



An update on AEGIS – with special reference to in situ/on-farm conservation

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**Towards the establishment of genetic reserves for CWRs and landraces in Europe
ECPGR *In Situ* and On-Farm Network
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Content of presentation

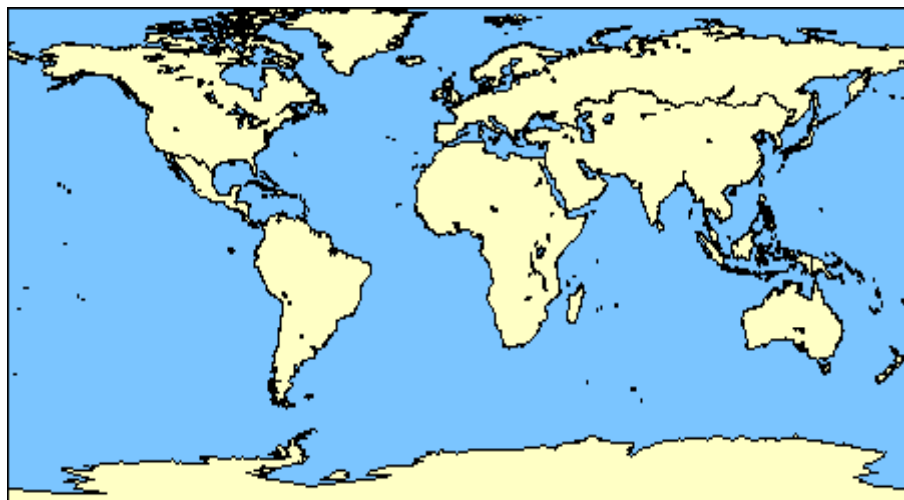


1. Historical background
2. Establishment, milestones and key components of AEGIS
3. Perceived benefits of AEGIS
4. The European Collection
5. AQUAS – development of a quality management system
6. Issues on including *in situ*/on-farm germplasm

Background ECPGR



■ Worldwide



- about **1,800** genebanks/collections
- Approx. **7.5 million** accessions
- Estimated 2 million unique
- About **700,000 (18%) CWR** and **1,700,000 (44%) landrace** accessions out of 3.8 million acc. with status info, held in **724/901 genebanks (SoW Report II)**

■ Europe



- App. **625** genebanks/germplasm coll.
- **> 2 million** accessions
- 30-40% unique (estimate)
- Example: approx. **84,351 wild spp** and **268,013 landrace** accessions of about 1.1 mill. acc in EURISCO; **119/223 genebanks**

Historical background



ECPGR:

- Reported **difficulties in PGR maintenance**:
 - ✓ lack of long-term conservation facilities
 - ✓ insufficient safety-duplication
 - ✓ regeneration backlogs
 - ✓ inhomogeneous quality of material
- Discussed options for **sharing conservation** responsibilities in Europe already in 1998
- SC decided in 2003 to initiate an integrated European genebank system **feasibility study** (4 model crops, incl. vegetatively propagated *Allium* and Brassicas) in 2004
- SC decided in 2006 to establish AEGIS

Selection of Model Crops



- **Seed propagated** material – annual
- **Annex I crops** of ITPGRFA

■ *Avena*

selfing



■ *Brassica*

outcrossing



-
- **Vegetatively propagated** material – biennial and perennial
 - **Non Annex I** of ITPGRFA

■ *Allium*
(*Veg. propag.*)



■ *Prunus*



AEGIS Objective



To create A European Genebank Integrated System for plant genetic resources for food and agriculture, aimed at **conserving the genetically unique and important accessions for Europe** and **making them available** for breeding and research. Such material will be safely conserved under conditions that **ensure genetic integrity and viability in the long term.**

AEGIS Objective



(Additional text from Strategic Framework Policy paper:)

***Ex situ* conservation** of germplasm will be carried out according to common, agreed quality standards, independently of where the germplasm is physically located, and will be carried out in such a way that it will facilitate close linkages with ***in situ* conservation**, and will facilitate the use of and research into the germplasm.

