منظمة	联 合 国	Food and Agriculture	Organisation des	Продовольственная и	Organización de las
الأغذية والزراعة	粮 食 及	Organization of the	Nations Unies pour	сельскохозяйственная	Naciones Unidas para la
للأم المتحدة	农 业 组 织	United Nations	l'alimentation et l'agriculture	организация Объединенных Наций	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: Indonesia

I. EXECUTIVE SUMMARY

Please provide an executive summary (not more than two pages) that will allow national and international stakeholders to gain a quick overview of the content of the country report.
The executive summary should contain information on:
- key trends and driving forces affecting animal genetic resources management in your country;
- strengths, weaknesses and gaps in capacity to manage animal genetic resources in your country;
- key constraints and challenges with respect to animal genetic resources management in your country;
- priorities and strategic directions for future action (focusing particularly on the next ten years).

EXECUTIVE SUMMARY

Indonesia is an archipelago country which has 5 large islands and over 30 smaller islands. Geographically territory stretches on the equatorial line, which lies between the continents of Asia and Australia. Indonesia has a mega biodiversity, including animal genetic resources (AGR) among species, breeds and populations. In a population of around 250 million people at a growth rate of about 1.49 %/year need animal foods (meat, eggs and milk) in a large volume and continually increase.

Animal food has been fulfilled by indigenous and local AGR (cattle, buffalo, sheep, goats, chickens, ducks, geese, quail and other). Additionally, the Government implemented a policy of importing exotic breeds. A quite large exotic breeds (species) have been imported, i.e. beef cattle from Australia, HF dairy cattle from Australia and New Zealand, and commercial poultry (broilers and layers) from USA and Europe. Importation of these species are predicted to continually increase. Indonesia, however, has also exported small ruminants (sheep and goats) to neighboring countries and the Middle East.

Changes in demand for animal production and quality, international trade of animal products, farm land uses, technology and policy can give effects to AGR and its management. Changes can occur in different forms, i.e. increasing genetic diversity, geography distribution pattern, selecting specific breeds (species) for production, increasing efficiency of land use, AGR methods.

For doing AGR management, the Government has completed any polices, regulations, breeding programs, facilities, researches, and infrastructures. AGR management has also been done by private sectors and farmer groups for some reasons, i.e. economic value, cultural, social and hobby. Implementation in the management of AGR for most breeds however still face many constraints. These are i.e. regulations and policies are weak, law enforcement, and no sanctions, lacking breeding activities (limited human resources, technical, facility, and funding), partial and discontinuous researches, lacking awareness and participation of relevant actors.

To facilitate AGR management, it should consider on prioritization species (breeds), support breeding activities (recording, goals, targets, design mating, genetic evaluation, ONBS), uses of appropriate technologies (AI, ET, molecular,

genomic), comprehensive researches, stronger collaboration between related sectors, more participation of farmers and relevant actors, facility, funding and added values (for breeding stocks).
 National action plan should be done (for next 10 years), ie inventory and characterization of both local and indigenous AGR on more breeds (species), better breeding management, encouraging active participation of relevant actors (farmers), more conservation (in situ and ex situ) especially on endangered breeds, enhancing capacity building and establishing more regional and international cooperation.

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.

Indonesia have imported a large number of GP and PS for modern chicken (broiler and layer), as well as dairy cattle (HF) and some breeds of beef cattle from Australia.

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).

Indonesian Livestock and Animal Health Statistic, 2012. (in Book and on Line / http://www.ditjennak.deptan.go.id)

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.

Increasing number of export of sheep and goats has occurred to neighboring countries and the middle east. Importation of Bos taurus (from Australia) has slightly increased. Further, importation of modern chicken from Europe and USA has also slightly increased.

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.

Increasing the occurrence of crossbreeding local beef cattle to exotics, decreasing effort in rearing replacement stock (i.e. HF heifers), and less effort in exploring and utilizing local animal genetic potential and depleting local animal genetic diversity.

