منظمة الأغذية والزراعة للأمم المتحدة | 联合国粮食及农业组织 | Food and Agriculture Organization of the United Nations | Organisation des Nations Unies pour l'alimentation et l'agriculture | Продовольственная и сельскохозяйственная организация Объединенных Наций | Organización de las Naciones Unidas para la Alimentación y la Agricultura

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: Sri Lanka

I. EXECUTIVE SUMMARY

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

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

EXECUTIVE SUMMARY

Sri Lanka is a tropical island lying in the Indian Ocean between 79°42[1] and 81°53[1] east longitudes and 5° 55[1] and consist mostly, a hot and humid climate. It is one of the densely populated country reporting 20.3 million populations with a density of 323 persons per square kilometer (Population census, 2012, Dept. of Census and statistics, Sri Lanka). Annual rainfall, elevation and soil types have demarcated 46 agro-ecological zones. Agriculture is continued to be an important sector and 30% of the land are under agriculture, mostly smallholdings. However, the share of the agriculture to the national GDP is on the decline in terms of both output and employment while share of the services and industries is on rise.

With the priority of self-sufficiency in milk and milk products requirements, the Government of Sri Lanka promotes dairy industry growth. Ever increasing price of imported dairy products and the quality issues rising in time to time had accelerated the process. Locally produced dairy products have enormous demand irrespective of the huge advertisement through the media. Rising per capita income with high literacy rate had tended people to consume high quality nutritious products and thus, demand for livestock products is increasing. Consumers opt for traditional livestock products over commercial livestock due to the health concern on the commercial livestock products. Therefore, it has become a good opportunity to popularize traditional livestock. Government import livestock and semen of both sexed and unsexed to improve the genetics of the livestock in confinement. Crossbreeding program has been strengthen by training of man power for breeding and reproduction. In addition, facilitate the farmers with proper feeding and management. Maintaining nuclear livestock farms is another aspects and the purpose of the state owned livestock farms is to maintain nuclear herds of selected breeds as per the national breeding policy and make available calves and kids for farmers. In parallel to that, it also promotes upgrading subsistence level farms to medium or commercial level through attractive loan schemes, projects with concessionary terms and facilitating farmers with artificial insemination scheme. The Government continues to import stud bulls, milking cows, heifers and, sexed and unsexed semen of high breeding value.

However, the growth of goat and sheep sub sector has remained rather static. Periodic importation of genetic materials has not been effective to provide a substantial boost to the sub sector. However, the two state owned goat nucleus farms continue to produce and issue breeding materials to the farmers while promoting the private breeder farms to produce high quality young stocks

The conventional extensive system of keeping large herds of livestock faces difficulty for continuation due to shrinkage of grazing lands in an alarming rate. Due to these large herd owners of cattle and buffalos compel to reduce their herds. Government has restricted slaughter of buffaloes to promote the utilization of animal power for draught power. However, buffalo population is still on the decline. Pig industry is confined to the coastal area and the population is static and the pork products are mainly consumed in the coastal cities. Sheep rearing is not yet popular and purpose is mainly for meat. Rearing sheep is not yet popular in the island, although locally adapted sheep have concentrated in the northern peninsular in low numbers and reared mainly for meat. Similarly, the swine sub-sector which is confined to western coastal areas also has not seen much growth. State owned nucleus farms promote production of Large White and Landrace breeds and their crosses. However, the adoption of commercial scale swine farming has been quite slow. Poultry (layer and broiler) are the fastest growing segments of the livestock sector in Sri Lanka. Private sector participation together with the use of appropriate technology has become the poultry industry economically attractive. Government involvement confines only to disease surveillance, vaccine production and legislative affairs. The broiler industry is mostly integrated, and employment opportunities are provided through the contract grower system. The branded chicken is marketed through 15 large and medium scale broiler processors operating in the country. In contrast, the backyard family poultry production continues to exist in a highly sustainable manner with minimum or no impact from commercial poultry industry. Its importance lies in providing family nutrition while supporting the livelihood of the resource poor communities.

