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: Bangladesh

I. EXECUTIVE SUMMARY

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

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

The present livestock population of Bangladesh is 23.24 million cattle, 1.45 million buffalo, 25.21 million goats, 3.12 million sheep, 246.60 million chicken and 46.63 million ducks. Most animals are raised by small-scale farmers who own 1-2 heads of cattle, 2-3 heads of goat / sheep and a few poultry birds. Management system is a combination of both tethering and scavenging with or little inputs for breeding, feeding & health care. The domestic production of milk, meat and eggs are only 12.82%, 10.42% and 24.28% respectively of minimum requirements. Bangladesh is rich in Animal Genetic Resources (AnGR). The common AnGR are cattle, buffalo, goat, sheep, horse, chicken, duck, geese, pigeon and pigs. Most of these species are indigenous types except some exotic breeds of cattle, buffalo, goat, sheep and chicken and their crossbred progenies. Donkey and Black buck are the extinct species. Most of the aforesaid species are indigenous type except that only about 10% cattle & 20 % chicken are exotic cross & commercial types. These indigenous types possess many positive qualities, e.g. considerable adaptability to harsh climate, poor nutrition and easy or no care management system, resistance to local diseases and parasites and suitability to subsistence farmers' economy except that their productivity is low compared to improved breeds / types of livestock available in the country. A wide variation in terms of coat / plumage colour, size, body weight, production and reproduction has been found to exist among all indigenous AnGRs of Bangladesh.

Among the indigenous AnGRs non-descript Deshi, Red Chittagong, Pabna, North Bengal Grey, Madaripur and Munshigong in cattle; non-descript Deshi in buffalo; Black Bengal and Jamnapari in goat; non-descript Deshi and Garole in sheep; non-descript Deshi in pig; non-descript Deshi and Rajshahi Pony in horse; non-descript Deshi and Sarail in dog; non-descript Deshi in rabbit; non-descript Deshi, Naked Neck, Hilly, Aseel in chicken; non-descript Deshi, White, Deshi Black, Sylhet Mete, Nageswari, and Muscovy in ducks; non-descript Deshi, Jalali, Siraji, Giribus & Loton in pigeon and non-descript Deshi guinea fowl are notable. However, exact population size of each type of the said indigenous AnGRs in the country are not known. In general, majority of the said indigenous AnGRs are in declining trend due to urbanization, population growth and land pressure. The said AnGRs are endemic to Bangladesh except Black Bengal and Jamunapari goat, Garole sheep and gayal which are present in the neighboring countries. The Aseel chicken, Sarail dog and Red Chittagong, Pabna, North Bengal Grey, Madaripur and Munshigong cattle are to rapidly declining and deserve immediate

attention.

The indigenous AnGRs in general are distributed all over the country, ago-ecological zone and subsistence or traditional production and management system (low to zero input system) except that some breeds / types are found only in specific areas of the country.

The village farmers feel more comfortable with indigenous AnGRs in terms of their maintenance, easy of management and time spent after them. The farmers have the opinion that the wild relatives of AnGRs are seldom seen nowadays. The inhabitants of the forest areas have a tendency to catch or hunt wild relatives of AnGRs particularly the tribal people.

The following constraints hindering successful AnGR development in Bangladesh:
1. Lack of awareness and commitment among policy makers, farmers and private entrepreneurs about the value of AnGRs especially the indigenous AnGRs,
2. Lack of preventive medicare facilities,
3. Lack of sustainable indigenous breed development policy and programmes,
4. Not getting good price of AnGR due to absence of ensured / steady market,
5. Lack of high yielding and quality breeding animals / semen (indigenous and exotic),
6. Acute shortage of trained human capacity in this field (scientists, academicians, technicians, field assistants),
7. Poor coordination among organizations and scientists and
8. Absence of farmers association on AnGRs.

Potential indigenous AnGR populations of Bangladesh are under threat. Therefore, future efforts should be focused on the *in situ* development & conservation of potential AnGRs of Bangladesh. The most successful way could be genetic screening & open nucleus breeding strategies (ONBS) for the improvement of most promising indigenous AnGRs. The programmes may operate through both selection & distribution of males to participating & non-participating village farmers for agreed upon breeding goal. Another way may be operation of sire selection & multiplication for distribution scheme. The said approaches will not only improve the indigenous genetic material but will conserve them *in situ* for the benefit of the livestock keepers.

