



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: Mauritius

I. EXECUTIVE SUMMARY

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

The executive summary should contain information on:

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

The livestock sector in Mauritius consists primarily of poultry reared for meat and eggs, cattle for milk and meat, pigs, goats, sheep and deer with the other species being marginally present. While the share of agriculture in the Gross Domestic Product (GDP) has decreased over the past decade, from 6% in 1999 to 3% in 2012, the importance of the livestock and poultry sector in agriculture has increased from 13 % in 1999 to 23 % in 2012. However, this increase does not reflect the general situation within the livestock industry in the country, where, only the poultry and deer (to a certain extent) sub sectors have experienced substantial increases in production.

Livestock statistics show that, in general, the decreasing trend in livestock population, which has been observed some 7 years back, has been reversed as a result of new policy measures to boost up the livestock sector. These policies are geared towards improving level of self sufficiency in milk and meat through improved livestock production. Consequently with respect to the dairy and beef sector there has been a shift towards more intensive production with use of imported improved breeding stock instead of the traditional system characterised by low input and low productivity.

Decline in livestock population, among small scale farmers, is accounted by increase in standard of living, lack of interest of younger generation to undertake livestock activities, cheap imports of livestock products. Environmental issues linked with livestock rearing and decrease in fodder availability as a result of property development also contribute in reduction of livestock population.

No major changes have been observed in the deer sector which is characterised by extensive system in *chassées* (deer ranches) and intensive feedlot system in the last decade. This limited development in the sector which was mainly due to development of residential properties namely Integrated Resorts Scheme/(IRS) and leisure facilities (golf courts), a lucrative activity affecting development of feedlot system. Moreover, feedlots systems are affected by high cost of establishment and management.

The poultry sector has witnessed significant development with the importation of grandparent and parent stock of exotic

breeds to supply broiler and layer production units. Meat and egg production from local breeds is negligible. However during the past years there has been the emergence of a market for slow growing free range type chicken which has resulted in importation and rearing of novel slow growing breeds (e.g naked neck chicken). Other poultry species such as duck, guinea fowl, turkey, etc. though less important represent a significant livelihood for many small scale livestock farmers.

The goat and sheep subsector has remained stagnant as introduction of new breeds in the past to develop the sub sectors has not been successful. The present herd comprise mainly a mixture of different breeds introduced over time. Action taken to revitalise the goat/sheep subsectors consist of development and implementation of cross breeding programmes to upgrade the local stock and setting up of multiplier goat farm to increase production.

The pig sub sector was seriously affected by the African Swine Fever in 2007 and around 70 % of the herd was wiped out. A relaunching programme comprising importation of exotic breeds was implemented and hybrid strains were introduced from South Africa. The impact was a rapid increase in the pig population and indiscriminate breeding leading to poor quality piglet production. The government launched a programme for artificial insemination using exotic breed and later on new blood was introduced to minimise the impact of indiscriminate breeding.

Population trends

Mauritius being a Small Island State (SIDS) has very limited space for livestock farming. Policies and environmental laws and Town and Country Planning Act have been enacted to mitigate environmental nuisances and rationalise the sector in general and in relation to medium and long term planning. These are impacting negatively on livestock farmers who operate in sensitive areas leading to disengagement in livestock activities.

Characterisation

Very limited characterisation exercises have been undertaken during the past decade and no policy to support such initiatives due to low economic importance of the livestock sector.

Further, there is no regular monitoring of livestock population breed-wise due to lack of resources and complexity of identifying crossbreeds.

Institution and Stakeholders

The Animal Production Division (APD) of the Ministry of Agro Industry and Food Security (MAIFS) is responsible for animal breeding policies and the Division of Veterinary Services (DVS) is responsible for animal health in general and implements the artificial insemination programme as well as regulates importation of livestock. The Division of Veterinary Services is also responsible for tagging of cattle. Data collection and reporting is carried out both by the DVS and Extension Services (which mainly collects data on livestock population). The Agricultural Research and Extension Unit (AREU), a parastatal institution operating under the aegis of the MAIFS, is the focal point for animal genetic resources, and, together with the University of Mauritius (UOM) conduct research and training in livestock production.

Breeding programmes

Although there are no formal policies for breeding and no systematic breeding programmes, policies are in place to provide artificial insemination service and schemes are implemented to facilitate importation of improved breeds of cattle, goat and sheep.

