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

Country report

supporting the preparation of *The Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture*, including sector-specific data contributing to *The State of the World's Biodiversity for Food and Agriculture* - 2013 -

Country: Serbia

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).

From total number of agricultural households in the Republic of Serbia the 77 % raise of livestock. Animal husbandry is widespread in the Shumadia and Western Serbia regions. It should be noted that the average farm in Serbia is small, with an average size of utilized agricultural land about 5.4 ha. The most common size of the cattle herd is 1-2 cattle, 3-9 pigs and 3-9 sheep. However, the agricultural households, or farms that primarily registered for livestock production are much greater with a larger number of bred animals and larger areas to be covered.

All the family farms in size can be divided into small, medium and large, with the intensity of production increases proportionally with the increase in farm size. On the other hand, livestock farms that are part of agricultural companies are mostly large and intensive.

The Republic of Serbia has never experienced problems related to providing food for existing population. Our country disposes of natural resources for high level of production, for domestic needs and export. However, potentials were insufficiently used because of the lack of competitiveness of Serbian agriculture in relation to the highly developed countries, liberalization of markets and imports of cheaper agricultural products. The importance of animal products is fairly high. But meat consumption with declining living standards significantly reduced, although from the cultural point of view it still represents, besides bread, the most important foodstuff. Lamb and beef which had been one of the major export items, in the last twenty years are significantly more difficult to export because the traditional markets during the crisis of the 90s of the twentieth century are lost. The risks of food shortages are negligible, localized and mainly associated with the appearance of natural disasters (lately extreme draughts during summer months and spring frosts). Risk of draught is extremely significant due to very small areas under irrigation systems.

With the increase in standard of living of population the demand in regard to the quality and quantity of agriculture products also increases. AnGR will have a significant role regarding satisfying the future demand of population for high quality food (production of healthy and safe food, organic production), ecological production and integral development of rural areas anticipating combination of agriculture and tourism.

Importance of various livestock products is both economic and social. The most significant livestock products in Republic of Serbia are: milk and dairy products, pork, beef and beef products, poultry meat, eggs, lamb, liquid manure, skin, giblets, manufactured products and wool. Even in relation to economic importance of these products, the order is identical.

The most important actual and potential threats to genetic diversity in livestock of Republic of Serbia are the following:

- Degradation and loss of natural resources
- Import of exotic breeds
- Endangering the locally adapted breeds
- Inadequate support measures
- The weakening of the capacity for in situ and ex situ AnGR conservation programs
- Lack of markets for products derived from locally adapted breeds
- Delay in scientific and technological development
- The economic crisis

For Republic of Serbia the special importance will be on the following aspects of AnGR conservation:

1. Production systems in the fields of limited agricultural production and conservation of AnGR for food production
2. Conservation of AnGR in service of conservation of biodiversity
3. Conservation of AnGR and protection of regional diversity
4. Protection and improvement of menagement of forestry and waters in the light of conservation of AnGR for food production
5. Conservation of AnGR serving to environment protection
6. Cultural heritage and conservation of AnGR
7. Maintaining traditional knowledge and technologies in food production
8. Conservation of AnGR as a support to diversification of rural economy

II. DATA FOR UPDATING THE PARTS AND SECTIONS OF *THE STATE OF THE WORLD'S ANIMAL GENETIC RESOURCES FOR FOOD AND AGRICULTURE*

FLOWS OF ANIMAL GENETIC RESOURCES

1. Studies of gene flow in animal genetic resources have generally concluded that most gene flow occurs either between developed countries or from developed countries to developing countries. Does this correspond to the pattern of gene flow into and out of your country?

For developed countries, exceptions to the usual pattern would include significant imports of genetic resources from developing countries. For developing countries, exceptions would include significant exports of genetic resources to developed countries, and/or significant imports and/or exports of genetic resources to/from other developing countries.

- (•) yes
- ( ) no
- ( ) yes but with some significant exceptions

1.1. If you answer “no” or “yes but with some significant exceptions”, please provide further details. Please include information on: which species are exceptions and which regions of the world are the sources and/or destinations of the respective genetic material.

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

- ( ) yes
- (•) no

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

- ○ yes
- ○ no

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

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.

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.

With exotic breeds has been a genetic improvement of economically important traits, and increased interest in their breeding, but it is also an increased risk of extinction locally adapted breeds.

LIVESTOCK SECTOR TRENDS

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

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

Drivers of change	Impact on animal genetic resources and their management over last ten years	Future impact on animal genetic resources and their management (predicted for the next ten years)	Describe the effects on animal genetic resources and their management
Changing demand for livestock products (quantity)	low	low	There is a market for AnGR products but it is not well developed. No significant change is expected in the demand for products from AnGR, so do not expect a significant impact on the orientation of AnGR or management. However, in the event of a significant improvement in living standards, is expected to increase demand for products from AnGR.
Changing demand for livestock products (quality)	medium	medium	It is expected that demanded for quality AnGR products will be increased but slightly with no high impact on AnGR and their management.

