



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: Finland

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).

1. Strengths, weaknesses, caps, constraints and challenges with respect to AnGR management:

Finland has a relatively long history to maintain national AnGR's. The first national Action Plan was published in 1983 and it was updated in 2004. MTT Agrifood Research Finland, that is a governmental research institute operating under the Ministry of Agriculture and Forestry, is coordinating the National Action Plan. The National Action Plan promotes both *in situ* and *ex situ* conservation of genetic resources of cattle, dog, goat, horse, pig, poultry, reindeer and sheep genetic resources. The breeds within each species that are considered in the National Action Plan are native breeds and imported breeds with a long breeding history in Finland. There is Council of Genetic Resources in Finland nominated by the Ministry of Agriculture and Forestry. The mandate of the Council covers animal, fish, plant and forest tree genetic resources.

National funding for *in situ* and *ex situ* conservation activities is regularly available. In addition, farmers keeping old native breeds get special subsidy for their *in situ* conservation work. In Finland, there are three gene bank herds for native cattle and sheep breeds. These herds form the core of conservation work. The strength in the Finnish Action Plan is the close connection with the research work. Molecular and phenotypic characterization of native breeds has been conducted and the Finnish breeds have been examined in the global context to evaluate their genetic value for the global domestic animal diversity. Various multidisciplinary studies have been done including processing properties of milk of native cattle breeds, branding, marketing, socio-cultural and socio-economic valuation. Finland has been active in international collaboration in research and conservation. For example, Russian, Polish, Kazakh, Ukrainian and Chinese farm animal breeds have been characterized in the molecular genetic studies coordinated by MTT. NordGen - Nordic Genetic Resource Center has promoted the Finnish national activities by providing tools for management of populations (to control inbreeding and kinships within the conserved breeds) and projects that have been also nationally important. The networking among the Nordic coordinators has been useful to develop the national activities. Once a year Genetic Resources -Newsletter is published. Education on AnGr-issues is given in vocational colleagues and few universities. The conservation of rare breeds has obtained publicity in Finland.

In Finland, there are no AI stations for sheep and goat breeding and the collections of semen and freezing must be done on farms. This is less effective compared to the situation where permanent AI stations would exist. In addition, there are no experts on poultry semen freezing. However, NordGen will arrange a course to promote know-how on this special field. The national funding is not enough to have an effective and outstanding national program for the *in situ* and *ex situ* conservation of AnGR. Particularly, there should be more 'hands' available to do all the work listed in the National Action Plan.

There was 20 % decrease in the number of farms in the 2000's first decade. Nonetheless reduction was modest compared to the early 1990's and the EU membership. The greatest growth has been in category of farms bigger than 100 hectares of arable land, the average of the arable field area being 38.9 hectares. Today, the total number of farms is 59 000. Less than a third of them are specialized in livestock production. Thus a special challenge for the future conservation work is the decreasing trend of active farms in Finland. On the other hand, the Finnish farms will become bigger and there will be less livestock farms, but there the remaining livestock farms will have more animals. This trend will lead to situations where there are fewer opportunities to keep old native breeds. The bigger livestock farms will obviously favor few international commercial breeds in production. The current trend indicates that the Finnish Ayrshire breed, which has been for 50 years the most popular dairy breed in Finland, will be replaced by commercial Holstein cattle. On the other hand, there can be risks that breeding work also in cattle and pigs will be fully done by international companies and not nationally. The subsidy for keeping the old native breeds will be important also in the future, but also the promoting branding and marketing of native breeds' products will be of great importance in the future in order to have living populations of native breeds. New breeds will be imported in Finland threatening the census sizes of the native breeds. The landscape management of culturally and biologically important regions will offer new possibilities to promote the raising of old native breeds. However, this trend will mean particularly for the native cattle breeds that these breeds will not be anymore used in their traditional production system in dairy production and the conservation approach would be *in vivo ex situ*. The Finnish native cattle breeds have been dairy breeds and have several valuable characters in their milk.

2. Priorities and strategic directions for future action:

Ex situ and *in situ* conservation has been the most active one for the native cattle breeds. However, particularly the *ex situ* conservation of other species and breeds will be enhanced. The management of cryobank material will be developed (the duplicate storage, the use of long term storage and the responsibilities of different stakeholders to contribute to the cryobanking). The *ex situ* conservation of imported breeds which have a long breeding history (e.g. Finnish Ayrshire, Texel sheep and Yorkshire pig) should be better considered in the actions.

The future of the three living gene bank herds must be secured (administrative action) and these farms should get a status as national centers for Finnish native genetic resources.

Active and internationally high level research work on characterization of AnGR is our goal. The new genomic tools and approaches will be applied, such as transcriptome profiling and epigenetic profiling of native, locally adapted farm animal breeds to examine their special characters. Finland will have an active research networking with several international research groups, particularly with Russian and Chinese research groups. Multidisciplinary studies on values of animal genetic resources will be done.

The networking among owners of native breeds will be strengthened. The model for the networking can be obtained from the current conservation network of Landrace chicken owners. The branding and marketing of products (cheese, raw milk, meat, eggs, wool) based on the native breeds will be developed and collaboration of producers enhanced.

The collaboration with genetic conservation programs of plants, fish and forest trees particularly in information work will be developed. International collaboration in all conservation activities will be important also in the future. Particularly, the collaboration with NordGen - Nordic Genetic Resource Center will be considered very important for the National Action Plan.

Additional funding for *in situ* and *ex situ* conservation will be applied.

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.

Genetic material of Holstein Cattle is imported from USA, The Netherlands and Denmark. Frozen semen of all beef cattle breeds is currently imported and no own semen production exists. Moreover, all commercial poultry is imported. Also new genetic material (semen) of Texel sheep has been recently imported. From Finland, semen and embryos of Finnish Ayrshire are exported to other Nordic countries and there is an interest towards use of Finnsheep in crossing of local and commercial sheep breeds in several countries to improve the fertility traits in sheep breeds.