A breeding programme is difficult to implement due to low population size and lack of systematic collection of performance data. Instead a large proportion of indiscriminate cross breeding occurs in all species with the exception poultry (excluding local poultry) where hybrids (chicken, ducks, guineafowl and turkey) are produced from imported exotic parent stock.

There is also a dearth of human capacity to man a breeding programme.

Conservation

Implementation of conservation programme requires both financial and human resources. Since government objective is to increase productivity to enhance food security, all initiatives have been geared towards importation of improved genetic stock and genetic improvement. Public financial resources have therefore been directed towards this objective.

The only institution, AREU, responsible for conservation of AnGR has limited financial resources and is also required to generate revenue to meet part of its expenditure.

Policy changes are necessary to ensure food security without compromising conservation of AnGR. Unlike other African Countries the contribution of livestock in the GDP of Mauritius is relatively low and most probably does not justify high investment in conservation programme. Instead, collaboration with regional countries and cryopreservation of breed at

risk is probably the most appropriate method for conservation.

Reproductive and Molecular Biotechnologies

University graduates have a relatively good background in animal genetics and molecular biotechnologies facilities exist at the University of Mauritius. However very few characterization studies have been carried out.

A national commercial company recently set up also proposes to offer AI service to dairy, beef and the goat sub sectors and assist in conservation programme.

Priorities and strategic directions for future action

- Seek funding for the preparation of a national strategy and action plan, agreed by all stakeholders, to ensure strategic and comprehensive approaches to the sustainable use, development and conservation of AnGR for food and agriculture
- Identify present and future training and technical support programmes to enhance the use and development of AnGR.
- Set up a national breeding policy with clearly defined breeding objectives and establish breeding programmes at national level.
- Identify most appropriate methods for conservation of selected breeds.
- Seek funding for collaborative research and development programme with sharing of facilities and expertise with other regional countries to facilitate knowledge exchange and enhance conservation.
- Conduct characterisation of breeds (both phenotypically and genetically) identified for conservation purposes.
- Set up of appropriate policy to encourage stakeholders' participation in conservation programme especially those involved in ecotourism.
- Promote products derived from indigenous and local species and locally adapted breeds and facilitate market access (e.g milk and meat of creole breed, local goats, Rodriguan chicken, etc.)

The National Livestock Policy Hub which has been established recently and involves all stakeholders of the livestock sector should gear the establishment of policies and strategies for the use of AnGR and their implementation.

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.

While the gene flow is mainly from the developed countries to Mauritius in the poultry sector, in the dairy cattle and goat sectors, importations is very often from South Africa.
Regarding pigs, stocks is imported primarily from Reunion island, a French dependency in the Indian Ocean.

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).

Importation of improved exotic pig and dairy cattle breeds.
Bovine Semen have also been imported from Australia and South Africa.

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.

- Improved exotic pig breed for reproduction and commercial hybrid pigs were imported from South Africa.
- Improved exotic dairy cattle breeds and beef cattle breeds were imported from South Africa both for reproduction and production of semen.
- Improved exotic goat breed were imported from South Africa for reproduction and semen production.
- Exotic pig were imported from Reunion Island for production of semen.
- Regular importation of poultry parent stock from France, United States and Holland for production of hybrid broiler and layer chicks.
- Importation of parent stock from France for production of slow growing free range chicken.
- Importation of exotic turkey breed from France for reproduction.

Trade statistics: <http://statsmauritius.gov.mu/English/Documents/data12/totimp12.xls>

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.

- Importation of exotic breeds has resulted in further increase in the percentage of exotic cattle breed in the population. Different management practices regarding feeding housing and disease management were required. Only the large scale companies were able to adopt appropriate management practices.
- Increase in demand for slow growing chicken resulted in importation of new breeds (naked neck) requiring different management practices.