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 marketing infrastructure and access	medium	medium	It is expected positive changes in marketing infrastructure and access to the market due to more EU funds that will be available for this purpose.
Changes in retailing	medium	medium	Expansion of supermarkets will play important roll for changes in retailing of AnGR products.
Changes in international trade in animal products (imports)	medium	medium	Import of different animal products could have an impact on AnGR and their management in sense of decreasing in diversity of locally adapted breeds.
Changes in international trade in animal products (exports)	low	low	There will be no significant effect.
Climatic changes	none	none	
Degradation or improvement of grazing land	low	medium	With conservation of locally adapted breeds and with proper management, it is expected that the quality of pastures and grazing land will be increased.
Loss of, or loss of access to, grazing land and other natural resources	medium	medium	With increased the number of locally adapted breed, which mainly use production systems with low input, expected more pressure on pastures and other natural resources.
Economic, livelihood or lifestyle factors affecting the popularity of livestock keeping	medium	medium	The popularity of livestock keeping will be increased if government continues to support the measures from rural development program.
Replacement of livestock functions	none	none	
Changing cultural roles of livestock	none	none	
Changes in technology	low	medium	
Policy factors	high	high	The impact of policy factors on the AnGR keeper`s is very high and play the key role on sustainable use and conservation of AnGR.
Disease epidemics	low	medium	Harmonization of domestic legislation with the EU, is expected to reduce the risk of epidemics.

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	3

Species	Locally adapted breeds	Exotic breeds
Cattle (specialized beef)	1	4
Cattle (multipurpose)	1	1
Sheep	11	6
Goats	1	2
Pigs	4	5
Chickens	3	17
Buffaloes	1	0
Horses	2	11
Asses	1	0
Ducks	1	4
Geese	2	3
Turkeys	1	0
Guinea fowls	1	0

CHARACTERIZATION

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

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

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

Species	Baseline survey of population size	Regular monitoring of population size	Phenotypic characterization	Molecular genetic diversity studies – within breed	Genetic diversity studies based on pedigree	Molecular genetic diversity studies – between breed	Genetic variance component estimation	Molecular genetic evaluation
Cattle (specialized dairy)	3	3	high	low	medium	low	medium	low
Cattle (specialized beef)	5	1	high	low	low	low	low	low
Cattle (multipurpose)	2	2	high	low	medium	low	medium	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
Sheep	9	4	high	low	low	low	low	low
Goats	3	3	high	low	low	low	low	low
Pigs	9	9	high	low	low	low	low	low
Chickens	3	3	high	low	low	low	low	low
Buffaloes	1	0	medium	none	none	none	none	none
Horses	5	5	high	low	low	low	low	low
Asses	1	1	high	low	low	low	low	low
Ducks	0	0	none	none	none	none	none	none
Geese	0	0	none	none	none	none	none	none
Turkeys	0	0	none	none	none	none	none	none

INSTITUTIONS AND STAKEHOLDERS

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

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

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

	Score
Laws	medium
Implementation of laws	medium

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

	Description
Education	University of Belgrade Faculty of Agriculture, University of Novi Sad Faculty of Agriculture, University of Belgrade Faculty of Veterinary Medicine, University of Kragujevac Faculty of Agronomy in Cacak. The issues related to locally adapted breeds are covered either within common courses (e.g. Cattle Breeding and Production, Pig Breeding and Production etc.) or within more specific courses such as "Animal Genetic Resources" that is taught at University of Belgrade - Faculty of Agriculture.
Research	University of Belgrade Faculty of Agriculture, University of Novi Sad Faculty of Agriculture, University of Belgrade Faculty of Veterinary Medicine, Institute for Animal Husbandry Zemun. The research were focused so far on development of breeding goals and programs, the analysis of the quality of milk and meat, molecular genetic characterization etc.
Knowledge	The transfer of knowledge is based on long life education through the Universities and contacts with extension services.
Awareness	Through the regular livestock shows and agriculture fairs, all stakeholders in agriculture and rural development are aware of the roles and values of AnGR. Dissemination of printing materials.
Infrastructure	The organizational infrastructure needed to deliver services related to AnGR management is partially in place since there is no specific breeder association for autochthonous livestock breeds.
Stakeholder participation	The stakeholders participate mainly on local level and national level. They are included in the development of policy, strategy, and national livestock programs through the public consultations or as members of different working groups.
Policies	Agriculture Strategy Republic of Serbia 2005 (Government decision from the date of 18.08.2005.), National Programme of Rural Development 2011-2013 („Official Gazette R.S.“, No. 15/11), The National Agricultural Programme of the Republic of Serbia 2010-2013 („Official Gazette R.S.“, No. 83/10), Biodiversity Strategy of the Republic of Serbia for the period 2011-2018 („Official Gazette R.S.“, No. 13/1).
Policy implementation	For the implementation of the sustainable use and conservation of AnGR greatly affect the Common Agricultural Policy and changes in the level of Government. The policies listed above recognize the animal genetic resources but its implementation is weak. Some of the policy could not be realized since there was a lack of the budget for this purpose.
Laws	**Law on Livestock** („Official Gazette R.S.“, No. 41/09, 93/12). This law sets measures and rules for: animal husbandry; animal husbandry subjects and their organization forms; animal husbandry programs; production control and preservation of characteristics of domestic animals; This Law provides standards for husbandry of: beef; buffaloes; sheep; goats; horses; donkeys; pigs; poultry; furry animals; rabbits; bees; wild animals; fish and other aquatic organisms; and other domestic animals. Law on Animal Husbandry in Chapter X, in articles 67-71, defines the preservation of genetic reserves of domestic animals and biological diversity in livestock. **Law on Agriculture and Rural Development** ("Official Gazette RS", No. 41/09). This law regulates: the objectives of agricultural policy and the way of its implementation, the types of incentives in agriculture, the conditions for achieving right to incentives, incentives to users, Register of Agricultural farms, logging and reporting of agriculture, an integrated agricultural information system, monitoring the implementation of this law. The articles 3, 6, 9, 12 and 13 define the possibilities of using financial incentives for preservation of

	Description
	indigenous breeds (biodiversity) through rural development measures (structural incentives).
Implementation of laws	Implementation of laws is good.

