



# 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: Ethiopia

## 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).

Ethiopia is a country of great geographic diversity. Macro- and micro-climatic conditions of the country are highly variable. The rainfall distribution is seasonal and the mean annual rainfall ranges from 500 mm to 2800 mm. In addition the cultural diversity of the country is immense with more than 80 nations- nationalities existing in the country. The country also has a rich diversity of indigenous farm animal genetic resources. Due to the geographic location of the country it has been entry point of various livestock from their center of domestication into Africa. The diverse ecology and culture gave rise to further diversification and thus contributed to develop the large number of genotypes the country host today. There is lack of comprehensive inventory of breeds in the country. However, to date, 28 cattle 9 sheep 8 goats 8 horse 6 donkey and 7 chicken `breeds' have been identified.

Exotic cattle and chicken, and to a limited extent sheep and goat breeds have been introduced into the country. Lack of breeding policy and the uncontrolled use of Artificial Insemination in cattle and extensive distribution of exotic chicken to the farming community have posed a serious threat to the indigenous cattle and chicken genetic resources.

There is no formal work to know the status of indigenous breeds, but based on informal approaches it is known that a number of cattle breeds and one horse population are at risk. Changing quantitative demand for livestock products has been one of the major drivers of change along with change in market structure and access, change in international trade of animal products, climatic changes, degradation of grazing land, loss of access to grazing land, lifestyle change (pastoral to sedentary), technological change, policy factors and human population growth. At times the market demand (the export), becomes in excess of the off-take rate, as a result reduction in population size occurs. However, in the long run the market demand has served as an incentive to increase livestock production and population size. Drought occurring as a result of climate change has been causing significant loss of the animal genetic resources. Despite presence of disaster prevention and preparedness activities the implementation required destocking to balance feed resource with livestock number and to avoid loss of animals through death. However, subsequent restocking actions are usually done without consideration to the type of species or breed to be used. In addition climate change in some pastoral areas has resulted shift in species of animals from cattle to camel and goats, causing threat to cattle genetic resources.

Lifestyle change, mainly from pastoral to sedentary agriculture, has resulted in change of the contribution of livestock to livelihood resulting in reduction of livestock population size and species change. Human population growth has also affected animal genetic resources indirectly as a result of shrinking grazing land with expansion of crop land to meet the demand of the increased population. Except in camel, in recent past, disease has not played sizable role as a driver of change for animal genetic resources conservation or sustainable utilization.

Community based breeding programs have been started in sheep and goats. Promising results have been obtained for some sheep breeds in the mixed crop livestock production, while attempts to implement community based breeding program under pastoral system failed because of the mobility of flocks.

Institutional changes have been implemented which contributed to capacity building. The Ethiopian Institute of Biodiversity has significantly strengthened its human resources in the area of Animal genetic resources. The institute has also worked with National Regional states for establishment of a structure mandated for biodiversity conservation and sustainable use. A gene bank is under establishment which has facilities for crop, forest, microbial and animal genetic resources. In the mean time collaborative ex situ in vitro semen conservation has been initiated for three cattle breeds (Sheko, Fogera, Begait) using the facilities of the National Artificial Insemination Center. Effort is being made to revive the population of the threatened Sheko cattle through synchronized and regular Artificial Insemination using the ex-situ collections.

Inventory of breeds of the various species of animal genetic resources is not complete. Hitherto breed characterization at both phenotypic and molecular level in most cases lacked robustness. Therefore refining work is required to arrive at breed characterization that will serve parsimonious prioritization and decision making towards conservation and sustainable utilization of the breeds.

The drive to achieve food self sufficiency and accelerated development, and the transition to market oriented and commercial type of livestock production has put indigenous animals at disadvantage. Funding (from government or donor) for improvement programs focusing on selective breeding of indigenous animals is limited as compared to available for crossbreeding or introduction of pure exotic breeds. No incentives for livestock keepers who manage indigenous breeds. Breeding policy that guides genetic improvement of livestock is lacking. The level of awareness of stakeholders on the importance of indigenous animal genetic resources is low and even when awareness is there it is not at a level that can trigger actions for conservation and sustainable utilization. Disaster management actions in general and livestock restocking actions in particular should take into consideration the animal genetic resources in the area.

Building capacity towards characterization, conservation and sustainable utilization is critical. Complete and reliable inventory along with valuation of the animal genetic resources is required. Determining the risk status of the resources is critical to prioritize and plan conservation actions. The establishment of an animal gene bank which is underway needs to be finalized and strengthened in terms of facilities.

The country is divided into nine national regional states and two city administrations. The on-going establishment of structures mandated for biodiversity at national regional states level should be strengthened so that monitoring of the animal genetic resources can be decentralized and implemented. Current monitoring work is based on data from the Central Statistical Agency which provides species based livestock population data per geographic regions. Despite the importance such data have for monitoring of breeds with distinct identification and clearly known geographic distribution, important disaggregated data lacks for effective evaluation of risk status. Here in lies the importance of improving the monitoring activity.

## **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.

There are sheep (Dorper) and goat (Boar) germ-plasm imported from South Africa for use in crossbreeding. Chicken germ-plasm has also been imported from Egypt (Fayoumi) and South Africa (Koekoek) for research purposes to improve meat and/or egg production.

2. Have there been any significant changes in patterns of geneflow in and out of your country in the last ten years?

- yes
- no

2.1. If yes, please indicate whether this view is based on quantified data (e.g. import and export statistics collected by the government).

- yes
- no

2.2. If yes, please provide references (preferably including web links) (if relevant, indicate which types of animal genetic resources are covered).

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

There is increased introduction of exotic germplasm in cattle, chicken and to a limited extent in sheep and goats. The introduction of cattle germplasm occurs from developed countries in Europe (Italy, Netherlands, Sweden and Finland), Asia (Israel) and North America (World sire). Chicken germplasm has also been imported from Europe (Czech republic, German, Netherlands, France), and Africa (Egypt, South Africa). For sheep and goats recent introductions are from South Africa (Dorper sheep and Boar goat) and Israel (Awassi sheep). The use of Awassi sheep in crossbreeding program has accelerated in the Central Highland of the country as a result of strong extension support.

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.*

The introduction of exotic germplasm and use in crossbreeding (both controlled and uncontrolled) is causing significant introgression of the exotic genes and dilution of the indigenous germplasm. This is true mainly for cattle and chicken and to a limited extent in sheep and goats. As a result the indigenous cattle and chicken breeds in central highland areas of the country are being threatened. Sheep and goats are also being introduced in pastoral areas. Along with a move to sedentarize pastoral people in the near future the threat of dilution could also happen in those areas.