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).

The breeding organizations keep the records.
For cattle: FABA-Finnish Animal Breeding Association (<http://www.faba.fi/en>).
For sheep: ProAgria Rural Advisory Center. And the Finnish Customs keep all records <http://www.tulli.fi/en/index.jsp>.

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.

All beef cattle materials are currently imported; previously there was own semen production of the beef cattle breeds in Finland. New cattle breeds have been imported: Jersey from Denmark and Brown Swiss from USA. These numbers are still very low in Finland.

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.

In dairy cattle, continuous gene flow between Nordic red cattle breeds (semen & embryos) is unifying the national red breeds. There is a risk that the Finnish Ayrshire cattle do not exist as pure breed in the future.

LIVESTOCK SECTOR TRENDS

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

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

Drivers of change	Impact on animal genetic resources and their management over last ten years	Future impact on animal genetic resources and their management (predicted for the next ten years)	Describe the effects on animal genetic resources and their management
Changing demand for livestock products (quantity)	high	high	The census sizes of native farm animal breeds have decreased and some of them have been close to extinct. There will be less livestock farms, and international breeds will replaced the national populations of regional transboundary breeds.
Changing demand for livestock products (quality)	low	low	Increasing consumption of poultry meat has decreased the consumption of pork. More sheep meat will be consumed.
Changes in marketing infrastructure and access	medium	medium	The food industry and marketing are very concentrated in Finland: there are few actors in milk, meat etc industry and marketing. In the future, local food business will increase which will promote AnGR conservation.
Changes in retailing	medium	medium	Only few retailers in marketing. However, they have become more interested in regional produced products. This trend to sell local, regional products (special cheese etc) will increase.
Changes in international trade in animal products (imports)	medium	medium	Importing cheaper beef from South-America has decreased the consumption of domestic beef meat. A lot of chicken, pork and mutton are imported.
Changes in international trade in animal products (exports)	low	low	
Climatic changes	none	high	We will need robust animals which have resistance towards new pathogens and diseases; characterization of local genetic resources will have importance to identify adaptation and disease resistance characters (and genetics) and use these valuable gentic resources in introgression and genomic selection approaches.
Degradation or improvement of grazing land	low	medium	Sheep and native cattle breeds will be used more in the future lanscape management. This trend will increase the census sizes of the native breeds and will therefore have positive impact on genetic resources.
Loss of, or loss of access to, grazing land and other natural resources	low	low	

Drivers of change	Impact on animal genetic resources and their management over last ten years	Future impact on animal genetic resources and their management (predicted for the next ten years)	Describe the effects on animal genetic resources and their management
Economic, livelihood or lifestyle factors affecting the popularity of livestock keeping	high	high	In the 1960's the number of small farms decreased dramatically and agriculture was modernized. This led to the dramatic decrease in numbers of native farm animal breeds. Some of them were nearly totally lost (the native pig breeds became extinct). More small-scale farming, such as regional and local production will be more important in the future. EU agricultural policy will have impact on AnGR: subsidies promoting the conservation and branding of local native breeds Organic farming is increasing. In the other hand, profitable farming needs bigger units.
Replacement of livestock functions	high	medium	The native breeds were typical in the past small-scale farming and subsistence agriculture, while the modernization of the Finnish agriculture led to the dramatic decrease in these breeds' census sizes. In the future, animals will be used e.g. in landscape management and green care-farming. These new ways to use animals will effect on the popularity of native breeds.
Changing cultural roles of livestock	medium	medium	The native breeds were typical in the past small-scale farming and subsistence agriculture, while the modernization of the Finnish agriculture led to the dramatic decrease in these breeds' census sizes. In the future, animals will have also other roles than food production. See the previous comment. The cultural value of the native breeds will be more important in the future.
Changes in technology	medium	high	The industrialized agriculture needs homogenous, very uniform production animals. Also the food industry requires this to develop cost-effective production chains.
Policy factors	high	high	The policy has favored high input-high output breeds. The subsidy for keeping rare native breeds during the EU time has been very important to save our native breeds.
Disease epidemics	low	medium	New diseases are arriving, high productive animals are less resistance against them.

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)	3	5
Cattle (specialized beef)	0	11
Cattle (multipurpose)	0	0
Sheep	3	4
Goats	1	0
Pigs	0	6
Chickens	1	3
Horses	1	13
Ducks	0	1
Geese	0	1
Quails	0	1
Turkeys	0	2

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)	7	7	high	high	medium	high	high	medium
Cattle (specialized beef)	11	11	high	none	low	none	high	none
Cattle (multipurpose)	0	0	none	none	none	none	none	none
Sheep	7	7	low	high	high	high	low	none

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
Goats	1	1	low	low	low	medium	none	none
Pigs	6	6	high	medium	high	medium	high	high
Chickens	1	1	low	high	none	medium	none	low
Horses	14	14	high	medium	medium	medium	medium	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	high
Research	high
Knowledge	high
Awareness	high
Infrastructure	high
Stakeholder participation	high
Policies	high
Policy implementation	high
Laws	medium
Implementation of laws	high

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	Multilevel education starting from farmers and advisory to high university level.
Research	From basic study to applied science, international co-operations.
Knowledge	From medium to high.
Awareness	Due to active publicity, increasing.
Infrastructure	Proper infrastructure is ensuring the future for all domestic animal breeds in Finland.
Stakeholder participation	There are general working groups where stakeholders are involved. Breeding organizations have livestock keepers as members of board making decisions.
Policies	National Animal Genetic Resources Programme (established in 2004) lists activities for the conservation of genetic resources of native breeds and imported breeds with longer breeding history in Finland. It is coordinated by MTT Agrifood Research Finland in collaboration with the Ministry of Agriculture and Forestry. Genetic Resource committee operating under the Ministry of Agriculture and Forestry is monitoring the progress.
Policy implementation	Sustainable use of animal genetic resources are written in the Government's program. This program is valid till 2020.
Laws	The law concerning animal breeding aims to maintain and develop high-quality livestock production by promoting national activities and to ensure the health and well-being of farm animals.
Implementation of laws	At this moment, there is not particular law for directly favouring the sustainable use, development or conservation of animal genetic resources. The issue is under discussion.