National breeding policy guidelines address the target of self-sufficiency in milk which also has been the present government priority. The national breeding policy guidelines illustrate the need of grading up locally adapted livestock breeds/types distributed in the diverse agro-eco systems towards more on dairy type genotypes. In contrast, traditional livestock farmers of large herd owners who also have been the real custodians of indigenous livestock types continue to practice selection of stud bulls for their desired traits such as prolificacy and growth under harsh environmental conditions, aiming to sell animals for meat on live weight basis. The long history of cross breeding of national cattle and buffalo herds with exotic genotypes has resulted in improvement of the genetic makeup of the national herd towards dairying although their potential production has not been exploited due to limitations in other traits. On the other hand, genetic improvement through pedigree selection and progeny testing is also in progress to identify the appropriate bull mothers for dairying. Implementation of milk recording and selection of high performing cows for nucleus herds is also in progress. States owned farms with nucleus herds of different breeds are located in different agro-climatic zones. However, inadequacy of population size, epidemic diseases and managerial constraints have hindered the development of those herds. Although policy guidelines have the directive to conserve locally adapted breeds in-situ, it has not been successful due to pressure from various other sources. As an alternative, nucleus farms for locally adapted breed types also have to be established. A sizable population of indigenous livestock still remains with considerably high genetic diversity. Although the Breeding Policy document has identified the need to conserve and maintain indigenous stock, an effective and detailed protocol has not been outlined. Hence, formulation of appropriate strategies and preparation of action plans are required taking the breeding policy as a guideline. As the farming systems are dynamic under the continuously changing environment, breeding policy also should be updated to ensure sustainability of the populations and the livestock industry.

The farm animals in Sri Lanka can be categorized into three major groups, namely locally adapted, recently introduced and continually imported breeds. Out of the three categories, locally adapted breeds are the most threatened as their populations are gradually decreasing. Among the factors contributing to this diminishing trend, lack of information on the proper evaluation of local breeds can be identified as a main factor. The wild relatives of three major farm animal species, namely buffalo, pig and chicken inhabit the wildlife protected areas and the surroundings. Other than those wild species, the wild relatives of quails and ducks could also be found in scrub jungles in all parts of the country. In the case of buffaloes and pigs, there is a definite gene flow from the wild relatives to domesticated indigenous varieties in certain localities where there is a direct contact between wild relatives and domestic animals. In the case of jungle fowl, which is endemic to Sri Lanka, there is no concrete evidence for such an interaction in breeding.

Generally, most of the breeds of farm animals are widely distributed all over the country. However, population density is not similar in all the provinces. Pigs are mostly found in the Western coast of the country. Buffaloes are distributed in lowland areas and central part of the country. The distribution of cattle is very distinct as the European pure breeds and their crossbreds are distributed in central hills and wet zone of the country while exotic tropical crosses and indigenous varieties are found in dry lowland areas. Comparatively a higher number of goats is found in dry lowlands, mostly in remote rural areas. The pattern of distribution of poultry is highly influenced by the number of commercial type birds.

However, village chickens (the indigenous types) are found throughout the island under backyard system of rearing.

Since livestock is an integral component in the agriculture sector of the country several livestock production systems could be identified. In most of these production systems, livestock is represented as a co-component or subcomponent within the system since the whole production system is crop based, mainly paddy. The role of livestock in these farming systems varies according to the level of input of the livestock for the whole system and nature of service that it provides for the sustainability of the system.

In the absence of individual statistics available for any of the indigenous species, the population trends of this category cannot be assessed or quantified. However, the general perception is that the indigenous categories are shrinking and phasing out gradually.

The present diminishing trends in population size and utilization pattern of indigenous categories of farm animals reveal that the indigenous animals need a far better attention and consideration at national level development and planning programs than at present.