Rapid improvement of farm animal productivity for food security and livelihood leading to poverty reduction is needed in Bangladesh. The following action programs have been considered essential for conservation and sustainable development of AnGRs in Bangladesh which may lead to food security and livelihood improvement.
1. A detail survey and database development as to the actual population size, phenotypic characteristics and production potential of various AnGRs and their wild relatives in terms of species, breeds/types, production system, agro-ecological zones of Bangladesh is needed.
2. Molecular characterization of promising AnGRs and their Wild Relatives is needed
3. Initiation of pilot breeding programs with the priority species / breed / type of indigenous AnGRs (chicken, goat, cattle) ensuring active participation of villagers or community people.
4. Regarding species indigenous chicken, Black Bengal goat and Red Chittagong cattle should get top priority
5. Human Resource & Infra-structure Capacity Development is needed at all stakeholders i.e. DLS, BLRI, BAU, NGOs and farmer group / breeders association
6. Introduction of Herd Book Registration and Animal Recording System is needed.
7. Establishment of Breed Improvement Association is needed in the country
8. Animal Seed Certification Board need to be established 9) Reforming AnGR Development Policy Issues is needed.

In contrast of Bangladesh animal genetic resource management program need to be developed. The country has rich diversity of AnGR, but its value is not sufficiently recognized by the national authorities. The awareness has to be increased in order to obtain financial resources for the management, improvement and conservation of local breeds. Capacity to develop animal breeding and production and to implement the genetic management of local populations should be a high priority. The multilateral or bilateral aid program for conservation of the country is necessary. Inter-country, sub-regional and regional program should be encouraged and supported through external technical and financial assistance. The establish of regional conservation program and gene bank for regional transboundary breeds should be a high priority in Bangladesh.

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.

No

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).

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.

Bangladesh has nearly 16 million peoples. Requirement of milk and meat is 250 ml/head/day and 43.25 kg/year, but availability is 54.65 ml/head/day and 9.12 kg/year. So, deficiency of milk and meat is nearly 78% and 79%. Above the circumstances, Govt. priority to import cattle semen for dairy and beef breed development. Govt. imported Sahiwal semen from Pakistan, on the other hand, Holstein Friesian and Jersey semen imported from Australia and Brahman semen imported from USA. Importation of dairy and beef semen increased milk and meat production of the country day by day and which helps to fulfill the national demand.

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.

Imported gene flow affected animal genetic resources and their management in our country. Imported live animals and semen from different environment mostly low temperature country. Those species affected high temperature in our environment. Most of the time we created artificial environment. Some unexpected diseases also imported with the animals and semen that was not found in our country earlier.

LIVESTOCK SECTOR TRENDS

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

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

Drivers of change	Impact on animal genetic resources and their management over last ten years	Future impact on animal genetic resources and their management (predicted for the next ten years)	Describe the effects on animal genetic resources and their management
Changing demand for livestock products (quantity)	medium	high	Increasing the population decreasing the lands and animals. Demand of livestock products is comparatively higher but population of livestock on a decreasing trends. It creates a favorable environment for alternative products to fulfill the gaps. So, we should increase the quantity of livestock products through developing AnGR.
Changing demand for livestock products (quality)	medium	high	To establish the quality of livestock products we may introduce healthy products, environment friendly products and traditionally improved products.
Changes in marketing infrastructure and access	low	high	Better transport and better access and marketing information affected the marketing system.
Changes in retailing	low	medium	Expansion of super market little changes in retailing.
Changes in international trade in animal products (imports)	low	medium	Population is increasing at a high rate of the country, so imported livestock product and materials (powder milk, semen, day old chick) is increasing day by day.
Changes in international trade in animal products (exports)	low	high	Population is increasing of the country. Demand of livestock product also increasing. So, international trading is possible if we may increase livestock production day by day.
Climatic changes	low	high	Temperature and rainfall affected the livestock. Droughts and hurricane also affected the livestock production of the country.
Degradation or improvement of grazing land	low	high	Soil erosion is affected the grazing land. Fodder production is also decreasing trends with effect on soil erosion.
Loss of, or loss of access to, grazing land and other natural resources	low	high	Loss of access to grazing land and other natural resources effects on increasing number of AnGR.
Economic, livelihood or lifestyle factors affecting the popularity of livestock keeping	medium	medium	Availability of alternative employment Activities outside of livestock keeping affecting on AnGR and their management of the country.