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).

Only partial steps have been taken in order to support various stakeholders in AnGR management (the establishment Breeder Association of Old Breeds was supported by the Ministry of Agriculture, Forestry and Water Management).

BREEDING PROGRAMMES

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

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

10. Who operates breeding programmes in your country?

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

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

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

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

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

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

Species	Tools															
	Animal identification		Breeding goal defined		Performance recording		Pedigree recording		Genetic evaluation (classic approach)		Genetic evaluation including genomic information		Management of genetic variation (by maximizing effective population size or minimizing rate of inbreeding)		Artificial insemination	
	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex	Loc	Ex
Cattle (specialized dairy)	0	3	0	4	0	3	0	2	0	1	0	0	0	3	0	3
Cattle (specialized beef)	1	4	1	0	1	1	1	0	0	0	0	0	1	1	0	1
Cattle (multipurpose)	1	1	1	2	1	1	1	1	0	1	0	0	1	1	0	1
Buffaloes	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sheep	12	7	11	3	8	3	8	3	2	3	2	0	8	3	0	0
Goats	1	2	1	2	1	2	1	2	1	2	0	0	1	2	0	0
Pigs	4	5	3	6	4	5	4	5	0	5	0	0	0	0	0	5
Chickens	3	17	3	17	0	6	0	0	0	0	0	0	0	0	0	0
Horses	2	11	2	1	2	3	2	3	0	1	0	0	0	0	0	2
Asses	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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

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

Species	Breeding method			
	Straight/pure-breeding only		Straight/pure-breeding and cross-breeding	
	Loc	Ex	Loc	Ex
Cattle (specialized dairy)	0	2	0	2
Cattle (specialized beef)	1	0	0	0
Cattle (multipurpose)	1	1	0	1
Sheep	11	3	0	0
Goats	0	2	1	0
Pigs	3	0	0	6
Chickens	3	0	3	17
Horses	2	11	1	0

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

Species	Training	Research
Cattle (specialized dairy)	high	high
Cattle (specialized beef)	medium	medium
Cattle (multipurpose)	high	high
Sheep	medium	medium
Goats	medium	medium
Pigs	high	high
Chickens	medium	high
Buffaloes	low	low
Horses	low	low
Asses	low	low

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Species	Policies or programmes
Cattle (specialized dairy)	yes
Cattle (specialized beef)	yes
Cattle (multipurpose)	yes
Sheep	yes
Goats	yes
Pigs	yes
Chickens	yes
Buffaloes	yes
Horses	yes
Asses	yes

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

Species	Description of policies or programmes
Cattle (specialized dairy)	In order to support the implementation of breeding programs and goals in the Republic of Serbia, annual support measures for genetic improvement, which includes mostly of exotic breeds, are applied. Although some measures of selection are performed on the annual level, there are no official breeding programs for the locally adapted breeds of domestic animals. Annual selection measures are compatible with the main breeding program for certain livestock species. The following measures are implemented: selection shows of cattle, linear evaluation of heifers, milk recording, recording of dams and sires, performance and progeny testing.
Cattle (specialized beef)	The following measures are implemented: selection shows of cattle, linear evaluation of heifers, recording of dams and sires, performance and progeny testing.
Cattle (multipurpose)	The following measures are implemented: selection shows of cattle, linear evaluation of heifers, recording of dams and sires, performance and progeny testing.
Sheep	In order to support the implementation of breeding programs and goals in the Republic of Serbia, annual support measures for genetic improvement, which includes mostly of exotic breeds, are applied. Some of selection measures are performed on the annual level. Annual selection measures are compatible with the main breeding program for certain livestock species. The following measures are implemented: selection shows of sheep and goats, productivity recording, milk recording, performance and progeny testing.
Goats	In order to support the implementation of breeding programs and goals in the Republic of Serbia, annual support measures for genetic improvement, which includes mostly of exotic breeds, are applied. Although some measures of selection are performed on the annual level, there are no official breeding programs for the indigenous breeds of domestic animals. Annual selection measures are compatible with the main breeding program for certain livestock species. The following measures are implemented: selection shows of sheep and goats, productivity recording, milk recording, performance and progeny testing.
Pigs	In order to support the implementation of breeding programs and goals in the Republic of Serbia, annual support measures for genetic improvement, which includes mostly of exotic breeds, are applied. Although some measures of selection are performed on the annual level, there are no official breeding programs for the indigenous breeds of domestic animals. Annual selection measures are compatible with the main breeding program for certain livestock species. The following measures are implemented: selection shows, recording of reproduction traits, performance test, performance and progeny testing.
Chickens	In order to support the implementation of breeding programs and goals in the Republic of Serbia, annual support measures for genetic improvement, which includes mostly of exotic breeds, are applied. Although some measures of selection are performed on the annual level, there are no official breeding programs for the indigenous breeds of domestic animals. Annual selection measures are compatible with the main breeding program for certain livestock species. The following measures are implemented: productivity recording
Horses	In order to support the implementation of breeding programs and goals in the Republic of Serbia, annual support measures for genetic improvement, which includes mostly of exotic breeds, are applied. Although some measures of selection are performed on the annual level, there are no official breeding programs for the indigenous breeds of domestic animals. Annual selection measures are compatible with the main breeding program for certain livestock species. The following measures are implemented: productivity recording, licensing stallion.