Current germplasm scope of AEGIS



AEGIS focuses primarily on the conservation and use of **genetically unique** and **important accessions** of PGRFA (**as per IT + medicinal and ornamental spp**) for Europe of **agricultural and horticultural species** and **their wild relatives** of European origin or such species as have been introduced, that **exist in genebanks** of the AEGIS member countries, that are of importance for **breeding and research** in Europe and that are **in the public domain**.

Establishment and milestones of AEGIS



1. ECPGR SC decision to initiate establishment of AEGIS in 2006
2. ECPGR Secretariat to coordinate; an AEGIS Coordinator appointed
3. Feasibility studies for 4 model crops conducted (2004-2008)
4. Strategic framework policy guide agreed (2008)
5. Memorandum of Understanding (MOU) developed and sent for signature to all ECPGR member countries in 1st half of 2009
6. Currently **22** countries have signed MOU



A European Genebank Integrated System



AEGIS > Membership > Member countries

About AEGIS

Membership

> **Member countries**

> Associate Members

Structure

Implementation

Documents

AEGIS Member Countries

The following countries have signed the MoU:

1. **Albania** (6 May 2009)
2. **Azerbaijan** (16 July 2009) - [Associate Members](#)
3. **Bosnia and Herzegovina** (19 May 2010)
4. **Bulgaria** (2 December 2009) - [Associate Members](#)
5. **Cyprus** (15 September 2009) - [Associate Member](#)
6. **Czech Republic** (23 July 2009)
7. **Denmark** (22 February 2010)
8. **Estonia** (22 May 2009) - [Associate Members](#)
9. **Finland** (2 December 2009)
10. **Georgia** (18 May 2009) - [Associate Member](#)
11. **Germany** (9 September 2009) - [Associate Members](#)
12. **Ireland** (22 July 2009)
13. **The Netherlands** (28 May 2009) - [Associate Members](#)
14. **Norway** (17 August 2009)
15. **Poland** (17 May 2010)
16. **Portugal** (20 November 2009)
17. **Romania** (14 April 2010)
18. **Slovakia** (16 June 2009)
19. **Slovenia** (21 September 2009) - [Associate Members](#)
20. **Switzerland** (27 May 2009) - [Associate Member](#)
21. **Ukraine** (30 April 2009)
22. **United Kingdom** (21 June 2010)

Establishment and milestones of AEGIS



7. Agreement on development of AQUAS; discussion paper
8. Agreement on requirements and criteria to select MAAs
9. Competitive Small Grant Scheme launched (to facilitate establishment/operation process); 18 proposals received; 3 awarded.

New Call foreseen for late Autumn 2010!

10. EUROGENEBANK proposal submitted to FP7 Research Infrastructure Call; met threshold but not selected for funding; consideration to re-submit for 2012 Call

Key components of AEGIS



1. A **Strategic Framework** for the Implementation of a European Genebank Integrated System - A Policy Guide
2. Formal **agreement** with countries (MOU) and institutions within countries (Associate Membership)
3. **European Collection** (contains identified and by countries agreed MAAs for each crop; in public domain; readily available)
4. **Generic and crop specific standards**



Key components of AEGIS



5. Quality management system (reporting; monitoring; capacity building)
6. EURISCO as information portal for European Collection



35*. AEGIS Status

(AEGISSTAT)

The coded status of an accession with regard to the European Genebank Integrated System (AEGIS).

Provides the information, whether the accession is conserved for AEGIS.

0 – not part of AEGIS

1 – part of AEGIS

If the AEGIS status is unknown, the field stays empty

7. Dedicated AEGIS website:



A European Genebank Integrated System

AEGIS > About AEGIS

 Search

About AEGIS

- > Objectives
- > Benefits
- > European Collection
- > Role of Members
- > Role of Associate Members
- > AQUAS
- > Relationship of AEGIS with ECPGR
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Membership

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About AEGIS



The AEGIS initiative is the brain child of the European Cooperative Programme for Plant Genetic Resources (ECPGR)¹. At the present time, plant genetic resources for food and agriculture (PGRFA) in Europe are conserved in some 500 institutions scattered over more than 40 European countries. While coordination of activities is carried out within the framework of the ECPGR and the ECPGR Crop Working Groups, each genebank basically operates on its own, providing for the conservation of a full range of crop germplasm important for agriculture in the area it serves.

