THE GLOBAL CROP DIVERSITY TRUST: DEVELOPPING STRATEGIES TOWARDS EFFICIENT AND EFFECTIVE *ex situ* PGR CONSERVATION

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SUMMARY

The Global Crop Diversity Trust (the Trust) aims to support the long-term maintenance of an efficient and effective arrangement for the *ex situ* conservation of the most important crop collections around the world. To achieve this goal, the Trust is supporting the development of conservation strategies that will guide the allocation of resources to the most important and needy crop diversity collections. The strategies are identifying appropriate roles for the holders of collections as well as for other individuals and institutions concerned with the conservation, regeneration, documentation and distribution of crop diversity. The Trust is supporting two complementary and mutually reinforcing approaches. One is to identify key ex situ collections of globally important crops (Annex 1 of the ITPGRFA) on a region-by-region basis. The other is to prioritize collections on a crop-by-crop basis at the global level. This process brings together the managers of plant genetic resources and other experts to develop and implement the most cost efficient and effective strategies for ensuring the long-term conservation and availability of the crops that are vital to the world's food security. The strategy should consider the most appropriate approach to managing the eligible collections, given their location and available resources, and the standards they should be expected to fulfill in the management of the given crop. Finally, it will propose a model for sharing responsibilities for certain activities amongst collection holders and service providers, and identify and prioritize collections for long-term conservation support. In addition, they will identify priority needs for upgrading support.

KEY WORDS: Global Crop Diversity Trust, plant genetic resources, *ex situ* conservation, regional conservation strategy, global crop conservation strategy.

RESUMEN

EL FONDO FIDUCIARIO PARA LA DIVERSIDAD DE LOS CULTIVOS: DESARROLLO DE ESTRATEGIAS PARA LOGRAR UNA CONSERVACIÓN EX SITU EFICIENTE Y EFECTIVA

El objetivo del Fondo Fiduciario para la Diversidad de los Cultivos (el Fondo), es el apoyo al mantenimiento de una conservación *ex situ* a largo plazo efectiva y eficiente para asegurar la conservación de las colecciones más importantes a nivel mundial. Para lograr este objetivo, el Fondo está apoyando el desarrollo de estrategias de conservación que guiará la colocación de recursos a las colecciones más necesitadas de los cultivos más importantes. Las estrategias están identificando roles apropiados tanto para los poseedores de las colecciones como para los individuos o instituciones involucradas con la conservación , regeneración, documentación y distribución de la diversidad de cultivos. El Fondo está apoyando dos estrategias complementarias. Una es identificando colecciones *ex situ* claves de cultivos importantes a nivel global (Anexo I del TIRFAA) en una base regional. La otra es priorizando colecciones cultivo a cultivo a nivel global. Este proceso reúne los especialistas que manejan recursos fitogenéticos y otros expertos para desarrollar e implementar las estrategias más efectivas y eficientes desde el punto de vista de uso de recursos para asegurar la conservación a largo plazo y la disponibilidad de los cultivos que son vitales para la seguridad alimentaria mundial. La estrategia deberá considerar la forma más apropiada de manejar las colecciones elegibles, dada su ubicación y los recursos disponibles, y los requerimientos que debería esperarse cumplieran en el manejo de las colecciones de un cultivo dado. Finalmente, se propondrá un modelo para compartir responsabilidades en ciertas

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actividades entre poseedores de colecciones y proveedores de servicios y en identificar y priorizar colecciones para apoyar la conservación a largo plazo. Además identificará necesidades prioritarias para apoyar las mejoras necesarias para asegurar esa conservación.

PALABRAS CLAVE: Fondo fiduciario diversidad cultivos, recursos fitogenéticos, conservación ex situ, estrategia regional de conservación, estrategia global conservación cultivos.

INTRODUCTION

The goals of the Global Crop Diversity Trust underpin the process of identifying potential grant recipients, in particular the goal of supporting an efficient and effective arrangement for the *ex situ* conservation of the most important crop collections around the world.