Species	Description of policies or programmes
Asses	In order to support the implementation of breeding programs and goals in the Republic of Serbia, annual support measures for genetic improvement, which includes mostly of exotic breeds, are applied. Although some measures of selection are performed on the annual level, there are no official breeding programs for the indigenous breeds of domestic animals. Annual selection measures are compatible with the main breeding program for certain livestock species. The following measures are implemented: productivity recording, licensing stallion.

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 exotic dairy cattle breeds, due to the implementation of breeding programs, there is a genetic improvement of production, reproduction and functional properties. On the other hand, in the locally adapted breeds has no visible genetic progress due to the fact that there are difficulties in the implementation of breeding programs. The consequence of this is the occasional occurrence of uncontrolled cross-breeding between locally adapted and exotic breeds what is especially pronounced in certain regions of Serbia.
Cattle (specialized beef)	There main purpose of breeding program for locally adapted beef breed is stabilizing of the effective size of population.
Cattle (multipurpose)	In dual-purpose cattle breeds, due to the implementation of breeding programs, there is a genetic improvement of production, reproduction and functional properties. On the other hand, in the locally adapted breeds has no visible genetic progress due to the fact that there are difficulties in the implementation of breeding programs. The consequence of this is the occasional occurrence of uncontrolled cross-breeding between locally adapted and exotic breeds what is especially pronounced in certain regions of Serbia.
Sheep	There is a slightly genetic improvement in sheep due to implementation of breeding programs and systematic cross-breeding.
Goats	There is no visible genetic improvement.
Pigs	Genetic progress has been the result of the application to breeding programs, as well as modern technologies of breeding.
Chickens	Mainly grown-line hybrids and no special genetic progress.
Buffaloes	There is no breeding programme.
Horses	The greatest genetic progress has been realized in the sport horse breeds with traits that are important for sports racing and competition.
Asses	There is no breeding programme.

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.

Financial resources allocated for the realization of the breeding programmes are provided from the Governmetal budget. Breeders are not ready to financially participates in realization of selection programmes. Breeding Associations do not have enough capacity to financially participates in realization of selection programmes.

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)	Definition of breeding programmes and goals for locally adapted breeds; Increasing of population size of locally adapted breeds; Genetic improvement of economically important traits;

Species	Description of future objectives, priorities and plans
Cattle (specialized beef)	Definition of breeding programmes and goals for locally adapted breeds; Increasing of population size of locally adapted breeds; Genetic improvement of economically important traits;
Cattle (multipurpose)	Definition of breeding programmes and goals for locally adapted breeds; Increasing of population size of locally adapted breeds; Genetic improvement of economically important traits;
Sheep	Definition of breeding programmes and goals for locally adapted breeds; Increasing of population size of locally adapted breeds; Genetic improvement of economically important traits;
Goats	Definition of breeding programmes and goals for locally adapted breeds; Increasing of population size of locally adapted breeds; Genetic improvement of economically important traits;
Pigs	Definition of breeding programmes and goals for locally adapted breeds; Increasing of population size of locally adapted breeds; Genetic improvement of economically important traits;
Chickens	Definition of breeding programmes and goals for locally adapted breeds; Increasing of population size of locally adapted breeds; Genetic improvement of economically important traits;
Buffaloes	Increasing of population size
Horses	Definition of breeding programmes and goals for locally adapted breeds; Increasing of population size of locally adapted breeds;
Asses	Increasing of population size

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

Species	In situ conservation	Ex situ in vivo conservation	Ex situ in vitro conservation
Asses	medium	none	none

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

- (•) yes
- ( ) no

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

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

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

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

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

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

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
Cattle (multipurpose)	no	no	no	no	no	no	no	no	no	no	no	no
Sheep	yes	yes	yes	no	no	yes	yes	yes	yes	yes	yes	yes
Goats	yes	yes	yes	no	no	yes	yes	yes	yes	yes	yes	yes
Pigs	yes	yes	yes	no	no	yes	yes	yes	yes	yes	yes	yes
Chickens	yes	yes	yes	no	no	yes	yes	yes	no	yes	yes	yes
Buffaloes	yes	yes	yes	no	no	yes	yes	yes	yes	yes	yes	yes
Horses	yes	yes	yes	no	no	yes	yes	yes	yes	yes	yes	yes
Asses	yes	no	yes	no	no	yes	yes	yes	yes	yes	yes	yes

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.