## 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)	high	medium	There is increased cattle, camel, sheep and goats export trade and domestic demand. The magnitude of the demand in some areas is more than that can be supported by the resource base (off-take) resulting in depletion of the animal genetic resources and increase in the risk of breeds exposed to extinction. Additionally to meet the demand there was a trend to turn into exotic breeds. In the future the situation is likely to improve through increased production and prevention of informal trade, reduction in live animal export (value addition) and ensuring optimal export.
Changing demand for livestock products (quality)	low	medium	The livestock domestic market system was not based on quality and as a result there was no significant impact of quality demand on animal genetic resources. However there is a trend for increased demand in terms of quality of livestock products which is likely to increase the demand for exotic animals. This will cause negative effect on indigenous animal genetic resources.
Changes in marketing infrastructure and access	medium	low	In the past increased market infrastructure and access to export (formal and informal) market was causing depletion of the indigenous livestock resource base (e.g. sale of reproducing animals). There is improvement in market policy (sex of animal for export market), and in productivity (extension support). In the future the live animal and meat market would contribute as incentive to keep indigenous livestock breeds and it is likely that the market is going to have very little negative impact on the animal genetic resources. The impact of the market was more serious in pastoral and agro-pastoral areas due to the fact that the lions share of the export market supply comes from these areas. As a result interventions are also likely to have more impact in the pastoral and agro-pastoral areas than in the mixed crop livestock system.

Drivers of change	Impact on animal genetic resources and their management over last ten years	Future impact on animal genetic resources and their management (predicted for the next ten years)	Describe the effects on animal genetic resources and their management
Changes in retailing	low	medium	There is a tendency for change in retailing particularly in chicken marketing. Marketing dressed chicken is being introduced by supermarkets in urban centers. In most cases exotic chicken are used for production of dressed chicken. To date the magnitude is low and has no sizeable impact on animal genetic resources. In the future the trend is likely to accelerate and can cause significant increase in exotic chicken (broilers) and diminishing of the indigenous breeds. For the other species there was no significant change in retailing. It is likely for change in retailing to occur in the future but it is not clear if that can have impact on genetic resources.
Changes in international trade in animal products (imports)	low	medium	The magnitude of import of animal products to date is low and it has no sizeable impact on animal genetic resources. In the future, however, it is likely for increase in import of animal products (e.g. powdered milk, meat export by elite catering industry). It will be difficult for indigenous animal producers to be competitive under this condition and there is a very high likelihood of for shift to take to exotic animals and market oriented/commercial type of production.
Changes in international trade in animal products (exports)	medium	medium	In the last 10 years export, both formal and informal has increased in animal products. This includes live animal, meat, leather and leather products. The rate of export was so high it was affecting the resource base, particularly in pastoral areas. Livestock holding per household has decreased but as human population increased the total livestock population appears to have increased. The increment however has caused significant interbreeding between breeds.
Climatic changes	medium	medium	In the past ten years climate change has resulted in frequent drought which caused significant loss of animals in pastoral areas. In addition restocking efforts with other breeds, increased mobility to further areas, change towards more adaptive species (e.g. cattle to camel; sheep to goat), increased bush encroachment of grazing lands has significantly affected the animal genetic resources in pastoral and agro-pastoral areas. In the future it is likely for the trend to continue but mitigation and adaptation measures are also expected to increase.

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
Degradation or improvement of grazing land	medium	medium	Degradation of grazing land has happened as a result of overgrazing and it is affecting the feed resource base. This has caused significant effect on the animal genetic resources. In some areas the degradation has caused change in plant species composition of grazing lands which subsequently has resulted in change of animal species composition (e.g. from grazers to browsers). There is extensive activity on natural resources management. In most areas stock exclusion and zero grazing is planned to be implemented. This may lead to change from low input low output type of system to medium/high input high output system which is likely to cause breed/species replacement. Therefore, in the future, the indigenous animal genetic resources are likely to be disfavored.
Loss of, or loss of access to, grazing land and other natural resources	medium	medium	Replacement of grazing land with crop, bush encroachment in pastoral areas, increase in areas demarcated for stock exclusion in the past has significant effect on animal genetic resources. There is reduction in sheep and goat population in the highland areas and a shift to cattle. Household cattle holding has reduced but overall cattle population has increased with increase in human population. There is a change in tending management from free to tethering. There is also change from indigenous to crossbred animals. The effect however is not on reduction of the livestock population but on productivity (and probably on the negative selection for adaptation to less feed).



Drivers of change	Impact on animal genetic resources and their management over last ten years	Future impact on animal genetic resources and their management (predicted for the next ten years)	Describe the effects on animal genetic resources and their management
Economic, livelihood or lifestyle factors affecting the popularity of livestock keeping	medium	medium	<p>Change from pastoral to sedentary type of production, use of grazing land for crop, change in type of crop produced or production system has resulted in significant change on the Animal genetic resources. Cases in point include two cattle breeds (Fogera and Sheko) in the country. Fogera cattle population has been significantly affected as result of expansion of rice cultivation in the wetland breeding tract of the breed. Sheko used to be a breed highly adapted to free grazing within dense forest, with expansion of crop tethering management has replaced free grazing. The breed is aggressive (mainly the males) and difficult to handle under tethering management thus owners either sale or castrate the males. This has significantly affected the Sheko cattle population and led to high level of zebu introgression into the only shorthorn cattle of East Africa. Large area of pastoral land is being turned into large scale farms (e.g. sugar production). The plan is to sendentarize pastoral people and also to get them involved in the development as out-growers. Livestock production is likely to be secondary in importance and there could be change in breed and species composition. In pastoral areas due to the various challenges on livestock keeping (drought; bush encroachment; reduced mobility) has forced them to look for alternative livelihoods (petty trade; casual labour; urbanization). This is an emerging trend but is likely to be increasing at faster rate in the future and to affect the animal genetic resources. In addition change in sources of income from livestock to other sources is likely to increase with subsequent effect on livestock genetic resources.</p>

Drivers of change	Impact on animal genetic resources and their management over last ten years	Future impact on animal genetic resources and their management (predicted for the next ten years)	Describe the effects on animal genetic resources and their management
Replacement of livestock functions	low	medium	There is no significant change in livestock function. Noticeable mechanization of agriculture is mainly in commercial farms with few small scale farmers utilizing hired service for harvesting and threshing. Large areas of the country have rugged terrain which is not conducive for mechanization. Plowing and other crop farming activities are still dependent on livestock (mainly oxen power). Despite extensive development of road infrastructure draft and pack animals still make significant contribution to rural transport and non-trivial contribution in urban and peri-urban areas. As a result replacement of livestock function has non-significant impact on indigenous animal genetic resources. The only exception is a feral horse population (Kundido horse) which was re-domesticated but is at the point of extinction because of reduced use of the animal as a result of expansion of road infrastructure and public transport in the area.
Changing cultural roles of livestock	low	low	There is change in cultural role of livestock mainly in pastoral areas. Livestock used to serve as compensation in case of cultural settlement of disputes but there is increasing tendency for use of the legal system. Instead of livestock cash payments are replacing other cultural roles of livestock. But this has no significant effect on the livestock genetic resources and it is also unlikely to have sizeable effect in the foreseeable future.
Changes in technology	medium	medium	There are two aspects of technology change. One is in the area of animal health (vaccination, proper health treatment) while the other is in terms of reproductive technologies. Animal health technologies have positively contributed to animal genetic resources a case example can be vaccination against Rinderpest which led to eradication of the disease. Artificial insemination mainly has been implemented to introduce exotic germplasm in cattle and has played negative role on animal genetic resources. But there is an emerging effort to use Artificial insemination to revive declining populations of Animal genetic resources (e.g. Sheko cattle semen has been used to inseminate sheko females in areas where there is shortage of bulls).