A number of acts and legislations exist to conserve, develop and secure farm animal genetic resources. Although many of the acts and legislations are specifically not targeted on conservation and management of farm animal genetic resources, all are in favor of their security and sustainability. Animal Act (1958), Animal Disease Act (1909), Animal Feed Act (1986), Butchers Ordinance (1893), Contagious Disease Act (1961), Corporation Act (1955), Cruelty of Animals Ordinance (1907), Custom Ordinance (1869), Dried Meat Ordinance (1908) and Food Control Act (1950) are the most important legal documents in favor of conservation and management of farm animal genetic resources.

A comprehensive review of policies related to livestock sector was completed in 1992 and the document stressed the lack of sufficient public and private sector participation in the implementation and the need of a well defined policy framework. Submission of the above document led to prepare a memorandum to the Cabinet in 1992 concentrating several aspects such as protection of local dairy industry from imports, milk pricing, tax regimes, dairy co-ops, slaughter regulations, meat quality standards and production of feed for local feed industry. The resultant policies developed for the livestock sector were collaborated under eight main principles.

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.

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).

Report on "Dairy Development Project" page 13. http://livestock.gov.lk,
Report on Sri Lanka Dairy Development Project http://nldb.gov.lk

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

Importation of nearly 5,000 pregnant pure Jersey and Friesian and their crosses in year 2012 and 2013 Cattle to the existing nuclear cattle farms to replace the old stock. Excess calves of the subsequent progeny are issued to the farmers making said breeds and their crosses dominant.

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.

High yielding breeds and their crosses are attracted by the dairy farmers and thus, their male calves are raised or used as stud bulls to breed the locally adapted stock seeking improvement in productivity. This would lead to change the genetic composition of the local cattle breeds.

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	Commercial strains of livestock and poultry farms are increasingly expanding as commercial oriented industries utilizing the lands and other resources and this trend invade the natural habitats of indigenous livestock and poultry. Keeping Locally adapted livestock are discouraged or expelled by such industries due to fear of diseases that believed to be acted as carriers.

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 (quality)	low	medium	Preference on products of locally adapted breed types due to fear of chemical trace in commercial livestock products. Goat meat has exceptional demand as the goat rearing is still under extensive management. Local chicken is more demanded over its commercial counterparts reared under intensive management. Demand for organic or close to organic products show increasing demand. Programs to multiply high demanding local breeds are very scanty and thus, this would negatively affect their sustainability.
Changes in marketing infrastructure and access	low	medium	Market infrastructure and transport facilities have drastically changed. Access to market information for the producer has improved. Market for sale of live animals have not developed. Restrictions for movement animals are there to control diseases spread. Sale of live animals have changed to processed products. This has affected to the multiplication of locally adapted breeds.
Changes in retailing	low	medium	Retailing at village level fair has changed to supermarket system where consumer has the access to check and buy in only required quantity. Only the processed commercial meat products are available. No established market to the locally adapted animal products and thus, farmers do not keep such low producing local breeds. ie. Village pig has only road side retail market and the regular availability is limited.
Changes in international trade in animal products (imports)	medium	high	Before progressive introduction of exotic breeds, there had been a reasonable market for locally adapted animal products. Importation of animal products mainly, milk powder has an increasing trend while status of all other animal products remain static. As the powdered milk is available at any retail outlet, the traditional habit of consumption of liquid milk at village tea rooms is not popular. Therefore, sale of liquid milk extracted from locally adapted cattle has no attractive market. This would lead to discourage milking of locally adapted cattle. Then the purpose of keeping locally adapted cattle would change from duel purpose to sale of live animals for beef. Cultivation of imported shrimps and ornamental fish have tenancy in escaping to the natural inland water streams and they could have adverse effects on endemic and locally adapted aquatic animals.
Changes in international trade in animal products (exports)	low	medium	Only poultry and few aquatic products had gain access for export market. Few enterprises are now on export oriented production. So far there is no direct impact on animal genetic resources.