Since 2003. years we are permanently working on the identification of endangered breed of domestic animals. Completing inventories of the location, population status, trends and characteristics of AnGR are finalized. The institutional responsibilities for monitoring of trends in AnGR are established. Basic and regional selection services registered, controlled and carried out selection measures during the year. Through the selection measures information on breeding structure and organization of each breed is maintained. Regular sharing information with EFABIS/DAD-IS established.
Financial support (subsidies) to the stakeholders was given due in time, according to the available budget. Many NGO`s were included in activities of on-farm conservation of locally adapted breeds. They gave a very important role to increase of public awareness. Support promotion of locally adapted breeds true financial assistance for organization of Balkan agrobiodiversity fair and rural tradition.
Analyze of pilot HNVF areas typical for Serbia was done, for agro-environment policies and programming and possibilities of sustainable agriculture and rural development in wetland nature protected areas which holds collections of locally adapted breeds.
Serbian umbrella association “Breeding Association of Old Breeds” was established aiming to support Serbian breeders of locally adapted breeds.
Harmonization of our Agriculture Lows with EU regulative, creating the National Strategy for the Conservation of Biodiversity, the National Programme of Rural Development, the National Agricultural Programme and translation on national language Global Plan of Action for AnGR and Interlaken Declaration, was performed successfully. Development of activities on regional network in function of sustainable breeding programs for transboundary breeds.
Many projects related to AnGR are realized: Case Study -Community based management and used of AnGR in traditional livestock farming systems.

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

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

- ○ yes
- ◉ no

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

- ○ yes
- ◉ no

23.2. If yes, please describe the plans.

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

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

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

Species	Number of breeds for which material is stored	Number of breeds for which sufficient material is stored	Does the collection include material from not-at-risk breeds?	Have any extinct populations been reconstituted using material from the gene bank?	Have the gene bank collections been used to introduce genetic variability into an in situ population?	Have the gene bank collections been used to introduce genetic variability into an ex situ population?	Do livestock keepers or breeders' associations participate in the planning of the gene banking activities?
Cattle (specialized dairy)							
Cattle (specialized beef)							
Cattle (multipurpose)	1	1	no	no	no	no	no
Sheep							
Goats							
Pigs							
Chickens							

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

There are semen stocks of the two bulls of Busha cattle in an amount of about 5.000 doses. Establishment of semen stocks was carried out on the initiative of the Centre for Reproduction and A.I. from the Velika Plana, but is not financially supported by the state.

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.

Coordination establishing of gene bank was conducted through ERFP working group on ex-situ conservation.

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.

Mangalitza pig. The population number has increased from about 60 animals (2000 year) at about 3.000 (2013 year) through the promotion of breed and traditional products, import of breeding boars and increasing awareness among the breeders about the importance of preserving this breed.

REPRODUCTIVE AND MOLECULAR BIOTECHNOLOGIES

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

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

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

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

The most common is the A.I. and control and synchronization of estrus in cattle, sheep and pigs.

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

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

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

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

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

30.1. Please briefly describe the research.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

	Extent of collaboration	Description
Development of joint national strategies or action plans	limited	The aim of National Biodiversity Strategy is to develop action plans for plant, animal and forestry genetic resources.
Collaboration in the characterization, surveying or monitoring of genetic resources, production environments or ecosystems	limited	There are sporadic cooperation on environment and ecosystems.
Collaboration related to genetic improvement	none	
Collaboration related to product development and/or marketing	limited	Individual efforts of farmers who were engaged in the breeding of native breeds and plants.
Collaboration in conservation strategies, programmes or projects	limited	There have been several national projects to support the development of agro-environmental measures.
Collaboration in awareness-raising on the roles and values of genetic resources	limited	There are individual cases of cooperation organizing a joint Balkan agro-biodiversity fair, where the promotion of value for breeding of indigenous breeds/plants and products derived from them.
Training activities and/or educational curricula that address genetic resources in an integrated manner	limited	Elective courses at University levels.
Collaboration in the mobilization of resources for the management of genetic resources	limited	Collaboration on preparing of legislative.

2. Please describe any other types of collaboration.

Joint workshops and scientific meetings.

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

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

Lack of communication between different authorities.

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

Better coordination of activities.

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

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

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

- ○ yes
- ◉ no

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

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

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

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

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

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

- ○ yes
- ◉ no

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

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

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

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

9. Please provide examples of cases in which the role of livestock or specific animal genetic resources is particularly important in the provision of regulating and/or supporting ecosystem services in your country. Please also describe any examples in which diverse animal genetic resources are important in terms of reducing the adverse environmental effects of livestock production.

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

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

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

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

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

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

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

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

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

Please provide further details:

Registries (Herd books) for all breeds of economic significance existed prior to the adoption of the GPA.

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:

The all livestock species of economic importance are identified in terms of phenotypic characterization including morphology, production and reproduction traits, location, production environments etc.

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:

Molecular genetic characterization of livestock was made in certain extent before the adoption of the GPA, as well as after its adoption.

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:

After adoption of the GPA, the registries for locally adapted breeds were established.

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:

Responsibility for monitoring is on institutions that implement the selection programmes. The programmes are supported by the Government and are funded annually by the Ministry of Agriculture, Forestry and Water Management.

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:

Protocols have been established within programme for livestock genetic improvement.

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:

Monitoring has been regularly carried out within program for livestock genetic improvement.

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:

According to the Rules on the list of genetic reserves of domestic animals, the way of preserving genetic reserves of domestic animals, as well as a list of locally adapted breeds of domestic animals and endangered indigenous breeds ("Official Gazette RS", No. 38/10).
Endangered locally adapted breeds are those breeds of domestic animals in which the total number of female breeding stock does not exceed:
1. Cattle 7.500
2. Sheep 10.000
3. Goat 10.000
4. Horse 5.000
5. Pig 15.000
6. Poultry 25.000

9. Has your country established an operational emergency response system (http://www.fao.org/docrep/meeting/021/K3812e.pdf) that provides for immediate action to safeguard breeds at risk in all important livestock species (SP 1, Action 7)?

