. Have priorities for future technical training and support programmes to enhance the use and development of animal genetic resources in your country been identified (SP 4, paragraph 42)?

- ◉ a. Yes, priorities have been identified or updated since the adoption of the GPA
- ○ b. Yes, priorities were identified before the adaption of the GPA but have not been updated
- ○ c. No, but action is planned and funding identified
- ○ d. No, but action is planned and funding is sought
- ○ e. No

Please provide further details:

- Training on characterization on inventory of AnGR
- Training in genetic evaluation
- Breed comparison and design of appropriate breeding plans for AnGR

26. Have efforts been made in your country to assess and support indigenous or local production systems and associated traditional knowledge and practices related to animal genetic resources (SP 6, Action 1, 2)?

- ○ a. Yes, sufficient measures have been in place since before the adoption of the GPA
- ○ b. Yes, sufficient measures are in place because of progress made since the adoption of the GPA
- ◉ c. Yes, some measures are in place (and were established or strengthened after the adoption of the GPA)
- ○ d. Yes, some measures are in place (but no progress has been made since the adoption of the GPA)
- ○ e. No, but action is planned and funding identified
- ○ f. No, but action is planned and funding is sought
- ○ g. No

Please provide further details:

Indigenous chicken production system is being promoted in the country.

27. Have efforts been made in your country to promote products derived from indigenous and local species and locally adapted breeds, and facilitate access to markets (SP 6, Action 2, 4)?

- ○ a. Yes, sufficient measures have been in place since before the adoption of the GPA
- ◉ b. Yes, sufficient measures are in place because of progress made since the adoption of the GPA
- ○ c. Yes, some measures are in place (and were established or strengthened after the adoption of the GPA)
- ○ d. Yes, some measures are in place (but no progress has been made since the adoption of the GPA)
- ○ e. No, but action is planned and funding identified
- ○ f. No, but action is planned and funding is sought
- ○ g. No

Please provide further details:

Promotion of indigenous chicken products (eggs and meat).

28. If applicable, please list and describe priority requirements for enhancing the sustainable use and development of animal genetic resources in your country:

- Characterization and inventory of indigenous breeds
- Develop breeding programmes for AnGR
- Development of sustainable use policies
- Establishment of breed societies of indigenous breeds
- Research on indigenous breeds

29. Please provide further comments on your country's activities related to Strategic Priority Area 2: Sustainable Use and Development (including regional and international cooperation)

Note: It is not necessary to duplicate information provided in previous sections. Where relevant, please provide cross-references.

N/A

STRATEGIC PRIORITY AREA 3: CONSERVATION

- The state of national conservation policies
- The state of *in situ* and *ex situ* conservation programmes
- The state of regional and global long-term conservation strategies and agreement on technical standards for conservation

30. Does your country regularly assess factors leading to the erosion of its animal genetic resources (SP 7, Action 2)?

- ○ a. Erosion not occurring
- ○ b. Yes, regular assessments have been implemented since before the adoption of the GPA
- ○ c. Yes, regular assessments have commenced since the adoption of the GPA
- ○ d. No, but action is planned and funding identified
- ○ e. No, but action is planned and funding is sought
- ◉ f. No

Please provide further details:

We are aware of erosion of indigenous AnGR, however no assessment of factors leading to this has been done.

31. What factors or drivers are leading to the erosion of animal genetic resources? Please describe the factors specifying which breeds or species are affected:

- Indiscriminate cross breeding of indigenous with exotic breeds mainly of cattle, sheep and goats
- Natural disasters like drought leading to massive deaths

32. Does your country have conservation policies and programmes in place to protect locally adapted breeds at risk in all important livestock species (SP 7, SP 8 and SP 9)?

Glossary: Locally adapted breeds are breeds that have been in the country for a sufficient time to be genetically adapted to one or more of traditional production systems or environments in the country. The phrase "sufficient time" refers to time present in one or more of the country's traditional production systems or environments. Taking cultural, social and genetic aspects into account, a period of 40 years and six generations of the respective species might be considered as a guiding value for "sufficient time", subject to specific national circumstances.

- ○ a. Country requires no policies and programmes because all locally adapted breeds are secure
- ○ b. Yes, comprehensive policies and programmes have been in place since before the adoption of the GPA
- ○ c. Yes, comprehensive policies and programmes exist because of progress made since the adoption of the GPA
- ○ d. For some species and breeds (coverage expanded since the adoption of the GPA)
- ○ e. For some species and breeds (coverage not expanded since the adoption of the GPA)
- ○ f. No, but action is planned and funding identified
- ○ g. No, but action is planned and funding is sought
- ◉ h. No

Please provide further details:

N/A

33. If conservation policies and programmes are in place, are they regularly evaluated or reviewed (SP 7, Action 1; SP 8, Action 1; and SP 9, Action 1)?