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)	low	low	Improving management of animal genetic resources (AGR), different type breeds (species) of AGR, increasing AGR diversity, changes in AGR geographical distribution. Increasing genetic diversity is due to more imported exotic breeds (mainly beef cattle). Changing in geographical distribution is more exotic breeds (commercial) in production area (dense area), but more local AGR in rare area due to improving newly breeding area.
Changing demand for livestock products (quality)	none	low	Improving AGR management to meet better quality, type of breeds within species, increasing AGR diversity by importing more breeds (i.e. beef cattle), and getting added values of local AGR resulting in better attention for conservation by farmers.
Changes in marketing infrastructure and access	none	low	Making easier of local AGR to be marketed (moved out) causing decreasing certain breeds of local AGR (i.e. beef cattle and buffalo).
Changes in retailing	none	low	Changes in AGR management and AGR geographical distribution for more exotic breeds (commercial) in production area (dense area).
Changes in international trade in animal products (imports)	high	low	Changing patterns of production and breeds (species) of AGR developed by increasing species faster and less expensive to produce food.
Changes in international trade in animal products (exports)	low	low	Changing patterns of production and species (breeds) of AGR developed.
Climatic changes	none	low	Changing breeding target by developing animal genetic resources more adaptive in tropic.
Degradation or improvement of grazing land	medium	medium	Changes in land use pattern from dense areas to sparse area and AGR geographical distribution.

Drivers of change	Impact on animal genetic resources and their management over last ten years	Future impact on animal genetic resources and their management (predicted for the next ten years)	Describe the effects on animal genetic resources and their management
Loss of, or loss of access to, grazing land and other natural resources	low	low	Changes in land use pattern from dense to sparse area, AGR geographical distribution pattern, and improving the efficiency of land use (i.e. developing integration system and inter-cropping patterns).
Economic, livelihood or lifestyle factors affecting the popularity of livestock keeping	low	low	Improving AGR management and production systems to achieve the goal.
Replacement of livestock functions	low	medium	changes in the use and AGR geography distribution, i.e. less functioned breeds be threaten vulnerable.
Changing cultural roles of livestock	low	low	Some breeds playing important cultural roles will be at risk due to lesser interest from farmers to manage and conserve local AGR which previously has strategic cultural values for community.
Changes in technology	low	low	Improving the efficiency of AGR management i.e. by AI mating.
Policy factors	low	low	Polices and regulations already exist but implementation and law enforcement are still limited.
Disease epidemics	low	low	Giving very significant impact on local animal genetic resources.

OVERVIEW OF ANIMAL GENETIC RESOURCES

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

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

Species	Locally adapted breeds	Exotic breeds
Cattle (specialized dairy)	1	1
Cattle (specialized beef)	9	9
Cattle (multipurpose)	2	0
Sheep	5	4
Goats	6	3
Pigs	3	1
Chickens	20	2
Ducks	11	4
Buffaloes	9	0
Horses	2	2

Species	Locally adapted breeds	Exotic breeds
Pigeons	2	0
Quails	2	0
Rabbits	5	4

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)	1	1	medium	low	low	none	medium	low
Cattle (specialized beef)	7	7	medium	low	low	low	medium	low
Cattle (multipurpose)	1	1	none	low	low	none	none	none
Sheep	5	5	low	low	low	medium	medium	low
Goats	6	6	low	low	low	low	low	none
Pigs	1	1	low	low	low	none	low	none
Chickens	20	20	medium	medium	low	medium	medium	medium
Ducks	11	11	medium	low	low	low	medium	low
Buffaloes	9	9	medium	low	low	low	low	low
Horses	2	2	low	low	low	none	low	none
Pigeons	1	1	low	low	low	none	low	none
Quails	1	1	low	low	low	none	low	none
Rabbits	4	4	low	none	low	none	low	none

INSTITUTIONS AND STAKEHOLDERS

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

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

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

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

	Description
Education	Education has been given by educational institutions, research, government to relevant stakeholders and farmers. In some cases, understanding of AGR management is acceptable, but implementation is still limited.
Research	Researches are sufficiently done (by universities and research institutes), but facilities and funding often face limited.
Knowledge	Many relevant government authorities, farmers, and communities still have limited knowledge.
Awareness	Sufficient awareness of both national and local livestock services about conserving animal genetic resources.
Infrastructure	Insufficient infrastructure for maintaining, conserving and doing research for managing animal genetic resources.
Stakeholder participation	Low participation from stakeholders for managing and conserving animal genetic resources.
Policies	Sufficient relevant policies for AGR management, both from national and local governments.
Policy implementation	For some provinces are still insufficient.
Laws	A number of laws are still weak due to very limited sanctions.
Implementation of laws	Very limited law enforcement.

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).

By autonomy, local governments have been given the authority to set breeds/strains for specific region, but concerns are still lacking (programs, financial and funding). Further, local governments have been given authority to make local regulations but implementation varies.

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

Species	Government	Livestock keepers organized at community level	Breeders' associations or cooperatives	National commercial companies	External commercial companies	Non-governmental organizations	Others
Chickens	yes	no	yes	yes	yes	no	yes
Buffaloes	yes	no	no	no	no	no	yes
Ducks	yes	no	no	no	no	no	yes
Horses	no	yes	yes	no	no	no	yes

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

Breeding activities are partially contributed by farmer group / individual farmers related to cultural, social and hobby.