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	medium	Increasing demands for livestock products has resulted in a shift towards a more intensive system of production especially for dairy cattle and chicken resulting in the use of improved imported breeds at the expense of the locally adapted breeds.
Changing demand for livestock products (quality)	low	low	Regarding the chicken sector, the past years has witnessed the emergence of a market for higher quality chicken, e.g. free-range chicken/chicken with slower growth rates. This has been accompanied by the importation of novel breeds of chicken (such as naked-necks) other than the classical commercial hybrids. Within the next decade a bigger demand for turkey is also expected although it will probably remain a niche market. Increase in purchasing power and demand for better quality products that meets international norms have reduced the competitiveness of local produce (pork products) and resulted in significant reduction in the pig population.
Changes in marketing infrastructure and access	low	low	Removal of the milk marketing scheme has impacted negatively on the number of small scale farmers and livestock owned by them.
Changes in retailing	low	low	Large scale companies involved in milk processing and retailing is in direct competition with small scale farmers leading to disengagement of the latter in cowbreeding activities.
Changes in international trade in animal products (imports)	low	medium	Soaring food prices, especially milk, has led to the establishment of schemes to promote livestock rearing activities. It is expected that this will lead to more interest in livestock activities in the next decade.
Changes in international trade in animal products (exports)	none	none	None
Climatic changes	none	low	Climatic changes is expected to affect fodder availability and disease outbreak and is expected to affect the exotic breeds more than the locally adapted breeds.
Degradation or improvement of grazing land	none	none	Livestock production system is not based on grazing but rather on cut and carry system except for deer.
Loss of, or loss of access to, grazing land and other natural resources	none	none	Not applicable

Drivers of change	Impact on animal genetic resources and their management over last ten years	Future impact on animal genetic resources and their management (predicted for the next ten years)	Describe the effects on animal genetic resources and their management
Economic, livelihood or lifestyle factors affecting the popularity of livestock keeping	high	medium	With an increase in the standard of living in Mauritius, the younger generation has shifted away from agriculture and more particularly from livestock activities. This has resulted in a general decrease of livestock populations in the island and thus has deeply affected the number of animals for both local and exotic breeds. This is expected to continue during the next decade but in smaller numbers.
Replacement of livestock functions	none	none	na
Changing cultural roles of livestock	none	none	na
Changes in technology	low	low	Set up of new dairy farms have changed the type of feeding and management.
Policy factors	medium	medium	Policy measures are geared towards enhancing food security through use of improved exotic breed to increase productivity.
Disease epidemics	medium	medium	In the pig sector, with the outbreak of African Swine Fever in 2007 and a large scale stamping out of the existing pig population, importation of commercial hybrids has resulted in a predominance of these animals on the island.

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	2
Cattle (specialized beef)	0	5
Cattle (multipurpose)	1	0
Sheep	1	3
Goats	1	2
Pigs	1	4
Chickens	2	8
Guinea fowls	1	1
Turkeys	3	1

Species	Locally adapted breeds	Exotic breeds
Deer	1	0
Ducks	4	1
Rabbits	3	0

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)	2	0	high	low	none	low	none	none
Cattle (specialized beef)	2	2	none	none	none	none	none	none
Cattle (multipurpose)	1	1	high	none	none	none	none	none
Sheep	4	0	none	none	none	none	none	none
Goats	3	0	medium	none	none	none	none	none
Pigs	4	0	none	none	none	none	none	none
Chickens	8	8	none	none	none	none	none	none
Deer	1	1	none	none	none	low	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	low
Stakeholder participation	low
Policies	low
Policy implementation	low
Laws	low
Implementation of laws	low

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

	Description
Education	The Faculty of Agriculture of the UOM provides undergraduate and post graduate programme of studies in agriculture and allied sciences. Modules in animal genetics are taught as from year 1 up to year 3. There is a brief introduction on the importance of animal genetic conservation but it is not a major component.
Research	Very little research are done on animal genetics at the University. AREU conduct research to a certain extent on different breeds.
Knowledge	Knowledge in animal breeding is relatively good but application of knowledge is limited.
Awareness	Activities to create awareness is limited.
Infrastructure	The existing infrastructure is limited.
Stakeholder participation	There is limited stakeholder involvement due to a tendency towards an individualistic approach.
Policies	The policies are not well defined.
Policy implementation	na
Laws	There are no specific laws pertaining to AnGR.
Implementation of laws	na

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>).