- ○ a. Yes
- ○ b. No, but action is planned and funding identified
- ○ c. No, but action is planned and funding is sought

- [x] d. No

Please provide further details:

N/A

34. Does your country have in situ conservation measures in place for locally adapted breeds at risk of extinction and to prevent breeds from becoming at risk (SP 8 and SP 9)?

Glossary: Locally adapted breeds are breeds that have been in the country for a sufficient time to be genetically adapted to one or more of traditional production systems or environments in the country. The phrase "sufficient time" refers to time present in one or more of the country's traditional production systems or environments. Taking cultural, social and genetic aspects into account, a period of 40 years and six generations of the respective species might be considered as a guiding value for "sufficient time", subject to specific national circumstances.

- [ ] a. Country requires no in situ conservation measures because all locally adapted breeds are secure
- [ ] b. Yes for all breeds
- [x] c. For some breeds (coverage expanded since the adoption of the GPA)
- [ ] d. For some breeds (coverage not expanded since the adoption of the GPA)
- [ ] e. No, but action is planned and funding identified
- [ ] f. No, but action is planned and funding is sought
- [ ] g. No

Please provide further details:

There are in situ conservation of the Red maasai sheep in specific government farms.

35. Does your country have ex situ in vivo conservation measures in place for locally adapted breeds at risk of extinction and to prevent breeds from becoming at risk (SP 8 and SP 9)?

Glossary: Ex situ in vivo conservation - maintenance of live animal populations not kept under their normal management conditions - e.g. in zoological parks or governmental farms - and/or outside the area in which they evolved or are now normally found.

- [ ] a. Country requires no ex situ in vivo conservation measures because all locally adapted breeds are secure
- [ ] b. Yes for all breeds
- [ ] c. For some breeds (coverage expanded since the adoption of the GPA)
- [x] d. For some breeds (coverage not expanded since the adoption of the GPA)
- [ ] e. No, but action is planned and funding identified
- [ ] f. No, but action is planned and funding is sought
- [ ] g. No

Please provide further details:

There are government farms where the various breeds of livestock are kept to ensure the breeds are conserved.

36. Does your country have ex situ in vitro conservation measures in place for locally adapted breeds at risk of extinction and to prevent breeds from becoming at risk (SP 8 and SP 9)?

Glossary: Ex situ in vitro - conservation, under cryogenic conditions including, inter alia, the cryoconservation of embryos, semen, oocytes, somatic cells or tissues having the potential to reconstitute live animals at a later date.

- [ ] a. Country requires no ex situ in vitro conservation measures because all locally adapted breeds are secure
- [ ] b. Yes for all breeds
- [ ] c. For some breeds (coverage expanded since the adoption of the GPA)
- [ ] d. For some breeds (coverage not expanded since the adoption of the GPA)
- [ ] e. No, but action is planned and funding identified

- ○ f. No, but action is planned and funding is sought
- ◉ g. No

Please provide further details:

N/A

37. Please describe the measures (indicating for each whether they were introduced before or after the adoption of the GPA) or provide a web link to a published document that provides further information:

N/A

38. If your country has not established any conservation programmes, is this a future priority?

- ◉ a. Yes
- ○ b. No

Please provide further details:

This will be a priority for other breeds which may be at risk

39. Has your country identified the major barriers and obstacles to enhancing the conservation of its animal genetic resources?

- ○ a. Country requires no conservation programmes because all animal genetic resources are secure
- ◉ b. Yes
- ○ c. No
- ○ d. No major barriers and obstacles exist. Comprehensive conservation programmes are in place

Please provide further details. If barriers and obstacles have been identified, please list them:

- Inadequate human resource capacity
- Lack of funding
- Lack of AnGR management strategies and action plans
- Lack of adequate infrastructure and facilities
- Lack of awareness on conservation

40. If your country has existing ex situ collections of animal genetic resources, are there major gaps in these collections (SP 9, Action 5)?

- ○ a. Yes
- ○ b. No

If yes, have priorities for filling the gaps been established?

- ○ a. Yes
- ○ b. No, but action is planned and funding identified
- ○ c. No, but action is planned and funding is sought
- ○ d. No

Please provide further details:

N/A

41. Are arrangements in place in your country to protect breeds and populations that are at risk from natural or human-induced disasters (SPA 3)?