Such an arrangement would comprise collections that:

- Serve or have the potential to serve as a key resource for sustainable development
- are regionally and/or internationally important
- collectively cover the major part of the genepool of the crops concerned (both cultivated species and their wild relatives)
- are viable and healthy
- accessible under the internationally agreed terms of access and benefit sharing provided for in the multilateral system as set out in the International Treaty
- make proactive efforts to link to users of the collections
- are maintained by institutions committed to their long-term conservation, availability and use
- are managed efficiently and effectively within the context of a rational arrangement that has appropriate coordination mechanisms and shared responsibilities among the institutions concerned for specific conservation and distribution activities
- are well documented and the information on them is freely and widely available
- are housed in facilities that meet the scientific and technical standards necessary to ensure long-term conservation
- are duplicated in at least one other location for safety, but excessive duplication is avoided, and ideally also in a safety depository serving as an ultimate 'safety net.'
- continue to evolve and improve over time

At least initially, the Trust will concentrate on supporting collections of the food and forage crops that are included in the Multilateral System under the International Treaty (i.e. those crops found on Annex 1 of the International Treaty), or are international collections referred to in Article 15 (b) of the Treaty.

ELIGIBILITY PRINCIPLES

A first filter for eligibility is provided by the eligibility principles of the Trust. Meeting these principles is the minimum requirement for a collection to be eligible for support:

- *The plant genetic resources are of crops included in Annex 1 or referred to in Article 15.1 (b) of the International Treaty*
- *The plant genetic resources are accessible under the internationally agreed terms of access and benefit sharing provided for in the multilateral system as set out in the International Treaty*
- *Each holder of plant genetic resources for food and agriculture commits to its long term conservation and availability*
- *Each recipient of funds from the Trust shall undertake to work in partnership with the aim of developing an efficient and effective global conservation system*

ELIGIBILITY CRITERIA

To further define these broad principles, the Trust has developed a set of criteria to be met before a collection will be considered for long-term conservation support. In cases where a collection meets the eligibility principles but is unable to meet all of the eligibility criteria, the Trust will consider providing support for the upgrading and capacity building needed to enable the collection to meet the criteria. In either case the Trust may provide financial support directly to the holder of the collection in question and/or to third party institutions for the provision of specific conservation services.

These criteria, and the way in which they are applied, will be kept under review and revised as needed, based on experience. It is proposed that, at least initially, there will be six criteria as follows:

1. The recipient has effective links to users of plant genetic resources.
2. The collection is judged to be important within the context of an agreed regional or crop conservation strategy.

3. The legal status of the collection and holder are such that their ability to meet the eligibility principles with respect to access and benefit-sharing, and their commitment to long-term conservation are assured.
4. The recipient is willing to act in partnership with others to achieve a rational system for conserving plant genetic resources and making them available.
5. The recipient has the human resources and management systems needed to maintain the plant genetic resources and can demonstrate conformity with agreed scientific and technical standards of management.
6. The facilities in which the collection is maintained are adequate to ensure long-term conservation.

Each of the eligibility criteria is discussed in more detail in Appendix 1.

PRIORITIES FOR ALLOCATING FUNDS

While the Trust aims to support the long-term maintenance of an efficient and effective arrangement for conserving each of the crops that are most important for global food security, clearly it will not be able to provide funds to every institution that is party to that arrangement. The Trust will thus target its support to helping the neediest collections to meet the above principles and criteria and, once they have attained the required standards, to helping them play an effective role within the conservation arrangement over the long-term.

The Trust will identify the neediest collections, and will determine the extent of such needs, based on a consideration of the following factors:

- The extent, urgency and nature of actual or potential threats to the collection.
- The availability of alternative funding and other resources to support the work.
- The feasibility of instituting alternative, more cost-effective measures to ensure the effective conservation. and availability of the material in question.

Before receiving a grant, all grantees will need to be able to demonstrate that there are adequate mechanisms and procedures in place to ensure sound financial management and accountability.