None

BREEDING PROGRAMMES

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

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

10. Who operates breeding programmes in your country?

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

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

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

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

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

Species	Tools															
	Animal identification		Breeding goal defined		Performance recording		Pedigree recording		Genetic evaluation (classic approach)		Genetic evaluation including genomic information		Management of genetic variation (by maximizing effective population size or minimizing rate of inbreeding)		Artificial insemination	
	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex
Cattle (specialized dairy)	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Cattle (specialized beef)	0	2	0	2	0	2	0	2	0	0	0	0	0	0	0	1
Cattle (multipurpose)	1	0	1	0	1	0	0	0	0	0	0	0	1	0	1	0
Goats	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sheep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pigs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Deer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Guinea fowls	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

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

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

Species	Breeding method			
	Straight/pure-breeding only		Straight/pure-breeding and cross-breeding	
	Loc	Ex	Loc	Ex
Cattle (specialized dairy)	0	0	0	2
Cattle (specialized beef)	0	0	0	2
Cattle (multipurpose)	0	0	1	0
Goats	0	0	1	1
Deer	1	0	0	0
Pigs	0	0	1	3
Sheep	0	0	1	3

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

Species	Training	Research
Cattle (specialized dairy)	low	low
Cattle (specialized beef)	none	none
Cattle (multipurpose)	none	low
Sheep	none	none
Goats	none	low
Pigs	none	none
Chickens	none	none

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

Species	Organization of livestock keepers
Cattle (specialized dairy)	low
Cattle (specialized beef)	none
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	low	none	none	none	none	none	none	none
Animal identification	high	low	none	none	low	none	none	none
Recording	low	medium	none	none	medium	none	none	none
Provision of artificial insemination services	high	none	none	none	medium	none	none	none
Genetic evaluation	none	low	none	none	low	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	none	none	none	none	medium	none	none	none
Animal identification	none	none	none	none	high	none	none	none
Recording	none	none	none	none	high	none	none	none
Provision of artificial insemination services	none	none	none	none	none	none	none	none
Genetic evaluation	none	none	none	none	none	none	none	none

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

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

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

<p>Cattle - Specialized dairy</p> <p>The government, through the DVS, is responsible for the tagging of all animals in the dairy herd at smallholder's level as well as provide an artificial insemination service. The APD is responsible for the formulation of breeding policies. While there are no breeding goals <i>per se</i>, there are certain specifications which have to be met when breeding animals and semen are being recommended for purchase e.g, milk production and milk fat levels. However no systematic recording is carried out except for some artificial insemination details.</p> <p>AREU is responsible for the tagging of all animals on its farm including animals which are being sold to the farming community. In terms of recording, the lineage of all animals can be worked back over several generations together with production data of all animals for simple evaluation works.</p> <p>There is a national commercial company involved in the production of dairy cattle semen which has started to supply the local government and which also provides artificial insemination service upon requests.</p> <p>Cattle - Specialized beef</p> <p>One commercial company specialized in beef cattle production is currently carrying out breeding activities with set breeding goals with animal identification and record keeping.</p> <p>Cattle - Multipurpose</p> <p>The government is responsible for the provision of artificial insemination and tagging services at national level, the multipurpose cattle (Creole breed) found at small-holder's level automatically falls under its responsibility. However since most of the pure Creole animals are found at the AREU, most of the recordings for this breed are carried out by the latter together with some evaluation work on this breed.</p> <p>Goats</p> <p>The government is in the process of tagging all the goats at small-holder's level throughout the island. AREU and a national commercial company tag their animals and keep their own records for evaluation purposes.</p>

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)	no
Cattle (multipurpose)	yes
Sheep	yes
Goats	yes
Pigs	yes
Chickens	no
Deer	no

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

Species	Description of policies or programmes
Cattle (specialized dairy)	The policy of the government is to enhance food security and financial schemes are being implemented to facilitate the acquisition of specific imported improved dairy breeds http://agriculture.gov.mu/English/DOCUMENTS/FOOD%20SECURITY%20FUND%20STRATEGIES.PDF and is concurrently providing artificial insemination services with semen of the exotic breeds.