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>).

The commercial breeding organization (FABA) considers also the breeding of local native cattle breeds, even though the activity concerns only a small minority of the dairy farmers. Three living conservation herds for native breeds have been established locating on Pelso Prison farm and in two vocational colleagues (Kainuu Vocational Colleague and Ahlman Vocational Colleague). The governmental research institute MTT Agrifood Research Finland coordinates national activities and has established conservation programs for rare native breeds. In addition, semen and embryos are collected (MTT initiative in collaboration with FABA Breeding Organization). Associations for the conservation of rare breeds have been established (for the conservation of agricultural biodiversity including native breeds, for the conservation of working type Finnhorse, for the promoting breeding and conservation of Finnsheep etc). Annual seminars are organized and "GeeniVarat" (Genetic Resources) -newsletter published by MTT. In addition, Internet pages on the issue has been established and a FaceBook page on conservation of the Finnish Landrace Chicken opened. Lectures and seminars given for university students, policy makers, breeding and rural development advisors and professional articles published in Finnish in several newspapers and professional journals.

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)	no	no	yes	yes	yes	no	no
Cattle (specialized beef)	no	no	yes	no	yes	no	no
Cattle (multipurpose)	no	no	no	no	no	no	no
Sheep	no	yes	yes	no	yes	yes	no
Goats	no	yes	yes	no	no	yes	no
Pigs	no	no	yes	yes	yes	no	no
Chickens	no	no	no	no	yes	no	no
Horses	no	no	yes	no	yes	no	no
Ducks	no	no	no	no	yes	no	no
Geese	no	no	no	no	yes	no	no
Quails	no	no	no	no	yes	no	no
Turkeys	no	no	yes	no	yes	no	no

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

The own breeding for beef cattle breeds is currently marginal and some animal owners apply their own farm-level

breeding. We do not have operators classified as "others".

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)	3	5	1	3	3	5	3	5	3	2	0	3	3	3	3	4
Sheep	3	5	3	5	3	5	3	5	2	2	0	0	3	5	0	0
Pigs	0	6	0	6	0	6	0	6	0	6	0	0	0	6	0	6
Chickens	1	3	0	0	1	3	0	3	0	0	1	0	1	0	0	2
Goats	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Horses	1	13	1	4	1	13	1	13	1	1	0	0	1	0	0	1
Cattle (specialized beef)	0	11	0	11	0	11	0	11	0	5	0	0	0	0	0	11
Ducks	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geese	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quails	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turkeys	0	1	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)	3	5	0	0
Goats	1	0	0	0
Pigs	0	2	0	5
Chickens	1	0	0	0
Horses	1	13	0	0
Sheep	3	5	0	0
Cattle (specialized beef)	0	11	0	0
Ducks	0	1	0	0
Geese	0	1	0	0
Quails	0	1	0	0
Turkeys	0	1	0	0

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

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

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

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

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

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

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

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

We do not have "others"-actors.

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

The breeding organization FABA provides services from artificial insemination and embryo transfer to genetic evaluations and breeding-advising. It takes care of export and import of bull semen, cattle embryos and cattle breeding. It maintains the official herdbooks for dairy and beef cattle. Mating plans are done by breeding advisors on herd level. FABA is also responsible for genetic evaluations. Co-operates with other Nordic countries.

Figen Ltd is a pig breeding company producing the semen, as well as implementing breeding program. It offers a nationwide breeding and advisory services, coordinates the farm testing, monitors the breed registry and offers an application to renew the sown material.

Suomen Hippos (Horse breeding organization in Finland) keeps the horse register and maintains breeding records.

ProAgria takes care of sheep and goat breeding and provides advisory services. The organization collects sheep production data for the national register, that is used for breeding value estimations of sheep and for BLUP-indecies. It also draws up regional and national comparisons and summaries of the collected data. The collected data are used on the farm level for planning of breeding, feeding and health care of animals.

Finnish Poultry Association (in Finnish, Suomen siipikarjaliitto), is an independent association in the poultry sector, and promotes collaboration between poultry farmers, public authorities and diverse companies operating in the poultry industry. The organization improves profitability of the sector, and promotes good animal health by providing diverse services and products for poultry farmers.

Reindeer Herders' Association is a collaborative association of herders promoting reindeer herding and husbandry, research and experiment activities.

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)	no
Sheep	yes
Goats	yes
Pigs	yes
Chickens	yes
Horses	yes
Ducks	no
Geese	no
Quails	no
Turkeys	no
Deer	no

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

Species	Description of policies or programmes
Cattle (specialized dairy)	The National Action Plan supports embryo and semen collections of the native breeds; the development and breeding of the breeds are considered when cryomaterial is collected (donor animals must be healthy, a relative good in production, have good body struture. The low average kinship to other individuals of the breed is of special importance).

Species	Description of policies or programmes
Cattle (specialized beef)	
Cattle (multipurpose)	
Sheep	The National Action Plan supports semen collection of the native breeds; the rams should be healthy, be of different colour types and have a good body structure. In addition they should be represent different lines/families of the breeds.
Goats	The National Action Plan supports semen collection of the Finnish Landrace Goat breed.
Pigs	
Chickens	The National Action Plan supports semen collection of the Finnish Landrace breed. The cocks should be from different Landrace families.
Deer	ELY Centre supports the reindeer herding and nature-based persons carrying on livelihood opportunities and living conditions of the reindeer husbandry and Natural Financing Act (45/2000) form.
Horses	The National Action Plan supports semen collection of stallions showing low average kinship to the rest of the Finnhorse population.