- ○ a. Yes, a comprehensive system was established before the adoption of the GPA
- ○ b. Yes, a comprehensive system has been established since the adoption of the GPA
- ○ c. For some species and breeds (coverage expanded since the adoption of the GPA)
- ○ d. For some species and breeds (coverage not expanded since the adoption of the GPA)
- ○ e. No, but action is planned and funding identified
- ○ f. No, but action is planned and funding is sought
- ◉ g. No

Please provide further details:

10. Is your country conducting research to develop methods, technical standards or protocols for phenotypic or molecular characterization, or breed evaluation, valuation or comparison? (SP 2, Action 2)

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

- ○ e. No

Please provide further details:

Several research have been carried out on locally adapted cattle, pig, sheep and goat breeds.

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:

Despite that breeder associations have been established, there are still managerial constraints that influence their work.
Market for traditional products obtained from locally adapted breeds is not developed well.
The lack of sufficient economic interest for keeping and rising of locally adapted breeds.

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:

Increasing the number of breeders that are keeping and raising the locally adapted breeds.
Measures for promotion of establishing breeder associations.
Measures for promotion of traditional products and traditional livestock production systems.
Increasing the awareness of importance for sustainable use and management of AnGR.

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

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

STRATEGIC PRIORITY AREA 2: SUSTAINABLE USE AND DEVELOPMENT

- The state of national sustainable use policies for animal genetic resources
- The state of national species and breed development strategies and programmes
- The state of efforts to promote agro-ecosystem approaches

14. Does your country have adequate national policies in place to promote the sustainable use of animal genetic resources (see also questions 46 and 54)?

- ○ a. Yes, since before the adoption of the GPA
- ○ b. Yes, policies put in place or updated after the adoption of the GPA
- ○ c. No, but action is planned and funding identified
- ◉ d. No, but action is planned and funding is sought
- ○ e. No

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

15. Do these policies address the integration of agro-ecosystem approaches into the management of animal genetic resources in your country (SP5) (see also questions 46 and 54)?

Glossary: The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way (for further information see http://www.cbd.int/ecosystem/description.shtml).

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

Please provide further details:

16. Do breeding programmes exist in your country for all major species and breeds, and are these programmes regularly reviewed, and if necessary revised, with the aim of meeting foreseeable economic and social needs and market demands (SP4, Action 2)?

- ○ a. Yes, since before the adoption of the GPA
- ○ b. Yes, put in place after the adoption of the GPA
- ◉ c. For some species and breeds (coverage has increased since the adoption of the GPA)
- ○ d. For some species and breeds (coverage has not increased since the adoption of the GPA)
- ○ e. No, but action is planned and funding identified
- ○ f. No, but action is planned and funding is sought
- ○ g. No

Please provide further details:

Breeding programmes are regularly reviewed and updated on 5 year base.

17. Is long-term sustainable use planning – including, if appropriate, strategic breeding programmes – in place for all major livestock species and breeds (SP4, Action 1)?

- ○ a. Yes, since before the adoption of the GPA
- ○ b. Yes, put in place after the adoption of the GPA
- ○ c. For some species and breeds (further progress made since the adoption of the GPA)
- ○ d. For some species and breeds (no further progress made since the adoption of the GPA)
- ○ e. No, but action is planned and funding identified
- ○ f. No, but action is planned and funding is sought
- ◉ g. No

Please provide further details:

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

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

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

Market for traditional products obtained from locally adapted breeds is not developed well.
The lack of sufficient economic interest for keeping and rising of locally adapted breeds.

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

Glossary:

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

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

f. No

Please provide further details:

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

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

Please provide further details:

There are major breeding organizations for all types of domestic animals and they are responsible for adopting, implementing and control implementation of breeding programs. Financed from the national budget, and the MAFWM control proper use of funds on an annual basis. In addition, there are several major regional and basic breeding organizations, which are responsible for the implementation of breeding programs in the field. All collected data are required to submit to the major breeding organizations, which are responsible for keeping of herd books.

21. Are mechanisms in place in your country to facilitate interactions among stakeholders, scientific disciplines and sectors as part of sustainable use development planning (SP5, Action 3)?

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

Please provide further details:

22. Have measures been implemented in your country to provide farmers and livestock keepers with information that facilitates their access to animal genetic resources (SP 4, Action 7)?

- ○ a. Yes, comprehensive measures have existed since before the adoption of the GPA
- ○ b. Yes, comprehensive measures exist because of progress made since the adoption of the GPA
- ○ c. Yes, measures partially implemented (and were established or strengthened after the adoption of the GPA)
- ◉ d. Yes, measures partially implemented (but no progress has been made since the adoption of the GPA)
- ○ e. No, but action is planned and funding identified
- ○ f. No, but action is planned and funding is sought
- ○ g. No

Please provide further details:

Ministry of Agriculture, Forestry and Water Management provide and distribute information related to different governmental measures that support AnGR.
Several NGOs are involved in promotion of AnGR.

23. Has your country developed a national policy or entered specific contractual agreements for access to and the equitable sharing of benefits resulting from the use and development of animal genetic resources and associated traditional knowledge (SP3, Action 2)?

