



# 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: Uganda

## 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).

### EXECUTIVE SUMMARY:

In 2008, Uganda completed National Livestock Census exercise. The main objective of the census was to collect high quality data which would help to establish livestock numbers and their characteristics nationally, regionally and by district. The census was also aimed at establishing data at household level; production systems; enterprise and land ownership; cattle population; milk production and sales; goat population; pig population; poultry population and egg production; duck and turkey population and other domestic animals. The Livestock Census was also intended to be used as tool for planning and decision making (The National Livestock Census Report 2008; Uganda Bureau of Statistics).

The National herd cattle population was estimated to be 11.4 million, of which 2.5 million (22.3%) was in the Western Region, 2.5 million (21.8%) was in the Eastern Region, 2.5 million (21.7%) was in the Central Region, 2.3 million (19.8%) in the Karamoja Sub-region. The dominant cattle grouping in Uganda are the indigenous cattle 10.6 million (93.6%) and the exotic cattle were estimated to be 1.52 million.

The National goat production was estimated to be 12.5 million. Overall, about four out of every ten households (39.2%), owned goats and the estimated number of households owning goats are 2.5 million. Almost all goats in Uganda are indigenous 12.3 million (98.7%).

The National sheep herd was estimated to be 3.4 million and regionally the Karamoja zone had the largest number of sheep estimated to be 1.69 million (49.4%). Amongst the sheep owning communities, a typical household would have 6.0 sheep per household.

The National pig herd was estimated to be 3.2 million and regionally, the Central Region had the highest number of pigs estimated at 1.3 million (41.1%), while Karamoja had the least number estimated to be 0.06 million (18.3%).

About half of the households in the country (50.1%) owned chicken and the estimated number of households with chicken was estimated to be 3.2 million and a typical household owns on average twelve (11.7) chicken. The National chicken flock was estimated to be 37.4 million and the largest grouping was the indigenous chicken (at 87.7%) while the exotic layer was 2.5 million (6.6%) and broilers 1.5 million (4.1%).

The other key trends and driving forces which would affect the management of Animal Genetic Resource: the increasing population coupled with the reducing land size (especially that available for livestock), improving income per capita and the emergence of the "middle class" (with increased spending on livestock products) and availability of improved technologies.

There are a number of strengths which as a country Uganda is endowed with and these include the very good tropical climate, good for livestock production; having the Animal Breeding Act ready and passed by Parliament as early as 2001 and formation of a body in-charge of animals breeding by 2003. These gave the country an early start on the implementation of different activities in the management of the Animal Genetic Resources. There have, however, been two major challenges in the management of the AnGR and these have been the high expenses of the Breeding programmes and research, coupled with limited appreciation of AnGR by some decision makers. However, Government has fulfilled its obligation to fund the Breeding activities as much as it could.

Some key constraints and challenges faced by the Country have been mainly two:

- (i) Breeding programmes and research in Livestock require a lot of time and therefore great patience must be exercised before attaining results.
- (ii) Some programmes must be implemented regionally as a number of breeds of animals are transboundary and therefore the programmes developed must be Regional in nature. These must be prepared and implemented by more than one country.

With the afore mentioned issues, therefore there is need to clearly outline priorities and strategic directions for future directions which need to be clearly thought about, planned for and implemented, to have successful AnGR Management programmes. To achieve these expected good results, the following broad areas must be looked into carefully and undertaken:-

- (i) Characterization, Inventory and Monitoring of Trends and Associated Risks. These should be undertaken by doing the following:
  - Examining and developing the Inventory and Characterization of the Animal Genetic Resources
  - Developing monitoring programmes and country-based early warning and response systems
  - Developing international technical standards and protocols for characterization, inventory, and monitoring
- (ii) Sustainable Use and Development of the AnGR through:
  - Implementation of the Animal Breeding Policy (1998) and the Animal Breeding Act (2001)
  - Establishment of the National species and breed development strategies and programmes
  - Encourage efforts to promote and use agro-ecosystem approaches
- (iii) Conservation of AnGR through:
  - Implementation of policies already developed Conservation of AnGR
  - Implementation of in-situ and ex-situ conservation programmes
  - Development of regional and global long-term conservation strategies and agreement on technical standards of conservation
- (iv) Develop Policies, Institutions and Capacity Building through:
  - Strengthening National Institutions for planning and implementing AnGR measures
  - Encourage Information sharing
  - Strengthening Education and Research facilities to improve capacity for characterization, inventory and monitoring sustainable use, development and conservation
  - Increase of awareness of the roles and values of Animal Genetic Resources (AnGR)
  - Implementation of the Animal Breeding Act (2001) and also relate with other laws eg. that of the Dairy Development Authority (DDA, Act, 2001) and the National Research Organization Act (1992).