- ○ a. Yes, arrangements have been in place since before the adoption of the GPA

- ○ b. Yes, arrangements put in place after the adoption of the GPA
- ○ c. No, but action is planned and funding identified
- ○ d. No, but action is planned and funding is sought
- ◉ e. No

Please provide further details:

N/A

42. Are arrangements in place in your country for extraction and use of conserved genetic material following loss of animal genetic resources (e.g. through disasters), including arrangements to enable restocking (SP 9, Action 3)?

- ○ a. Yes, arrangements have been in place since before the adoption of the GPA
- ○ b. Yes, arrangements put in place after the adoption of the GPA
- ○ c. No, but action is planned and funding identified
- ○ d. No, but action is planned and funding is sought
- ◉ e. No

Please provide further details:

N/A

43. Is your country conducting research to adapt existing, or develop new, methods and technologies for in situ and ex situ conservation of animal genetic resources (SP 11, Action 1)?

- ○ a. Yes, research commenced before the adoption of the GPA
- ○ b. Yes, research commenced since the adoption of the GPA
- ○ c. No, but action is planned and funding identified
- ○ d. No, but action is planned and funding is sought
- ◉ e. No

Please provide further details. If yes, please briefly describe the research:

N/A

44. Does your country implement programmes to promote documentation and dissemination of knowledge, technologies and best practices for conservation (SP 11, Action 2)?

- ○ a. Yes, programmes commenced before the adoption of the GPA
- ○ b. Yes, programmes commenced since the adoption of the GPA
- ○ c. No, but action is planned and funding identified
- ○ d. No, but action is planned and funding is sought
- ◉ e. No

Please provide further details:

N/A

45. What are your country's priority requirements for enhancing conservation measures for animal genetic resources? Please list and describe them:

- Increase research on indigenous breeds
- Build human resource capacity
- Mobilize funding for conservation measures

- Develop AnGR management strategies and action plans
- Develop infrastructure and facilities for conservation measures

46. Please provide further comments describing your country's activities related to Strategic Priority Area 3: Conservation (including regional and international cooperation)

Note: It is not necessary to duplicate information provided in previous sections. Where relevant, please provide cross-references.

N/A

STRATEGIC PRIORITY AREA 4: POLICIES, INSTITUTIONS AND CAPACITY-BUILDING IMPLEMENTATION AND FINANCING OF THE GLOBAL PLAN OF ACTION FOR ANIMAL GENETIC RESOURCES

- The state of national institutions for planning and implementing animal genetic resources measures
- The state of information sharing
- The state of educational and research facilities capacity for characterization, inventory, and monitoring, sustainable use, development, and conservation
- The state of awareness of the roles and values of animal genetic resources
- The state of policies and legal frameworks for animal genetic resources

47. Does your country have sufficient institutional capacity to support holistic planning of the livestock sector (SP 12, Action1)?

- (●) a. Yes, sufficient capacity has been in place since before the adoption of the GPA
- ( ) b. Yes, sufficient capacity is in place because of progress made after the adoption of the GPA
- ( ) c. No, but action is planned and funding identified
- ( ) d. No, but action is planned and funding is sought
- ( ) e. No

Please provide further details:

The Ministry of Agriculture, Livestock and Fisheries is responsible for supporting holistic planning for the livestock sector in collaboration with other government agencies and stakeholders.

48. What is the current status of your country's national strategy and action plan for animal genetic resources (SP 20)?

Glossary: National strategy and action plan for animal genetic resources: a strategy and plan, agreed by stakeholders and preferably government-endorsed, that translates the internationally agreed Global Plan of Action for Animal Genetic Resources into national actions, with the aim of ensuring a strategic and comprehensive approach to the sustainable use, development and conservation of animal genetic resources for food and agriculture.

- ( ) a. Previously endorsed national strategy and action plan is being updated (or new version has been endorsed)
- ( ) b. Completed and government-endorsed
- ( ) c. Completed and agreed by stakeholders
- ( ) d. In preparation
- ( ) e. Preparation is planned and funding identified
- (●) f. Future priority activity
- ( ) g. Not planned

Please provide further details. If available, please provide a copy of your country's national strategy and action plan as a separate document or as a web link:

N/A

49. Are animal genetic resources addressed in your country's National Biodiversity Strategy and Action Plan (http://www.cbd.int/nbsap/)?