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
Climatic changes	medium	medium	Average Ambient temperature has increased while decrease in quantity and the distribution of the rainfall. Length of dry period extended and regular forest fire has been common leading destruction of feed resources for animal genetic resources and their habitats. Increased temperature results activation of pathogens and Zoonoses with adverse impact on local genotypes as they are not adequately exposed for annual vaccination.
Degradation or improvement of grazing land	high	medium	Traditional grazing lands convert to other uses such as human settlements, agricultural activities and wildlife parks limiting feed resource base for animal genetic resources.
Loss of, or loss of access to, grazing land and other natural resources	high	high	Traditional grazing lands in certain areas have allocated to Mini-power generating companies to cultivate fodder trees (Gliricidia) to used in bio-fuel for generation of electricity. As the tree stems are used, leaves are left unutilized and no access to livestock in the area. Rapid urbanization and other prioritized activities limit access for grazing/feeding for animal genetic resources usually under extensive management.
Economic, livelihood or lifestyle factors affecting the popularity of livestock keeping	high	high	Rapid urbanization followed by industrialization created more attractive employments than livestock keeping. Younger generation attracts urban employments involved no economic risk compared to livestock keeping. Therefore, there is a risk of diminishing in No. of livestock keepers in future.
Replacement of livestock functions	medium	high	Sacrifice livestock for religious functions of the certain groups of the population are now aggressively discouraged by the society and therefore, drastic reduction in the livestock (ie. goat) population within a specific period especially male animals is not there. This trend ensure the sustainability of locally adapted livestock.
Changing cultural roles of livestock	medium	high	Provision of livestock at the time of traditional marriages, had been a feature in the society. This practice helped to distribute livestock in the country and thus to maintain their diversity. This practice has not been seen in the present marriages. Animal welfare increasingly considered and animal sports such as cock fighting prohibited by law. Sacrificing animals for spiritual events also in decreasing trend and such activities discouraged by society and thus breeding for such activities are not there.

Drivers of change	Impact on animal genetic resources and their management over last ten years	Future impact on animal genetic resources and their management (predicted for the next ten years)	Describe the effects on animal genetic resources and their management
Changes in technology	medium	high	Buffalo, the main draught animal had replaced with machineries of land preparation and combine harvesters in agriculture. Therefore, changes in the breeding programs are seen moving from Duel (Draught, milk) purpose to milk type in buffalo rearing in the country. High cost of manual labour, changes in climatic pattern have contributed to this change Slaughter of buffalo for meat purpose unless otherwise unfit for both milk and draught has been banned by the government to retard the rate of diminishing population size. However, statistics shows stagnated population growth.

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
Policy factors	low	medium	Animals act (No. 29 of 1958, 20 of 1964,10 of 1968 and 46 of 1988 controls the slaughter of animals and movement of herds from one administrative area to other, breeding and castration of cattle, trespass and destruction of crops etc., This act has great impact on the sustainability of the livestock species, slaughter of genetically important animals. Act also suggest animal traceability system which is more important in national breeding programs and record keeping. It help to maintain traditional breeding tracts of locally adapted livestock species. Animal Disease act No. 25 of 1909, covers the area of sealing of infected premises and areas, power to close animal movement, immunization of animals, destruction and disposal of infected animals, testing of animals, registration of premises, manufacture of veterinary drugs and biological products, issue of licenses for stud bulls and cows, import and export of animals and animal products and control authority of veterinary drugs. Animal Feed act No. 15 of 1986. Areas covered are approval of animal feeds, sale of approved animal feed. Maintaining minimum of standard. Prevent mass destruction of livestock populations in the different breeding tracts. Butchers ordinance No. 09 of 1893, 44 o, f 1947 Act No. 2 of 1951, 48 of 1953, Law No. 31 of 1936. This control of where and when animal to be slaughtered, permit to slaughter of cattle, Need for registration slaughtered animals and function of slaughter house. The controlling authority is local government. This helps to maintain systematic record keeping and prevent slaughter of genetically valued animals. Although, number of acts are in forced, they have not yet been empowered with legal power and authority. The implementing authority of these acts lies with the Agrarian Service department where crop has been the main concern. Dept. of Animal production & Health which has been the agency responsible for livestock regulatory affairs is yet to acquire authority.