THE CONSERVATION STRATEGIES

The Global Crop Diversity Trust will support the development, through a series of consultations and studies, of a set of conservation strategies that will guide the allocation of resources to the most important and needy crop diversity collections. The conservation strategies will identify the collections that will be of highest priority for support by the Trust. The strategies will identify appropriate roles for the holders of priority collections as well as for other individuals and institutions concerned with the conservation, regeneration, documentation and distribution of crop diversity.

The Trust is supporting two complementary and mutually reinforcing approaches to identifying and prioritizing eligible collections for upgrading and long-term conservation funding. One approach is to identify key *ex situ* collections of globally important crops[2] on a region-by-region basis. The other is to prioritize collections on a crop-by-crop basis at the global level. Both approaches will lead to the definition of strategies for rationalizing conservation.

This process will bring together the managers of plant genetic resources and other experts from developing and developed countries to develop and implement the most cost efficient and effective strategies for ensuring the long-term conservation and availability of the crops that are vital to the world's food security. Such strategies will not only involve the holders of the plant genetic resources, but also other institutions and individuals that can contribute to the conservation of priority crop diversity collections.

The regional strategies will identify the most important collections and genebanks in a given region and prioritize their upgrading and capacity building needs. The crop strategies will identify the subset of global holdings containing the widest and most important diversity of a given crop and assign priority to the collections that are most in need of support from the Trust. While the Trust has chosen to place priority on completing all of the regional strategies as soon as possible, hopefully within the next 18 months, it will also kick off a number of crop studies immediately and aim to complete all of these (35 crop strategies plus forages) by the end of 2006. The emphasis on undertaking the regional strategies as a matter of priority is based on the need to identify, in the first instance, those genebanks in need of urgent upgrading support. The additional information provided by the crop strategies will allow a fuller understanding of the conservation of a given crop globally, an important factor in identifying priority collections for on-going long-term conservation support.

An important output of the process to develop crop and regional strategies will be a global knowledge base on

[2]These are identified as those crops appearing on Annex 1 or in Article 15 of the International Treaty on Plant Genetic Resources.

the collections, crops and services selected for priority support by the Trust. This may prove useful beyond the immediate needs of the Trust, such as in assessments for the Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture

THE REGIONAL CONSERVATION STRATEGIES

The strategy development process will, for the most part, involve the leadership and members of regional plant genetic resources networks. However, while such networks exist for all regions of the world, some function more effectively than others, thus in some regions, alternative mechanisms may have to be substituted. A consultant or consultants may be also needed to facilitate the development of each regional strategy in consultation with the key crop diversity managers in the region.

The development of the regional conservation strategies has generally started with a desk assessment of the existing state of diversity conserved in the region. There is a good deal of information available on this in many, although not all, regions. Thus in some cases it has been necessary to follow up the desk assessment with an inventory of regional holdings, in order to fill gaps in knowledge. At this point, a meeting of regional network members is held (or some other mechanism employed in the absence of a functional regional network) to consider, *inter alia*, the following questions.

- Which crops on Annex 1 to the International Treaty are of greatest importance to the agriculture of the region or to at least one or a few countries in the region, and which of these have the region as their primary or secondary centre of diversity?
- Which collections of the crops identified above are 'most important' in terms of size, extent of diversity, holdings of wild relatives and other standards of measurement identified by network members?
- Which collections adhere to the eligibility principles of the Trust?
- How can conservation activities be organized most cost effectively in the region and which individuals and institutions are best placed to provide the various services required?

Based on the outcome of this exercise, the facilitator of the strategy, in collaboration with network members, will analyze regional priorities and needs, and develop a strategy that identifies the region's most important collections and assigns funding priority to them for upgrading and capacity building. The strategy identifies potential providers of conservation services (e.g. regeneration) and proposes ways to promote the rationalization of collections and their cost-effective management within the region. The strategy is reviewed and validated by a conservation expert before being passed back to the regional network for approval and then forwarded to the relevant regional forum for endorsement. Finally, the strategy will be presented to the Interim Panel of Eminent Experts to approve as a basis for funding decisions by the Trust.

Following the presentation of the strategy to the IPEE, the Trust will invite the identified collection holders and service providers to submit pre-proposals, and subsequently proposals, for upgrading and capacity building activities to be funded by the Trust.