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

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

Species	Tools															
	Animal identification		Breeding goal defined		Performance recording		Pedigree recording		Genetic evaluation (classic approach)		Genetic evaluation including genomic information		Management of genetic variation (by maximizing effective population size or minimizing rate of inbreeding)		Artificial insemination	
	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex
Cattle (specialized dairy)	1	1	1	0	1	0	1	0	1	0	0	0	0	0	1	0
Cattle (specialized beef)	7	7	7	0	7	0	7	0	7	0	7	0	1	0	7	7
Cattle (multipurpose)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sheep	2	0	5	0	5	0	0	0	3	0	0	0	3	0	2	0
Goats	1	0	2	0	2	0	0	0	2	0	0	0	0	0	1	0
Pigs	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0
Ducks	0	0	2	0	2	0	0	0	2	0	0	0	2	0	0	0
Chickens	0	0	3	0	3	0	0	0	3	0	0	0	1	0	0	0
Horses	1	2	1	2	1	2	1	2	1	0	0	0	0	0	1	2

12. Please indicate how many of the breeds in your country are subject to breeding programmes applying the following breeding methods.
Note: Loc = Locally adapted breeds; Ex = Exotic breeds.

Species	Breeding method			
	Straight/pure-breeding only		Straight/pure-breeding and cross-breeding	
	Loc	Ex	Loc	Ex
Cattle (specialized dairy)	1	1	0	0
Cattle (specialized beef)	5	0	3	0
Sheep	3	0	2	0
Goats	2	0	1	0
Pigs	1	0	0	0
Chickens	3	0	2	0
Buffaloes	0	0	0	0
Ducks	2	0	1	0
Horses	1	0	0	2
Rabbits	3	0	2	0

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

Species	Training	Research
Cattle (specialized dairy)	medium	medium
Cattle (specialized beef)	medium	medium
Cattle (multipurpose)	none	none
Sheep	medium	medium
Goats	medium	medium
Pigs	low	low
Chickens	high	medium
Buffaloes	low	low
Ducks	medium	medium
Horses	medium	low
Quails	low	low
Pigeons	low	low
Rabbits	medium	medium

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

Species	Organization of livestock keepers
Cattle (specialized dairy)	low
Cattle (specialized beef)	medium
Cattle (multipurpose)	none
Sheep	low
Goats	low
Pigs	low
Chickens	low
Buffaloes	low
Ducks	low
Horses	low
Rabbits	low

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

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

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

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

Pigs

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

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

Chickens

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

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

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

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

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

-

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

Government plays an important role in determining breeding program to improve AGR productivity. Government facilitates tool (i.e. AI mating) to support breeding and multiplication population. Research institutions conduct researches to create new breeds/strains by mating and selection methods. Farmer association contribute less in determining breeding program. Some farmers do breeding practically to get specific purpose(s).

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	yes
Chickens	yes
Buffaloes	yes
Ducks	yes
Horses	no

Species	Policies or programmes
Rabbits	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)	Government has continually keeping pure HF breed for farmers, facilitating AI mating and importing HF heifers to add RS, conducting progeny testing for identifying superior HF bulls. Progeny testing has been done to identify HF proven bulls for having good milk transmitting ability in various management and agro-ecosystem.
Cattle (specialized beef)	Government has done performances test to produce qualified bulls for natural and AI mating on local breeds (mainly beef cattle and buffalo) to anticipate limited bulls due to high mutation and depress inbreeding. Supporting policy and action exist to decrease of slaughtering productive females as well as to encourage the use of local breeds/strains. The government has also considered to keep purity of some breeds of exotic beef cattle.
Cattle (multipurpose)	Increasing productivity and a workforce in agriculture and plantations.
Sheep	Selection to improve productivity and other traits (i.e. Garut sheep for fighting and sheep for good heat tolerance) as well as to do crossbreeding local to exotic breed(s) to create new breed(s). As an example crossing has been done between local Sumatra sheep (resistant liver fluke) to 2 exotic breeds to create composite Sumatran sheep having good heart worm resistance and efficient in converting feed.
Goats	Selection to improve productivity and performing crossbreeding local to exotic to create new breed(s). As an illustration of selection is for local Etawah Grade (EG) goat to produce a new strain of dairy goats having higher milk production.
Pigs	Improvement of productivity of local pig through genetic management, i.e. by selecting females having good index productivity.
Chickens	Improvement on native/local chicken productivity (and other purposes) through selection within breed / strain and to a lesser extent performing crossing to create new strains.
Buffaloes	Improvement on local buffalo through selection within breed to improve productivity (i.e. growth and body weight) and other purposes. As illustration, at local government breeding centers at provincial have been conducted performance test to identify superior bulls to improve growth trait of female buffaloes at that specific location.
Ducks	Improvement on native/local chicken productivity through selection within breed/strain and to a lesser extent performing crossing to create new strains. Selection has been done for some local duck breeds to produce new strains for broiler or layer. For example crossing was made between 2 local selected duck breeds to produce commercial duck egg producer.
Horses	Improvement on local horse through selection within breed / strain and performing crossing to create new breed(s).
Rabbits	Improvement on local rabbit productivity by selection within breed and performing crossing to create new breed(s), i.e. by crossing local rabbit to exotic breeds (from New Zealand) to get a new breed with the advantages on body weight, coat color and pet.