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)	Gene flow between the most popular dairy breed, Finnish Ayrshire, and the other Nordic red cattle has increased. New dairy breeds have been imported which may affect the census sizes of the native cattle breeds.
Cattle (specialized beef)	The current breeding program is less active: all AI bulls are imported.
Cattle (multipurpose)	
Sheep	To improve the meat production, sheep farmers are crossbreeding Finnsheep with Texel or other exotic breeds. According to production control, however, the native Finnsheep can obtain similar kind of daily gain in growth as foreign breeds in Finland. So there is a need for promotion and correct the old preconceptions.
Goats	Lack of breeding policies.
Pigs	The future of own national pig breeding has some challenges.
Chickens	Breeding activities has not seen important => no Finnish breeding material exist anymore. The native chicken breed still exists, but it is mainly a hobby breed and not for commercial use.
Horses	The number of Finnhorse mares mated each year has decreased and is already under the critical minimum threshold value defined for the Finnhorse breeding (2,000 mares). In addition, there is a low interest to breed working horse breeding line of the Finnhorse.

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.

The own national breeding programs have faced international competition. For example, there is no more national poultry breeding. At some extent, the national pig breeding program is also threatened and the Finnish breeding animals partly replaced by breeding material of foreign companies. In general, the infrastructure for animal breeding, performance recording and implementation of breeding programs has high standard and quality in Finland.

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)	The breeding programs for farm animal breeds in Finland aim at balancing between high production capacity, health and fertility traits as well as at maintaining genetic variation in breeding populations by controlling inbreeding and kinship rates of breeding animals. Considering the mitigation of and adaptation to climate change will be a further challenge in animal breeding. A special issue will be preservation of the main dairy breed Finnish Ayrshire as an independent and competitive breed. Also, sustainable conservation of the native Finncattle breeds is challenge that the breeds will be used in active use in animal production. One option is to find add-values for native breeds and their products. In all breeds (native ones and commercial breeds), the maintenance of genetic variation within the breeds is an important, long-term objective.
Cattle (specialized beef)	Reduction of greenhouse gases of beef production by using the most suitable breeds and breeding selection.
Cattle (multipurpose)	
Sheep	Finnsheep should remain as a multipurpose breed and the breed's characters related to the meat production should be improved. In addition, the different colours and high quality of Finnsheep wool should be maintained. In imported breeds, the rate of inbreeding should be carefully monitored. The genetic diversity of the breeds should be maintained. Remarkable part of the Finnsheep population is on herds which do not belong to breeding program and production control; new valuable breeding animals can be found on these farms (for avoidance of inbreeding).
Goats	A well-working goat register is needed in the nearest future. The rate of inbreeding should be monitored. Animals kept by 'hobby-breeders' may be important animal resource for breeding.
Pigs	The breeding program has to be active and competitive. In the program, quality of piglets plays an important role, also boar testing by using standardized conditions are important in order to have a high reliability breeding values.
Chickens	In the conservation of the Finnish landrace Chicken: to calculate genetic parameters (relationships, diversity, possible origin of the breed/lines) to be able to elaborate a preservation strategy for all of the sublines.
Horses	To maintain genetic variation in the Finnhorse and within different (four) breeding lines of the breed. To strengthen the working horse line of Finnhorse.

CONSERVATION

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

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

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

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

Species	In situ conservation	Ex situ in vivo conservation	Ex situ in vitro conservation
Cattle (specialized dairy)	high	medium	medium
Cattle (specialized beef)	n/a	n/a	n/a
Cattle (multipurpose)	n/a	n/a	n/a
Sheep	high	low	medium

Species	In situ conservation	Ex situ in vivo conservation	Ex situ in vitro conservation
Goats	low	low	low
Pigs	n/a	n/a	n/a
Chickens	high	low	low
Horses	low	none	low

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

- yes
 no

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

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

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

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

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

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

Finland has notable conservation herds (in situ conservation) for native breeds of cattle and sheep: Pelso prison farm in Vaala keeps living gene bank for Northern Finncattle, Finnsheep and Kainuu Grey Sheep, Ahlman Vocational College has a living gene bank for Eastern and Western Finncattle and Kainuu Vocational College for Eastern Finncattle. The conservation of the Finnish Landrace Chicken, in turn, is based on a network of 330 hobby-breeders of the breed. The participants in the Conservation Network have currently about 5000 Finnish Landrace hens and cocks.

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.

In the collection of genetic material (embryos and semen) the guidelines given in the National Strategy for the Conservation of AnGR are followed. All native breeds have or will have ex situ in vitro banks (cryo-conservation) and in addition, genetic materials (semen and embryos) of one imported breed (Finnish Ayrshire) have been frozen.

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

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

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)	8	8	yes	no	yes	yes	yes
Cattle (specialized beef)	11	11	yes	no	yes	no	yes
Cattle (multipurpose)	0	0	no	no	no	no	no
Sheep	3	0	yes	no	no	no	yes
Goats	1	0	no	no	no	no	yes
Pigs	6	6	yes	no	yes	no	no
Chickens	1	0		no	no	no	yes
Horses	1	0	yes	no	no	no	yes

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.

Cattle embryos (Eastern, Northern and Western Finncattle) and semen (Eastern, Northern and Western Finncattle, Finnsheep, Kainuu Grey Sheep and Aland Sheep) have been stored in the cryo bank (ex situ preservation). Semen from two Finnhorse stallions has been collected. The collection of semen from the Finnish Landrace Goat and the Finnish Landrace Chicken breed will be commenced in the nearest future. From cattle, sheep, horse, goat and chicken, DNA has been isolated and stored to DNA gene bank.