## **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.

Yes, there has been gene flow from Developing countries into Uganda. However, there has been a few exceptions in the following cases:

- (i) There has been export of both indigenous animals (mainly Ankole cattle) from Uganda into Kenya, Tanzania, Rwanda and Southern Sudan). Uganda has got the largest stock of the Ankole Breed in the World (approximately, 3,000,000) and many Countries have expressed a need interest in exporting the breed as far as the United States of America.
- (ii) There has also been export of cross-bred animals (mainly between Ankole/ Fresian cattle) into especially three countries of Democratic Republic of Congo, Rwanda, and Burundi). Of the 180,000 dairy cattle (for the Cow per family programme) imported into Rwanda from different parts of the world, 30% of these were procured from Uganda in the last eight (8) years.
- (iii) There has also been importation of scavenging backyard chicken (the Kuroiller) from India (as day-old chicks or hatching eggs) in the country. The Kuroiler is dual (faster growing and high number of eggs) purpose breed developed to This importation started in 2010 and up to now about 270,000 day-old have been distributed to farmers.
- (iv) There also importation of exotic breeds of cattle (Frisian, Aryshire, Guernsey, Jersey, Sahiwal, Brahman, Boran and Charolais) from Kenya. We also imported cattle (Frisian, Aryshire, Guernsey, Jersey, Brown Swiss, Brahman and Romagnola) from south Africa.
- (v) We have also imported exotic Goats (Boer and Savanah) from South African.
- (vi) From 2006 and onwards, there has been an importation of exotic pigs (Camborough) for both pure breeding and cross-breeding with the Ugandan pig, to mainly increase in the growth rates.

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).

There has been a significant change in the pattern of gene-flow of poultry by importation of Kuroiler from India.

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.

Importation of the Kuroiler (a hybrid chicken) from India during the last three years (since 2010), has brought about the following changes:

- (i) The chicken (Kuroiler) has been mainly distributed/adopted by the the Resource - Poor farmers. This positive

adoption by the rural farmers of the breed is due to:

- (a) the scavenging pattern of the bird
  - (b) The faster growth rate and
  - (c) The larger number of eggs laid (between 150 - 200) by the Kuroiler as compared to the indigenous chicken (30 - 40 eggs).
- (ii) The positive aspect of the introduction of the Kuroiler has been the ease of management of the breed with higher returns compared to the indigenous chicken.
- (iii) A negative trend is developing where, some farmers cross-breeding the Kuroiler(s) with the indigenous chicken which may lead to erosion of the indigenous chicken.

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.*

(i) CATTLE: The export of cattle especially to Rwanda, followed by Burundi, has led to some farmers drastically reduce their herds in an effort to raise money. They are now raising their herds again through increased use of Artificial Insemination (A. I.).

In an effort to curtail the increasing cross-breeding programme, Government has set up a conservation programme for the Ankole and the East African Shorthorn cattle on three Government farms.

USE OF A. I. has seen an increase in its use, especially in the cross-breeding Programme with the Indigenous cattle (especially the Ankole).

(ii) GOAT BREEDING: Importation of especially the Boer goats, has seen an increase in the cross-breeding of the same with the indigenous goats. More farmers are starting organized goat production, by establishing different sizes of flocks in properly fenced farms.

In preparation of the possible loss of Uganda's indigenous goats, Government has set up a Conservation programme for Mubende goat and the Small East African.

(iii) PIG PRODUCTION: The earlier importation of the Comborough for cross-breeding has led to more and bigger pig farms being established. More recently (from 2012-2013), there has also been importation of the Large White and Land Race for improvement of the existing pig flocks for greater productivity. The increased demand for pork has been stimulated by changing feeding habits of especially the middle class.

## 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)	medium	high	Due to the increase in urbanization, there is increased demand on livestock products and this has led to an increase in the number of animals (cattle, goat, pigs), slaughtered every day. For example, milk consumption per capita increased from 20 liters (in 2000) to 65 liters (in 2014) and meat consumption per capita during the same period has increased from 5kg to 20kg. This has encouraged new farmers to go into livestock production and also improve on the production methods and this is at an increase. The price of land for livestock production is at an increase and the trend is likely to increase in the next ten years.
Changing demand for livestock products (quality)	medium	high	Due to the improved living standards and levels of incomes (with a higher middle class emerging), there is increasing demand of quality livestock products. This is exemplified the increased number of supermarkets with specially parked, semi-processed or processed products. Chain Super Markets like NAKUMAT, UCHUMI (from Kenya), SHOP RIGHT and GAME (from South Africa) have opened in the Country. This trend is at an increase and is likely to stay.
Changes in marketing infrastructure and access	medium	high	There is a general improvement in the marketing infrastructure like roads, INTERNET and telecommunication, vehicles, electricity, trained manpower. There is also a continuous improvement in the establishment of facilities for value addition like factories (eg. milk and milk processing). Government has increased the budgets for for main roads (by tarmacking) and feeder roads (by grading and using marrum). There is also an increase in availability of infrastructure for value addition of livestock products like bulk milk delivery/ processing and abattoirs/ meat processing, just to mention some.
Changes in retailing	high	high	There is a tremendous improvement in the way in which livestock products are handled and marketed. There great efforts to retail meat in markets and under high levels of hygiene. There is an ever increasing number of supermarkets in which livestock products are processed and parked. This increases the shelf life of the products to the final consumers.