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)	Low productivity and decreasing HF population as well as limited replacement stocks. For example, keeping purebred between HF superior imported bulls to imported HF cows or the offspring having experience of tropical stress causes of low milk production around 10-12 lt/d at farmers.
Cattle (specialized beef)	Crossing local beef cattle to exotic ones causing AGR erosion and decreasing population of some breeds due to high meat demand. For example, the ease AI breeding facilities and faster growth of crossbred offspring are very attractive to farmers causing widespread crossbreeding to local beef cattle. Decreasing population is due to many constraint in operating breeding program (ONBS) especially at small farmer level.
Cattle (multipurpose)	Very little effects (very limited multiple purpose cattle).
Sheep	Less exploration on genetic potency and still limited contribution for food and other purposes (i.e. local markets, cultural, and social).
Goats	Less exploration on genetic potency and still limited contribution for food and other purposes (i.e. local markets, cultural, and social).
Pigs	Low productivity and decreased population.
Chickens	Leading extinction on some breeds (strains) as replaced by commercial chicken to produce meat and eggs.

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.

Government and breeder and stake holders still have not appreciated quality of breeding stocks, as well as limited facilities and funds.

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

Species	Description of future objectives, priorities and plans
Cattle (specialized dairy)	Continuing progeny test, operating breeding program (ONBS), supporting AI mating, keeping replacement stock, and developing new dairy area.
Cattle (specialized beef)	Performance test, implementing breeding program (ONBS), depressing on inbreeding, developing new breeding area, incentives for farmers preserving pure breed(s).
Cattle (multipurpose)	Small attention (limited multiple purpose cattle).
Sheep	Selection to improve productivity, crossing to get complimentary effects, developing on breeding area, and more appreciation on breeding stocks.
Goats	Selection to improve productivity, crossing to get complimentary effects, developing on breeding area, and more appreciation on breeding stocks.
Pigs	Selection to improve productivity and crossing to get complimentary effects.
Chickens	Selection within breeds or strains for productivity, preserving purity, and limited crossing to get complementary.
Ducks	Selection within breeds or strains for productivity, preserving purity, and limited crossing to get complementary effects.
Buffaloes	Genetic improvement through selection in breeds, depressing on inbreeding, improving breeding area.

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)	high	high	high
Cattle (specialized beef)	high	high	high
Cattle (multipurpose)	none	none	none
Sheep	high	medium	medium
Goats	high	medium	low
Pigs	high	medium	low
Chickens	high	high	low
Ducks	high	high	low
Buffaloes	high	high	medium
Horses	high	high	low
Pigeons	high	medium	none
Quails	high	medium	none
Rabbits	high	high	none