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

- yes
 no

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

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

The Finnish Landrace chicken has been recovered via the conservation networking and thanks to hobby-breeders' activities. In the beginning of 1980's, there were only 30 Northern and 50 Eastern Finncattle cows left, but the current, respective population sizes (females) are 600 and 800. Less than 100 Aland sheep existed in the 1990's. Living gene banks for the cattle breeds were established and an active conservation program for the Landrace chicken commenced. The breeds were included in various of research projects. A special agricultural subsidy for raising of native breeds has been very important to enhance the population sizes. In addition, the conservation of native rare breeds has obtained publicity in media (TV, radio, newspapers).

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

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

High quality experts are doing research in area of reproduction biotechnologies in Finland. Various technologies are

available for cattle while for other species, the reproduction technologies are used only occasionally and mainly at experimental level.

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

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

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.

In Finland, effective service is available for artificial insemination for cattle and pigs in the whole country. Few development agencies, for instance research institutes, are giving biotechnology services alongside their research activities. That is for instance embryo sexing, freezing embryos etc.

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

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

30.1. Please briefly describe the research.

1. Artificial insemination technology is studied in horses (University of Helsinki) in collaboration with Universität Leipzig, Universitat Autònoma de Barcelona, SLU Sweden, Technical University of Lisbon, University of Latvia and University of Tartu (Estonia).
2. MTT Agrifood Research Finland has conducted embryo research in sheep, cattle and horses for several decades, aiming to deliver practical applications. MTT has research activity on production of bovine embryos, embryo diagnostics and gene expression in cattle embryos. Co-operation with research groups from Canada, Germany and Denmark.
3. At MTT, genomes of prolific breeds of sheep (*Ovis aries*) are investigated in the collaboration with Russian and Chinese research groups.
4. At MTT, research on genomic selection and implementation of quantitative genetics in breeding programs has been conducted.
5. Nordic research network of animal genetic resources in adapting to climate change.
6. Genetic diversity, population structure and genomic structure of north Eurasian cattle and sheep populations has been investigated using diverse set of molecular markers. Also whole-genome sequence data of native cattle and sheep breeds have been analyzed.
7. Genetic diversity in ancient cattle and sheep populations and temporal changes in genetic variation have been investigated.

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

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

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

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

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

Mating and breeding plans for the endangered native cattle breeds are done using a computer program called 'EVA' (the aim is to avoid inbreeding and preserve genetic variation within the breeds) and the recommendation lists are sent by mail to animal owners. At this moment, there are no AI stations for sheep and goat in Finland and the semen collections have been done on the farms. The level of knowledge in goat, sheep and chicken breeding technologies should be strengthened before reproduction technology can be implemented in the AnGR conservation of these species. The capacity to implement reproduction technology in AnGR conservation of sheep breeds has been improved by international networking and demonstrations given by a foreign expert on Finnish sheep farms. There is also a plan to take part in a course on freezing of poultry semen in the nearest future.

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	extensive	There are National Action Strategies for animals, plants and forest trees. These are coordinated by MTT Agrifood Research Finland and METLA The Finnish Forest Research Institute. The Advisory Board on Genetic Resources under the Ministry of Agriculture and Forestry is supervising and monitoring the implementation of the Strategies. In the Board, there are representatives of different ministries, breeding industry, research organizations and NGOs.
Collaboration in the characterization, surveying or monitoring of genetic resources, production environments or ecosystems	limited	Few joint research projects ongoing; mainly on branding of local breeds and varieties.
Collaboration related to genetic improvement	none	Planned
Collaboration related to product development and/or marketing	limited	Some projects about animal and plant genetic resources ongoing. Actions have been planned and funding is sought.
Collaboration in conservation strategies, programmes or projects	limited	There is one Board in Finland that takes care of implementation of the different strategies on genetic resources.
Collaboration in awareness-raising on the roles and values of genetic resources	extensive	Annual publication (news letter) on genetic resources, Board meetings for planning various activities, exhibitions etc.
Training activities and/or educational curricula that address genetic resources in an integrated manner	extensive	Green care -thinking in vocational education and training school is becoming more popular. Research project ongoing in the field of green care.
Collaboration in the mobilization of resources for the management of genetic resources	limited	Collaboarion between different genetic resource disciplines will increase in the nearest future.

2. Please describe any other types of collaboration.

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

Collaboration will play a more important role in the nearest future because the research institutes responsible for genetic resources will merge next year (2015) to form Natural Resources Institute Finland. This brings the actors under the same administration and the share in coordination of the national strategies can be rethought. There are possibilities to collaborate also in cryopreservation of genetic materials and develop joint research projects.

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

The task to manage different genetic resources strategies has been distributed in different research institutes and no strategy for coordination among the animal, plant, forest tree and fish genetic has been developed. However, this will be changed in the nearest future because the institutes responsible for the genetic resource strategies will form one institute in 2015. On the other hand, biological issues related to different species (animals vs plants) are different and it may not have

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

Revision of tasks in different gen-res strategies and develop a plan that would diminish overlapping in coordination work.

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).

Grazing and browsing livestock are kept in traditional rural biotypes and culture landscapes to maintain these rare ecotypes open. Cattle and sheep are the most common species that are used for these purposes. However, the management of landscapes through grazing should be increased in Finland to prevent loss of biodiversity.

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).

A few endangered, valuable landscapes have been saved. In Southern part of Finland and in national parks, the use of grazing animals in preservation of cultural landscape is done currently on the regular basis.

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).

Person who are keeping animals for grazing traditional rural biotype meadows are entitled to receive environmental subsidy.

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

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

- yes
 no

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

The loss of culture landscape due to more intensive agriculture. In the future, genetic resources may play a role in the mitigation of climate change and adaptation to changes in 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).