With this in mind, the countries of the European region believe that there is a need to improve coordination and share responsibilities with respect to the conservation of, management of and access to PGRFA in Europe by setting up AEGIS.

The legal mechanism for establishing AEGIS is the Memorandum of Understanding (MoU) entered into by eligible countries of the region and the European Commission. The MoU sets out their commitments as full Members of AEGIS and the main lines of AEGIS. To be eligible for membership, the countries listed must be members of ECPGR, and either Contracting Parties to the Treaty or otherwise willing to make PGRFA under their jurisdiction available under the conditions of the Treaty.

The MoU comes into force on its signature by [at least 10 eligible countries](#). The MoU is supplemented by a series of Associate Member Agreements for the individual genebanks that wish to become part of AEGIS.

The [Associate Member Agreements](#) is entered into by the genebanks with the ECPGR National Coordinator for the country concerned, who undertakes to work with the genebank in implementing AEGIS, and who is ultimately responsible for overseeing the genebank's compliance with its obligations under the agreement.

¹ ECPGR was founded in 1980 on the basis of the recommendations of the United Nations Development Programme (UNDP), the Food and Agriculture Organization of the United Nations (FAO) and the Genebank Committee of the European Association for Research on Plant Breeding (EUCARPIA). It is a collaborative Programme among most European countries, aimed at facilitating the long-term conservation on a cooperative basis of plant genetic resources in Europe and their increased utilization. The Programme, which is entirely financed by the participating countries and is coordinated by a Secretariat at Bioversity International, operates through broadly focused Networks dealing with groups of crops or general themes related to plant genetic resources.

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RELATED INFORMATION



The International Treaty

Highlights

EUROGENEBANK PROPOSAL SUBMITTED

In response to the Seventh Framework Programme call FP: INFRA-2010-1.1.7, Plant Genetic Resources Centres, Bioversity International has coordinated the preparation of the project proposal **EUROGENEBANK**.

The proposal was submitted on **3 December 2009**. For more information on the submitted proposal, [click here](#)



Perceived Benefits of AEGIS



- Improved **security of germplasm** through long-term commitment and systematic safety-duplication
- Facilitated access to and **availability** of germplasm
- Improved **quality standards** of conserved material
- **Cost efficient** conservation activities
- **Reduced duplication** of germplasm material
- Improved **sharing of knowledge** and information

AEGIS and the European Collection



- European Collection will consist of **dispersed accessions (MAAs)**, i.e. a virtual European genebank
- Through signing the **MOU** countries accept responsibilities for **long-term conservation** and **availability of EA**, and to
- Conserve/manage according to **quality standards**
- **Conservation/management strategies** for each crop are prepared by respective Crop WG/NCG and approved by SC
- For the time being, “work in progress”!

AQUAS – AEGIS quality system



- Development of a **quality management system**, including generic and crop operational standards, reporting and monitoring
- **Discussion paper** endorsed by SC; on the AEGIS website
- Brassica, Forages and Grain legumes WGs are invited to test the template for an **operational genebank manual**
- Draft of **generic genebank standards** by Secretariat

ECPGR and *in situ*/on-farm conservation



1. The very first ECPGR objective states: “To facilitate the long-term ***in situ* and *ex situ* conservation** of PGR in Europe”
2. Since 2000 the **In situ and On-farm Network** exists
3. A number of outstanding **achievements**
4. ECPGR strategy predominantly **focuses on *ex situ* conservation**
5. So far ***in situ*/on-farm conserved germplasm** has not been considered as part of AEGIS

ECPGR and *in situ*/on-farm conservation



6. Recommendation of the recent ECPGR External Review states:

“Fully integrate in situ and on-farm activities in The European Genebank Integrated System (AEGIS), expanding in a second step the Genebanks’ ex situ coverage to both in situ crop relatives’ populations and on farm managed landraces; this will imply to expand EURISCO’s structure, in order to include relevant data for the management of the in situ and on-farm components”

7. Consequently, the assessment of how this could be implemented has to be undertaken!

What are the questions/ issues?