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

- ⦿ yes
- ◯ no

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

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

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

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

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

Operators / Species targeted	Promotion of niche marketing or other market differentiation	Community-based conservation programmes	Incentive or subsidy payment schemes for keeping at-risk breeds	Development of biocultural community protocols	Recognition/award programmes for breeders	Conservation breeding programmes	Selection programmes for increased production or productivity in at-risk breeds	Promotion of at-risk breeds as tourist attractions	Use of at-risk breeds in the management of wildlife habitats and landscapes	Promotion of breed-related cultural activities	Extension programmes to improve the management of at-risk breeds	Awareness-raising activities providing information on the potential of specific at-risk breeds
Public sector	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no	yes
Private sector	yes	yes	no	no	no	yes	no	no	no	yes	no	yes
Cattle (specialized dairy)	yes	yes	yes	no	no	no	no	no	no	no	no	no
Cattle (specialized beef)	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes
Cattle (multipurpose)	no	no	no	no	no	no	no	no	no	no	no	no
Sheep	yes	yes	yes	yes	yes	yes	no	no	no	yes	yes	yes
Goats	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	yes	yes
Pigs	yes	yes	no	yes	no	no	no	no	no	yes	no	no
Chickens	yes	yes	no	no	no	yes	no	yes	no	yes	no	no
Buffaloes	yes	yes	no	yes	yes	no	no	no	no	yes	yes	yes
Ducks	yes	yes	no	yes	no	no	no	yes	no	no	no	no
Rabbits	yes	yes	no	no	no	no	no	yes	no	no	no	no
Horses	yes	yes	no	yes	no	no	no	no	no	yes	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 situ conservation program has been carried out mainly on the species (breeds) are threatened at risk, by supporting one or more activities (on the list). In breeds as important food sources (i.e. beef cattle) are facilitated by community-based conservation, award (subsidy) for breeder group by the government and extension programs for sustainable management. In breeds for having cultural value to the community has been facilitated by increasing specific information on their uniqueness, government subsidies, intensive research, increasing population and extension programs for sustainable management (i.e. Gembrong goat in Bali and some local chiken strains).

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.

We surely plan to have animal gene bank by preparing national conservation program of local animal genetic resources giving the priority on the species and breed chosen.

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

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

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

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

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

In vitro conservation program is conducted in line with procurement activities of local livestock breeding stocks in the forms of frozen semen and frozen embryos that are produced and distributed by National (2) and Local Artificial Insemination Agencies and National frozen embryo Agency.

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

◉ yes

◯ no

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

We plan to invite neighborhood countries to joint in developing in vitro gene bank.

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.

Some breeds (of several species) undergo endangered conditions, but by applying appropriate conservation management and breeding programs conducted by governments (national and local), farmers and related stakeholders, the breed(s) have recovered and no longer at risk, for example for Gembrong goat in Bali Island and Pesisir beef cattle in West Sumatera Province.

REPRODUCTIVE AND MOLECULAR BIOTECHNOLOGIES

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

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

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

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

AI mating is the only mating method in HF cows, while for beef cattle, AI mating is used at intensive management in mostly west part Indonesia. Embryo Transfer has been used on a limited basis government cattle breeding stations. Molecular technology is used to study genetic diversity and to explore major genes to improve AGR productivity.

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

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

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

Those stakeholders involved in the activities of AI (and ET) services, for example in the provision of frozen semen storages (and N2 liquid), private AI services and medical services.

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	no
Semen sexing	yes	no
In vitro fertilization	yes	yes
Cloning	no	yes
Genetic modification	no	no
Use of molecular genetic or genomic information for estimation of genetic diversity	yes	yes
Use of molecular genetic or genomic information for prediction of breeding values	yes	yes
Research on adaptedness based on molecular genetic or genomic information	yes	no

30.1. Please briefly describe the research.

Researches are still carried on AI, ET and IVF to get better technical coefficients and specific targets, i.e. sexing sperm and embryos. Molecular genetic is used to study phylogeny and major genes in controlling economic traits. Genome research has been performed by whole-genome sequencing analysis (7 local beef cattle) and using bovine SNP bead chip genotype to be considered as MAS (beef and dairy cattle).

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.

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

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

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

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

Constraints are costly implementation (exception for AI), suboptimal management at farmers and unclear purposes. Structured breeding programs should be in place to make effective use of reproductive biotechnology. Limited molecular use (human resources, facilities, and laboratories) and expensive.

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	Each sector has its own mandate and functions, but collaboration is limited. For example The Ministry of Agriculture c.q. Directorate General of Livestock Services has authority to manage livestock, Ministry of forestry for wild animals, and Ministry of fisheries for marine fish.

	Extent of collaboration	Description
Collaboration in the characterization, surveying or monitoring of genetic resources, production environments or ecosystems	limited	Activities and collaboration have still been limited. Each sector conduct activities (characterization, surveying or monitoring of genetic resources) for AGR more based its responsibility). However, in developing ecosystem is enable for intensive collaboration between sectors. These activities in livestock have been conducted by research Inst, University, Local Livestock Services, and Statistic Bureau.
Collaboration related to genetic improvement	limited	Collaboration has still been limited to improve animal genetic resources among sectors. Within agric. sector, intensive collaboration has been going on among relevant stake holders (Directorate Livestock services, Academia, and farmer groups).
Collaboration related to product development and/or marketing	extensive	Massive implementation of integration pattern, i.e. cattle-oil palm, cattle-cocoa, goat-cacao, cattle-coconut, goat-coffee and cattle-food crops. These provide a better profit for farmers and environments.
Collaboration in conservation strategies, programmes or projects	limited	Having responsibility to improve breeds or species regarding to respective responsibility according their sectors' authority.
Collaboration in awareness-raising on the roles and values of genetic resources	limited	Limited collaboration as each sector conduct activities (characterization, surveying or monitoring of genetic resources) for AGR more based its responsibility).
Training activities and/or educational curricula that address genetic resources in an integrated manner	limited	Mostly done by each sector, but at a sufficient occasion has been conducted between sectors.
Collaboration in the mobilization of resources for the management of genetic resources	extensive	Previously deer is considered to be the mandate commodity of the Ministry of Forestry, however, this mandate has been transferred to The Ministry of Agriculture. So deer breeding activity is now ad-dressed to fulfill food availability. However the wild deer are still under the authority of The Ministry of Forestry.