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
Changes in international trade in animal products (imports)	medium	medium	<p>There are some imports of livestock products, however, most of the livestock products retailed are processed and produced in the country. This trend is at an increase and acts as a motivating factor to the farmers to produce more and better quality animals.</p> <p>Packaging of livestock products for supermarkets is at an increase and will continue.</p>
Changes in international trade in animal products (exports)	medium	high	<p>With the establishment of the East African Community composed of five (5) East African Countries (Uganda, Kenya, Tanzania, Rwanda and Burundi), this opens doors for trade amongst the countries and therefore, greater opportunities for the farmer.</p> <p>Packaging for Export to these neighboring Countries is also increasing. Products produced for export markets must be of high standards which the processors strive to achieve. In the years 2013 and 2014, milk products (powdered milk and gee) have been produced and are being exported to India. The gee, produced is from milk mainly produced from the Ankole cattle.</p> <p>A big milk processing plant, in Western Uganda, is being constructed to produce "casein" from mainly the Ankole cattle. This casein is to be exported to the USA, where a market has been identified.</p>
Climatic changes	low	low	<p>Some moderate, climatic changes have been witnessed in the recent years, however, Uganda being at the Equator, the effects have not had a negative effect on the whole country. In a few places like mountain slopes, some human activities have affected the environment leading to landslides and causing land slides.</p> <p>Government has started resettling people to other areas to avoid land degradation.</p>
Degradation or improvement of grazing land	high	medium	<p>In some areas over grazing has been witnessed and at times leading to soil erosion. Over grazing has also led some farmers to encroach and try to graze animals in prohibited areas like National parks and this at times has led to spread of disease from wild animals to domestic animals.</p> <p>On the other hand, more farmers have engaged in modern management practices leading to improvement of grazing land for animals.</p> <p>Government has invested in earth moving equipment for the purpose of bush clearing for improvement of the available grazing land.</p>

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
Loss of, or loss of access to, grazing land and other natural resources	medium	medium	An increasing loss of access to grazing land has been witnessed and this has been due to increased population and the human migrations. However, there also remain large tracts of land which can be developed for use of livestock production. Loss of grazing land has forced livestock keepers to sale their animals and thereby reduce their herds or migrate to different parts of the country still with more land available.
Economic, livelihood or lifestyle factors affecting the popularity of livestock keeping	low	medium	Economic and lifestyle have led to reduced number of especially young people wanting to remain engaged into livestock farming. The current trend is having the older generation remaining in livestock farming. However, with mechanization and use of different technologies some young people are choosing to remain in livestock farming. Farmers especially pastoralists, are also being encouraged to keep less animals to avoid soil erosion. We are seeing less numbers of livestock stock in individual herds, however, with more people taking up livestock farming, the total national herd is increasing. More than 90% are indigenous and the exotic breeds are also increasing through cross breeding (using Artificial Insemination) and direct importation into the country. With more modern livestock husbandry practices being employed, nomadism is at a decline.
Replacement of livestock functions	low	medium	Livestock farming is still practiced in parts of the country. Livestock keeping still remains a major form of banking for most of the livestock keepers. The majority of animals being kept are indigenous breeds. However, crossbreeding with exotic breeds is at an increase. With an increasing human population and improving incomes especially of the middle class, more efficient exotic breeds are being used through cross breeding and direct importation. Use of livestock to provide labour for example oxploughing is still promoted by Government, however, mechanization especially the use of tractors is at an increase.
Changing cultural roles of livestock	low	medium	In different parts of the country, cultural aspects of livestock have not changed at all while in other parts the changes are marked, especially in areas where exotic kept are kept. For example, in Central Uganda cattle is no longer being used as bride-price, where as in western and the north eastern part of the country, this practice goes on.

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
Changes in technology	medium	high	Changes in livestock farming have been slow, however, the trend is slowly and steadily changing. Use of Artificial Insemination as breeding tool is increasingly being promoted. The use of multiple ovulation and embryo transfer has also been introduced in the last five years for both research purposes and also as an alternative for farmers. Importation of cattle Embryos for the Embryo Transfer programme has also been introduced, especially for exotic breeds, and this may slowly replace importation of live animals as it is cheaper and easier to handle.
Policy factors	low	medium	A number policy changes have been put in place and is increasingly impacting on livestock farming. The Animal Breeding Policy (of 1998) and the Animal Breeding Act of 2001, have had the major direct effect on management of Animal Genetic Resources in the Country. Although implementation of the breeding programmes is very expensive, efforts are being slowly being implemented.
Disease epidemics	medium	medium	A number of diseases have been controlled through regular prophylactic treatment and vaccinations. These programmes, are many times interfered with by uncontrolled movements of livestock keepers who do not adhere to regulations and manage their animals by being nomadic. These uncontrolled movement have at times led to outbreaks of diseases. Nomad-ism, however, is slowly dying due to the increasing human population and the land changing use in many part of the Country. Government efforts to control diseases, is also highly discouraging uncontrolled animal movement. This trend is likely to continue as diseases like Foot and Mouth Disease (FMD), Contagious Bovine Pleural Pneumonia (CBPP) and others have in the past led to loss of many animals in the Country.