Drivers of change	Impact on animal genetic resources and their management over last ten years	Future impact on animal genetic resources and their management (predicted for the next ten years)	Describe the effects on animal genetic resources and their management
Policy factors	medium	medium	There are policies which pertain to decentralization of decision on importation of breeds. This has resulted in increased importation of exotic germplasm from various parts of the world. In addition there is lack of breeding policy. Other existing policies are in favor of expansion of crop production to the disadvantage of grazing areas. As a result there is significant effect on animal genetic resources. Despite the possibility of development of breeding policy in the near future the situation is likely to continue in the coming ten years. A positive recent development is establishment of a State Ministry for livestock.
Disease epidemics	low	low	In the past ten years epidemics has happened in camel which has wiped out large number of animals. For other species the effect of epidemics was not significant though in some pastoral areas pasterolisis outbreak following feed shortage and drought has caused some damage. There is significant improvement (quality and accessibility) of veterinary service and in the future the impact of epidemics is expected to be low unless new epidemics such as avian flu happens which is beyond the preparation of the country for its containment.
Human population growth	medium	high	The current population of Ethiopia is more than 80 million and this was achieved as result of 2.7 % of annual growth. The population has increased by more than 30 million in the last ten years. This has led to increased pressure on gazing land as more grazing land is turned into crop land. Subsequently the livestock resource has been affected in various ways (e.g. reduction of herd /flock size per household, poor resistance to disease, interbreeding with other breeds as animal move in search of feed).

## OVERVIEW OF ANIMAL GENETIC RESOURCES

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

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

Species	Locally adapted breeds	Exotic breeds
Cattle (specialized dairy)	0	2

Species	Locally adapted breeds	Exotic breeds
Cattle (specialized beef)	0	0
Cattle (multipurpose)	28	2
Sheep	9	2
Goats	8	3
Pigs	0	0
Chickens	7	8
Dromedaries	7	0
Asses	6	0
Horses	8	0

## CHARACTERIZATION

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

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

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

Species	Baseline survey of population size	Regular monitoring of population size	Phenotypic characterization	Molecular genetic diversity studies – within breed	Genetic diversity studies based on pedigree	Molecular genetic diversity studies – between breed	Genetic variance component estimation	Molecular genetic evaluation
Cattle (specialized dairy)	2	1	medium	none	none	none	low	none
Cattle (specialized beef)	0	0	none	none	none	none	none	none
Cattle (multipurpose)	28	7	medium	low	none	medium	low	low
Sheep	9	8	medium	low	none	medium	medium	none
Goats	8	8	medium	low	none	medium	low	low
Pigs	0	0	none	none	none	none	none	none
Chickens	7	0	low	low	none	medium	low	low

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
Dromedaries	7	2	medium	none	none	none	none	none
Asses	6	1	medium	low	low	low	none	none
Horses	8	1	medium	low	none	medium	none	none

## INSTITUTIONS AND STAKEHOLDERS

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

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

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

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

	Description
Education	Ethiopia's achievement in social development, especially, the pace of knowledge creation in educational sector is accelerating in both formal and non formal educational activity. Ethiopia is one of very few countries in the world who established Ministry of capacity building to improve access to education for its citizen and established more than 30 Universities for the last ten years. Most of these universities have Agricultural Faculties/ Colleges which include Animal Science Departments. The problem lies on inadequacy of the curriculum to incorporate aspects of Animal genetic resources and inefficiency to apply the knowledge for change. Thus there is a need to avail prerequisite infrastructure and manpower in order to improve the deficiencies of knowledge creation and its application, to play its role in the development of the sector through both formal and none formal channels.
Research	There is an increasing trend in depth and quantity of research carried out in the country through improving training and establishing laboratories. But still there is lack of infrastructure and highly trained manpower in the Animal breeding and Biotechnology sector.
Knowledge	Despite an increasing trend in the knowledge level of stakeholders, still it is not at the level that ensures efficient and effective implementation of actions towards better management of Animal genetic resources. There is a need for further upgrading of the knowledge to the point where effective actions are in place.
Awareness	There is an increasing trend in the awareness of stakeholders working in the agriculture sector about the role of Animal genetic resources in poverty alleviation and food security. However other stakeholders especially working in the environment consider livestock as the cause of degradation of the natural resources and climate change and are inefficient to acquire food security.
Infrastructure	There is a serious lack of infrastructure in physical structures and facilities to characterize animal genetic resources at molecular level.
Stakeholder participation	There is an encouraging trend towards improved participation of stakeholders in policy development and decision making process. But ensuring stakeholders participation to a required level is a long process (at all levels of participation from initial consultation to ...) and needs high investment. Thus stakeholders participation at this point in time is low.
Policies	There are many policies, strategies and guidelines related to conservation, development and sustainable use. However, most of them do not specifically address Animal Genetic resources. There are draft policies which pertain to Animal genetic resources that await approval e.g. breeding policy.
Policy implementation	The government conservation and sustainable utilization policy implementation efforts in general and management of animal genetic resources in particular are affected by a number of factors including weak management, weak integration among stakeholders and weak enforcement capacities.
Laws	There are laws and regulations that have relevance to the management of animal genetic resources. There are also import export regulations to provide legal guidance on animal genetic resources trade.
Implementation of laws	Generally, there is lack of enforcement of laws which are relevant to Animal genetic resources.

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>).*

There are limited number of livestock keepers/producers associations which are established for the purpose of lobbying and/or marketing. There are two professional societies one for Animal Production and the other for Veterinary professionals. In addition to that there are Biodiversity Institute and pastoral affairs standing committee in the parliament. All these stakeholders work in awareness raising in addition to other specific tasks in Animal genetic resources.

## BREEDING PROGRAMMES

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

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

### 10. Who operates breeding programmes in your country?

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

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

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

The operators under others refer to universities whose teaching staffs are required to undertake research for about 25% of their time. Some breeding programs on indigenous cattle, goat and sheep have been undertaken.