2. Please describe any other types of collaboration.

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

Resulting more focused and integrated management to ensure sustainability, more effective in providing training to farmers and relevant actors and cost savings.

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

Constraints are each sector has different responsibilities and organization (setting priority, program, goal and com-modity).

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

Building similar perception and flat form in AGR management.

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).

1. The Law of No 32 in 2009 for conservation and management for life environment.
2. The Law No. 19 in 2009 for ratification Stockholm convention on persistent organic pollutant.
3. The law No. 18 in 2008 for garbage management, The Law No. 21 in 2004 for ratification on Cartagena Protocol on Biosafety to the conversion on biological diversity.
4. The Law No. 17 2004 for ratification of Kyoto Protocol to the United Nation Framework Convention on climate change
5. The law No. 6 1994 for ratification of United Nation framework convention on climate change.
6. The law no. 5 in 1994 for Ratification on United Nation Convention on Biological Diversity.
7. The Law No. 5 in 1990 for the Conservation of natural biodiversity and the ecosystem.

Regarding to regulation/legislation for animal genetic resources, Indonesia has Regulation from Environment Minister of the state number of 29 in 2009 on Guideline for Biodiversity Conservation in the Regions. See link www.menlh.go.id.

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).

At this Environment Minister Regulation on The No. 9 in 2009 at Chapter 3 (articles of 8-9) described outline of Conservation Policy and Implementation, sustainable utilization and biodiversity damage control. Indication of the outcomes are more implementation AGR conservation and sustainable use and controlling damage to biodiversity.

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).

Indication of outcome for animal genetic managements in terms of:
1. System planning and monitoring the implementation of conservation, sustainable use and damage control biodiversity
2. Application of the principles of good governance in the conservation, sustainable use and control damage to biodiversity, and
3. Institutional utilization and biodiversity damage control in sustainable way.

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:

> Before the GPA was adopted by Indonesian government, many government institutions, research inst., university and private sectors have done inventory of AGR covering most species for economic values.

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:

> Before the GPA was adopted by the Indonesian Government, many government institutions, research inst., university and private sectors have done characterization on AGR. Government is currently supporting the existence of various local/native breeds/strains allowing the availability of morphology, performance, location, production environment and specific features those breeds (strains).

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:

> Before the GPA adopted by Indonesian government, many government institutions, research inst., university and private sectors have done molecular characterization of animal genetic resources covering most species of economic values. Molecular characterization has been done on various breeds by several methods i.e. PCR-RFLP and SSCP on micro satellites, SNPs, mutation bases to determine AGR diversity.

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:

> Statistical Bureau Government has conducted baseline survey on the status of species having important economic value far all species of livestock at 10 years interval. The latest data are available in Indonesian Livestock Statistic Book in the year of 2012.

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:

> Indonesia has national committee and local committees (existing in some provinces) having one of the tasks to monitor status of animal genetic resources.

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:

> Before the GPA was adopted by Indonesian Government, a number of breeds have been regularly monitored their status, i.e. beef cattle, buffalo, dairy cattle, sheep, goat, chicken and duck. The remaining still has not be monitored due to spreading and unknown population.

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:

> The criteria has been conducted by our country according to the FAO Criteria in the year 1996 for classifying the risk status of animal genetic resources.

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:

Indonesia has a vast territory and an archipelago with mega diversity of genetic resources, then have difficulty in inventory, characterization and monitoring programmers on its local animal genetic resources.

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

-

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

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

Coordination among relevant actors (stakeholders) to conserve and increase population by implementing sustainable AGR management.