## 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	5
Cattle (specialized beef)	0	3
Cattle (multipurpose)	3	3
Sheep	2	1
Goats	2	4
Pigs	1	4
Chickens	3	6

## 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)	5	0	low	medium	low	low	low	low
Cattle (specialized beef)	3	0	none	low	none	none	none	none
Cattle (multipurpose)	6	0	low	low	low	low	low	low
Sheep	3	0	none	none	none	none	none	none
Goats	6	0	low	none	none	none	none	none
Pigs	5	0	low	none	none	none	none	none
Chickens	9	0	low	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	low
Infrastructure	medium
Stakeholder participation	medium
Policies	high
Policy implementation	high
Laws	high
Implementation of laws	high

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	(i) Animal Breeding course is part of the curricula (ii) Conservation of Animal Genetic Resources (AnGR) not given enough attention (iii) Trainers to be sensitized more about the importance of conservation (iv) Most Tertiary institutions make visits to NAGRC&DB, centre around the country
Research	(i) Most of the research undertaken pertains to characterization of AnGR (ii) Not much research has been done on sheep
Knowledge	Knowledge accessible through media, field visits, sensitization workshops, agricultural shows
Awareness	(i) A good degree of awareness is present in the area of the importance of AnGR conservation (ii) NAGRC&DB is constantly sensitizing the public (iii) Some Indigenous Livestock Keepers have formed Associations like the Ankole Cow Conservation Association (ACCA) (iv) More aggressive sensitisation the public is needed
Infrastructure	(i) Organizational: The National Animal Genetic Resources Centre and Data Bank (NAGRC&DB, was established to spearhead livestock breeding in Uganda (ii) Physical: Artificial Insemination (A. I.) in place; 13 NAGRC&DB farms in different agro-ecological zones of the country to be used for the improvement of AnGR
Stakeholder participation	(i) A good number of stakeholders, particularly livestock keepers are organized into groups through which they influence local activities (ii) Their influence is slowly getting National recognition (iii) Uganda is in the process of establishing a "Livestock Genetic Platform" to cater for the different stakeholders. It is hoped that through such a platform, they will be able to increasingly influence issues at National level

	Description
Policies	(i) The National Animal Breeding (NABP), 1997 is in place. Supporting documents to the policy include the following: (a) Background to the NABP (b) NABP Action Plan (c) Dairy Master Plan (d) Beef Master Plan
Policy implementation	The Policy has led to the establishment of NAGRC&DB, through which much of the breeding activities stipulated there-in, are being implemented.
Laws	Formulation of the policy was followed by the enacting of the "Animal Breeding Act, 2001", by parliament. This act was assented to by the President and it became law, in July 2001 and is now being implemented.
Implementation of laws	The Animal Breeding Act (2001), consists two sections:- (a) Establishment of National Animal Genetic Resources Centre and Data Bank (NAGRC&DB) - and it is supposed to spearhead breeding activities in the Country (b) Establishing and guiding the Regulatory Framework for Animal Breeding activities. This responsibility is under the Director for Animal Resources (DAR). The Directorate needs more capacity building and strengthening to enable it carry out its regulatory activities more efficiently.

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>).*

(i) Fostering and encouragement of formation of breed and breeders' groups undertaken. (ii) We have worked closely with the Ankole Keepers. (iii) Some small amounts of funding has been procured for working with the Livestock Keepers.
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## 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	yes	no	no	no	no	no
Cattle (specialized beef)	yes	yes	no	no	no	no	no
Cattle (multipurpose)	yes	yes	no	no	no	no	no
Sheep	no	no	no	no	no	no	no
Goats	yes	no	yes	no	no	no	no
Pigs	yes	no	no	no	no	no	no
Chickens	yes	no	no	no	no	no	no

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

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)	1	5	1	0	0	0	0	0	0	0	0	0	0	0	2	6
Cattle (multipurpose)	2	2	2	0	0	0	0	0	0	0	0	0	0	0	2	6
Goats	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Pigs	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chickens	3	2	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)	3		5		3		5	
Cattle (specialized beef)	2		2		2		3	
Cattle (multipurpose)	2		2		2		5	
Goats	2		2		2		2	
Pigs	0		3		0		3	
Chickens	3		2		3		2	

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	high
Sheep	low	low
Goats	medium	medium
Pigs	medium	high

Species	Training	Research
Chickens	low	high

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)	low
Cattle (specialized beef)	low
Cattle (multipurpose)	low
Sheep	none
Goats	low
Pigs	low
Chickens	none

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	none	none	none	none	none	none	none
Animal identification	high	low	low	low	low	low	low	none
Recording	low	low	low	medium	low	low	medium	none
Provision of artificial insemination services	high	none	low	none	none	low	low	none
Genetic evaluation	low	none	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	low	none	low	none	none	none	none
Animal identification	low	low	none	low	none	none	none	none
Recording	low	low	none	low	none	none	none	none
Provision of artificial insemination services	medium	none	none	low	none	none	none	none
Genetic evaluation	low	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	none	none	none	none	none	none
Animal identification	low	low	none	none	none	none	none	none
Recording	low	none	none	none	none	none	none	none
Provision of artificial insemination services	low	none	none	none	none	none	none	none
Genetic evaluation	low	low	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	none	low	none	none	none	none
Animal identification	low	low	none	low	none	none	none	none
Recording	low	low	none	low	none	none	none	none
Provision of artificial insemination services	low	none	none	none	none	none	none	none
Genetic evaluation	low	low	none	low	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	low	low	none	none	none	none	none	none
Recording	low	low	none	none	none	none	none	none
Provision of artificial insemination services	none	none	none	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	none	none	none	none	none
Animal identification	low	low	none	none	none	none	none	none
Recording	low	low	none	none	none	none	none	none
Provision of artificial insemination services	low	low	none	none	none	none	none	none
Genetic evaluation	low	low	none	none	none	none	none	none

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

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.