Species	Description of policies or programmes
Cattle (specialized beef)	na
Cattle (multipurpose)	The government has as part of its programme, the conservation and utilisation of the Creole cattle http://www.areu.mu/files/pub/areunssp.pdf . However there is no breeding policy for Creole cattle to support the measure.
Sheep	Financial schemes are being implemented to facilitate the acquisition of specific imported improved meat type sheep breeds
Goats	Financial schemes are being implemented to facilitate the acquisition of specific imported improved goat breed with a view to increase goat meat production in Mauritius. The government also encourage the setting up of multiplier farms through the importation of breeding animals of exotic meat type breeds http://agriculture.gov.mu/English/DOCUMENTS/FOOD%20SECURITY%20FUND%20STRATEGIES.PDF . It also intends to start a corresponding artificial insemination service for goats.
Pigs	With the outbreak of <i>African Swine Fever</i> in Mauritius in 2007, the Government had set up the <i>Pig Sector Restructuring Committee (PSRC)</i> , later renamed <i>Pig Steering Committee</i> , to resolve issues pertaining to the pig sector. To address the problem of inbreeding which is a real concern, a Pig Artificial Insemination Unit was set up with the objective of introducing new blood in the national herd and preventing inbreeding at local pig farms. Presently, there is no systematic breeding programme for locally adapted breeds or any measures specifically aimed at supporting breeding programmes for exotic breeds
Chickens	The lack of breeding policies has resulted in a complete reliance on imported

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)	The policy to increase the local dairy production through genetic improvement of the dairy herd using importation of exotic breeds and the use of artificial insemination has resulted in a dramatic decrease in the number of the local Creole animals. In terms of management, the introduction of exotic specialized dairy breeds has resulted in an increased reliability on concentrates feed which is becoming increasingly more expensive due to importation of several ingredients.
Cattle (specialized beef)	
Cattle (multipurpose)	The lack of a breeding policy for the Creole cattle coupled with the policy to increase the local dairy production through genetic improvement of the dairy herd by having recourse to importation of exotic breeds and the use of semen of exotic breeds for artificial insemination has resulted in making the local Creole cattle a critically endangered breed.
Sheep	na
Goats	The importation of exotic breeds and the proposed use of artificial insemination are expected to result in a genetic drift from the local breed to exotic breeds both through substitution of the local animals and through cross-breeding. A well defined breeding policy is required to conserve the local breed.
Pigs	The lack of breeding policy and programme as well as the use of semen of exotic breeds for artificial insemination has resulted in the progressive disappearance of our local "Mongoose" pig and unluckily, not much effort is being geared to conserve this breed and its genetic potential. The importation of exotic breed and use of artificial insemination in pigs are expected to mitigate problem of inbreeding and upgrade the existing herd.
Chickens	The use of commercial hybrid chicken by both the private companies and the APD of the Ministry of Agro-industry and Food Security has resulted in the availability of poultry meat at affordable prices. This has played an important role in the decline of the local chicken population.

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.

Lack of human capacity and the livestock production, except chicken, is not a sizeable portion of the economy to warrant investment in designing a breeding programme.
The environmental and ecological degradation caused by pig breeding could be a huge stumbling block for the implementation of pig breeding programmes in Mauritius.

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)	The establishment of a formal breeding policy after consultation with all stakeholders involved in the dairy sector is essential in order to avoid crossbreeding of the local Creole animals.
Cattle (specialized beef)	na
Cattle (multipurpose)	The establishment of the breeding policy, as stated above, for the dairy breeds will prevent cross-breeding of the Creole cattle but in order to conserve this breed, this must be coupled with conservation policies supported by incentive measures if necessary. A cryo-conservation programme of the Creole breed, at least for semen, is essential in order to preserve some genetic diversity which could be used in future breeding programmes.
Sheep	na
Goats	The formulation of policies to conserve the local breed is essential in view of sustainable use through cross-breeding with more productive exotic breeds.
Pigs	The establishment of a pig breeding policy may be a starting point to conserve the Mauritian "mongoose" breed. In parallel, conservation programmes should be initiated to preserve the genetic potential which could be used later in breeding programmes.
Chickens	A lack of breeding policy has resulted in a complete reliance on imported commercial hybrids which are not necessarily adapted for local conditions.

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

Species	In situ conservation	Ex situ in vivo conservation	Ex situ in vitro conservation
Sheep	none	none	none
Goats	none	none	none
Pigs	none	none	none
Chickens	none	none	none
Deer	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
Genetic uniqueness	yes
Genetic variation within the breed	no
Production traits	no
Non-production traits	no
Cultural or historical importance	no
Probability of success	no

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

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

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

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

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

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

- yes
 no

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

- yes
 no

23.2. If yes, please describe the plans.

The collaboration of newly set-up company engaged in the production of semen has been sought. It is agreeable to provide its help with respect to the cryo-conservation of Creole semen. The modalities need to be worked out.