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:

There is in the Regulation of the Minister of Agriculture. 36/Permentan/OT.140/8/2006 of the National Livestock Breeding Systems. (http://ditjennak.deptan.go.id)

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:

Contained in Chapter III of that Regulation of the Minister of Agriculture. 36/Permentan/OT.140/8/2006 at article 21: Sources of breeding area are if those are identified for having the potential and meet of breeding area criteria.

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:

Before the adoption of the GPA, breeding program has been done for some breeds mainly for economic value (i.e. beef cattle, buffalo, sheep and chickens/ducks) and social value in particular region (i.e. buffalo Tedong Bonga in South Sulawesi, Madura cattle in P. Madurarta, Garut sheep in Garut, West Java, etc.).

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:

Conducting mainly for local beef cattle to improve productivity (growth traits) by ONBS scheme supported by requirement technology (recording, mating design, AI services, genetic evaluation). Sustainable use has also been conducted on some breeds for other purposes i.e. culture (sheep, beef and chicken), uniqueness (chicken, goat), social values and hobby.

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:

Breeding program is a long-term activity that requires many factors (land, human actors, commitment, technical activities, facilities and big budget).

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:

Long-term effects of the use of exotic breeds on local breeds (for economy, genetic impact and environment) and food security have been done by many components i.e. central and local governments, research (universities and research centers), non-governmental organizations and part of community (in practice).

Importation of various exotic breeds (mostly life beef cattle) supported by good AI facilities has led to intensive cross-breeding to local / native beef cattle in wider area (including area for breeding and conservation). Crosses offspring has experience of reduced fertility and high production input support, as well as the expensive production cost. It has been identified for giving significant impact on reducing reproductive indexes (i.e. calve crop), economic losses for farmers, and genetic erosion on local beef cattle. For poultry, imported commercial chicken cause on marginalized local breeds (strains), changing production type to commercial production (broilers and layers) that threaten subsistence production (traditional) in farmers, and losing economic values of some local breeds (strains).

20. Have recording systems and organizational structures for breeding programmes been established or strengthened (SP4, Action 3)?
- ○ a. Yes, sufficient recording systems and organizational structures for breeding programmes have existed since before the adoption of the GPA
- ○ b. Yes, sufficient recording systems and organizational structures for breeding programmes exist because of progress made since the adoption of the GPA
- ● c. Yes, recording systems and organizational structures for breeding programmes are partially in place (and were established or strengthened after the adoption of the GPA)
- ○ d. Yes, recording systems and organizational structures for breeding programmes are partially in place (but no progress has been made since the adoption of the GPA)
- ○ e. No, but action is planned and funding identified
- ○ f. No, but action is planned and funding is sought
- ○ g. No

Please provide further details:

Recording programs have been developed at government and research breeding centers and by planning open nucleus breeding scheme (ONBS), i.e. for dairy cattle, some beef cattle, sheep and goat.

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:

Partial interaction has occurred between stakeholders, farmers, researchers and governments for AGR sustainable uses.

⊞

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:

Before The GPA was adopted, partial measures have been implemented to provide livestock keeper and farmers information through printing media (leaflets, brochures, books) or by on line.

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:

Government has set policies followed by relevant rules for access and utilization of local animal genetic resources and benefit-sharing system at local, national and international levels.

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:

Governments have supported technical aspects and training for farmers, universities and research institutes provide relevant researches for scientific aspects and some relevant agencies also involved to make breeding activities can run.

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:

The Governments (national and local) consider development of local AGR breeding programs as priority, so technical aspects and programs continually targetted through i.e. recording, performance test, producing frozen semen, health services and others.

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:

Many assessments and efforts have been made by gathering information i.e. potencies of nature and human resources, local wisdom communities, roles in related to culture, social, sustainability and other aspects.

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:

Government has promoted products derived from indigenous and local breeds by facilitating various processing technology, so various products can be marketed in wider region and consumer.

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

Encouraging relevant sectors/actors to have the same view in breeding program, set clear targets, methods, implementation of breeding programs and improvement of farming systems.

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.

Improving breeding area, increasing use of genetic potential and uniqueness, preserving local breeds/strains.

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:

Assessment erosion of genetic resources has been done quite regularly, especially in breeds that already have sufficient information about the distribution, amount, characterization and utilization.

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:

Government's policy to increase the productivity by importation exotic breeds (i.e. beef cattle), crossbreeding of exotic breeds (i.e. beef cattle and sheep), land conversion and habitat reduction (ruminants), less popular as low productivity and economic values (i.e. beef cattle, goat, chicken, ducks), changes of livestock function by machine (i.e. beef cattle, buffalo).

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:

Stated at the Minister of state environmental regulation No. 9 of 2009 on the conservation of genetic resources in chapter 3 for implementation of conservation, sustainable use and management of biodiversity destruction.