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
Disease epidemics	low	medium	Incidence of epidemic diseases (ie. Rinderpest, FMD) periodically give adverse effects to the livestock and locally adapted species are more vulnerable as the vaccination is less practiced in traditional livestock keepers. Poultry in the suspected locations for bird flu, destroyed to prevent further spread. Newcastle disease, which is the killer disease for locally adapted poultry wipe out unless vaccination is not practiced.

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)	1	5
Cattle (specialized beef)	0	0
Cattle (multipurpose)	3	3
Sheep	1	1
Goats	3	2
Pigs	1	3
Chickens	1	7
Buffaloes	4	3
Ducks	1	0
Geese	1	0
Guinea fowls	1	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)	0	0	low	low	low	low	low	low
Cattle (specialized beef)	0	0	none	none	none	none	none	none
Cattle (multipurpose)	2	2	low	medium	low	low	low	low
Sheep	0	0	none	none	none	low	low	low
Goats	0	0	low	low	low	medium	low	low
Pigs	1	1	low	low	low	low	low	low
Chickens	1	1	low	low	low	medium	low	low
Buffaloes	1	1	low	none	low	none	none	none

INSTITUTIONS AND STAKEHOLDERS

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

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

	Score
Education	low
Research	low
Knowledge	low
Awareness	low
Infrastructure	low
Stakeholder participation	low
Policies	medium
Policy implementation	low

	Score
Laws	medium
Implementation of laws	low

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

	Description
Education	Primary and secondary education syllabuses have been developed under the supervision of central government. The syllabus on primary education system include the environment as a subject which has no direct focus on FAnGR other than brief introduction of wild and endemic animals of the country. The secondary education mainly focus on streams identified for the higher education. Science based streams of secondary education have little emphasis on AnGR. Faculty of veterinary Medicine and Animal Science, University of Peradeniya. Structured academic approach more towards animal health. Less focus on FAnGR. Faculty of Agriculture, Dept. of Animal Science, University of Peradeniya, Ruhuna, Batticaloa, Jaffna. Structured academic approach more towards animal production and less focus on AnGR. Agriculty Faculty(Rajarata, Sabaragamuwa) Livestock, Fisheries & Nutrition, Agriculture Plantation management, wayamba, Animal Science & Export Agriculture (Uva Wellassa) Focus on wide range of livestock related disciplines, mostly on animal production and no direct course on AnGR. Very little focus is given by these universities, Postgraduate Institute of Agriculture. Postgraduate Institute of Science on AnGR. Postgraduate Institute of Agriculture initiated a course on Biodiversity and conservation in relation to Animals which directly addresses the issues on indigenous AnGR.
Research	The research wing of the Dept. of Animal Production & Health (Veterinary Research Institute) conduct research, contribute to diagnose diseases, vaccine production advisory and analytical services. It is equipped with basic laboratory facilities for Molecular genetic research and Reproductive Physiology. Trained manpower to undertake the research are also available and the training is continually implemented for latest technologies. Leaving the trained manpower for other countries for better remunerations are the constraint. University of Colombo has established a separate institute for Biotechnology well equipped with latest technologies. However, research undertaken on animal aspects are very limited. Research is needed to transform present livestock keeping into more scientific animal rearing through animal husbandry techniques. Participatory farming system research have to be implemented with minimal inputs, effort and time.
Knowledge	Related Agencies currently available are not at all adequate to disseminate adequate knowledge on FAnGR. Valued animals are slaughtered unnoticed and the genetic dilution due to indiscriminate crossbreeding is taken place due to lack of knowledge on the value of maintaining FanGR diversity. Knowledge on distinguishing different breed types among field workers and thus the livestock owners are not adequate and therefore, endangered breed types such as Kottukachchiya goat is about to extinct as the animals have sold together with the local goats. Most extension technical staff has no hands -on experience when leading with livestock production aspects. The supervision officers are veterinary surgeons trained in higher-level expertise and skill s in veterinary health. This can be remedied either by increasing graduates with agriculture background and training them in higher level expertise and skills in livestock production or allow extension staff to work in the national livestock farms.
Awareness	Dept. of Animal production & Health and the Ministry of Environment in collaboration with national universities, private sector companies and non-governmental organizations collectively conduct awareness programs to convince the importance of maintaining FAnGR.