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
Replacement of livestock functions	low	medium	Mechanical power replaced by draft power and livestock insurance affects on AnGR and their management.
Changing cultural roles of livestock	high	medium	The roles of livestock in cultural practices and events affect little on AnGR and their resources.
Changes in technology	low	high	Technological development is highly effect on AnGR and their resources.
Policy factors	low	high	Policy factors that affects on livestock sector and this also effects on AnGR and their management.
Disease epidemics	low	medium	Diseases epidemics on outbreak of animal diseases affected on AnGR and their management.

OVERVIEW OF ANIMAL GENETIC RESOURCES

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

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

Species	Locally adapted breeds	Exotic breeds
Cattle (specialized dairy)	0	4
Cattle (specialized beef)	0	1
Cattle (multipurpose)	4	3
Sheep	3	1
Goats	2	2
Pigs	0	0
Chickens	3	6
Ducks	3	3
Buffaloes	2	1

CHARACTERIZATION

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

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

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

Species	Baseline survey of population size	Regular monitoring of population size	Phenotypic characterization	Molecular genetic diversity studies – within breed	Genetic diversity studies based on pedigree	Molecular genetic diversity studies – between breed	Genetic variance component estimation	Molecular genetic evaluation
Cattle (specialized dairy)	0	0	none	none	none	none	none	none
Cattle (specialized beef)	0	0	none	none	none	none	none	none
Cattle (multipurpose)	2	2	medium	low	low	none	none	none
Sheep	0	0	medium	low	low	none	none	none
Goats	0	0	medium	low	low	none	none	none
Pigs	0	0	none	none	none	none	none	none
Chickens	2	2	medium	low	low	none	none	none
Ducks	0	0	medium	medium	none	none	none	none
Buffaloes	0	0	medium	medium	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	medium
Awareness	low
Infrastructure	medium
Stakeholder participation	medium
Policies	medium

	Score
Policy implementation	medium
Laws	medium
Implementation of laws	medium

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

	Description
Education	The state of education of our country capacities and provisions is low in case of animal genetic resources management. Because most of the people of our country below the poverty line. So, that they were not interested and unable to educated their child properly.
Research	As a developing country Bangladesh have lack of facilities to research on animal genetic resources management. Although Research institute and university have also research facilities.
Knowledge	The extent of knowledge needed to per forces the roles of animals genetic resources management is various on the stake holders. The livestock keepers knowledge level is low but knowledge level of policy-makers and technical experts are relatively high.
Awareness	Due to lake of knowledge and illiteracy the awareness of stakeholder and livestock keepers is relatively lower.
Infrastructure	The Infrastructure facilities both organizational and physical which are needed to deliver services related to animal genetic resources management is medium in place.
Stakeholder participation	The stakeholder participation is medium on animal genetic resources and management activities at local and national level. Nowadays several private companies and NGOs are interested to participated on these activities.
Policies	A national policies to ensure the sustainable use, development and conservation of animal genetic resources.
Policy implementation	The implementation of national policy is not successfully implemented in our country due to lack of awareness of livestock holders, policy makers and livestock experts.
Laws	The government of Bangladesh has some laws to protect the livestock breeder/awareness rights to manage animal genetic resources. Animal genetic resources management can be affected not applying the legislation in many fields.
Implementation of laws	The implementation of laws in our country is minimum, due to lack of necessary awareness.

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).

To engage or empowerment of various stakeholders in animal genetic resources management the following steps that we have to take in our country.

1. to encourage the stake holders and livestock keepers for the conservation of animal genetic resources.
2. to build up the awareness and increase their knowledge of the stakeholders about the necessity of animal genetic resources management.
3. to establish a livestock keeper's organization.
4. to improve the infrastructure facilities.
5. To increase the interest of stakeholders for their better participation.
6. to develop a bio-cultural community protocols.