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

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

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

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

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

Species	Breeding method			
	Straight/pure-breeding only		Straight/pure-breeding and cross-breeding	
	Loc	Ex	Loc	Ex
Cattle (specialized dairy)	0	0	0	2
Cattle (multipurpose)	0	0	5	0
Sheep	3	0	0	2
Goats	3	0	0	3
Chickens	4	0	1	5

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	low
Cattle (multipurpose)	medium	medium



Species	Training	Research
Sheep	medium	medium
Goats	medium	medium
Pigs	none	none
Chickens	medium	medium
Dromedaries	medium	low
Asses	medium	low
Horses	medium	low

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

Species	Organization of livestock keepers
Cattle (specialized dairy)	none
Cattle (specialized beef)	none
Cattle (multipurpose)	none
Sheep	low
Goats	low
Pigs	none
Chickens	none
Dromedaries	none
Asses	none
Horses	none

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

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

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

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

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

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

Others refers to Universities and International Organizations. Universities have Animal Science or related departments/ academic programs. Staff and graduate students of this universities are involved in the various aspects of breeding programs. International livestock Research Institute (ILRI) is working on community based breeding program with sheep and goats. International Center for Agricultural Research in Dry Areas (ICARDA) also work on community based goat improvement with implementation of value chain approach.

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.

The major breeding program with cattle is crossbreeding where specialized dairy breeds are crossed with multipurpose indigenous cattle. Therefore, in most cases, activities undertaken are similar for both categories. In the country research is public and what a research institute does is not different from what the government is implementing. With chicken the research system applies Artificial insemination to a limited scale in a situation where crossing is required between heavy breed cocks and light indigenous hens. No preservation is required and fresh semen will be used for the insemination.

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

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

Species	Policies or programmes
Asses	no
Horses	no

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

Species	Description of policies or programmes
Cattle (specialized dairy)	There is a program of crossbreeding between local and exotic dairy cattle for milk production, which is 50% F1 for small-holder farmers and 75% for improved production system.
Cattle (specialized beef)	
Cattle (multipurpose)	There is a program of crossbreeding between local and exotic dairy cattle for milk production, which is 50% F1 for small-holder farmers and 75% for improved production system.
Sheep	There is a program of crossbreeding between local and exotic (Dorper, Awassi) sheep breeds to improve wool and meat production of local breeds.
Goats	There is a program of crossbreeding between local and exotic (Boar, Anglo-Nubian, Toggenburg) goat breeds to improve meat and milk production of local goat breeds.
Pigs	
Chickens	There is a program of selective pure-breeding for local chicken and crossbreeding between local and exotic chicken breeds/strains to improve egg and meat production of local chicken breeds.

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)	In spite of increase in milk production and growth, because of absence of breeding policy that defines the areas where the crossbreeding should be implemented and how progenies be utilized to protect uncontrolled mating, the cattle crossbreeding programs have caused dilution of the indigenous cattle genetic resources.
Cattle (specialized beef)	
Cattle (multipurpose)	Even if there is an increase in milk production and growth (rate of cross bred animals), because of absence of breeding policy that defines the areas where the crossbreeding should be implemented and how progenies be utilized to protect uncontrolled mating, the cattle crossbreeding programs have caused dilution of the indigenous cattle genetic resources.
Sheep	Community based sheep selective pure breeding programs are showing promise that helps conservation and sustainable utilization. The crossbreeding program is also showing promising result with regard to improvement of growth and wool production, but it is too early to know (its full) consequences on the sheep genetic resources.
Goats	Community based (goat) pure breeding programs are at early stage to evaluate their consequences. Early crossbreeding programs have resulted (in) improvement in (of) milk production and to some extent on growth but they were project based and not sustained. No significant consequences have been observed. Latest crossbreeding programs are limited in magnitude and sizable consequences on the goat genetic resource is unlikely to happen.
Pigs	

Species	Description of consequences
Chickens	The extensive dissemination of exotic cocks and their uncontrolled use for mating with either exotic or indigenous chicken have resulted in sizable improvement in egg production and growth but has caused significant dilution of the indigenous chicken genetic resources.

18. Please describe the main constraints to the implementation of breeding programmes in your country and what needs to be done to address these constraints. You may also provide information on any particular successes achieved in your country with respect to the establishment and operation of breeding programmes and on the factors that have contributed to these successes.

Lack of record keeping, lack of immediate benefit or incentives, absence of institutions and inadequate capacity are among the main constraints to the implementation of breeding programs. Community based breeding program which is being implemented on four sheep breeds (Bonga, Horro, Menz and Afar) has shown promising result except the Afar sheep which is kept under pastoral production system. The program was highly participatory and ensured involvement of participant farmers at all levels.

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)	Introduction of exotic breeds is likely to increase to accelerate the rate at which milk production keep pace with population growth and increased per capita consumption. The exotic breeds are likely to be used as pure or crossbred with the indigenous depending on the type of management. Geographic areas for use of the exotic breeds will be defined along with a clear policy on their use. The draft breeding policy which is expected to be legislated soon will have significant contribution to guide the use of exotic dairy breeds.
Cattle (specialized beef)	Beef improvement program is at an infant stage, but in the future this program is strengthened through selection and crossbreeding. NAIC has the mandate to lead this program and research is expected to support the breeding program.
Cattle (multipurpose)	The National Artificial Insemination Center (NAIC) is to be restructured as an institution mandated for livestock genetic improvement. The mandate includes selective improvement of indigenous animal genetic resources. The draft breeding policy which is expected to be legislated will have significant contribution to guide the livestock improvement program of the country and the sustainable use of the indigenous Animal genetic resources.
Sheep	The existing community based selective breeding program on Bonga, Horro and Menz sheep is likely to be strengthened with methodologies that allow optimization of the breeding programs. The crossbreeding work between the indigenous Menz and Awassi sheep and between Dorper and the four indigenous sheep breeds (Menz, Afar, Horro, Blackhead Somali) are likely to continue but there is need to ensure that mating is controlled and the program should be guided by a breeding policy.
Goats	Five indigenous goat breeds (Short and long eared Somali, Afar, rift valley) are undergoing improvement program through crossbreeding with three improved exotic goat breeds (Boar, Anglo-Nubian and Toggenburg). There is critical need this program will be strengthened in the future by including other breeds of local goats. Recently initiated community based breeding programs on two indigenous goats will be strengthened and expanded to include other breeds which are important in relation to export trade. Cross breeding program need to be tested for relevance under the production system they are going to be kept before extensive dissemination,
Pigs	
Chickens	Indigenous chicken need to be improved through selective breeding for performance under backyard type of management and for adaptation to the environment. market oriented and commercial type of production require either cross breeds or exotic chicken which are specialized for meat egg or dual purpose, Synthetic breed development could be one area of focus in the future.



## CONSERVATION

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

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

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

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

Species	In situ conservation	Ex situ in vivo conservation	Ex situ in vitro conservation
Cattle (specialized dairy)	none	none	none
Cattle (specialized beef)	none	none	none
Cattle (multipurpose)	low	low	low
Sheep	n/a	n/a	n/a
Goats	n/a	n/a	n/a
Pigs	none	none	none
Chickens	none	none	none
Dromedaries	n/a	n/a	n/a
Asses	n/a	n/a	n/a
Horses	none	none	none

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

- yes  
 no

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

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

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

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

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

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

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

In situ conservation on two cattle breeds (Sheko and Begaria cattle) is being implemented by using extension program to improve management of AnGR and involve the community through awareness raising programs for the last four to five years. Recently, using promotion of niche marketing is understood to be crucial for success in situ conservation and it is included in the National Biodiversity Strategy and action plan as a target to be implemented for the next five years.

