



Ad Hoc Action Strengthening national capacities towards the development of a national Gene Bank strategy

Lead: Christina Ligda and Fernando Tejerina Ampudia

Ex situ WG meeting, 2 June 2021



Ad Hoc Action

Strengthening national capacities towards the development of a national Gene Bank strategy

Participants AHA:

| | |
|------------------------------------|-------------------------------|
| Lumturi Papa (Albania) | Anna Caroline Holene (Norway) |
| Beate Berger (Austria) | Ewa Sosin (Poland) |
| Michele Teixeira Boichard (France) | Rosa Lino (Portugal) |
| Christina Ligda (Greece) | Srdjan Stojanovic (Serbia) |
| Dimitrios Tsiokos (Greece) | Tina Flisar (Slovenia) |
| Sharon Walshe (Ireland) | Fernando Tejerina (Spain) |
| Gustavo Gandini (Italy) | |

**Ad Hoc Action****Strengthening national capacities towards the development of a national Gene Bank strategy****Background:**

Despite the awareness raised by the GPA, the ERFP WG *ex situ*, EUGENA and the IMAGE project, and several initiatives at national level and the recognition of the urgent need to proceed with a national plan for *ex situ* conservation of AnGR complementary to the ongoing *in situ* conservation programs, there are still **significant drawbacks that impede this development.**

**Ad Hoc Action****Strengthening national capacities towards the development of a national Gene Bank strategy****Objective:**

The proposed Ad hoc action aims to strengthen the national capacities for the management of AnGR and specifically on the *ex situ* conservation actions (development of a national GeneBank).

Assess current situation, needs and barriers and define solutions and priorities to support national efforts towards the development of a national cryo-conservation strategy.

**Ad Hoc Action****Strengthening national capacities towards the development of a national Gene Bank strategy****Workplan:**Contact members of the *ex situ* WG

Responses from 11 countries

Develop a questionnaire (with two parts)

To assess current situation and main drawbacks

Hold 3 meetings (on line) + work by distance

To define and rank drawbacks

Workshop, 26 May

– AHA group, ex situ WG, NCs

Aim: to identify solutions**Ad Hoc Action****Strengthening national capacities towards the development of a national Gene Bank strategy**

A questionnaire was designed with the next structure:

Part A. GENERAL INFORMATION.

- Organization in the country of the AnGR management and Ex situ conservation (National Plan of Action, Advisory Committee, Genebanks, EUGENA...).
- Breeds with material/enough material stored in genebanks.

Part B. ASSESSMENT OF CURRENT SITUATION (EX SITU CONSERVATION).

- Role of different actors in the Ex situ conservation, human and technical capacities, and collections of public bodies (ministries, regional governments, AI public centers, research Institutes) and private bodies (breeding societies, private companies, NGOs).
- Ex situ conservation in breeding programs.
- Legal framework.
- Organizational aspects of Genebank.
- Technical aspects.
- Funding.

11 answers from: Albania, Austria, France, Greece, Italy, Norway, Poland, Portugal, Serbia, Slovenia and Spain.



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Key findings from general information (Part A) and role of actors in ex situ conservation (Part B).

In all countries many breeds have no material or not sufficient material in gene banks, this is the most relevant gap in the ex situ conservation activities. The situation varies by country and some have more developed collection than others.

In general countries with more developed collections have designed an AnGR Plan of Action, have National Advisory Committees, National Genebanks and/or registers of Genebanks.

Regional/breeding associations Genebanks are not always essentials for the ex situ conservation strategies (country dependent).

The ministries (Agriculture) have a central role in the organization of AnGR conservation strategies. In several cases by delegating the functions in other organizations.

The main actors in the ex situ conservation strategies are public AI centers, research institutions/universities and breeders associations.

Other actors (Private companies, NGOs,) have less relevant in the current ex-situ conservation strategies



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Key findings from assessment of current situation (Part B)

The development of collections between species follow different speeds: Cattle, sheep, goats are more advanced, followed by pigs (issues with fertility), rabbits, poultry (differ among countries), horses (less experience)

Type of material: semen is the most common material storage and collections of embryos and oocytes are less developed, depending on species and human capacities per country.

In endangered breeds with small population size the concern is on the genetic diversity aspects, which makes more difficult the selection of donors.

Available funds, very small number of males in some breeds and a lack of a prioritization limits the collections of sufficient material per breed

Written agreements between Breeding Associations and Genebanks are essential tools, to reach these agreements is recommended establish a decision making process.