It has been possible to save some valuable culture ecotypes. Genetically distinct lines (families) within some native cattle and sheep breeds have been in situ preserved by these environmental activities.

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).

New way to utilize less-productive but genetically important native breeds; environmental subsidy for sheep farms has been important to improve the profitability of sheep farming in Finland and thereby the native sheep breeds.

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.

The number of livestock is decreasing; less active farmers who will take care of landscape.

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.

E.g. in Koli National Park in eastern Finland, native cattle and sheep breeds do valuable job to maintain the Finnish cultural landscape. On some islands of the Finnish Gulf, the native sheep breeds are used to maintain the landscape open.

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.

A more detailed strategy should be developed to promote the use of genetic resources in the landscape management. Special subsidy for landowners and farmers would be very useful when they consider genetic resource issues in ecosystem services.

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:

Finland has a relatively long tradition to conserve old native breeds. The first strategy for the conservation of farm animal genetic resources was published already in 1983 by the Ministry of Agriculture and Forestry. Therefore, the implementation of the GPA in 2007 has not had a fundamental influence on the progress of the Finnish Action Plan on animal genetic resources. The Ministry of Agriculture and Forestry nominated a working group for animal genetic resources in 1998. The working group had to deal with conservation and sustainable use and international collaboration for genetic resources of animals in food and agricultural production with the ultimate goal being a preparation of a national strategy for Finland. The country report on conservation of animal genetic resources in Finland was submitted to the FAO in January 2004. Based on this report, a National Action Plan for farm animal genetic resources was developed. The main objective of the National Action Plan is to encourage sustainable use of animal genetic resources and conservation of local breeds. The selection and maintenance of variation is used to improve security of food supply, the profitability and safety of animal production and diversity of production. Active publicity and education has increased awareness on animal genetic resources. The National Action Plan (=Strategy) is coordinated by MTT Agrifood Research Finland. The conservation is based on animals raised on-farm and cryoconservation of semen and embryos. The Advisory Board on Genetic Resources under the Ministry of Agriculture and Forestry is monitoring the progress of the Action Plan.

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:

Phenotypic information of production and other characteristics have been regularly collected. For most of the breeds comprehensive studies had been undertaken before the adoption of the GPA. However, there are few native where there exit problems to collect animals' performance, e.g. in the Finnish Landrace Goat breed and their phenotypic characters are poorly known.

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:

Comprehensive studies genetic markers have been undertaken for chicken, horse, cattle and sheep. For goat a research project is ongoing. Various molecular markers have been used for characterization including whole-genome DNA sequencing and RNA sequencing.

4. Has your country conducted a baseline survey of the population status of its animal genetic resources for all livestock species of economic importance (SP 1, Action 1)?

Glossary: A baseline provides a reference point for monitoring population trends. Population status refers to the total size of a national breed population (ideally, also the proportion that is actively used for breeding and the number of male and female breeding animals).

- a. Yes, a baseline survey was undertaken before the adoption of the GPA
- b. Yes, a baseline survey has been undertaken or has commenced after the adoption of the GPA
- c. Yes, a baseline survey has been undertaken for some species (coverage increased since the adoption of the GPA)
- d. Yes, a baseline survey has been undertaken for some species (coverage not increased since the adoption of the GPA)
- e. No, but action is planned and funding identified
- f. No, but action is planned and funding is sought
- g. No

Please provide further details:

5. Have institutional responsibilities for monitoring the status of animal genetic resources in your country been established (SP 1, Action 3)?

Glossary: Monitoring is a systematic set of activities undertaken to document changes in the population size and structure of animal genetic resources over time.

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

Please provide further details:

MTT Agrifood Research Finland is coonating the National Action Plan/Strategy. Breeding of cattle breeds, horses, pigs and sheep and the collection of census sizes of the breeds are done in the respective breeding organizations (cattle: VikingGenetics and FABA); horse: Finnish Hippos; pigs; Finngen; sheep: ProAgria). EVIRA (Finnish Food Safety Authority) maintains register for sheep and goat. Siipikarjaliitto Ry is monitoring the poultry sector, expect that MTT is responsible for landrace chicken. ProAgria is keeping the register for sheep and goat.

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:

these are not so detailed defined in the National Strategy.

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:

The authorized registers (mentioned above) are updated on a regular basis.

8. Which criteria does your country use for assessing the risk status of its animal genetic resources (SP 1, Action 7)?

Glossary: FAO has developed criteria that it uses to allocate breeds to risk-status categories based on the size and structure of their populations (<http://www.fao.org/docrep/010/a1250e/a1250e00.htm>).

- a. FAO criteria
- b. National criteria that differ from the FAO criteria
- c. Other criteria (e.g. defined by international body such as European Union)
- d. None

Please provide further details. If applicable, please describe (or provide a link to a web site that describes) your national criteria or those of the respective international body:

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

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

Please provide further details:

Trends of different breeds are monitored regularly. Especially breeds with declining trends are under more intensive control. For long-term preservation (e.g. breeds are threatened with extinction or they are having inbreeding problems) semen and embryos have been cryopreserved. Finnish Food Safety Authority EVIRA has a plan for the cases of infectious diseases.

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:

Especially on molecular characterization and breeding value estimation (REML, BLUP, genomic selection, inbreeding, QTL, breeding history). There has been extensive collaboration between both domestic and foreign universities, research centers and industry.

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:

1. The register for the Landrace Goat breed is missing and we do not the population structure of the breed. However, a project to establish the register has recently been launched and the register will be available in 2015.
2. Lack of knowledge in genetic relationship between the Landrace Chicken strains that would have influence on the conservation strategy; however, currently the lab analysis of SNP-markers is in progress.
3. Pig and poultry breeding is commercial international business, not all information is freely available for research and monitoring of genetic resources purposes.
4. lack of molecular characterization for some breeds (goat, reindeer)

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:

1. Funding for goat register, which has now obtained.
2. Funding for research study to DNA-characterize goat and reindeer.