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

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

yes

no

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

yes

no

23.2. If yes, please describe the plans.

The in vitro gene bank collection are being conserved using the facilities of the National Artificial Insemination Center (NAIC) for three indigenous multipurpose breeds. Work is in progress to establish a gene bank that will serve ex-situ conservation of animal genetic resources.

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

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

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

Species	Number of breeds for which material is stored	Number of breeds for which sufficient material is stored	Does the collection include material from not-at-risk breeds?	Have any extinct populations been reconstituted using material from the gene bank?	Have the gene bank collections been used to introduce genetic variability into an in situ population?	Have the gene bank collections been used to introduce genetic variability into an ex situ population?	Do livestock keepers or breeders' associations participate in the planning of the gene banking activities?
Cattle (specialized dairy)	0	0	no	no	no	no	no
Cattle (specialized beef)	0	0	no	no	no	no	no
Cattle (multipurpose)	3	0	no	no	yes	no	yes
Sheep	0	0	no	no	no	no	no
Goats	0	0	no	no	no	no	no
Pigs	0	0	no	no	no	no	no
Chickens	0	0	no	no	no	no	no
Dromedaries	0	0	no	no	no	no	no

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?
Asses	0	0	no	no	no	no	no
Horses	0	0	no	no	no	no	no

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

There is an effort which is underway to revive the Sheko cattle breed using conserved semen. Shortage of bull of the breed (Sheko bulls are aggressive and are either sold or castrated at early age) is major reason for decline of the population and supply of semen form the breed is believed to contribute to the revival of the breed.

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

- yes  
 no

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

27. If there have been any cases in your country in which breeds that were formerly classified as at risk of extinction have recovered to a position in which they are no longer at risk, please list the breeds and describe how the recovery was achieved.

## REPRODUCTIVE AND MOLECULAR BIOTECHNOLOGIES

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

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

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

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

The use of biotechnology in Ethiopia is at an infant stage. There are no extensive biotechnology application activities except the AI services. Multiple ovulation and Embryo transfer activities are used under experimental condition. Recently synchronization of heat has been used in relation to use of sex fixer (an Indian origin method to increase the proportion of birth of female calf) or to revive a population of threatened cattle breed (Sheko).

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

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

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

The public sector undertakes training of AI technicians, provision of Semen and liquid nitrogen and AI services at subsidized price. Some NGOs are involved in limited AI service while some private companies provide semen and AI

service.

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

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

30.1. Please briefly describe the research.

Some of the biotechnology techniques used in research stations include artificial insemination, embryo transfer and use of molecular techniques for the estimation of genetic diversity. Some molecular genetic research is undertaken in other countries by post graduate students who are studying for their academic degree, but has relevance for characterization of the indigenous animal genetic resources. Embryo transfer research work is being undertaken with capacity building support from other countries (e.g. South Korea).

31. Please estimate the extent to which artificial insemination (using semen from exotic and/or locally adapted breeds) and/or natural mating is used in your country's various production systems.

*Note: low = approximately <33% of matings; medium = approximately 33–67% of matings; high = approximately >67% of mating; n/a = production system not present in this country.*



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

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.

Except Artificial Insemination in cattle use of biotechnology in livestock is only at experimental stations. The National Artificial Insemination Center produces cattle semen from exotic bull selected from its bull dam farm. In addition small

amount of cattle semen is being imported. Recently cryo-preserved semen from Sheko (one of the threatened breeds) been used to revive the population through synchronized AI. Multiple ovulation and embryo transfer is being attempted in research stations and capacity is the most serious constraint in this regard. Use of artificial insemination in chicken has also been implemented at research level where heavy exotic chicken breeds are being crossed with light indigenous chicken. Semen will be used fresh without any cryo-preservation. Another biotechnology technique used for research purpose is use of molecular techniques for the estimation of genetic diversity. Capacity in the use of the biotechnologies, lack of infrastructures and facilities, lack of access to inputs and lack of awareness on the part of policy makers are major constraints.

### 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	Structurally aquatic animal genetic resources are put within Animal genetic resources and are handled together. Additionally there is a limited effort in the areas of joint national strategy development.
Collaboration in the characterization, surveying or monitoring of genetic resources, production environments or ecosystems	limited	There are isolated efforts in the characterization and monitoring activities among these entities.
Collaboration related to genetic improvement	none	
Collaboration related to product development and/or marketing	none	
Collaboration in conservation strategies, programmes or projects	limited	The national biodiversity strategy and action plan is developed for joint implementation. Thus a national task force will be established to lead this process. Moreover there is a collaboration in the mitigation and control of spreading of invasive-alien species.
Collaboration in awareness-raising on the roles and values of genetic resources	limited	Research institutions, NGOs, Universities working together for awareness raising. A national biodiversity forum is under establishment.
Training activities and/or educational curricula that address genetic resources in an integrated manner	limited	There are limited activities in the areas of training and development of curriculum. Memorandum of understanding has been signed by the Ethiopian Institute of Biodiversity with a number of universities for initiation of a graduate program on Biodiversity (forest, animal, plant and microbial).
Collaboration in the mobilization of resources for the management of genetic resources	limited	Research institutions, NGOs and Universities are working together in mobilization of resources including financial and skilled manpower for the management of genetic resources.

2. Please describe any other types of collaboration.

Ethiopian Institute of biodiversity is establishing a gene bank that serves plant, animal and microbial genetic resources. The management of the gene bank will be undertaken jointly by personnel from plant, animal and microbial genetic resources. To a limited extent forest genetic resource conservation is integrated with wildlife conservation.

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

Collaboration among these four sectors is important to be efficient in their activity and get the desired outcome. The national biodiversity strategies and action plan developed for joint implementation will have bigger effect on the implementations of the planned actions. Thus the national task force that will be established to lead this process and lead organization selected to lead the accomplishment of each actions will have a decisive role for the implementation of the plan. Moreover, there is a collaboration in the climate change mitigation and control of the spreading of the invasive-alien species which is a concrete experience in Ethiopia where huge areas are cleared from bush encroachment. Strengthening collaboration obviously will contribute to efficient utilization of resources (financial, human) and effectiveness of actions that can be realized as a result of integration.

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

The major constraints are leadership capacity and commitment, and considering collaborative approaches as time consuming and requiring high financial resources. Raising awareness of all stakeholders with regard to the importance of collaborative actions and integration can help to facilitate collaborative approaches.

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

There is need to plan and evaluate together. Discussions are important on these issues by higher level leaders and policy makers and adequate work with regard to awareness raising should be done.