As clearly demonstrated, Government and Research are the major players spearheading the breeding activities. This mainly because, in the beginning breeding activities are normally very expensive. However, as the programmes continue, there has been witnessed greater participation of other players joining (including Individual farmers). It is hoped this trend will continue as the benefits of organized breeding are realized.

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	no
Pigs	yes
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)	Specific breeds are recommended for the different agro-ecological zones eg. Tropicalized Friesian, Jersey, Guernsey, and Ayrshire are high altitude (zone 1) and Southern and Western Tall Grassland (Zone IV), (see page 73 for the types of zones in the Uganda, Country Report, 2004)
Cattle (specialized beef)	Breeding programmes for breeding programmes for Boran and Brahman have been initiated Western Grassland and also in Central part of Uganda. Originally the programme has began by cross-breeding with both the Ankole and East African Short Zebu (EASZ). The programme has been implemented by the use of semen for the Boran and Brahman to produce the F1 (50% cross Bred). Because of the demand by the farmers to improve on their indigenous cattle, they have been given the 50% breeding bulls from NAGRC&DB Maruzi Ranch, toicts framers in the surrounding districts. The next step is to back-cross with the pure Brahman and Boran Semen and produce 75% Pure and 25% indigenous. Eventually we shall develop a stabilized beef breed for this area as we work with the farmers in the area. We intend to multiply the stock produced and make it available to the farmers. We also intend to produce Semen to be used in the programme.
Cattle (multipurpose)	A special programme for conservation of the Ankole Breed has been initiated on one ranch (Nshara Ranch - 27 miles sq2) in Western Uganda. In this programme we are working with farmers in the region who own the breed, encouraging them to record and have an organized programme for the exchange of Breeding bulls. Semen collection from the the best bulls has been initiated and is being stored in the Gene-Bank.
Sheep	There is no breeding programme for sheep.
Goats	One breeding programme for improvement of goat productivity (faster growth rate) was initiated about seven (years ago), with the importation of the Boer goat from South Africa. Pure males are produced at two (2) NAGRC&DB farms and availed to farmers for cross-breeding with the indigenous goats of interested farmers. On another two (2) NAGRC&DB farms, pure Boer goats are kept as a back-up for the programme. Farmers are taught concerning the breeding programme and how to make sure that we avoid the indiscriminate cross - breeding. Farmers are also taught how to record.
Pigs	A small breeding programme was initiated in the pig production, by the introduction of the Comborough pig from South Africa.
Chickens	From 2009/10, a new hybrid chicken (Kuroiler) was introduced in Uganda from India, for the purpose of managing the breed under scavenging conditions as backyard chicken. The purpose of this introduction was to bring about increased productivity under this management system to bring about a greater income and better feeding for the rural resource poor families. The expected increased income would be through faster growth rate of the males and higher number of eggs laid compared to the indigenous chicken.

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 has been increased availability of breeding dairy animals in the country leading to increased milk production and increased incomes for the farmers. Farmers have been able to produce sale dairy bred heifers to the neighboring countries especially Rwanda and Burundi. This has given greater incomes for the farmers. One Farmers Association (RE-LINE) has been established. The Association is composed of commercial farmers who have come together to develop cattle farming a a serious commercial venture. NAGRC&DB has guided these farmers in different activities along the value chain including: the use of A. I., Recording, animal nutrition and herd health. Farmers have on their own carried out activities on their own e.g. organizing farm visits to the members in the association, getting different speakers on different topics and external tours, outside the country.
Cattle (specialized beef)	Beef farmers have come together and demanded for help in breeding programmes and the use of breeding technologies. The use of A. I. and recording has been emphasized. Farmers have also come together to identify their problems and seek for ways of solving them in beef farming.
Cattle (multipurpose)	Through the activities of conservation and utilization programme, the Ankole conservation programme at Nhsara Ranch has brought about great awareness of the attributes for the breed and this has led to the following: (i) An Association for Ankole Cattle farmers being established (ii) Attributes of the Ankole Cattle being studied and contributed to by and with the farmers' participation (iii) The demand of the breed increasing in many parts of the country and the price of the breed increasing in the country. Farmers have also been able to sale stock in the region especially to Southern Sudan, DRC and Rwanda.
Sheep	(i) Farmers have begun to enquire about the improvement programmes for sheep in the country. They have also made enquiries of how they can acquire Dopper sheep from Kenya. (ii) The conservation programme of the Mubende goat has brought about greater awareness of the breed. More farmers have acquired the breed and farming with the same and the farm gate price of the same has drastically increased.
Goats	The cross-breeding programme of the Boer with the indigenous goat has progressed with many farmers having adapted the breed. We are now at the stage of stabilizing the breed as we work with the farmers. The faster growing goats have brought increased incomes to the farmers.
Pigs	The breeding programme with the Comborough pig has also been adopted by many farmers. Some farmers have requested for importation of a bigger number of especially the Large white and Landrace, for the purpose of cross-breeding with the Comborough.
Chickens	The establishment of the Kuroiler as a backyard chicken has been so successful in the country especially in the rural family, due to the increased productivity in both meat and egg production. To date over 270,000 Day-old chicks has been distributed to over 525 farmers country wide. Greater incomes have been realized by the rural families. The demand for this bird has gone beyond Uganda into Kenya, Rwanda, DRC and Southern Sudan. Orders for both Day-old chicks and hatching eggs have been placed and supply out of Uganda begins in February, 2014.