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.

Finland is doing a lot of international collaboration: there have been EU-projects, and Nordic projects and collaboration with Russian, Estonian, Serbian and Chinese research groups to study animal biodiversity. Within the National Strategy, collaboration to conduct breed inventories has been conducted with different breeding organizations of various animal breeds/species.

STRATEGIC PRIORITY AREA 2: SUSTAINABLE USE AND DEVELOPMENT

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

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

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

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

The main objective of the National Action Plan/Strategy is to encourage for sustainable use of animal genetic resources and conservation of indigenous breeds. There is possibility for farmers to obtain special subsidy to keep old native breeds. The active publicity and education are used to increase awareness of animal genetic resources and their conservation. Also breeding organizations promote the maintenance of genetic variation within the breeding populations.

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:

The subsidy policy for native breeds is part of the agri-environmental programme (EU).

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:

For cattle, sheep, horse and pigs there are relevant programmes (for example production efficiency, meat quality and special products like cheese are taken into account in breeding programmes). The breeding work for the Landrace Goat is inefficient. All the commercial poultry hybrids are imported, so we do not have own poultry breeding in Finland.

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:

In Finland, there has been a long tradition for animal breeding. International collaboration is actively done. The decisions in breeding strategies are based on scientific suggestions.

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:

Globalization affects cattle and pig breeding sectors. Currently, the Finnish Ayrshire cattle breed is bred in collaboration with other Nordic Red-and-White cattle breeds and the gene pool of these breeds will be unified. The purebred Finnish Ayrshire will be at risk of vanishing.

Also a major decisions in the pig breeding is done by foreign companies. Currently, there are no national poultry breeding in Finland.

For landrace chicken, goat and reindeer, there is no breeding programmes on-going. In reindeer, the genetic diversity has not yet been monitored. Thus, the genetic distinctiveness of the Finnish reindeer population from other reindeer populations living in nearby areas is not known.

Management of genetic variation in populations with a small effective population size is a challenge in the conservation and developing work of the 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.

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

Please provide further details:

Exotic, i.e. international commercial breeds have displaced local breeds in most species (e.g. native Finncattle have been replaced by Holstein and Ayrshire). Finnsheep is still the most popular sheep breed in Finland, but breeds specialized for meat production have become more common. There have been studies on the risks of breed importing with respect to the good animal health situation in the country.

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

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

Please provide further details:

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

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

Please provide further details:

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

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

Please provide further details:

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

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

Please provide further details:

A working group reviewing the current status, implementation of Nagoya Protocol and future needs.

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

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

Please provide further details:

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

- a. Yes, priorities have been identified or updated since the adoption of the GPA
- b. Yes, priorities were identified before the adaptation of the GPA but have not been updated
- c. No, but action is planned and funding identified
- d. No, but action is planned and funding is sought
- e. No

Please provide further details:

The National Action Plan/Strategy will be revised in 2014.

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:

Niche products (cheese, raw milk and meat) based on the native Finncattle are available, but these products are rare. Also cheese brands made from the Landrace Goat milk are in some shops and meat and wool of Finnsheep are available. Funding has been sought to study quality of landrace chicken eggs and meat as a part of local food chain.

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

Subsidies which are specially targeted for branding of native breeds; positive publicity for the native breeds. Education. Agricultural subsidy policy should support the keeping of rare breeds also in the future. Studies, development, marketing of special products of local breeds need to be done. Breeding and maintenance of genetic diversity within the breeds should be kept in balance.

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.

At MTT Agrifood Research Finland there have been studies on special characteristics of local breeds including opportunities for marketing. Awareness and attitudes of consumers support the popularity of special products based on local breeds. International collaboration in sustainable use and development has been done with NordGen and ERFP. There is continuous research on sustainable breeding goals done in co-operation with breeding industry.

Internationalization of dairy and pig breeding have diminished impact of national programmes. In general, exotic genetic materials have become more popular in breeding work.

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:

Breeds' population structure in terms of inbreeding rate and average kinships are regularly monitored.

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:

Commercial dairy cattle breeds (Holstein & Finnish Ayrshire) are favoured in dairy production and only 1% of dairy cows in Finland belongs to the native cattle breeds. Currently, also the Finnish Ayrshire breed is losing the popularity and the census size is decreasing: more and more Holstein cows also in Finland. The crossing of Finnish Ayrshire with the other Nordic red-and-white cattle breeds diminishes the number of "old type" of Finnish Ayrshire cows. The number of breeding Finnhorse mares that foal annually is currently less than 2000. In general, loss of rare families

within each breed may cause problems in the future.
Small populations may have problems with inbreeding.

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

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

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

Please provide further details:

The first national activity plan was published in 1983. It was revised in 2004.

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:

MTT Agrifood Research Finland is coordinating National Activity Plan animal genetic resource program and a special committee is supervising the actions.

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:

We have three "gene bank herds" in Finland; these locate on Pelso prison farm in Vaala (for Northern Finncattle, Finnsheep and Kainuu Grey Sheep), Ahlman Vocational College's farm in Tampere (Eastern Finncattle and Western

Finncattle) and Kainuu Vocational College's farm in Kajaani (Eastern Finncattle).

Animals are kept there in normal production systems. MTT Agrifood Research Finland collaborates with these farms in the conservation of the native breeds.

The networking conservation program for the Landrace chicken was established in 1998. The network consists of 320 chicken owners and have about 5000 Landrace chickens. The keeping of all native breeds in Finland is supported by special subsidy.

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:

For the native cattle breeds: semen and embryos. Finnsheep, Kainuu Grey Sheep and Ålandsheep: semen. Finnhorse: semen. Finnish Landrace goat: semen. Ex situ cryobanking of Landrace cocks' semen will be started in 2015.