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

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

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

yes

no

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

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

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

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

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

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

yes

no

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

The Climate Resilient Green Economy Strategy of Ethiopia has livestock as one of the major components. In this strategy means to reduce the carbon footprint of livestock production through various interventions (e.g. proper grazing management, reduction of herd size through replacement of low producing with high producing animals, replacing ruminant with mono-gastric animals etc...) is planned to be implemented in mixed, pastoral and agro-pastoral production systems as deemed appropriate.

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).

Implementation of the strategy is at the beginning stage and it is too early to evaluate outcomes.

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).

Implementation of the strategy is at the beginning stage and it is too early to evaluate outcomes. But the scale of implementation is envisaged to be large and it is expected to have sizable effect on animal genetic resources management.

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.

There is a policy of stock exclusion in areas where rehabilitation of degraded areas is being implemented. Cut and carry can be practiced from the excluded area but the labor demand for such activity is quite high. Usually feed acquired in this way is meant for highly productive animals such as crossbred dairy cows. Indigenous animal genetic resources are disadvantaged under this condition since they are well suited to low-input (including low labor requirement) low output system.

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.

Livestock in the highland crop livestock mixed crop production system allowed grazing on crop stubbles and leftover after harvesting, while grazing animals defecate on the crop field in somewhat distributed manner and add organic matter to the soil, decrease the amount of biomass that will be available during preparation as such they avoid excessive soil burning and reduce the release of carbon dioxide to the atmosphere. Honey bees are also important in pollination and are providing significant ecosystem service.

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.

Currently there are no specific plans to strengthen or further expand positive links between animal genetic resources and provision of ecosystem services. But, since grazing is a low cost option for utilization of herbage on a grazing land, it allows animals to scatter their manure on the grazing field contributing to soil organic matter. Grazing can stimulate herbage growth and contribute to carbon sinking. At optimal stocking rate indigenous animals can serve the purpose and need to be considered as a low cost option to stock exclusion.

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:

There is significant level of work to characterization the domestic animal genetic resources of the country. Only some pocket areas remain for sheep, goat, cattle horse and donkey. The major problem is except few all the works focus on certain part of the country and there is a need for a meta analysis of available data to get the national picture. Because of inadequate information to define breeds different researchers who worked in adjacent areas might have given different names for the same population. Meta analysis of available data can solve the problem. Molecular level studies are not up to standard (e.g. studies on goats and sheep have only used 15 and 17 microsatellite markers, respectively; for chicken as low as seven microsatellite markers; for cattle despite presence of sizable information on characterization of genetic resources in the various parts of the country there exists lack of nationwide (comprehensive) study.

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:

There have been large number of studies focusing on phenotypic characterization of the indigenous livestock. This, coincidentally, largely happened after the adoption of GPA. The problem in most cases is they covered a limited geographic area of the country and methodologies were not consistent (including procedures and analysis of the data). As a result the outcomes with regard to breed classification were not exhaustive. A population classified as a breed by one researcher can be classified as two or more breed by another. In addition the terminology used was fraught with confusion, researchers calling an entity a breed, ecotype or population with no justification for doing so. In all cases production systems have been described adequately.

3. Which of the following options best describes your country's progress in molecular characterization of its animal genetic resources covering all livestock species of economic importance (SP 1)?

- a. Comprehensive studies were undertaken before the adoption of the GPA
- b. Sufficient information has been generated because of progress made since the adoption of the GPA
- c. Some information has been generated (further progress since the adoption of the GPA)
- d. Some information has been generated (no further progress since the adoption of the GPA)
- e. None, but action is planned and funding identified
- f. None, but action is planned and funding is sought
- g. None

Please provide further details:

A number of molecular characterization studies have been conducted on cattle, sheep, goats and chicken. The method used in most cases was micro-satellite markers. In one case each, mitochondrial, Y-Chromosome and single nucleotide polymorphic markers have been used in cattle. The number of micro-satellite markers used were much lower than the recommended numbers and classifications based on these are likely to be different from what can be found if a recommended set of microsatellite markers are used.

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:

In most cases breed level population data is lacking. However, the Central Statistical Authority (CSA) of Ethiopia provides estimation of population of the various domestic animals species for the different geographical parts of the country. Given the knowledge of a breed's geographical distribution, estimates of breed population size can be obtained by extrapolation. The problem lies for areas where mixed breeds are existing.



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:

Institutional responsibility for coordination of monitoring the status of animal genetic resources has been established before adoption of GPA. The animal biodiversity sub-directorate of the Ethiopian Institute of Biodiversity (EIB) has been mandated to undertake the responsibility. However due to low capacity in terms of human resource little effort has been made to discharge its responsibility. With the preparation of the national plan of action for animal genetic resources it is stipulated that national regional states will be responsible for monitoring of the status of animal genetic resources under the supervision of EIB.

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:

Monitoring work is planned to be undertaken using the agricultural extension structure of the respective national regional states. The protocols include use of census format which provide information on population size disaggregated into breed, sex and age classes.

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:

Decentralization of monitoring activity is being implemented by establishing a structure responsible for biodiversity at national regional states. It is planned that this structure will handle collection of the required data at national regional level. Formats have been developed for data collection at locality level. The activity will be handled by personnel at locality level as part of their regular activity and funding for this comes from government coffer.

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 FAO criteria is being used to assess the risk status. But due to limitation with availability of dependable disaggregated (breed, sex and age) data strict application is limited.

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:

In the national strategy and action plan emergency response systems for animal genetic resources have been considered and will be financed from government fund. The plan is to strengthen monitoring and inventory of Animal genetic resources so that risk status can be determined timely. Presently, emergency measures of ex situ in vitro conservation is being implemented haphazardly and semen from nine bulls of three threatened cattle breeds has been conserved.

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:

In all cases internationally accepted methodologies and guidelines will be used with minor modifications to fit to the local condition.

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:

The major barriers, until very recently, include lack of capacity and capability, and inability to decentralize the activity to the national regional states. In the absence of adequate institutional capacity and sufficient knowledge on the genetic resource it has been difficult to put in place systems of inventory and monitoring.



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:

There is a need to undertake comprehensive (nation wide) breed characterization work following standard methodologies and build institutional and human capacity. This would allow to put in place systems for monitoring and setting conservation priorities.

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.*

Large number of characterization works have been undertaken by academic institutions mainly for fulfillment of requirements for academic degrees. Most of these works are limited in area coverage and has not been systematized so that a national picture of the animal genetic resources can be drawn at the end. In addition molecular characterization works were not conducted using standard methodologies (fail to use recommended number of microsatellites).

## 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:

The legal framework has been put in place with the establishment of the Ethiopian Institute of Biodiversity. Relevant policies (e.g. breeding policy) are lacking, the importance of policies has been indicated in the National strategy and action plan for management of AnGR.

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:

This is included as part of the National Strategy and Action Plan for AnGR.