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.

- (i) The major challenges to establishment of the different breeding programmes has been the lack of adequate funds.  
(ii) Successes of the breeding programmes initiated so far and mentioned above, however, has been due to Government to implementation of the Law as passed by Parliament and availing facilities for the different programmes and also consistently providing some funds.

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)	Governments commitment for the above mentioned programmes (with objectives, priorities and plans) are well spelt out in the Strategic Plan for NAGRC&DB, which roles every five (5) years.
Cattle (specialized beef)	As above
Cattle (multipurpose)	As above
Sheep	As above
Goats	As above
Pigs	As above
Chickens	As above

## 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)	medium	medium	medium
Cattle (specialized beef)	medium	low	low
Cattle (multipurpose)	low	low	low
Sheep	none	none	none
Goats	low	low	none
Pigs	none	none	none
Chickens	none	none	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

	Considered in formal prioritization approaches
Genetic uniqueness	yes
Genetic variation within the breed	yes
Production traits	yes
Non-production traits	yes
Cultural or historical importance	yes
Probability of success	yes

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	yes	yes	yes	yes	yes	yes
Private sector	yes	no	no	yes	no	no	no	yes	yes	yes	no	yes
Cattle (specialized dairy)	yes	yes	yes	no	yes	yes	no	no	no	no	no	no
Cattle (specialized beef)	yes	no	yes	no	yes	yes	yes	yes	no	yes	no	no
Cattle (multipurpose)	yes	no	no	yes	yes	yes	yes	yes	no	yes	no	no
Sheep	no	no	no	no	no	no	no	no	no	no	no	no
Goats	yes	yes	no	no	no	yes	yes	no	no	no	yes	no
Pigs	no	no	no	no	no	no	no	no	no	no	no	no
Chickens	yes	no	yes	yes	no	no	no	no	yes	no	yes	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 two best details of Uganda's conservation programmes are:  
 (i) The Ankole Conservation programme - which is been spearheaded by NAGRC&DB. This programme has been undertaken due to rampant and increasing cross-breeding programme of the Ankole with especially the Friesian, by

the farmers, in search of more milk for increased incomes.

(ii) The conservation of the Mubende Goat Breed. This breed is known for its high milk production and twining ability. It also has high value for its skin, at the international market. The decision to conserve the breed was prompted by the increasing indiscriminate cross-breeding with the Boer Goat, for faster growth. Selection and multiplication of the breed has been embarked on.

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.

- (i) As mentioned in 23, we already have embarked on an in vitro gene bank development by processing and storing of semen and embryos.  
(ii) We have also already identified an additional building where genetic materials for gene bank (for storage) is expanding, as the programme grows.  
(iii) We also need to agree as a country what materials we need to conserve in the Regional Gene Bank.  
(iv) Agree with Countries in the Region with which we would like to associate.

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	yes
Embryos	yes
Oocytes	no
Somatic cells (tissue or cultured cells)	no
Isolated DNA	no

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)	6	6	yes	no	yes	yes	yes
Cattle (specialized beef)	4	4	yes	no	yes	yes	yes
Cattle (multipurpose)	4	4	yes	no	no	no	no
Sheep	0	0	no	no	no	no	no
Goats	0	0	no	no	no	no	no
Pigs	0	0	no	no	no	no	no
Chickens	0	0	no	no	no	no	no

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.

N/a

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.

We would like carry out the following plans developing of the Regional Gene Bank:  
(i) First develop a National In Vitro Gene Bank  
(ii) Develop strategic Regional Plans and protocols for developing Regional Gene Bank  
(iii) The countries in the region with which to develop the Regional Gene Bank would include Rwanda, Burundi, Tanzania, Kenya and Southern Sudan  
(iv) We would then develop agreement on how to run and Manage this Gene Bank  
(v) Have agreements developed on how the countries would access and share these Genetic Materials

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.

There has been no case so far.

## 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	none	none	none	low	none
Cattle (specialized beef)	low	low	none	none	none	none	none	none	none
Cattle (multipurpose)	low	none	none	none	none	none	none	none	none

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

- (i) Artificial Insemination (A. I.) has been used for a long time in Uganda. However its area of coverage (number of Inseminations in cattle) has been relatively low compared to the time the technology has been available. So now increase its usage both in Dairy and Beef, the use of planned A. I. has been embarked on through the use of synchronisation. The results have been encouraging and management of the service and the calves born, is made much more easier. This system is now being out - scaled to cover more areas. It is also being advocated for in the beef production. It helps to cut down on indiscriminate cross breeding.
- (ii) Multiple Ovulation and Embryo Transfer is being embarked on in special cases, to exploit the best of the best producing female and therefore produce more embryos (and letter live calves) from these females.

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	yes	no	yes
Embryo transfer	yes	no	no	yes	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.