In some countries, breeding programs have as objective (or obligation) to contribute to the Genebank, not in all.

The support from AI Public Centres is a key element, but in some countries developing GeneBanks is not a priority for their AI Public Centres.

EU Regulations on national aids and on Rural Development Programs allow the funding of genebanks, but not all countries take advantage of these regulations

Derogations in Animal Health Regulation for the use of old material or collection on field are highly recommended.



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Key findings from assessment of current situation (Part B)

Identification of every institution that is working on ex situ activities is a relevant step to organize and coordinate these institutions in a common strategy.

The research projects could play a key role in the collection of material.

Ex situ conservation demands a regulation and a coordination among the actors involved.

Other relevant gaps: Financial support (and prioritization for weakest breeder associations), human and technical capacities, awareness of ex situ conservation, dissemination among farmers, information systems, commitment and set priority on the *ex situ* conservation activities.

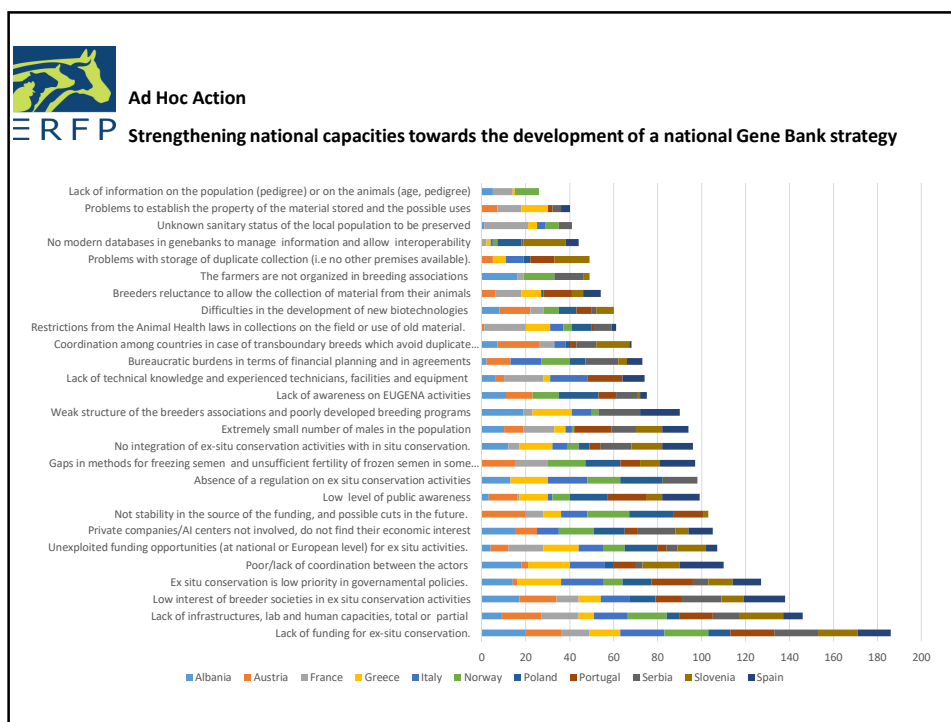


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Process followed:


- Use of metaplan strategy to define the main drawbacks
- Countries were asked to send a list of drawbacks
- The drawbacks received were grouped together in a unique list of 27 drawbacks
- Send back to participants (countries) that ranked the drawbacks (from 1 to 20)