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:

Breeding programs are at infant stage and even then do not cover all species and breeds. No review and revision of programs has been done for the few (e.g. cattle crossbreeding program) which was there for a relatively long period.

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:

Despite their focus on only two species (sheep and goats) and limited number of breeds, recently initiated community based programs are planned to ensure sustainable use.

18. Have the major barriers and obstacles to enhancing the sustainable use and development of animal genetic resources in your country been identified?

- a. Yes
- b. No
- c. No major barriers and obstacles exist. Comprehensive sustainable use and development measures are in place.

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

The major barriers include focus on use of exotic breeds, lack of adequate knowledge on indigenous animal genetic resources and absence of breeding programs for the improvement of indigenous animal genetic resources so that they can be competitive.

19. Have the long-term impacts of the use of exotic breeds on locally adapted breeds (e.g. economic, environmental or genetic impacts) and on food security been assessed in your country (SP4, Action 1)?

*Glossary:*

*Exotic breeds are breeds that are maintained in a different area from the one in which they were developed. Exotic breeds comprise both recently introduced breeds and continually imported breeds.*

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

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

Please provide further details:

The long term impacts of use of exotic breeds on locally adapted breeds and on food security has not been assessed. There were few studies that attempted to investigate if introduction of exotic breeds is beneficial. Crossbreeding work on cattle has been underway for more than fifty years with the rate increasing at higher rate in the last decade than in the previous periods. Introduction of exotic chicken likewise has been implemented for a long period of time. With regard to sheep and goats, until recently, crossing of exotic with indigenous animals has been of limited scale. The only study that can be mentioned with regard to economic aspect of crossbreeding programs is a case study on goat crossbreeding (Workneh, 2000) which proved that crossbred are not more beneficial than indigenous goats under farm condition. Workneh, 2000. Do smallholders farmers benefit more from crossbred (Somali x Anglo-Nubian) than from indigenous goats? Doctoral Dissertation, Faculty of Agricultural Sciences, George-August University of Goettingen. P. 171.

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:

There is an advanced plan to transform the National Artificial Insemination Center into Animal Improvement Institute. The transformation is meant to create the necessary organizational structure for breeding programs and to put in place recording systems. A pilot project for recording in dairy is underway around Addis Ababa. Funding will be sought from both governmental and others (e.g. donors) sources.

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:

There was no mentionable mechanism before. The National Strategy and Action Plan for AnGR has addressed the issue of interactions and implementation of the plan through government funding will put the mechanism in place.

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:

The extension system is very strong and support livestock keepers with provision of information and service pertaining to access to animal genetic resources. However, the type and quality of the information and service in terms of benefiting Animal genetic resources conservation and sustainable use is questionable.

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:

There is a national policy on access and benefit sharing which addresses all aspects of biodiversity. Despite some contractual agreements with regard to plant genetic resources (e.g. *teff*, *vernonia*) no agreement has been entered for animal genetic resources.

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:

Implementation of community based breeding programs are participatory from the initial planning to final application. Along the way training and technical support is provided to livestock keepers on record keeping, identification of best animals and optimal utilization for breeding of selected animals. But all are at experimental stage and of limited scale in terms of coverage of species, breeds and geographic areas.

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:

Awareness creation of stakeholders in animal genetic resources conservation and sustainable utilization is among the

mainstream activities of the Animal biodiversity sub-directorate of the Ethiopian Institute of Biodiversity. It is part of a National Strategy and Policy for AnGR and implementation will be effected using annual government budget allocations.

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:

There are works which assessed the production system and also limited attempts to support indigenous or local production systems and associated traditional knowledge and practices related to Animal Genetic resources. Coincidentally most activities have been undertaken since the adoption of GPA.

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:

Planned in situ conservation for some of the threatened cattle breeds have required market incentives to sustain the conservation effort. Therefore development of niche markets have been planned for products from these animals (e.g. premium price for butter and cheese from the cattle breeds).

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

1. Adequate knowledge of the resources and their importance.
2. Breed improvement programs for the indigenous genetic resources.
3. Presence of supportive policy environment.

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.*

Sustainable use and development of two goat breeds have been initiated in collaboration with the international Livestock Research Institute in a form of community based breeding project. The project envisages to follow a value chain approach where aspects from procurement of inputs to marketing and processing of outputs will be considered. Similar activities are being implemented on a number of indigenous sheep breeds. However, these are experimental and of a limited scale and need to be expanded. A collaborative project on indigenous chicken between Kenya, Uganda and Ethiopia is being undertaken as part of implementation of the funding strategy for GPA. These activities are likely to contribute to the sustainable use and development of animal genetic resources.

### 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:

Assessing the risk status of animal genetic resources is among the major activities of the Animal biodiversity sub-directorate of the Ethiopian Institute of Biodiversity. Factors leading to the erosion of Animal genetic resources are key components of assessment of the risk status. However, so far, assessments have been haphazard and strengthening the activity is planned within the National Strategy and action plan for Animal genetic resources.

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

1. Change in production system: Fogera cattle used to be kept under a livestock dominated crop-livestock system of production. The area was a wetland and in a time span of less than three decades the breeding tract of the breed has been turned into a mono-culture rice cultivation area. Rice became the major source of livelihood and grazing lands have been turned into rice fields depriving Fogera cattle its grazing area. As a result the population of Fogera cattle has shown dramatic decline in population size. Additionally Fogera cattle have been moved to other upland areas in search of feed where they are exposed to interbreeding with zebu breeds.
2. Change in management: Sheko cattle (the only short horned cattle breed of Eastern Africa) used to be managed under free grazing in a forest area. With growth in population size and expansion of crop farming tethering management has been introduced. Because of the aggressive nature of the breed (mainly the male) under tethering management, early castration or removal of the male has been common. This has caused a significant threat to the existence of the breed which is also trypanotolerant.
3. Climate change: In the area where Boran cattle is being kept there was significant change in the amount of rainfall and frequency of drought. As a result there was shift from cattle to camel and pastoralists' household possession of Boran cattle has shown significant reduction (<http://www.lrrd.org/lrrd25/9/yose25166.htm>).

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:

The legal framework has been put in place with establishment of the Ethiopian Institute of Biodiversity. Despite fragmented efforts, comprehensive policies and programs to protect locally adapted breeds at risk were not there. As part of the national strategy and action plan this has been addressed and funding is sought for implementation.

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:

No conservation policies in place. But with the development of the National strategy and action plan for animal genetic resources, development of conservation policy has been planned. The Ethiopian Institute of Biodiversity will be responsible for developing the policies and programs with involvement of key stakeholders.

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:

There are few community based breeding programs on two goat and three sheep breeds. These are meant to prevent breeds from becoming at risk.

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

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

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

Please provide further details:

There are government owned cattle (Fogera and Begait) ranches. The ranches were established for the purpose of genetic improvement but they can serve conservation objectives.