- (i) Government produces semen or buys in (imports) semen for the A. I. Programme for cattle
- (ii) Government trains all A. I. Technicians responsible for the provision of the A. I. services to farmers
- (iii) Government also imports embryos for use in the transfer of cattle Embryos.
- (iv) Government is has also established a new Embryo Transfer Laboratory which will start operating this year (2014)
- (v) All the other players in the sector import semen into the Country for the A. I. programme

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	yes
Embryo transfer or MOET	no	no
Semen sexing	no	no
<i>In vitro</i> fertilization	no	no
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	yes	yes
Research on adaptedness based on molecular genetic or genomic information	yes	yes

30.1. Please briefly describe the research.

There is research which has been undertaken between NAGRC&DB and Makerere University in the development and use of A. I. in Pig Reproduction. The technology in the study has yielded good results under the University farm. Now it is being evaluated in the field.

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	medium	low	medium
Artificial insemination using nationally produced semen from exotic breeds	medium	low	medium	low	medium
Artificial insemination using imported semen from exotic breeds	low	none	low	low	low
Natural mating	high	high	high	medium	low
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	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	low
Natural mating	high	high	high	medium	low

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	low	low	low	low
Artificial insemination using nationally produced semen from exotic breeds	low	none	low	low	low
Artificial insemination using imported semen from exotic breeds	low	low	low	low	low
Natural mating	high	high	medium	low	medium
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	none	none	none	none	none
Artificial insemination using nationally produced semen from exotic breeds	none	none	none	none	none
Artificial insemination using imported semen from exotic breeds	none	none	none	none	none
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	none	none	none	none	none
Artificial insemination using nationally produced semen from exotic breeds	none	none	none	none	none
Artificial insemination using imported semen from exotic breeds	none	none	none	none	none
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	none	none	none	none	none
Artificial insemination using nationally produced semen from exotic breeds	none	none	none	none	none
Artificial insemination using imported semen from exotic breeds	none	none	none	none	none
Natural mating	high	high	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	none	none	none	none	none
Artificial insemination using nationally produced semen from exotic breeds	none	none	none	none	none
Artificial insemination using imported semen from exotic breeds	none	none	none	none	none
Natural mating	high	high	high	high	high

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.

- (i) One major success in the use of biotechnology is the use of A. I. The technique is currently widely known by most of the farmers in the country.
- (ii) The major challenge affecting wider use of the biotechnology (including the use of A. I. is the high costs of the same to the farmer.

### 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	
Collaboration in the characterization, surveying or monitoring of genetic resources, production environments or ecosystems	none	

	Extent of collaboration	Description
Collaboration related to genetic improvement	none	
Collaboration related to product development and/or marketing	none	
Collaboration in conservation strategies, programmes or projects	none	
Collaboration in awareness-raising on the roles and values of genetic resources	none	
Training activities and/or educational curricula that address genetic resources in an integrated manner	none	
Collaboration in the mobilization of resources for the management of genetic resources	none	

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

Collaboration has not been initiated.

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

Factors which constraint the collaborative arrangements include lack of knowing the relationships between these different genetic resources. This then leads the initiation by the stakeholders to plan and wok together.

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

We need to do the following:  
 (i) There needs to be sensitization workshops  
 (ii) There is need to plan jointly and also implement some activities together  
 (iii) We also need explore the available linkages and benefits of joint collaboration  
 (iv) We need to have joint evaluation programmes of the agreed upon joint programmes

## 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.

These steps have not been studied.

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:

Country initiatives are underway.

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:

Research work was carried out under for "Comparison of production systems with pure bred Ankole vs. cross-bred Ankole - Friesian on-farm, using a combined cross - sectional and longitudinal Approach (Kiruhura District of Uganda). (An M.Sc. by Esau G. Galukande, 2010).

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:

There is work on going, in collaboration with ILRI, to characterise the milking Friesian cross cattle in Eastern and Central Uganda. The results are yet to be published.

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:

A livestock census for Uganda was completed in 2008.

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:

One of the main activities of NAGRC&DB is to monitor trends in the status of Animal Genetic Resources in the country.

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:

We are in the process of looking for funding to develop protocols for monitoring of status of the Uganda's AnGR.

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:

Funds is still the major problem.

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:

We have adopted the criteria developed by FAO.

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:

Funds are being sought to put a fully functional Emergency Response System to safe guard breeds at risk. However, the facilities established (farms/ ranches and Laboratories) by Government under the National Animal Genetic Universi Resources and Data Bank (NAGRC&DB), are currently ready carry out the role.

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:

Research work has been carried out to develop methods, technical standards and protocols for phenotypic and molecular characterization by staff in NAGRC&DB and at Makerere University. The species of focus has been Ankole cattle, the East African Zebu and the Nganda cattle.

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:

Although some work has been done in the area of developing the inventory, characterization and monitoring of the Uganda's AnGR, the major constraint has been limited funding. Much of the progress has been carried out as research work.

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:

More efforts are being sought to secure adequate funds for the work, starting with Government.

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.*

There is more on-going research work which will yield good results and this will be reported in the future reports. There is a great need to train more up-coming young Scientists, to adequately carry the necessary task.