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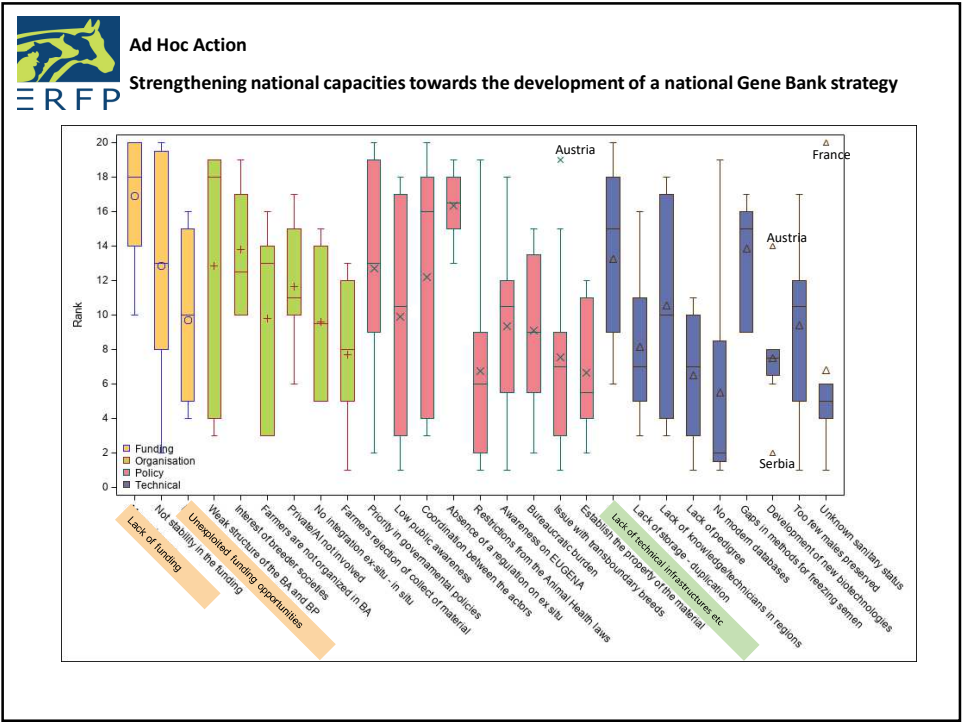
| Category | PROPOSALS OF DRAWBACKS AND OBSTACLES FOR DEVELOPMENT EX SITU CONSERVATION | Albania | Austria | France | Greece | Italy | Norway | Poland | Portugal | Serbia | Slovenia | Spain | Total |
|----------------------------------|--|---------|---------|--------|--------|-------|--------|--------|----------|--------|----------|-------|-------|
| Funding | Lack of funding for ex-situ conservation. | 20 | 10 | 13 | 14 | 20 | 20 | 10 | 20 | 20 | 18 | 18 | 186 |
| Technical | Lack of infrastructures, lab and human capacities, total or partial (either depending on the species (i.e. available for the cattle / not for other species), or on the population size (i.e. not available for endangered breeds)) | 9 | 18 | 17 | 7 | 15 | 18 | 6 | 15 | 12 | 20 | 9 | 146 |
| Policy | Ex situ conservation is low priority in governmental policies. Poor/lack of coordination between the actors (within Public bodies, and between Public / Private) involve in ex situ conservation activities and lack of accurate knowledge of all existant collections. | 14 | 2 | | 20 | 18 | 9 | 13 | 18 | 7 | 11 | 13 | 127 |
| Policy | Low interest of breeder societies in ex situ conservation activities | 12 | 2 | | 12 | 16 | | 4 | 10 | 3 | 17 | 20 | 110 |
| Organisation of livestock sector | Unexploited funding opportunities (at national or European level) for ex situ activities. | 17 | 17 | 10 | 10 | 13 | | 12 | 12 | 18 | 10 | 18 | 138 |
| Policy - funding | Private companies/Al centers not involve in the ex situ conservation activities, even if they have big collections of material, because they do not find their economic interest | 4 | 8 | 16 | 10 | 11 | 10 | 15 | 4 | 5 | 13 | 5 | 107 |
| Organisation of livestock sector | Not stability in the source of the funding, and possible cuts in the future. | 10 | 10 | | | 20 | 10 | 14 | 6 | 12 | 8 | 11 | 105 |
| Funding | Low level of public awareness, in general and in the farmer's community in particular, about the conservation of AnGR. | | 20 | 8 | 8 | 12 | 18 | 20 | 14 | | | 2 | 103 |
| Policy - society | Absence of a regulation on ex situ conservation activities (i.e. no recognition an institution as a Genebank) | 3 | 13 | 1 | 13 | 2 | 8 | 17 | 18 | | 7 | 17 | 99 |
| Policy - legal | Gaps in methods for freezing semen and insufficient fertility of frozen semen in some species (i.e. horse, poultry) | 17 | | | 17 | 18 | 15 | 18 | 18 | 18 | | | 98 |
| Technical | No integration of ex-situ conservation activities with in situ conservation. | | 15 | 15 | | | 17 | 16 | 9 | | 9 | 16 | 97 |
| Organisation of livestock sector | Extremely small number of males in the population intended to be preserved. | 12 | | 5 | 12 | 7 | 2 | 5 | 2 | 14 | 14 | 14 | 86 |
| Technical | Weak structure of the breeders associations and poorly developed breeding programs, which not allow the development of ex situ conservation activities. | 10 | 5 | 14 | 5 | 3 | 2 | | 17 | 11 | 12 | 12 | 84 |
| Organisation of livestock sector | | 19 | | 4 | 18 | 9 | 3 | | | 18 | | 18 | 90 |