	Description
Infrastructure	Available infrastructure mainly focus on crop agriculture with less focus on livestock. Infrastructure facilities currently available for characterization and conservation activities are scanty
Stakeholder participation	Milk Industries of Lanka Ltd (MILCO), a government own milk processing and marketing company has strong regional network covering areas that has more AnGR but less focus on AnGR
Policies	Policies have been developed. But present policy on livestock does not cater to AnGR conservation. in addition to promotion of village chicken, no mention is made to conserve other species. Corporate plan, 2002 of Dept of Animal production & Health mention on "National policy for Livestock sector in Sri Lanka under the heading of dairy development has mentioned dairy sector will be developed ensuring the conservation of the genetic diversity of the country. However, not commented on other species or wild relatives. Government policy favor crop production over livestock production needs to be changed by showing that FAnGR plays key role in food security and poverty reduction.
Policy implementation	Although the policies have developed, most have no legal power for implementation
Laws	Laws have established since long ago.
Implementation of laws	Adherence to the law is very marginal.

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).

Establishment of breeder farm societies. Maintenance and monitoring of livestock associations.

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

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

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

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

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

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	1	0	1
Goats	0	1	0	0

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

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

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

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

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

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

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

Government mainly implement animal breeding program with high priority for dairy development. Research organizations and the national universities undertake only the research but assist in decision making for the government on setting breeding goals etc. Breeders' associations and individual breeders mainly interact with marketing aspects while national commercial companies assist in some extent for the government programs by letting access for their properties for performance evaluation. Present animals stocks and maintain records. Provide manpower and infrastructure for handling and maintaining animals.

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

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

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

Species	Description of policies or programmes
Cattle (specialized dairy)	Current breeding policy policy directives for genetic upgrading of local livestock with improved exotic germplasm to different exotic genotypic levels to suit the progenies for different agro-climatic zones and diverse farming systems.
Cattle (specialized beef)	No policy for beef production.
Cattle (multipurpose)	Different exotic genotypic levels to suit the progenies for different agro-climatic zones and the purposes of diverse farming systems.
Sheep	No specific policy for sheep. However, national breeding policy guidelines are to produce a meat type sheep and for grading up using exotic breeds. Red Madras and Bannur crosses are to grading up up to 100% Red Madras or 100% Bannur level. Three nuclear farms are in operation under the National Livestock Development Board.
Goats	No specific policy for goat. However, national breeding policy guidelines are to produce a dairy type goat and to grade up of existing herds using exotic dairy breeds. For local goats, National breeding policy guidelines suggest to In-situ conservation by pure breeding or Ex-situ by appropriate technologies.
Pigs	National breeding policy guidelines suggest to improve fast growing commercial pig. There is no specific breeding programs for local pigs. For local pigs, nuclear farmer are maintained only for exotic breeds. National breeding policy guidelines suggest to In-situ conservation by pure breeding or Ex-situ by appropriate technologies.
Chickens	No specific program for chicken.
Buffaloes	National breeding policy guidelines suggest to develop buffalo a dairy type by grading up using exotic breeds. Lankan buffalo is to conserve as In-situ.