## 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:

Uganda developed an Animal Breeding Act (in 2001) and started its implementation effectively in 2003 with the establishment of the two organs:

- (i) The regulation of breeding activities in the country - carried out by the Director Animal Resources (DAR) in the Ministry of Agriculture Animal Industry and Fisheries
- (ii) The establishment of the National Animal Genetic Resources Centre and Data Bank (NAGRC&DB) with the main purpose of spearheading breeding activities in the country, working with farmers and other stakeholders. NAGRC&DB has developed Strategic Plan with six (6) Developmental roles:
  - (i) Serve as a Central Livestock Registry, quarantine centre, examine and evaluate genetic materials (live animals, semen and embryos)
  - (ii) Conduct training of technicians and farmers in different aspects of animal breeding
  - (iii) Collaborating in research genetic improvement (including conservation for utilization of our Animal Genetic Resources, through selection and multiplication)
  - (iv) Encourage formation and development of Breed Societies and Breeders' Associations
  - (v) To provide guidance on breeding and multiplication of improved breeds
  - (vi) To promote recording and performance testing of livestock

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:

The sixth Strategic Objective of strategic Plan for NAGRC&DB is to have Monitoring tool in place to make sure that the livestock breeding activities are in line with the conservation of the environment

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:

NAGRC&DB has developed a Strategic Plan of action which is monitored and reviewed and revised every five (5) years

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:

The Animal Breeding Act is in place and takes care of the mid and long-term planning for all major livestock species and breeds. Whenever it is deemed necessary, any part of the Animal Breeding Act can be revised and improved.

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:

The major barriers:  
(i) Lack of sensitization of the population/ farmers  
(ii) Lack of understanding fully the importance of Animal Genetic Resources by decision makers  
(iii) Lack of adequate funding to carry out the required activities to lead to sustainable use and development of AnGR

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.*

e. No, but action is planned and funding is sought

Please provide further details:

One major advantage we have in Uganda is that, Government has made a long - term commitment to supporting the activities under the Animal Breeding Act.

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:

Recording is a major challenge for the breeding programme in Uganda and therefore it is one of the major six Strategic Objectives to be given special focus by NAGRC&DB. NAGRC&DB has already started to produce and recording formats and these are being availed to farmers. There is a lot of work yet to be carried out to establish proper and useful Recording Systems in our breeding programmes.

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:

A platform for Livestock Genetics has been Established to allow constant interactions between the different stakeholders.

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:

Constant awareness programmes are constantly organized for the farmers.

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:

We yet have to carry out consultations with different stakeholders.

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:

These training workshops have been initiated.

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:

Priorities areas have been identified and activities developed. Implementation of a number of activities have already begun.

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:

The one prominent development has been the support which has been given to farmers keeping Ankole cattle. The farmers have received training and the need to keep records has been emphasized.

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:

Discussions are being held with farmers and different stakeholders to promote products from indigenous animals. to promote their utilization.

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

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.*

### **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:

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:

- (i) Indiscriminate cross-breeding of indigenous breeds with exotic breeds (dairy) - the affected breeds are mainly Ankole and the Nganda cattle breeds.
  - (ii) Diseases especially the tick - born diseases. The major disease is East Cost Fever (ECF) - caused by a protozoa - "theilaria parva", which affects calves and leads to high mortality.

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:

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
- d. No

Please provide further details:

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
- 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:

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)
- 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:

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:

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:

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

- a. Yes
- b. No

Please provide further details:

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:

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:

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:

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:

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:

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:

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

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.*

(i) We are in collaboration with International Livestock Research Institute (ILRI) to evaluate the different cattle genetics in the country. We have done this through two PhDs and research projects undertaken in both Uganda and Kenya. We have also collaborated with Agricultural University of Austria.

(ii) We also collaborate with semen producing institutions in Kenya, Tanzania and Rwanda in areas of semen production, Artificial Insemination and Embryo Transfer Programmes.

#### 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:

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:

(i) An "Animal Breeding Policy" and the "Implementation Plan" were approved by Cabinet in 1998  
(ii) An "Animal Breeding Act" for Uganda was enacted by Parliament and assented to by the President in July, 2001.

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:

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:

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:

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:

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:

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:

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:

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:

(i) "Animal Breeding Policy" and "Implementation Plan" in place 1998

(ii) "Animal Breeding Act" in place, July, 2001

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:

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:

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:

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:

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.*

### **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
- l. No

Please provide further details:

We have worked with both ILRI and the Agricultural University - in Austria (BOKU), mainly through research for PhD studies.

63. Are there any international 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 international NGOs:

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

- a. Yes
- b. No

Please provide further details:

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

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

Please provide further details:

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
- f. No

Please provide further details:

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:

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:

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:

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:

There work which has been going on between NAGRC&DB and ILRI (Nairobi) to characterize the Friesian (and its crosses) for milk production in the Region. This activity is still continuing and the results are yet to come out.

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:

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:

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:

We have held discussions with our colleagues in Kenya, Tanzania and Rwanda concerning the need to develop and establish a Regional Gene Bank.

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:

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:

Uganda (especially via NAGRC&DB) has take very consistent efforts both in the Region and Internationally to raise awareness of the status of Animal Genetic Resources and its impact on both the farmers and the Countries.

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:

Uganda, has regularly participated in the development of international policies both regionally and internationally. Uganda has attended and contributed to most of the meetings for FAO, on Animal Genetic Resources.

## 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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