1. What would in situ and on-farm “accessions” have to comply with for inclusion into AEGIS?
 - a) To be identified as “genetically unique and important” population/landrace (incl. definition of an in situ/on-farm “accession”!)
 - b) To be placed by the respective country into the public domain
 - c) Country to accept long-term conservation responsibility
 - d) To be available for distribution (together with relevant information)
 - e) To be managed in accordance with to-be-established standards

What are the questions/ issues?



2. What kind of adjustments need to be undertaken in AEGIS?
 - a) A Steering Committee decision on the inclusion of in situ and on-farm material is required
 - b) Scope of the AEGIS MOU will need to be expanded to include in situ and on-farm managed germplasm
 - c) Adjustments of MOU text will be required
 - d) In situ and On-Farm Network will have to assume technical and coordinating responsibilities
 - e) Adjustments in EURISCO will be required to allow relevant information to be included

What are the questions/ issues?



3. What kind of tools and procedures need to be developed in order to allow quality management?
 - a) Protocol /manual of currently followed management procedures by Associate Member Institutions
 - b) Generic technical management practices/standards for in situ/on-farm material
 - c) Species specific technical standards/requirements (e.g. minimum population size; specific management practices; etc.)
 - d) Reporting and monitoring procedures

Possible next steps



1. Decision by In Situ and On-Farm Network to aim at inclusion of in situ germplasm into AEGIS
2. Obtaining formal agreement of Steering Committee with this expansion of AEGIS (based on supporting documentation, incl. the benefits of such decision)
3. Initiating various development and adjustments steps as described in previous slides (i.e. definition of in situ/on-farm accession, MOU, AQUAS, EURISCO, others?)
4. Note: suggested to take full advantage of similar developments on FGRs by EUFORGEN (i.e. EUFGIS; definition of minimum requirements; standards; etc.)



Thank you
for your
attention!

The EUFGIS example



1. **EUFGIS information system** will include data on **gene conservation units** which are **established for these reasons**, have a **designated status** as gene conservation areas of forest trees **at national level**, and which are also **managed for this purpose**. Only those seed stands which **meet the minimum requirements can be included** in the information system.
2. **26 fields in EUFGIS** and their respective standards have been agreed.
3. The above could be "**translated**" to (largely annual) crop species and arrangements need to be made in **EURISCO** to provide for the required fields.

The EUFGIS example



Minimum requirements (as for European Information System on Forest Genetic Resources -**EUFGIS**):

- a) Define '**the dynamic gene conservation unit**' and increase awareness of **how such units should be managed** so that they contribute long-term gene conservation, i.e. maintenance of evolutionary processes within tree populations. This document also serves as a check list for national focal points before they start entering data into the EUFGIS information system.
- b) The units should have a **designated status** as gene conservation areas of forest trees at national level. **The units can be located in forests managed for multiple uses, protected areas or seed stands.**

The EUFGIS example



- c) The **appropriate minimum population size** of a unit depends on (tree) **species** and **conservation objectives** as follows ;
- 1) **500 or more reproducing trees** (when the objective is to conserve gene diversity of **widely occurring and stand-forming conifers or broadleaf species**),
 - 2) **50 reproducing trees** (when the objective is to conserve **adaptive or other traits in marginal or scattered tree populations**) or
 - 3) **50 seed bearing trees** (scattered tree species with **sexual dimorphism**), and
 - 4) **15 unrelated reproducing trees** (when the objective is to conserve **remaining populations of rare or endangered tree species**).

The EUFGIS example



- d) One or more tree species should be recognized as **target tree species** for each unit. This means that the management efforts for the purpose of gene conservation are being carried out to equally favour these species. If a unit has several target species, **each target species must meet the appropriate minimum population size**
- e) The **management** of the units should aim to **maintain and enhance the long-term evolutionary potential of tree populations**. This means that management measures and silvicultural techniques are applied, as needed, to **favour genetic processes** that maintain the long-term viability of target tree populations

The EUFGIS example



- e) The **monitoring** of the units should be carried out by **visiting** them regularly to **observe** that they still serve their purpose and that they have not been damaged or destroyed. A **comprehensive assessment** of the units should ideally be carried out through **systematic field inventories** conducted every 5 or 10 years.
- f) An expert group recommended that the **minimum size** of a gene conservation unit **can be adjusted** according to tree species and specific conditions