- (●) a. Yes
- ( ) b. No, but they will be addressed in forthcoming plan
- ( ) c. No

Please provide further details:

All agricultural biodiversity are addressed.

50. Are animal genetic resources addressed in your country's national livestock sector strategy, plan or policy (or equivalent instrument)?

- (●) a. Yes
- ( ) b. No, but they will be addressed in a forthcoming strategy, plan or policy
- ( ) c. No, animal genetic resources are not addressed
- ( ) d. No, the country does not have a national livestock sector strategy, plan or policy

Please provide further details. If available, please provide the text of the strategy, plan or policy or a web link to the text:

The National Livestock Policy promotes utilization and conservation of AnGR by establishment of institutions. It further calls for regulation and facilitation of documentation and conservation of genetic resources in Kenya.

51. Has your country established or strengthened a national database for animal genetic resources (independent from DAD-IS) (SP 15, Action 4)?

- ( ) a. Yes, a national database has been in place since before the adoption of the GPA
- ( ) b. Yes, a national database is in place because of progress made since the adoption of the GPA
- ( ) c. Yes, a national database is in place but still requires strengthening (progress since adoption of the GPA)
- ( ) d. Yes, a national database is in place but still requires strengthening (no progress since adoption of the GPA)
- ( ) e. No, but action is planned and funding identified
- ( ) f. No, but action is planned and funding is sought
- (●) g. No

Please provide further details:

N/A

52. Have your country's national data on animal genetic resources been regularly updated in DAD-IS?

Note that the Commission on Genetic Resources for Food and Agriculture has requested FAO to produce global status and trends reports every two years.

- ( ) a. Yes, regular updates have been occurring since before the adoption of the GPA
- ( ) b. Yes, regular updates started after the adoption of the GPA
- (●) c. No, but it is a future priority
- ( ) d. No

Please provide further details:

There is lack of regular livestock surveys and census to assist in the update.

53. Has your country established a National Advisory Committee for Animal Genetic Resources (SP 12, Action 3)?

- ○ a. Yes, established before the adoption of the GPA
- ◉ b. Yes, established after the adoption of the GPA
- ○ c. No, but action is planned and funding identified
- ○ d. No, but action is planned and funding is sought
- ○ e. No

Please provide further details. If a National Advisory Committee has been established, please list its main functions:

The National Advisory Committee on AnGR was established but is inactive due to lack of financial resources.

54. Is there strong coordination and interaction between the National Focal Point and stakeholders involved with animal genetic resources, such as the breeding industry, livestock keepers, government agencies, research institutes and civil society organizations (SP 12, Action 3)?

- ○ a. Yes, strong coordination has been in place since before the adoption of the GPA
- ○ b. Yes, strong coordination was established after the adoption of the GPA
- ○ c. No, but action is planned and funding identified
- ◉ d. No, but action is planned and funding is sought
- ○ e. No

Please provide further details:

The National focal point has not been active due to lack funding and that the national advisory committee on animal genetic resources which was formed has not been able to meet.

55. Does the National Focal Point (or other institutions) undertake activities to increase public awareness of the roles and values of animal genetic resources (SP 18)?

- ○ a. Yes, activities commenced before the adoption of the GPA
- ○ b. Yes, activities commenced after the adoption of the GPA
- ○ c. No, but activities are planned and funding identified
- ◉ d. No, but activities are planned and funding is sought
- ○ e. No

Please provide further details:

N/A

56. Does your country have national policies and legal frameworks for animal genetic resources management (SP 20)?

- ○ a. Yes, comprehensive national policies and legal frameworks were in place before the adoption of the GPA and are kept up to date
- ○ b. Yes, comprehensive and up-to-date national policies and legal frameworks in place because of progress made since the adoption of the GPA
- ◉ c. Yes, some national policies and legislation in place (strengthened since the adoption of the GPA)
- ○ d. Yes, some national policies and legislation in place (not strengthened since the adoption of the GPA)
- ○ e. No, but action is planned and funding identified
- ○ f. No, but action is planned and funding is sought
- ○ g. No

Please provide further details:

Kenya has a National Livestock Policy, National Poultry Policy and a Draft Animal breeding policy and Bill, Legal notice

for the establishment of Kenya animal genetic resources centre (KAGRC).

57. Which of the following options best describes the state of training and technology transfer programmes in your country related to inventory, characterization, monitoring, sustainable use, development and conservation of animal genetic resources (SP14, Action 1)?