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| PROPOSALS OF DRAWBACKS AND OBSTACLES FOR DEVELOPMENT EX SITU CONSERVATION. | | Albania | Austria | France | Greece | Italy | Norway | Poland | Portugal | Serbia | Slovenia | Spain | Total |
|--|--|---------|---------|--------|--------|-------|--------|--------|----------|--------|----------|-------|-------|
| Category new | | | | | | | | | | | | | |
| Policy - society | Lack of awareness on EUGENA activities | 11 | 12 | | | | 12 | 18 | 8 | 10 | | 1 | 75 |
| | Lack of technical knowledge and experienced technicians, facilities and equipment in different regions of the country (including specific problems in islands) | 6 | 4 | 18 | 3 | 17 | | | 16 | | | 10 | 74 |
| Technical | Bureaucratic burdens in terms of financial planning and in agreements between the government and breeders associations to develop genebanks. | 2 | 11 | | | 14 | 13 | 7 | | 15 | | 4 | 73 |
| Policy | Coordination among countries in case of transboundary breeds which avoid duplicate efforts. | 7 | 19 | 7 | | 5 | | 2 | 3 | 9 | 19 | 1 | 68 |
| Policy | Restrictions from the Animal Health laws in collections on the field or use of old material. | 1 | 19 | 11 | | 6 | 4 | 9 | 1 | 8 | | 2 | 61 |
| Policy - legal | Difficulties in the development of new biotechnologies (ET, IVF, freezing of oocytes, gonad grafting, etc.). | 8 | 14 | 6 | | 7 | 8 | 7 | 2 | 8 | | | 60 |
| Technical | Breeders reluctance to allow the collection of material from their animals, afraid to loose ownership on their animals. | | 6 | 12 | 5 | | | 1 | 13 | | 5 | 8 | 54 |
| Organisation of livestock sector | The farmers are not organized in breeding associations, which are necessary to establish herd books and for the implementation of conservation programs. | 16 | | 3 | | 14 | | | 15 | | 3 | | 49 |
| Organisation of livestock sector | Problems with storage of duplicate collection (i.e no other premises available). | | | 5 | | 6 | | 3 | 10 | | 16 | | 49 |
| Technical | No modern databases in genebanks to manage the information and allow the interoperability with other databases (i.e. breeders associations database to choose the donors). | | | 2 | 2 | 1 | 2 | 11 | | 1 | 18 | 6 | 44 |
| Technical | Unknown sanitary status of the local population to be preserved | 1 | | 20 | 4 | 4 | 6 | | | 6 | | | 41 |
| Technical | Problems to establish the property of the material stored and the possible uses allowed for this material | | 7 | 11 | 12 | | | | 2 | 4 | | 4 | 40 |
| Policy - legal | Lack of information on the population (pedigree) or on the animals (age, pedigree) intended to be preserved. | 5 | | 9 | 1 | 11 | | | | | | | 26 |
| Technical | | | | | | | | | | | | | |





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Solutions

Funding

- Calculate costs
- Compare costs (and potential losses)
- Strategic analysis for long-term funding
- Opportunities from EU programmes (RDP)
- Opportunities from EU Research Grants
- Breeding organisations –fund the Ex-situ collections / Small breeding organisations can get some extra funding from the Norwegian Agriculture Agency (annual project application).
- Small grants to Breeders Societies
- Distinction between funds for conservation/activity and funds for conservation/research
- Reduce collection targets

Organization of livestock sector

- Distinguish cryopreservation for preservation / cryopreservation for industrial dissemination
- Build interest showing benefits – develop awareness
- Education activities
- Support breeders associations
- Capacity building for breeders
- Complementarity with in situ
- Include cryopreservation in any conservation programme
- Develop modern Genebanks



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Solutions

Policy

- Established National Plan and National Strategy
- Long-term mandate
- Legal documents, clear breeders' rights
- Cooperation with animal health services
- EUGENA to exchange across countries
- Networking – coordination between countries (i.e. transboundary breeds) (exploit the ERFP experience / global commitments)

Technical issues

- Research and training to improve methodologies for cryoconservation in species lacking routine techniques
- Molecular tests for pedigree testing
- Molecular tests to assess the sanitary status of the material collected instead of that of the entire flock
- Official document recognising the skills of AI technicians in cryoconservation for a range of species
- Cooperation within and between countries (gain from expertise / overcome gaps).

**Ad Hoc Action****Strengthening national capacities towards the development of a national Gene Bank strategy****Thank you!**

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