Incremental Costs Analysis of AEGIS

(Summary of inputs from AEGIS meeting in Poland)

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The implementation of AEGIS will generate benefits to the institutions involved in the conservation of plant genetic resources in Europe. This implementation however also represents costs that are related to the setting up, running and management of AEGIS. An incremental costs analysis can help to understand if the additional benefits overcome the additional costs. While an incremental costs analysis is rather a qualitative analysis, quantitative approximations can be used to support the analysis (see table below).

Global benefits that AEGIS will bring are: a better management and conservation of European Plant Genetic Resources and an improved coordination and collaboration among members. These benefits can be disaggregated in several components: coverage of the gene pool, quality of the materials conserved, availability of the materials and of the related information, redundancy, knowledge transfer, integration and participation. It is clear that with AEGIS in place there will be a great potential for a larger coverage of the gene pool since the identification of gaps and collection efforts will be better targeted. AEGIS will improve the quality of the materials since the system will adopt uniform quality standards. Better quality accessions can in turn increase the average regeneration period, and thus reduced the costs of regeneration in the long run. The integrated system can also help to improve the availability[1] of the genetic materials and related information and thus accelerate the respond to users' requests. With a more consistent and reliable database the problem of redundancy and duplicates can be tackled more effectively. This can eventually lead to a deeper compromise by the members to reduce the unnecessary duplication in the system and therefore to a considerable cut on operational costs across the system. Another expected benefit of AEGIS is a larger participation and integration. There is some collaboration among countries and institutions that work on conservation of plant genetic resources in Europe but this collaboration and trust can still be considerably enhanced.

The global costs of AEGIS[2], on the other hand, can be disaggregated in costs related to: coordination of AEGIS, identification of most appropriate accessions (MAA), database management, adoption of AEGIS quality standards, and more specific costs related to promotion, publication and fund raising activities for this initiative. For an integrated system to work greater coordination is needed. The coordination costs can be measured as number of meetings organized annually, increased communication costs, and number of positions created. The identification of MAAs and the database managements can be directly estimated as number of man hours (days) needed to complete the activities. A more complex costs component is the implementation of quality standards. Some genebanks have adopted sophisticated

[1] It is a formal responsibility of the associate members to facilitate access to and availability of AEGIS accessions, using a Standard Material Transfer Agreement (SMTA).

[2] At the moment the costs should be split between national governments (the maintenance costs) and ECPGR (extra costs such as coordination), until other sources can be identified.

quality systems, and in that case the additional costs with AEGIS will be minimal. Other genebanks will have to invest on the amelioration of their quality systems. At this point there are several observations specific to the genetic materials. In the case of Allium for instance, a clear additional costs will be cryopreservation of the MAAs. It is important to mention that in kind contributions from national governments will be needed to make AEGIS functional.

Table 1. Incremental Costs Analysis of AEGIS

Incremental Costs Analysis	Baseline (B) Current situation	Alternative (A) AEGIS	Increment (A-B)
Global Benefit:	The management of conservation of plant genetic resources is the responsibility of individual institutions / countries. The accessions are conserved under different quality standards and there is considerable duplication across institutions.	- Better management and conservation of European Plant Genetic Resources - Improved coordination and collaboration	
Coverage of the gene pool:	Current average collection costs **Total** €	- Better identification of gaps in the collections - Reduction in acquisition /collection costs Expected decrease € **Total** €	
Quality of the materials conserved:	Regeneration costs per genetic material can be determined by multiplying the number of institutions and the average annual expenditure on regeneration.	- Improved ex-situ conservation of European genetic resources - Percentage of accessions meeting the crop specific standards - Increased of MAA accessions (because they meet the standards) - Increased in the average regeneration period - Expected decrease in regeneration costs in the long run (in similar proportion to decrease in duplication 35%)	
Availability of materials Functional benefits to the users		- Increased availability of germplasm (No. shipments) - Availability of non-annex 1 material (no. shipments)[3] - Length of the period from request to shipment	

[3] Not for CGN, they treat materials as Annex 1

Incremental Costs Analysis	Baseline (B) Current situation	Alternative (A) AEGIS	Increment (A-B)
		- Percentage of successful requests[4] - Greater transparency	
Availability of information Facilitating use:	Current number o accessions with complete information in EURISCO	- Increased information, quantity and quality (missing information in database) - Accessions evaluated - Accessions characterized - Improved information systems (information available in EURISCO)	
Redundancy	**Duplicates** - 500 Genebanks - 40 Countries - 2 million accessions - Average costs of maintaining 1 accession (including Safety duplication) per accession €10 per year[5] **Total costs €20 million per year**	**Focus on unique accessions** - 500 Genebanks - 40 Countries - 35% of accessions are unique[6], this means that the focus would be on about 700,000 accessions–1 million accessions - Average costs per accession €10 **Total cost €7 – 10 million per year**	**Incremental benefit € 10 – 13 million per year**

[4] This is because information quality is improved and also because AEGIS genebanks are following standards, and one of the consideration is the minimum number of seeds.

[5] The costs of maintaining one accession in a genebank (conservation, distribution) vary considerably depending on the type of material. A value of €10 / accession is a very conservative and lays more on the lower end of the range. Koo et al (2002) reported costs that vary from approximately €7 to 170 in the CG system. These estimations were done a few years ago and they do not include for instance cryopreservation costs. The European system also has different operational priorities than the CG system, for instance acquisition of materials is a more active operation for the Europeans banks than it is for the CG system. This can significantly affect costs.

[6] Source: Plucknett et al. 1987, FAO 1988)

Incremental Costs Analysis	Baseline (B) Current situation	Alternative (A) AEGIS	Increment (A-B)
Global Costs: Cost of setting up and maintaining AEGIS	500 genebanks, 40 European countries, 2 million accessions **Total cost €**	**Total cost €**	**Incremental cost €**
Coordination	- No costs related	- Number of meetings per year: at least 2 meetings per year; approximate average costs of a meeting € - Costs to the leading institute - Communication costs - HR for positions and works	
Identification of MAA	- No control over duplicates, no costs related	- Costs of identifying MAA (time?) - Identifying synonyms - Characterization - Fingerprinting - Based on database info	
Database management	- Current costs of maintaining integrated database (EURISCO)	- Additional costs of keeping the information from AEGIS accessions (if any)	
Costs of adopting AEGIS standards	- Current operational budget for European genebanks	- Costs of implementing AEGIS standards in genebanks with lower standards - Characterization and evaluation - Safety duplication, costs related to cryopreservation of materials (EURALLIVEG) - Regeneration - Seed health testing - Distribution (seed amount available)	
In kind contributions from national governments		- Input curator, WG member, Focal point (NC) - Costs of updating databases, regeneration - Quality management system in place	
Publication			
Promotion			
Seeking Funding			