7. to give attention on the implementation of national policies and laws on animal genetic resources management.

BREEDING PROGRAMMES

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

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

10. Who operates breeding programmes in your country?

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

Species	Government	Livestock keepers organized at community level	Breeders' associations or cooperatives	National commercial companies	External commercial companies	Non-governmental organizations	Others
Cattle (specialized dairy)	yes	no	yes	no	no	yes	no
Cattle (specialized beef)	yes	no	no	no	no	yes	no
Cattle (multipurpose)	yes	no	no	no	no	yes	no
Sheep	yes	no	no	no	no	yes	no
Goats	yes	no	no	no	no	yes	no
Pigs	no	no	no	no	no	no	no
Chickens	yes	yes	yes	yes	no	yes	no
Ducks	yes	yes	no	no	no	yes	no
Buffaloes	yes	yes	no	no	no	yes	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 (multipurpose)	2	3	2	3	2	3	0	0	0	0	0	0	0	0	2	3
Sheep	3	1	3	1	3	1	0	0	0	0	0	0	0	0	0	0
Goats	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0
Chickens	3	6	3	6	3	6	0	0	0	0	0	0	0	0	0	0
Buffaloes	2	0	2	0	2	0	0	0	0	0	0	0	0	0	2	1
Ducks	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0
Cattle (specialized dairy)	0	4	0	4	0	4	0	0	0	0	0	0	0	0	0	4
Cattle (specialized beef)	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	1
Pigs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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

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

Species	Breeding method			
	Straight/pure-breeding only		Straight/pure-breeding and cross-breeding	
	Loc	Ex	Loc	Ex
Cattle (multipurpose)	2	3	1	4
Sheep	1	0	0	0
Goats	2	0	0	0
Chickens	3	1	1	6
Buffaloes	2	0	2	1
Ducks	3	0	1	2
Cattle (specialized dairy)	0	0	1	4
Cattle (specialized beef)	0	0	1	1
Pigs	0	0	0	0

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

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

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

Species	Organization of livestock keepers
Cattle (specialized dairy)	low
Cattle (specialized beef)	low
Cattle (multipurpose)	medium
Sheep	low
Goats	low
Pigs	none
Chickens	medium
Ducks	low
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	none	low	none	low	none	low	low	none
Animal identification	none	low	none	none	none	none	low	none
Recording	none	low	none	none	none	none	low	none
Provision of artificial insemination services	medium	medium	none	none	none	none	medium	none
Genetic evaluation	none	low	none	none	none	none	none	none

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

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

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

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

Chickens	Government	Research organizations	Breeders' associations or cooperatives	Individual breeders/livestock keepers	National commercial companies	External commercial companies	Non-governmental organizations	Others
Setting breeding goals	medium	medium	medium	medium	low	low	medium	low
Animal identification	medium	medium	medium	medium	low	low	medium	low
Recording	medium	medium	medium	medium	low	low	medium	low
Provision of artificial insemination services	medium	medium	low	medium	low	low	medium	low
Genetic evaluation	low	medium	low	medium	low	low	medium	low