- ○ a. Yes, sufficient measures (policy and/or agreements) have been in place since before the adoption of the GPA
- ○ b. Yes, sufficient measures (policy and/or agreements) are in place because of progress made since the adoption of the GPA
- ○ c. Yes, some measures (policy and/or agreements) are in place (progress has been made since the adoption of the GPA)
- ○ d. Yes, some measures (policy and/or agreements) are in place (but no progress has been made since the adoption of the GPA)
- ○ e. No, but a policy and/or agreements are in preparation
- ○ f. No, but a policy and/or agreements are planned
- ◉ g. No

Please provide further details:

24. Have training and technical support programmes for the breeding activities of livestock-keepers been established or strengthened in your country (SP 4, Action 1)?

- ◉ a. Yes, sufficient programmes have existed since before the adoption of the GPA
- ○ b. Yes, sufficient programmes exist because of progress made since the adoption of the GPA
- ○ c. Yes, some programmes exist (progress has been made since the adoption of the GPA)
- ○ d. Yes, some programmes exist (but no progress has been made since the adoption of the GPA)
- ○ e. No, but action is planned and funding identified
- ○ f. No, but action is planned and funding is sought
- ○ g. No

Please provide further details:

Faculties of Agriculture and agricultural extension services offer training and technical support programmes on regular time bases.

25. Have priorities for future technical training and support programmes to enhance the use and development of animal genetic resources in your country been identified (SP 4, paragraph 42)?

- ○ a. Yes, priorities have been identified or updated since the adoption of the GPA
- ○ b. Yes, priorities were identified before the adaption of the GPA but have not been updated

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

Please provide further details:

26. Have efforts been made in your country to assess and support indigenous or local production systems and associated traditional knowledge and practices related to animal genetic resources (SP 6, Action 1, 2)?

- ○ a. Yes, sufficient measures have been in place since before the adoption of the GPA
- ○ b. Yes, sufficient measures are in place because of progress made since the adoption of the GPA
- ○ c. Yes, some measures are in place (and were established or strengthened after the adoption of the GPA)
- ○ d. Yes, some measures are in place (but no progress has been made since the adoption of the GPA)
- ○ e. No, but action is planned and funding identified
- ○ f. No, but action is planned and funding is sought
- ◉ g. No

Please provide further details:

27. Have efforts been made in your country to promote products derived from indigenous and local species and locally adapted breeds, and facilitate access to markets (SP 6, Action 2, 4)?

- ○ a. Yes, sufficient measures have been in place since before the adoption of the GPA
- ○ b. Yes, sufficient measures are in place because of progress made since the adoption of the GPA
- ○ c. Yes, some measures are in place (and were established or strengthened after the adoption of the GPA)
- ○ d. Yes, some measures are in place (but no progress has been made since the adoption of the GPA)
- ○ e. No, but action is planned and funding identified
- ◉ f. No, but action is planned and funding is sought
- ○ g. No

Please provide further details:

Promotion of products obtained from local breeds and their placement on the market are mostly carried out on the initiative of individuals who are the producers of those products.

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

Increasing the number of breeders that are keeping and raising the locally adapted breeds.
Measures for livestock genetic improvement.
Measures for promotion of traditional products and traditional livestock production systems.
Increasing the awareness of importance for sustainable use and management of AnGR.
Measures for supporting low input livestock production systems.

29. Please provide further comments on your country's activities related to Strategic Priority Area 2: Sustainable Use and Development (including regional and international cooperation)

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

STRATEGIC PRIORITY AREA 3: CONSERVATION

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

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

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

Please provide further details:

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

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:

Measures for the conservation of AnGR are defined in the program of Rural Development. Also, the adoption of the Strategy on Agriculture, Strategy on Biological Diversity, as well as the adoption of key legal framework, developed an institutional system for the preservation of AnGR. Established information systems for animal identification and database on indigenous species. Mainly carried out in situ conservation, while the ex situ there is not enough funding. Incentives paid to holders of endangered indigenous breeds, led to a positive trend when it comes to increasing populations. Established the central Association of breeders of old breeds, and numerous non-governmental organizations working to

promote conservation and sustainable use of AnGR. There is intensive cooperation at the regional level when it comes to defining the framework for the establishment of gene banks.

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

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

Please provide further details:

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

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

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

Please provide further details:

In situ conservation measures are mainly focused to the payment of incentives for keepers of low productivity of indigenous breeds, in order to cover the economic differences with the exotic breeds and thus to stimulate farmers to keep their indigenous breeds.

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

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

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

Please provide further details:

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

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

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

Please provide further details:

There are 5.000 doses of semen Busha breed in the Center for reproduction and A.I. in Velika Plana. The center is with own initiatives and resources gathered and stored these doses of semen.

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

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

- ○ a. Yes
- ◉ b. No

Please provide further details:

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

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

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

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

Please provide further details:

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

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

Please provide further details:

We have only materials from one breed conserved ex situ in gene bank.

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:

There are no standardized methods and technologies for in situ and ex situ conservation.