- ○ a. Comprehensive programmes have been in place since before the adoption of the GPA
- ○ b. Comprehensive programmes exist because of progress made since the adoption of the GPA
- ◉ c. Some programmes exist (further progress since the adoption of the GPA)
- ○ d. Some programmes (no further progress since the adoption of the GPA)
- ○ e. None, but action is planned and funding identified
- ○ f. None, but action is planned and funding is sought
- ○ g. None

Please provide further details:

Some trainings undertaken in formal colleges and technology transfer is carried by extension agencies in the country.

58. Have organizations (including where relevant community-based organizations), networks and initiatives for sustainable use, breeding and conservation been established or strengthened (SP 14, Action 3)?

- ○ a. Yes, comprehensive organizations, networks and initiatives have existed since before the adoption of the GPA
- ○ b. Yes, comprehensive organizations, networks and initiatives exist because of progress made since the adoption of the GPA
- ◉ c. Yes, some organizations, networks and initiatives exist (established or strengthened since adoption of the GPA)
- ○ d. Yes, some organizations, networks and initiatives exist (but no progress made since adoption of the GPA)
- ○ e. No, but action is planned and funding identified
- ○ f. No, but action is planned and funding is sought
- ○ g. No

Please provide further details:

Kenya livestock breeders organisation (KLBO), Breed societies, community based breeding entities (
Dairy goats association of Kenya (DGAK), Meru goat breeders association), Kenya poultry farmers association (KEPOFA) etc. have been strengthened.

59. Are there any national NGOs active in your country in the fields of:

Characterization?

- ○ a. Yes
- ◉ b. No

Sustainable use and development?

- ○ c. Yes
- ◉ d. No

Conservation of breeds at risk?

- ◉ e. Yes
- ○ f. No

If yes, please list the national NGOs and provide links to their web sites:

The conservation programme of the red maasai sheep by the Samburu community through the support of the LIFE Network, an international NGO.

60. Has your country established or strengthened research or educational institutions in the field of animal genetic resources management (SP 13, Action 3)?

- ○ a. Yes, adequate research and education institutions have existed since before the adoption of the GPA
- ○ b. Yes, adequate research and education institutions exist because of progress made since the adoption of the GPA
- ◉ c. Yes, research and education institutions exist but still require strengthening (progress made since the adoption of the GPA)
- ○ d. Yes, research and education institutions exist but still require strengthening (no progress made since the adoption of the GPA)
- ○ e. No, but action is planned and funding identified
- ○ f. No, but action is planned and funding is sought
- ○ g. No

Please provide further details:

Strengthening in terms of Animal genetic resources research.

61. Please provide further comments describing your country's activities related to Strategic Priority Area 4: Policies, Institutions and Capacity-building (including regional and international cooperation)

Note: It is not necessary to duplicate information provided in previous sections. Where relevant, please provide cross-references.

N/A

IMPLEMENTATION AND FINANCING OF THE *GLOBAL PLAN OF ACTION FOR ANIMAL GENETIC RESOURCES*

- The state of international collaboration for planning and implementing animal genetic resources measures
- The state of financial resources for the conservation, sustainable use and development of animal genetic resources

62. Has your country established or strengthened international collaboration in (SP 16):

Characterization?

- ◉ a. Yes
- ○ b. No, but action is planned and funding identified
- ○ c. No, but action is planned and funding is sought
- ○ d. No

Sustainable use and development?

- ○ e. Yes
- ○ f. No, but action is planned and funding identified
- ○ g. No, but action is planned and funding is sought
- ◉ h. No

Conservation of breeds at risk?

- ○ i. Yes
- ○ j. No, but action is planned and funding identified
- ○ k. No, but action is planned and funding is sought

- [x] l. No

Please provide further details:

Kenya is collaborating with Uganda and Ethiopia in characterization of indigenous chicken.

63. Are there any international NGOs active in your country in the fields of:

Characterization?

- [ ] a. Yes
- [x] b. No

Sustainable use and development?

- [ ] c. Yes
- [x] d. No

Conservation of breeds at risk?

- [x] e. Yes
- [ ] f. No

If yes, please list the international NGOs:

LIFE network (conservation of the red maasai).

64. Has national funding for animal genetic resources programmes increased since the adoption of the GPA?

- [ ] a. Yes
- [x] b. No

Please provide further details:

N/A

65. Has your country received external funding for implementation of the GPA?

- [x] a. Yes
- [ ] b. No
- [ ] c. No, because country generally does not receive external funding

Please provide further details:

Kenya received financial support from the FAO's Funding Strategy for the GPA on AnGR for promotion of indigenous chicken.