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

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

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

Species	Policies or programmes
Cattle (specialized dairy)	yes
Cattle (specialized beef)	yes
Cattle (multipurpose)	yes
Sheep	yes
Goats	yes
Pigs	no
Chickens	yes
Ducks	yes
Buffaloes	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)	For cows reared under intensive system i.e high level of input supply and zero grazing. To produce dairy cattle that will yield more than 6000kg milk per lactation (305 days lactation period) at the end of 5 years Insemination the top most cross bred Holstein Friesian cows (daily yield 10 kg or more) reared under intensive management system with imported semen of progeny tested bulls of Holstein - Friesian cattle having milk yield capacity of 9.500-10.000kg in 305 days lactation period. 1 million doses of such semen should be imported by DLS and inseminated maintaining proper records.
Cattle (specialized beef)	Up-graded Brahman Deshi (50%-50%) germplasm under research trial. Small doses of high merit Brahman semen procure from beef rich countries. Cross bred males (Friesian Deshi) use in the high input production system.
Cattle (multipurpose)	For cows reared under low input production system. To produce native dairy cattle that will yield more than 1000 kg milk per lactation (305 day lactation period) at the end of 5 years. Inseminate native cows reared under low input production system with semen of progeny tested/pedigree bulls of Sahiwal, Pabna cattle, RCC Munshigong other improved deshi cattle.
Sheep	Using and fixing up crossbred (Lohi/Romrcy Marsh Deshi 50% 50%) in the sheep pocket areas of the country. Ensuring steady production of consistently superior Lohi/ Romrcy MarshDesh ram or semen by government or other stakeholders.
Goats	Using high merit pure bred Black Bengal buck or semen all over the country. Ensuring steady production of consistently superior Black Bengal Buck or semen by government or other stakeholders.
Pigs	No policy in our country.
Chickens	For eggs: Using of specialized germ lines for high input production system. Initiating programme for in country strain development using exotic and Deshi chicken genetic resources (e.g. improved Deshi). For meat: Using of specialized germ lines for high input production system. Initiating programme for in country strain development using exotic and Deshi chicken genetic resources (e.g. Naked Neck, Aseel, improved Deshi).

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)	Lack of a national breeding policy. Use of inappropriate breeds, weak infrastructures (human capacity, national service delivery breeding farms). Limited technical knowledge, Unplanned and sporadic attempts that were affected breed improvement of various species. Because the initiative were not based on well thought and sound breeding goals. Breeding criteria such as animal recording system, animal evaluation procedures, animal selection and mating plans are not required standards.
Cattle (specialized beef)	Lack of a national breeding policy. Use of inappropriate breeds, weak infrastructures (human capacity, national service delivery breeding farms). Limited technical knowledge, Unplanned and sporadic attempts that were affected breed improvement of various species. Because the initiative were not based on well thought and sound breeding goals. Breeding criteria such as animal recording system, animal evaluation procedures, animal selection and mating plans are not required standard.

Species	Description of consequences
Cattle (multipurpose)	Lack of a national breeding policy. Use of inappropriate breeds, weak infrastructures (human capacity, national service delivery breeding farms). Limited technical knowledge, Unplanned and sporadic attempts that were affected breed improvement of various species. Because the initiative were not based on well thought and sound breeding goals. Breeding criteria such as animal recording system, animal evaluation procedures, animal selection and mating plans are not required standard.
Sheep	Lack of a national breeding policy. Use of inappropriate breeds, weak infrastructures (human capacity). Limited technical knowledge. Unplanned and sporadic attempts that were affected breed improvement of various species. Because the initiative were not based on well thought and sound breeding goals. Breeding criteria such as sheep recording system, sheep evaluation procedures, sheep selection and mating plans are not required standard.
Goats	Lack of a national breeding policy. Use of inappropriate breeds, weak infrastructures (human capacity). Limited technical knowledge. Unplanned and sporadic attempts that were affected breed improvement of various species. Because the initiative were not based on well thought and sound breeding goals. Breeding criteria such as goat recording system, goat evaluation procedures, goat selection and mating plans are not required standard.
Pigs	No breeding policy.
Chickens	Lack of a national breeding policy. Use of inappropriate breeds, weak infrastructures (human capacity). Limited technical knowledge. Unplanned and sporadic attempts that were affected breed improvement of various species. Because the initiative were not based on well thought and sound breeding goals. Breeding criteria such as poultry recording system, poultry evaluation procedures, poultry selection and mating plans are not required standard.

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.

There is no regulatory body on national Breeding Act to regulate breed imports, prices of breeding materials, merit and quality of breeds, breeding materials and breeding services. Withier the existing cattle breeding services (including artificial insemination), farmers have little or no idea at the merit and quality of the semen being provided for insemination. Sustained farming supports for breeding work has not been for theoming.