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

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

Please provide further details:

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

1. Identification of AnGR (domestic animals and their wild relatives) and their habitats.
2. Clear definition of the role, utilisation and conservation of AnGR, that is precisian the current and the future needs of the nation in livestock production from the standpoint of meeting national requirements in animal products, as well as conquering the foreign markets.
   a. In that sense it is necessary to make sure that securing national safety in nutrition and production of animal products for export must adhere to the concept of sustainable development, as well as to secure the support to rural development.
   b. Planning of sustainable use of breeds should assume the development specific for all breeds and agrosystems which exist in the country, that is to provide continued and exclusive use of locally adapted breeds, as well as the use of exotic breeds as original.
   c. For survival of locally adapted breeds and species of domestic animals it is necessary to develop markets of traditional products, ethno, agro and rural tourism, in order to enable creation of added value which would compensate for the losses due to extensively.
3. Enhancement of capacities of communication and information systems
4. Establishment of permanent programmes for monitoring farm AnGR and their wild relatives, which have agricultural, economic, cultural or scientific value.
5. Training of personnel, especially when it is about the new technologies applied in conservation.
6. Development of permanent and functional relationship with the public. Through means of public communications, providing appropriate publications, as well as through public affirmation of scientific and professional papers etc. the public would be continually acquainted with the requirements and significance of conservation of the endangered AnGR and the need for their conservation.
7. Development of legislation and regulations.
8. To continue with international communication.

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.

At the regional level, we cooperate within ERFP and established working groups.

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

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

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

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

- ○ e. No

Please provide further details:

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

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

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

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

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

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

Please provide further details:

In National Biodiversity Strategy and Action Plan, the AnGR are addressed. The National Biodiversity Strategy and Action Plan has been adopted on 2011.

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

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

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

AnGR are addressed in National Agriculture Strategy within chapter on natural resources and environment.

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:

Officially there is no database for AnGR independent from DAD-IS.

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

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

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

Please provide further details:

Officially there is no database for AnGR independent from 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:

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:

Cooperation exists and depends on the nature of the action that should be carried out.

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:

Activities to increase public awareness have been in place for many years. These activities include various media appearances, trade fairs, exhibitions, printing of various promotional brochures, research papers and so on.

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:

We have only Livestock law which regulate policies related to AnGR, but have not all the national legislation and policies as indicated in the GPA.

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:

Several projects on training and technology transfer related to AnGR have been carried in the last decade. These projects were supported by either Ministry of Agriculture, Forestry and Water Management or Ministry of Education, Science and Technological Development.

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

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

Please provide further details:

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

Characterization?

- ○ a. Yes
- ◉ b. No

Sustainable use and development?

- ○ c. Yes
- ◉ d. No

Conservation of breeds at risk?

- ◉ e. Yes
- ○ f. No

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

1. "Natura Balkanika", Dimitrovgrad, https://www.facebook.com/pages/NGO-Natura-Balkanika-Dimitrovgrad/109851969039646
2. "Pokret gorana", Sremska Mitrovica, www.zasavica.org.rs

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

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

Please provide further details:

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

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

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

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

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

Characterization?

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

Sustainable use and development?

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

Conservation of breeds at risk?

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

Please provide further details:

1. Regional „BushaLive“ project on characterization of Busha Cattle as transboundary breed.
2. Regional ERFP working groups on ex situ conservation and documentation and information.

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:

SAVE foundation
DAGENE.

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

- ( ) a. Yes
- (●) b. No

Please provide further details:

65. Has your country received external funding for implementation of the GPA?

- ○ a. Yes
- ◉ b. No
- ○ c. No, because country generally does not receive external funding

Please provide further details:

66. Has your country supported or participated in international research and education programmes assisting developing countries and countries with economies in transition to better manage animal genetic resources (SP 15 and 16)?

- ○ a. Yes, support or participation in place before the adoption of the GPA and strengthened since
- ○ b. Yes, support or participation in place before the adoption of the GPA but not strengthened since
- ○ c. Yes, support or participation in place since the adoption of the GPA
- ○ d. No, but action is planned and funding identified
- ○ e. No, but action is planned and funding is sought
- ◉ f. No

Please provide further details:

67. Has your country supported or participated in programmes aimed at assisting developing countries and countries with economies in transition to obtain training and technologies and to build their information systems (SP 15 and 16)?

- ○ a. Yes, support or participation commenced before the adoption of the GPA and strengthened since
- ○ b. Yes, support or participation commenced before the adoption of the GPA but not strengthened since
- ○ c. Yes, support or participation commenced since the adoption of the GPA
- ○ d. No, but action is planned and funding identified
- ○ e. No, but action is planned and funding is sought
- ◉ f. No

Please provide further details:

68. Has your country provided funding to other countries for implementation of the Global Plan of Action?

- ○ a. Yes
- ○ b. No, but action is planned and funding identified
- ○ c. No, but action is planned and funding is sought
- ◉ d. No
- ○ e. No, because country is generally not a donor country

Please provide further details. If relevant, specify whether funding was bilateral or multilateral; research cooperation or aid; and to whom and for what it was given:

69. Has your country contributed to international cooperative inventory, characterization and monitoring activities involving countries sharing transboundary breeds and similar production systems (SP 1, Action 5)?

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

Please provide further details:

Participation in preparing of regional list of transboundary breeds for FAO, true the ERFP WG of documentation and information.

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:

Annually update data in EFABIS/DAD-IS. We have official agreement with ERFP related to updating of database on annual level.

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:

True the ERFP activities and different projects.

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:

True the ERFP WG for ex situ conservation.

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

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

Please provide further details:

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

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

Please provide further details:

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

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

Please provide further details:

EMERGING ISSUES

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

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

Submit by Email