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:

Before the adoption of GPA, breeds becoming at risk have been prevented by increasing and conserving those animal genetic resources both in situ and ex situ.

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:

Conducted by raising at government breeding centers, research institutions (government and private), raising in animal garden (zoo) and selected farmers.

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:

Before the adoption of GPA, in vitro ex situ conservation has been done especially for food security and high economic values by keeping frozen semen (and frozen embryo) storages at national and local AI centers.

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:

1. www.litbang.deptan.go.id
2. www.http://ditjennak.deptan.go.id

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

- ○ a. Yes
- ○ b. No

Please provide further details:

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

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

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

Constraints are the need for food comes from growing livestock, conversion and degradation of farm land, limited facilities (in situ and ex situ), lack of understanding for AGR future uses.

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

- ● a. Yes
- ○ b. No

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

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

○ d. No

Please provide further details:

Gap is still large as high number of native/local animal genetic resources being unidentified and characterized.

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

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

○ b. Yes, arrangements put in place after the adoption of the GPA

○ c. No, but action is planned and funding identified

◉ d. No, but action is planned and funding is sought

○ e. No

Please provide further details:

-

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

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

○ b. Yes, arrangements put in place after the adoption of the GPA

○ c. No, but action is planned and funding identified

◉ d. No, but action is planned and funding is sought

○ e. No

Please provide further details:

-

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

○ a. Yes, research commenced before the adoption of the GPA

○ b. Yes, research commenced since the adoption of the GPA

○ c. No, but action is planned and funding identified

◉ d. No, but action is planned and funding is sought

○ e. No

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

-

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

○ a. Yes, programmes commenced before the adoption of the GPA

○ b. Yes, programmes commenced since the adoption of the GPA

○ c. No, but action is planned and funding identified

◉ d. No, but action is planned and funding is sought

○ e. No

Please provide further details:

-

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

Priority extinct, economic value, unique.

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.

Conservation with regional and international parties will be more planned.

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:

Local livestock services in each Province, districts and subdistrict have key role in evaluating status of local animal genetic resources.

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:

> Giving acknowledgment of the existence of specific animal genetic resources at the provincial and district levels, as well as the government encourages the conservation and sustainable use of genetic resources.

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:

> It has been regulated in:
> 1. The Law Number 18 of 2009 concerning livestock and animal health (http://www.hukumonline.com/pusatdata/download/lt4a9ca3d6a5991/node/lt4a72ca14928fa)
> 2. Policies and programs to conserve local genetic resources with condition is at risk exist as stated in the Minister of state environmental regulation No. 9 of 2009.

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:

> It has been reported at National Strategy for Agriculture Development 2013-2045 (www.deptan.litbang.go.id) and Regulation of the Minister of Agriculture No. 19/Permentan/OT.140/2/2008 on the Recognition and Releasing animal breeds or strains.

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:

> National database of animal genetic resources have been created but we are now following DAD IS.

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:

> We plan to update the animal genetic resources data on a regular basis in most breeds (species) in DAD IS data.

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

◉ a. Yes, established before the adoption of the GPA

○ b. Yes, established after the adoption of the GPA

○ c. No, but action is planned and funding identified

○ d. No, but action is planned and funding is sought

○ e. No

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

> The National Advisory Committee for Agriculture Genetic Resources consist of delegates representing several ministries such as Min. of Agri., Min. of Forestry, Min. of Fisheries, Center of Indonesian Science and universities across the country.

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:

> Some activities undertaken such as socialization, exhibition (local genetic resources), education, interaction communication, electronic media and publication.

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:

Policies and programs to manage local genetic resources is stated in the Minister of state environmental regulation No. 9 of 2009.

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:

By offering the education (formal) in university, extension by the government (central and local), demonstration, plot and training for related actors.

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:

Related organizations have been set up but the action are still limited.

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:

<div style="border:1px solid black; height:80px;"></div>

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:

> Research Institution, academic institution and relevant universities have been involved .

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.

> NPA should be done for inventory and characterization of both local and indigenous AGR on more breeds (species), better breeding management, encouraging active participation of relevant actors (farmers), more conservation (in situ and ex situ) especially on endangered breeds, enhancing capacity building and establishing more 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:

[ ]

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:

Few international NGO have been involved to conserve local AGR.

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:

We are expecting to take part in both regional and international networking for ex situ conservation program for breed at risk.

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:

We have just planned to build national gene bank for livestock.

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:

We have not done such activities regionally, however we are willing to take part in this program.

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:

Participation at FAO meeting for AGR isues.

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