66. Has your country supported or participated in international research and education programmes assisting developing countries and countries with economies in transition to better manage animal genetic resources (SP 15 and 16)?

- [ ] a. Yes, support or participation in place before the adoption of the GPA and strengthened since
- [ ] b. Yes, support or participation in place before the adoption of the GPA but not strengthened since
- [ ] c. Yes, support or participation in place since the adoption of the GPA
- [ ] d. No, but action is planned and funding identified
- [ ] e. No, but action is planned and funding is sought
- [x] f. No

Please provide further details:

N/A

67. Has your country supported or participated in programmes aimed at assisting developing countries and countries with economies in transition to obtain training and technologies and to build their information systems (SP 15 and 16)?

- ○ a. Yes, support or participation commenced before the adoption of the GPA and strengthened since
- ○ b. Yes, support or participation commenced before the adoption of the GPA but not strengthened since
- ○ c. Yes, support or participation commenced since the adoption of the GPA
- ○ d. No, but action is planned and funding identified
- ○ e. No, but action is planned and funding is sought
- ◉ f. No

Please provide further details:

N/A

68. Has your country provided funding to other countries for implementation of the Global Plan of Action?

- ○ a. Yes
- ○ b. No, but action is planned and funding identified
- ○ c. No, but action is planned and funding is sought
- ◉ d. No
- ○ e. No, because country is generally not a donor country

Please provide further details. If relevant, specify whether funding was bilateral or multilateral; research cooperation or aid; and to whom and for what it was given:

N/A

69. Has your country contributed to international cooperative inventory, characterization and monitoring activities involving countries sharing transboundary breeds and similar production systems (SP 1, Action 5)?

- ○ a. Yes
- ○ b. No, but action is planned and funding identified
- ○ c. No, but action is planned and funding is sought
- ◉ d. No

Please provide further details:

N/A

70. Has your country contributed to establishing or strengthening global or regional information systems or networks related to inventory, monitoring and characterization of animal genetic resources (SP 1, Action 6)?

- ○ a. Yes
- ○ b. No, but action is planned and funding identified
- ○ c. No, but action is planned and funding is sought
- ◉ d. No

Please provide further details:

N/A

71. Has your country contributed to the development of international technical standards and protocols for characterization, inventory and monitoring of animal genetic resources (SP2)?

- ○ a. Yes
- ○ b. No, but action is planned and funding identified
- ○ c. No, but action is planned and funding is sought
- ◉ d. No

Please provide further details:

N/A

72. Has your country contributed to the development and implementation of regional in situ conservation programmes for breeds that are at risk (SP 8, Action 2; SP 10, Action 1)?

- ○ a. Yes
- ○ b. No, but action is planned and funding identified
- ○ c. No, but action is planned and funding is sought
- ◉ d. No

Please provide further details:

N/A

73. Has your country contributed to the development and implementation of regional ex situ conservation programmes for breeds that are at risk (SP 9, Action 2; SP 10, Action 3; SP 10, Action 4)?

- ○ a. Yes
- ○ b. No, but action is planned and funding identified
- ○ c. No, but action is planned and funding is sought
- ◉ d. No

Please provide further details:

N/A

74. Has your country contributed to the establishment of fair and equitable arrangements for the storage, access and use of genetic material stored in supra-national ex situ gene banks (SP9, Action 3)?

- ○ a. Yes
- ○ b. No, but action is planned and funding identified
- ○ c. No, but action is planned and funding is sought
- ◉ d. No

Please provide further details:

N/A

75. Has your country participated in regional or international campaigns to raise awareness of the status of animal genetic resources (SP19)?

- ○ a. Yes
- ○ b. No, but action is planned and funding identified
- ○ c. No, but action is planned and funding is sought
- ◉ d. No

Please provide further details:

N/A

76. Has your country participated in reviewing or developing international policies and regulatory frameworks relevant to animal genetic resources (SP 21)?

- ◉ a. Yes
- ○ b. No, but action is planned and funding identified
- ○ c. No, but action is planned and funding is sought
- ○ d. No

Please provide further details:

Kenya participated in the development of the East African Community Livestock policy.

EMERGING ISSUES

77. In view of the possibility that at some point countries may wish to update the GPA, please list any aspects of animal genetic resources management that are not addressed in the current GPA but will be important to address in the future (approximately the next ten years). Please also describe why these issues are important and indicate what needs to be done to address them.
Issues to be addressed in future

Issues to be addressed in future (next ten years)	Reasons	Actions required

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