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	no
Embryos	no
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)							
Cattle (specialized beef)							
Cattle (multipurpose)							
Sheep							
Goats							
Pigs							
Chickens							

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

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

- yes
 no

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

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.

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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)	high	none	none	none	none	none	none	low	none
Cattle (specialized beef)	medium	none	none	none	none	none	none	none	none
Cattle (multipurpose)	high	none	none	none	none	none	none	low	none
Goats	low	none	none	none	none	none	none	none	none
Pigs	medium	none	none	none	none	none	none	none	none
Guinea fowls	medium	none	none	none	none	none	none	none	none

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

The molecular studies carried out at the University are mainly for training purposes and are not meant as such to be part of a breeding programme. But skills and expertise exists to do the genetic analysis using microsatellite and primers.

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	no	no	no	yes	no
Embryo transfer	no	no	no	no	no	no
Molecular genetic or genomic information	yes	no	no	no	no	no

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

The Division of Veterinary Services of the Ministry of Agro-Industry and Food Security is currently providing artificial insemination services for dairy cattle over the whole island while the Animal Production Division of the Ministry of Agro-Industry and Food Security caters, to some extent, for the pig farmers. It is also envisaging to provide AI service for goats.
A National commercial company is also proposing to offer AI service to dairy, beef and goat sector.

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	no	no
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	no
Use of molecular genetic or genomic information for prediction of breeding values	no	no
Research on adaptedness based on molecular genetic or genomic information	no	no

30.1. Please briefly describe the research.

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

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

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

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

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	limited	The extensive deer production system (chassée) is submitted to restrictions as to pasture development as set up in the SHOOTING AND FISHING LEASES ACT http://196.31.109.102/MauritiusPDF/SHOOTING%20AND%20FISHING%20LEASES%20ACT.pdf . Culling and selling of extensive production is limited to 4 months a year (June to September) limiting possible increase in production due to market saturation during this period.
Collaboration in the characterization, surveying or monitoring of genetic resources, production environments or ecosystems	none	
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.

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

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

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

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).

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).

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).

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.

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).

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).

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.

Lack of human resources to enforce the laws to reduce environmental problems.
The high costs associated to the mitigation measures.
Lack of collaboration between the different institutions involved in the regulation and support the different measures.

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.

Except for deer based on extensive production system, all the other livestock species are based on a cut and carry production system and do not fit the ecosystem services approach.

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.

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.

The extensive deer production system (chassée) is submitted to restrictions as to pasture development as set up in the SHOOTING AND FISHING LEASES ACT
<http://196.31.109.102/MauritiusPDF/SHOOTING%20AND%20FISHING%20LEASES%20ACT.pdf>
Culling and selling of extensive production is limited to 4 months a year (June to September) limiting possible increase in production due to market saturation during this period.

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

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

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

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

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

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

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

Please provide further details:

The results of a livestock census carried out in 2009 are now available. A list of the different breeds for each species is available. However a new census is scheduled for 2014 whereby a clearer picture of the status of animal genetic resources will be obtained.

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:

Production parameters and phenotypic characterisation have been worked out for the Creole cattle and local goat.

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:

A project which contained a genetic characterisation component was not approved by the funding agency to which it was submitted. Funding is expected within the AU-IBAR project.

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 national livestock census was carried out in 2009. Another livestock census is being planned for 2014.

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:

Monitoring of the population is carried out by extension services but this does not include breed information. With the implementation of ARIS-II, responsibilities will be assigned to institutions.

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:

The Ministry of Agro-Industry and Food Security will undertake structural changes in the non-sugar sector (crop and livestock), responsibilities will then be assigned.

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:

The herd size for all major livestock species is regularly monitored by the Extension Department of the Agricultural Research and Extension Unit but no data are collected at breed level.

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:

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:

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:

There is a lack of fund and expertise in the country.

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:

Lack of resources in terms of funds, trained human resource and equipment.

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:

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.

The livestock sector does not contribute significantly in the economy and few characterisation exercises has been carried out.
X reference to question 11.

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:

A National Livestock Policy Hub has been established recently. Priorities have been identified and funding is sought for implementation.

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:

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:

There are no real breeding programmes which are being followed be it at species level or breed level. However an informal breeding policy is being followed for the *ex-situ* herd of Creole cattle which constitute the bulk of the pure animals for Creole breed.
Large commercial companies have breeding programmes to suit their needs.