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)	Appropriate breeding program is an important part of livestock development strategy. Breeding strategy usually aims at maximizing production per animal or bird. A long-term breed development policy and research program need to be developed and implemented while at the same time quality of breeding services need to be improved and the current AI service provision by various providers need to be streamlined in a way that be complementary to the long-term strategy. However, the long term strategy should be based on a detailed assessment of the genetic characterization of the local breeds, efficiency and impact of past AI and other breeding services, their constraints, and current and future demand for breeds of producers of all categories and other stakeholders. The most successful way could be genetic screening & open nucleus breeding strategies (ONBS) for the improvement of most promising indigenous AnGRs. The programs may operate through both selection & distribution of males to participating & non-participating village farmers for agreed upon breeding goal. Another way may be operation of sire selection & multiplication for distribution scheme.

Species	Description of future objectives, priorities and plans
Cattle (specialized beef)	A long-term breed development policy and research program need to be developed and implemented while at the same time quality of breeding services need to be improved and the current AI service provision by various providers need to be streamlined in a way that be complementary to the long-term strategy. However, the long term strategy should be based on a detailed assessment of the genetic characterization of the local breeds, efficiency and impact of past AI and other breeding services, their constraints, and current and future demand for breeds of producers of all categories and other stakeholders. The most successful way could be genetic screening & open nucleus breeding strategies (ONBS) for the improvement of most promising indigenous AnGRs. The programs may operate through both selection & distribution of males to participating & non-participating village farmers for agreed upon breeding goal. Another way may be operation of sire selection & multiplication for distribution scheme.
Cattle (multipurpose)	A long-term breed development policy and research program need to be developed and implemented while at the same time quality of breeding services need to be improved and the current AI service provision by various providers need to be streamlined in a way that be complementary to the long-term strategy. However, the long term strategy should be based on a detailed assessment of the genetic characterization of the local breeds, efficiency and impact of past AI and other breeding services, their constraints, and current and future demand for breeds of producers of all categories and other stakeholders.The most successful way could be genetic screening & open nucleus breeding strategies (ONBS) for the improvement of most promising indigenous AnGRs. The programs may operate through both selection & distribution of males to participating & non-participating village farmers for agreed upon breeding goal. Another way may be operation of sire selection & multiplication for distribution scheme.
Sheep	A long-term breed development policy and research program need to be developed and implemented while at the same time quality of breeding services need to be improved and however, the long term strategy should be based on a detailed assessment of the genetic characterization of the local breeds, efficiency, their constraints, and current and future demand for sheep of producers of all categories and other stakeholders. The most successful way could be genetic screening & open nucleus breeding strategies (ONBS) for the improvement of most promising indigenous AnGRs. The programs may operate through both selection & distribution of males to participating & non-participating village farmers for agreed upon breeding goal. Another way may be operation of ram selection & multiplication for distribution scheme.
Goats	A long-term breed development policy and research program need to be developed and implemented while at the same time quality of breeding services need to be improved and however, the long term strategy should be based on a detailed assessment of the genetic characterization of the local breeds, efficiency, their constraints, and current and future demand for goat of producers of all categories and other stakeholders. The most successful way could be genetic screening & open nucleus breeding strategies (ONBS) for the improvement of most promising indigenous AnGRs. The programs may operate through both selection & distribution of males to participating & non-participating village farmers for agreed upon breeding goal. Another way may be operation of buck selection & multiplication for distribution scheme.
Pigs	No breeding policy.
Chickens	A long-term breed development policy and research program need to be developed and implemented while at the same time quality of breeding services need to be improved and. however, the long term strategy should be based on a detailed assessment of the genetic characterization of the local breeds, efficiency, their constraints, and current and future demand for chicken of producers of all categories and other stakeholders. The most successful way could be genetic screening & open nucleus breeding strategies (ONBS) for the improvement of most promising indigenous AnGRs. The programs may operate through both selection & distribution of males to participating & non-participating village farmers for agreed upon breeding goal. Another way may be operation of cock selection & multiplication for distribution scheme.