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)	Upgrading animals ignoring the guidelines given in the breeding policy resulted inappropriate for the agro-climatic zone and the management system.
Cattle (specialized beef)	Not applicable
Cattle (multipurpose)	Upgrading animals ignoring the guidelines given in the breeding policy resulted inappropriate for the agro-climatic zone and the management system.
Sheep	No comment
Goats	No comment
Pigs	Ad-hoc breeding resulted instances of inbreeding due to lack of proper breeding materials.
Chickens	No comment
Buffaloes	Draught power become less important and thus breeding buffaloes towards the dairy type.

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 proper record keeping and availability of reliable data on time has been the constraint. Effective and timely data reporting system needed to established

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)	Improved dairy quality such as high fat and high protein.
Cattle (specialized beef)	Non
Cattle (multipurpose)	Selection program to identify breeds specifically for a purpose and implement specific breeding programs.
Sheep	Multiplication.
Goats	Upgrading of existing stock for meat and milk purpose.
Pigs	Breeding pigs for improved quality pork in commercial oriented farming.
Chickens	Quality improvement in broiler and eggs: Inclusion of Conjugated Linoleic Acid in eggs.
Buffaloes	Develop buffalo as a dairy type animal.

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

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

- (•) yes
- ( ) no

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

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

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

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

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

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

Further details are not available as the in situ conservation activities commenced very recently. Recent survey on veterinary range basis would reveal the status of population. Identification and differentiation of local species from their other counterparts and collection of blood samples and in some cases the semen samples have collected and have preserved under ultra minus temperatures.

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.

Maintain livestock gene bank by conserving semen blood, isolated genetic materials and tissues for future use

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

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

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

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

No such cases.

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.

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

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

Artificial Insemination has been the commonly used biotechnological tool.

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	no	no
Embryo transfer	no	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.

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

Biotechnologies	Public or private research at national level	Research undertaken as part of international collaboration
Artificial insemination	yes	no
Embryo transfer or MOET	yes	no
Semen sexing	no	no
In vitro 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	yes	no
Research on adaptedness based on molecular genetic or genomic information	yes	no

30.1. Please briefly describe the research.

Molecular genetic evaluation research are still in the initial stage.

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

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.

Lack of infrastructure and trained manpower and the small population size have been the constraint.

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

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

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

	Extent of collaboration	Description
Development of joint national strategies or action plans	none	No collaboration
Collaboration in the characterization, surveying or monitoring of genetic resources, production environments or ecosystems	none	No collaboration
Collaboration related to genetic improvement	limited	Limited collaboration

	Extent of collaboration	Description
Collaboration related to product development and/or marketing	none	No collaboration
Collaboration in conservation strategies, programmes or projects	none	No collaboration
Collaboration in awareness-raising on the roles and values of genetic resources	limited	Some collaboration
Training activities and/or educational curricula that address genetic resources in an integrated manner	limited	Low collaboration
Collaboration in the mobilization of resources for the management of genetic resources	limited	Low collaboration

2. Please describe any other types of collaboration.

Shara of laboratory facilities

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

Optimum use of scare resources.

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

Lack of skilled manpower.

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

Capacity building of the local manpower.

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).

Distribution of seed planting materials in the habitats.

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).

Maintaining plant stands adapted to their habitat localities without disappearance.

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).

Control of invasive plants and maintain beneficial plants for feeding livestock.

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.

Soil erosion in extensive grazing 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).

Controlled grazing.

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).

Extensive management of livestock is discouraged due to overgrazing. Herd owners have no other alternative for feeding large herds of mainly comprising locally adapted breeds and thus compelled to reduce the herd size to match the feed availability by selling animals for slaughter with adverse impact on their diversity.

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.

Loss of livelihood of certain categories of people who keep large herds of locally adapted animals and their supporters. This has a significant impact on AnGR diversity.

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.

Use of goat for controlling inversive plants in the dry lands.

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.

Implementation of strong awareness program.

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.

Conduct eco-system surveys to disclose benefits and constraints.

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:

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:

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:

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:

Baseline survey based on the ruminant species.

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:

Limited funding allocated to initiate activities.