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:

A National Livestock Policy Hub has been established recently. Priorities have been identified and funding is sought for implementation

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:

While the barriers and obstacles are known, it must be pointed out that they have not been formalised in any document. They are:

- Decrease in the number of livestock keepers and livestock population.
- Use of semen of exotic breeds for artificial insemination (for dairy cattle).
- Existence of schemes that favours the import of exotic breeds
- Lack of proper and formal breeding policy resulting in indiscriminate breeding of the animals.

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.

f. No

Please provide further details:

There have been no in-depth systematic study to evaluate the impacts of exotic breeds on the locally adapted breeds and on the food security for the country.

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

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

Please provide further details:

Capacity building on the use of ARIS II has been conducted. Action is underway for its implementation.

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 National Livestock Policy Has has recently been established and provide a platform for all stakeholders of the livestock sector to interact.
The Agricultural Research and Extension unit holds regular public lectures for sharing scientific knowledge and technologies developed to the farming community and stakeholders at large.

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:

Departments of the Ministry and institution operating under the Aegis of the Ministry of Agro Industry and food Security provide information and facilitate sourcing of breeding animals.

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:

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:

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 adaptation 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:

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:

Some results of the work on local cattle, goats, Rodriguan chicken, have been disseminated and made accessible to stakeholders. However no specific support measures targeting these breeds are in place.

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:

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:

There is a lack of breeding policies for the different livestock species and more particularly for cattle. This results in indiscriminate use of semen of exotic breeds for artificial insemination.

A decrease in the number of livestock farmers together with a lack of incentives regarding conservation of local breeds have resulted in a decreasing number of the local Creole cattle, thereby decreasing the genebase available for conservation purposes.

Introduction of exotic breeds and indiscriminate breeding in goats and pigs.

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:

There is a conservation programme for the critically endangered Creole cattle and this has the backing of the government. <http://www.areu.mu/files/pub/areunssp.pdf>. However so far, the programme is restricted to the creation of an ex-situ herd.

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:

There is a nucleus herd of "pure" local Creole cattle on the research institution (AREU) in Mauritius, with animals from different sources. A nucleus of local goat is also being setup for conservation purpose.

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:

Action has been initiated to have a private company undertake in vitro conservation

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:

An agreement will have to be signed with the private company before implementation.

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:

The major obstacles which are preventing the expansion of conservation of animal genetic resources are: the lack of funds and infrastructure.

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:

Lack of funds and infrastructure limits further activities on research station.
Stakeholders have been identified to participate in the programme.

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:

Lack of resources.

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:

Lack of resources.

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:

The Agricultural Research and Extension Unit promotes documentation and dissemination of information on conservation and its importance through Public Lectures and exhibitions.

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

The priority requirements are: clear cut policies regarding conservation and utilisation of local animal genetic resources and availability of funds and infrastructure.

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.

X reference with questions 36. and 40.

The livestock sector does not contribute significantly in the economy and investment in conservation programme is limited. Private sector has been encouraged to support such programmes to enhance their image.

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:

Mauritius has a Programme Manager responsible for the livestock sector and the National Coordinator AnGR is nominated to coordinate actions under the GPA but lack resources (financial and trained staff) to support holistic planning of the sector.

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:

While there are no national strategy and action plan for animal genetic resources, some components are covered in other document. <http://www.areu.mu/files/pub/areunssp.pdf>.

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:

AnGR is addressed in the NBSAP but not specifically addressed in the action plan.

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:

AnGR is not specifically addressed in the National Livestock Sector Strategic plan but rather at institutional level.

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:

Capacity building on the use of ARIS II has been conducted. Action is underway for its implementation.

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:

The results of the National livestock census will be used to update DAD-IS.

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:

For the purpose of the preparation of the Second Country report on SOWAnGR a stakeholders meeting was convened to set up the National Advisory committee. Eventually the committee will meet to define 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:

The Focal Point, AREU which operates under the aegis of the Ministry of Agro Industry and Food Security interacts and entertains strong collaboration with other Department of the Ministry University and other Stakeholders.

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:

every opportunity is taken (e.g. world food days, open days, meeting of agricultural scientists, Public Lectures) to disseminate information on the roles and values of animal genetic resources.

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:

This is one of the priority action to be undertaken by the National Livestock Policy Hub.

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:

Contact has been established with stakeholders and private sector in this respect.

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:

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:

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:

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:

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:

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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