CONSERVATION

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

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

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

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

Species	In situ conservation	Ex situ in vivo conservation	Ex situ in vitro conservation
Cattle (specialized dairy)	none	low	none
Cattle (specialized beef)	none	low	none
Cattle (multipurpose)	low	low	none
Sheep	none	low	none
Goats	none	low	none
Pigs	none	none	none
Chickens	none	low	none
Ducks	low	low	none
Buffaloes	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	no
Genetic variation within the breed	no
Production traits	no
Non-production traits	no
Cultural or historical importance	no
Probability of success	no

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

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

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

In our country whole area under the activities of A1. Some rare local cattle breed e.g. Pabna cattle, Red Chittagong cattle rear *In situ* and *Ex situ* and *In vivo* conservation for future foundation stock in govt. farm.

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.

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

	Stored in national genebank
Semen	yes
Embryos	no
Oocytes	no
Somatic cells (tissue or cultured cells)	no
Isolated DNA	no

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

Species	Number of breeds for which material is stored	Number of breeds for which sufficient material is stored	Does the collection include material from not-at-risk breeds?	Have any extinct populations been reconstituted using material from the gene bank?	Have the gene bank collections been used to introduce genetic variability into an in situ population?	Have the gene bank collections been used to introduce genetic variability into an ex situ population?	Do livestock keepers or breeders' associations participate in the planning of the gene banking activities?
Cattle (specialized dairy)	0	0	no	no	no	no	no
Cattle (specialized beef)	0	0	no	no	no	no	no
Cattle (multipurpose)	0	0	no	no	no	no	no
Sheep	0	0	no	no	no	no	no
Goats	0	0	no	no	no	no	no
Pigs	0	0	no	no	no	no	no
Chickens	0	0	no	no	no	no	no

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

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.

1. Pabna cattle: BLRI and BAU started *in situ* and *ex situ* conservation and improvement program of this breed.
2. Red Chittagong cattle: BLRI and BAU started *in situ* and *ex situ* conservation and improvement program of breed.

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 (multipurpose)	high	low	none	none	none	none	none	low	none
Sheep	none	none	none	none	none	none	none	low	none
Goats	low	none	none	none	none	none	none	low	none
Chickens	low	none	none	none	none	none	none	low	none
Ducks	none	none	none	none	none	none	none	none	none
Buffaloes	low	none	none	none	none	none	none	low	none

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

The country only artificial insemination is applied for cattle breeding. On the other hand artificial insemination is practiced at limited level for goat, buffaloes and chicken in some areas of Bangladesh. Artificial insemination in sheep is practice only at BLRI for research purpose. IVM, IVF, MOET and ET are practiced in our country only for research purpose at limited level.

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

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

Artificial insemination is available in our country on public sectors like Director of livestock services (DLS), Bangladesh Livestock Research Institute (BLRI) and several agricultural universities plays an important role for the dissemination of these technology. On the other hand some non-government organization like Milk Vita, Laltir, BRAC, Pran, Arong etc. plays a vital role to establish this technology in Bangladesh. Embryo transfer and MOET are also introduced in our country but it is only limited in the laboratory and experimental purpose.

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

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

30.1. Please briefly describe the research.

In our country several research work have been done on Artificial insemination, *in vitro* matruration, *in vitro* fertilization, MOET and ET at BLRI, DLS and some agricultural universities (e.g. BAU).

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

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	medium	medium	medium	medium	medium
Artificial insemination using imported semen from exotic breeds	medium	medium	medium	medium	medium
Natural mating	none	none	none	none	none

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

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

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

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

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

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

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

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

Lack of sustainable breed development policy and programs, lack of high yielding and quality breeding animals/semen (indigenous and exotic), acute shortage of trained human capacity in this field (scientists, academicians, technicians, field assistants) and poor coordination among organizations and scientists.

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

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

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

	Extent of collaboration	Description
Development of joint national strategies or action plans	limited	ILRI through UNEP-GEF-ILRI FAnGR Asia Project, USDA through Characterization, Conservation and improvement of Red Chitagong Cattle of Bangladesh.
Collaboration in the characterization, surveying or monitoring of genetic resources, production environments or ecosystems	limited	Availability of priority species, indigenous FAnGRs and other criteria Gazipur district and Chittagong district are two important pilot project sites.

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

2. Please describe any other types of collaboration.

There are several types of collaboration which take place between the management of animal genetic resources with the management of plant, forestry and aquatic genetic resources. Some of the collaborations are described on the above chart. Beside this, our country also practices many other integration cultures like Duck-cum-fish integrates production which is very popular and beneficial to our country prospective.