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:

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:

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:

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:

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:

Small population size of different species in each breeding tract constraint to implement a selection programs. Inventory of these livestock had become difficult as they migrate from one area to other owing to the limitation in grazing lands. lack of skilled manpower also had become a constraint. Allocation of funds for these activities until recent time had been a constraint.

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.

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:

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:

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:

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:

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:

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:

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:

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:

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 adaption of the GPA but have not been updated
- ( ) c. No, but action is planned and funding identified
- (●) d. No, but action is planned and funding is sought
- ( ) e. No

Please provide further details:

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:

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:

Create premium markets for such animal products, especially for tourists.

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:

Periodical surveys conducted on veterinary range basis.

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:

Epidemic diseases, animal theft for slaughtering.

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

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

- ○ a. Country requires no policies and programmes because all locally adapted breeds are secure
- ○ b. Yes, comprehensive policies and programmes have been in place since before the adoption of the GPA
- ○ c. Yes, comprehensive policies and programmes exist because of progress made since the adoption of the GPA
- ○ d. For some species and breeds (coverage expanded since the adoption of the GPA)

- ○ e. For some species and breeds (coverage not expanded since the adoption of the GPA)
- ◉ f. No, but action is planned and funding identified
- ○ g. No, but action is planned and funding is sought
- ○ h. No

Please provide further details:

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

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

Please provide further details:

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

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

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

Please provide further details:

As the government agencies mainly involve in conservation activities, required funds and the competent manpower had become constraint until recent time.

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

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

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

Please provide further details:

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

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

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

Please provide further details:

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

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

- ◉ a. Yes
- ○ b. No

Please provide further details:

For species other than ruminants, conservation program planned.

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:

Most of the risks are due to accelerated and unacceptable rate of human population growth.
1. Transforming traditional agricultural systems to modern systems with the trend of loosing biodiversity.
2. Indiscriminate use of exotic animal genetic resources for high output leading complete replacement of locally adapted breeds.
3. Intensive livestock rearing use only one or few breeds or strains that drastically limit the diversity.
4. Indiscriminate cross breeding and use of breeding tools ie. AI with limitted number of breeds causing poor diversity.
5. war, various violence and natural disasters such as earth slips, flood and drought cause threat to AnGR. Due to recent war in the North and east in the country, AnGR either been neglected or lost.
6. Farm mechanization led to be at risk of some draught breeds such as "Kinniya" due to dis creasing population.
7. Changing farming systems such as mahaweli Irrigation scheme led to reduce the AnGR population.

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

- (●) a. Yes
- ( ) b. No

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

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

Please provide further details:

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

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

Please provide further details:

Arrangements are in place to identify animal species that are in risk due to forest fire and every possible measures have taken to mitigate such disasters and their impact on AnGR.

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

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

Please provide further details:

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

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

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

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

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

Please provide further details:

Awareness program on documentation of AnGR are being implemented.

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

Capacity building of local manpower.

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.

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

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

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

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

Please provide further details:

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

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

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

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

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

- ○ a. Yes
- ○ b. No, but they will be addressed in forthcoming plan
- ◉ c. No

Please provide further details:

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

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

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

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

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

- ○ g. No

Please provide further details:

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

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

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

Please provide further details:

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

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

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

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

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

Please provide further details:

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

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

- ○ e. No

Please provide further details:

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

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

Please provide further details:

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

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

Please provide further details:

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

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

Please provide further details:

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

Characterization?

- ○ a. Yes
- ◉ b. No

Sustainable use and development?

- ◉ c. Yes
- ○ d. No

Conservation of breeds at risk?

- ○ e. Yes
- ◉ f. No

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

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

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

Please provide further details:

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

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

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

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

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

Characterization?

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

Sustainable use and development?

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

Conservation of breeds at risk?

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

Please provide further details:

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
Animal genetic resources that can thrive on vegetation in saline soil	Salinity of the soil is increasing in alarming rate	Funding for adaptive research

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