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:

Most of the collection of semen have been planned before the adoption of GPA, but the collection was not completed before that. It is on-going and more action is needed.

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:

We should have publicly supported conservation hers also for Ålandsheep, for the Finish Landrace Goat and should have more active networking among the owners of native breeds. Low number of animals in most of our native breeds prevents effective breeding work. The funding provided for semen and embryo cryobanking is not enough leading to the slow progress in the establishment of long-term storages of genetic materials. In addition, we do not special AI stations for sheep and goat, and semen must be collected and frozen on farms. We need also a better back-up system for the cryoconserved materials. Studies, development, marketing of special products of local breeds need to be done.

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:

cryobanking of sheep, goat, horse and poultry genetic materials is far from sufficient. Also we will have a semen cryobank for the native dog breeds.

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

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

Please provide further details:

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

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

e. No

Please provide further details:

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

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

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

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

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

Please provide further details:

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

1. Updating the National Action Plan and enhancing conservation of sheep, goat, horse, poultry and dog genetic resources.
 2. Strategy for emergency cases of new animal diseases and natural catastrophes.
 3. back-up for cryostorages on different locations.
 4. product branding and marketing to promote the conservation of native breeds.

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.

International co-operation on conservation issues with FAO, NordGen and ERF. To enhance national networking among owners of rare breeds.
Active promoting to raise awareness on local breed has been successful; it has increased the popularity of local breeds. Thus at this moment, the risk for extinction of the local breeds is relatively low.

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:

The Action Plan from the year 2004 will be updated in 2015.

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:

AnGR are mentioned in the new Strategy for the Conservation and Sustainable Use of Biodiversity in Finland published in 2012.

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

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

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

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

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

Please provide further details:

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

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

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

Please provide further details:

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

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

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

The Council of Genetic Resources under the Ministry of Agriculture on Forestry monitors and develops the strategies for animal, plant and forest tree resources. The members of the Board are from ministries, breeding industry, research organizations and NGOs.

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:

The national program is coordinated by MTT Agrifood Research Finland in cooperation with the Ministry of Agriculture and Forestry. The activities and implementation is supervised and followed by The Council of Genetic Resources under the Ministry of Agriculture and Forestry. Stakeholders (breeding organizations etc.) are consulted regularly.

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:

Active publicity (media, internet, events, animal shows, seminars, workshops, brochures, GeeniVarat -annual newsletter about genetic resources), education (university and colleges) are used to increase awareness of animal resources and conservation.

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

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

Please provide further details:

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

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

- f. None, but action is planned and funding is sought
- g. None

Please provide further details:

Research work is an active part of the national program and implementation.

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:

The main organizations and networks have been established before the GPA.

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. Faba (<http://www.faba.fi/en>)
2. VikingGenetics ((<http://www.vikinggenetics.com/en>))
3. ProAgria (<https://www.proagria.fi/>)
4. Hippos (http://www.hippos.fi/in_english)
5. Finnish Poultry Association (<http://www.siipi.net>)
6. The Finnish Landrace Association ((<http://www.maatiainen.fi/english.htm>))
7. The Finnish Native Cattle Association (<http://www.kolumbus.fi/suomenalkuperaiskarja/>)
8. The Finnish Sheep Association (<http://www.lammasyhdistys.fi/>)
9. The Finnish Goat Association (<http://suomenvuohiyhdistys.nettisivu.org>)
10. The Finnhorse Association ((<http://suomenhevosliitto.fi>))
11. The Finnish Workhorse Association (<http://tyohevosseura.fi>)
12. Reindeer Herders' Association (<http://paliskunnat.fi/PoroNet2/>)

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

- a. Yes, adequate research and education institutions have existed since before the adoption of the GPA
- b. Yes, adequate research and education institutions exist because of progress made since the adoption of the GPA

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

Please provide further details:

The education has been tailored to cover at least the basic elements of animal genetic resources management in all levels.

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.

There was a working group which worked under the Ministry of Agriculture and Forestry and worked for a national strategy for the legislation on genetic resources (conservation, sustainable use and access-and-benefit sharing-issues). NordGen has published a book concerning these issues and Finland took part in that.

International collaboration: NordGen, ERFP, and FAO. Active research collaboration with the Nordic and Baltic countries, several European research groups, Russian research groups and Chinese research groups. Finland has actively taken part in EU's Agri Ren Res-projects.

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:

EU-research collaboration, Nordic collaboration, joint research project with Russia and China and collaboration between Central and Eastern European countries.

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:

Breeding companies (VikingGenetics, Lohmann Tierzucht GmbH, Aviagen, Hy-Line, Norsvin, Semex etc).

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:

EU pays 50 or 75% of the special subsidy for the keeping of rare native breeds.

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:

Research collaboration with Africa (ILRI).

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:

Country report preparation in Africa 2003.

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:

National research funding for characterization of Russian, Ukrainian, Polish, Kazak, Caucasian (in general) and Chinese sheep and cattle breeds.

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:

Reindeer-project. European projects to conduct molecular genetic characterization of sheep and cattle genetic resources.

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:

Co-operation in molecular genetic studies on cattle, sheep, horse and chicken breeds.

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:

Sheep SNP BeadChips that were developed by the International Sheep Genome Consortium.

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:

Nordic collaboration promoted by NordGen.

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

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

Please provide further details:

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

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

Please provide further details:

A common Nordic DNA-bank for the Nordic farm animal breeds for future research purposes.

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:

EU's Agr Gen Res -projects; ERFP working group SUBSIBREED.

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:

ERFP working groups of cryoconservation, SUBSIBREED, NordGen,

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
Considering climate change effects on conservation of animal genetic resources; how to mitigate and adapt to climate change	Climate change will have fundamental effects on animal production.	Research work, workshops, practical advice for the implementation

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