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

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

Factors that facilitate or constrain collaborative approaches to the management of genetic resources in our country.

1. Most of the livestock holders in our country are illiterate so they are not properly aware of the importance of the conservation of animal genetic resources and this main constrain for the collaborative approaches.
2. Due to the lack of national and foreign funds, appropriate training program or awareness building program for the development of the livestock holders cannot be organized.

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

To overcome the problems we should need:

1. To create facilities for the farmers or livestock holders to train them properly about the importance and the management of animal genetic resources and their collaboration with others.
2. Ensure proper education & awareness.
3. Women empowerment.

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

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

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

- ○ yes

- ◉ no

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

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

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

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

The supply of the respective ecosystem services (including an indication of the scale on which these outcomes have been obtained).

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

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

- ○ yes
- ◉ no

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

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

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

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

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.

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

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

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:

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:

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:

Technical and financial support to initiate the process at national level through cooperation with the FAO.

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

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

The country has population pressure and need to be the gear up production of food for animal origin. Bangladesh must need to participate in the implementation of Global plan of action for the AnGRs through regional and international cooperation.

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.

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

Please provide further details:

Before 1947, indigenous AnGRs were the sole source of livestock produce to the people of the country. Mainly after 1971, introduction of imported/exotic breeds of cattle, buffalo, chicken and duck received momentum for livestock development in Bangladesh. However, the performance of indigenous AnGRs in the traditional production system is much low compared to intensive production system utilizing exotic breeds and their crosses with indigenous AnGRs.

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:

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

Technical and financial support to facilitate:
1. National consultative planning process.
2. Formulating national action plan for AnGR development.
3. Pilot breed development program.
4. Pilot conservation and sustainable use program.
5. Capacity development program.

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.

Given the country population pressure and need to gear up production of food of animal origin. Bangladesh must need to participate in the implementation of Global Plan of Action for the AnGRs through regional and international cooperation.

STRATEGIC PRIORITY AREA 3: CONSERVATION

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

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

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

Please provide further details:

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

1. Indiscriminate crossbreeding program (all species).
2. Lack of long term animal genetic resource use plan.
3. Lack of national regulatory bodies.

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

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

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

Please provide further details:

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

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

Please provide further details:

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

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

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

Please provide further details:

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

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

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

Please provide further details:

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

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

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

Please provide further details:

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

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

- ◉ a. Yes
- ○ b. No

Please provide further details:

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

- ○ a. Country requires no conservation programmes because all animal genetic resources are secure
- ○ b. Yes

- [x] c. No
- [ ] d. No major barriers and obstacles exist. Comprehensive conservation programmes are in place

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

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

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

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

- [x] 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
- [x] e. No

Please provide further details:

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

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

- [x] 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:

1. Pabna cattle: BLRI and BAU has started *In situ* and *Ex situ* conservation and improvement program of this species.
2. Red Chittagong: BLRI and BAU has started *In situ* and *Ex situ* conservation and improvement program of this species.
3. Hilly chicken: BLRI and BAU has started to conserve Deshi Hilly and Naked Neck chicken *In situ* and *Ex situ* conservation and improvement program of this species.
4. Goyal: In situ conservation of these animals in their natural habitats already started by BLRI.

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

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

Please provide further details:

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

1. Legal instrument is needed for conservation.
2. To take on initiative a breeder association, private companies and NGO's stated to take AnGR program.
3. To take an initiative Government and university will start a project related to conservation.
4. Long term breeding program.
5. Endanger species must be conserved.

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.

Given the country's population pressure and need to gear up production of food of animal origin. Bangladesh must need to participated in the implementation of Global plan of action for the AnGRs through regional and international cooperation.

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.

Given the country's population pressure and need to gear up production of food of animal origin. Bangladesh must need to participated in the implementation of Global plan of action for the AnGRs through regional and international cooperation.

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:

ILRI through UEEP- GEF-ILRI FAnGR Asia Project. USDA through Characterization, Conservation and improvement of Red Chittagong Cattle of Bangladesh.

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

Submit by Email