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:

Semen cryo-conservation has been started for three cattle breeds (Sheko, Begiat and Fogera) as a measure to save breeds at risk and to prevent breeds from becoming at risk. The work is being done in collaboration with the National Artificial insemination center. Only three bulls of each breed have been used and the work need to be strengthened (more number of bulls) to capture the diversity within the breeds adequately.

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

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

- a. Yes
- b. No

Please provide further details:

There are some attempts towards conserving the AnGR of the country. But these will be a priority and strengthened in the future to a level the situation warrants.

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

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

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

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

- a. Yes
- b. No



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

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

Please provide further details:

The ex situ collections have been done on three animals of each breed. This is not adequate to capture the within breed diversity and action is planned to increase the number of animals with appropriate sampling.

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:

There is an institutional structure called Disaster Risk Management (DRM) and Food Security. This follows an approach of a full cycle of DRM (prevention, mitigation, preparedness, response, recovery and rehabilitation). The arrangement has three steps, viz, a pre-disaster, during disaster and post disaster systems. In relation to livestock during disaster there is destocking program and provision of water and feed with especial emphasis for breeding stock. During post disaster there is a strong restocking program, theoretically by selection of appropriate breeds and or species from similar agro-ecology. The restocking program is fraught with problems of appropriate implementation.

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:

There is an ongoing effort to use ex situ conserved semen to revive the sheko cattle population. Institutionalized and organized arrangements are planned within the National Strategic and Action plan for AnGR which is yet to be implemented.

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:

Currently conservation actions are planned to be implemented using standard methodologies developed elsewhere.

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:

Programs to promote documentation and dissemination of knowledge are institutionalized with establishment of the Ethiopian Institute of Biodiversity. Review of works on characterization by various stakeholders, accessing important information relevant to conservation and dissemination are being implemented through various means (workshops, website, publications etc...).

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

1. Complete knowledge of the animal genetic resources of the country.
2. Adequate capacity for ex situ in vitro conservation.
2. Appropriate policy environment for conservation of breeds at risk.
3. Conducive policy for sustainable utilization of indigenous animal genetic resources.

46. Please provide further comments describing your country's activities related to Strategic Priority Area 3: Conservation (including regional and international cooperation)

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

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

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

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

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

Please provide further details:

Very recently the livestock sector has been structured at a State Ministerial level. Fulfilling the human resource for the

new structure is underway. With that it is expected that sufficient institutional capacity to support holistic planning of the livestock sector will be put in place. A livestock master plan is also under development and that contributes to planning.

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:

A draft has been prepared and discussed by a number of stakeholders. Review by key stakeholders and endorsement by the appropriate authority remains.

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

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

Please provide further details:

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

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

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

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

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

- g. No

Please provide further details:

The national strategy and action plan for AnGR envisages establishment of a national database for AnGR of the country.

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:

There is critical need for updating the information on the data base with regard to Ethiopia's AnGR. Large number of studies on characterization of indigenous animals of the various species and breeds in the country have been conducted since the last time the database was updated. The information generated from this studies need to be synthesized and be used to update DAD-IS.

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

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

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

The national advisory committee should be established by involving the national regional states. Constitutionally the regional states have the right to decide on their own resources. Periodic meetings require bringing together members of the advisory committee representing the national regional states. This incurs cost and funding is being sought.

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:

Mass media (including radio and TV) programs, workshops, various publications and public events have been used to raise public awareness of the roles and values of Animal genetic resources. These have been going on for a long period of time but has been significantly strengthened in recent years.

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

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

Please provide further details:

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

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

Please provide further details:

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

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

Please provide further details:

There are experimental stage community based organizations in relation to sheep and goat breeding. But systematic development in this direction is planned within the national strategy and action plan for AnGR and the source of fund will be from public coffer.

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

Characterization?

- a. Yes
- b. No

Sustainable use and development?

- c. Yes
- d. No

Conservation of breeds at risk?

- e. Yes
- f. No

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

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

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

Please provide further details:

The Animal biodiversity sub directorate of Ethiopian Institute of Biodiversity (EIB) is mandated to undertake conservation related research activities. In addition there are agreements between a number of universities and EIB to initiate graduate program on biodiversity.

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

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

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

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

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

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

Sustainable use and development?

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

Conservation of breeds at risk?

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

Please provide further details:

Limited funding (from funding strategy of GPA) have been acquired for regional (Kenya, Uganda, Ethiopia) characterization, sustainable use and conservation of indigenous chicken. Work on characterization has been finalized while work on sustainable use and development is underway.

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:

International Livestock Research Institute is actively involved in characterization and sustainable use of AnGR. Most of the characterization work is being implemented through fellowship to graduate students working for their academic degree while the sustainable utilization and development is implemented as community based breeding programs in collaboration with the national research system. The International Center of Agricultural Research in Dry areas (ICARDA) is also involved in indigenous goat improvement program.

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

- a. Yes
- b. No

Please provide further details:

Annual budget for the Ethiopian Institute of Biodiversity has increased from time to time and likewise the share of the Animal biodiversity sub-directorate.

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:

A collaborative project (Kenya, Uganda and Ethiopia) on promotion of indigenous chicken has been funded by the funding strategy for GPA.

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:

Characterization of indigenous chicken in similar production systems have been done by collaborative project between Uganda, Kenya and Ethiopia.

70. Has your country contributed to establishing or strengthening global or regional information systems or networks related to inventory, monitoring and characterization of animal genetic resources (SP 1, Action 6)?

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

Please provide further details:

There is a plan to update DAD-IS and also to have a regional data base for chicken genetic resources.

71. Has your country contributed to the development of international technical standards and protocols for characterization, inventory and monitoring of animal genetic resources (SP2)?

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

Please provide further details:

72. Has your country contributed to the development and implementation of regional in situ conservation programmes for breeds that are at risk (SP 8, Action 2; SP 10, Action 1)?

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

Please provide further details:

73. Has your country contributed to the development and implementation of regional ex situ conservation programmes for breeds that are at risk (SP 9, Action 2; SP 10, Action 3; SP 10, Action 4)?

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

Please provide further details:

74. Has your country contributed to the establishment of fair and equitable arrangements for the storage, access and use of genetic material stored in supra-national ex situ gene banks (SP9, Action 3)?

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

Please provide further details:

75. Has your country participated in regional or international campaigns to raise awareness of the status of animal genetic resources (SP19)?

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

Please provide further details:

76. Has your country participated in reviewing or developing international policies and regulatory frameworks relevant to animal genetic resources (SP 21)?

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

Please provide further details:

Despite limited participation in on-line discussions no significant contribution has been made.

## EMERGING ISSUES

77. In view of the possibility that at some point countries may wish to update the GPA, please list any aspects of animal genetic resources management that are not addressed in the current GPA but will be important to address in the future (approximately the next ten years). Please also describe why these issues are important and indicate what needs to be done to address them.

Issues to be addressed in future

Issues to be addressed in future (next ten years)	Reasons	Actions required
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