THE CROP CONSERVATION STRATEGIES

The crop conservation strategies will identify critically important collection on a crop by crop basis, and assign priority ranking to them for support by the Trust. They will also identify any gaps in the regional strategies with regard to important plant diversity collections, ensuring that they receive support. The approach to developing crop strategies is based on the same philosophy as the regional approach, *i.e.* it will be largely driven by experts and holders of genetic resources of the crop in question. The process will begin with a preliminary period of research into the state of diversity in the collections of that crop by an expert consultant, with assistance from IPGRI and FAO. Additional experts would then be consulted, as needed, to assist in the prioritization of collections and service providers for funding. In many cases, existing crop networks will be able to mobilize for this purpose; in others, a group of national and international crop experts might need to come together on one or more occasions.

The main task will be to identify the subset of global holdings of the crop that best represents the range of diversity held *ex situ* around the world, taking into account the recommendations of the regional strategies and trying to minimize unnecessary duplication on a global basis. The facilitators and crop experts will also consider the most appropriate approach to managing the eligible collections, given their location and available resources, and the standards they should be expected to fulfill in the management of the crop. Finally, they will develop a model for sharing responsibilities for certain activities amongst collection holders and service providers, and will identify

and prioritize collections for long-term conservation support. In addition, they will identify priority needs for upgrading support amongst collections that may not have been identified during the regional process but emerged in consideration of global conservation needs. As with the regional strategies, the crop strategies will be reviewed and validated by experts who have not been involved in their development before being approved by the crop networks and presented to the Interim Panel to be approved as a basis for funding decisions by the Trust.

APPENDIX 1 - ELIGIBILITY CRITERIA

Criteria for determining eligibility to receive Trust funding for long-term conservation

The following criteria will be applied in determining the eligibility of collections to receive support from the Trust for long-term conservation. They will be kept under review and will continue to be further developed and elaborated to assist in their interpretation and application, and to help ensure that they can be applied consistently. In almost all cases the ability of a potential recipient to meet the criteria is likely to require expert judgment. Thus pre-proposals and proposals for funding will be subject to independent expert peer review.

1) The recipient has effective links to users of plant genetic resources

The Trust aims to ensure that the plant genetic resources whose conservation it supports actively contribute to sustainable agricultural development and the achievement of food security. Thus it is vital that recipients are able to demonstrate strong and effective links with key user groups including rural communities, individual farmers, professional plant breeders, researchers and others. Where such links are weak, a recipient must be able to demonstrate a willingness to strengthen them. The Trust is willing to provide support for this. In order to be able to assess the ability of the plant genetic resources manager to adhere to this criterion, the following questions will be considered:

- What is the collection holder's record with respect to the distribution of samples? How many samples have been distributed, over what time period and to whom?
- Does the collection holder maintain records on the quality, usefulness and actual use made of the material distributed?
- Does the collection holder take steps to analyze, on a regular basis, the usefulness of the service it provides to users? With what results? Has this resulted in any concrete steps to strengthen links with users?
- Does the genebank actively promote its material with farmers and/or plant breeders and if so how? How effective is this promotion judged to be?
- Have any requests for material ever been refused, and if so why?
- Is the information and documentation on the material sufficient, readily available and judged useful for identifying appropriate material?
- Is the material healthy and available in sufficient quantity? Are quarantine procedures judged to be efficient and effective?
- What other links are there with the user community, e.g. are farmers and/or professional plant breeders represented on the Board or other governance or management mechanisms of the genebank? Do genebank managers and staff participate in the planning of local, national or regional research and development strategies and priorities?

2) The collection is important

The conservation systems supported by the Trust will comprise those plant genetic resources that, collectively, cover the major part of the crop genepool in question and that are judged to be important regionally or globally. The importance of individual collections will be determined through the process of developing regional and crop conservation systems and funding strategies. In evaluating a collection's importance, the following questions need to be considered:

- What proportion of the collection originated in the country concerned?
- For material not originating in the country, what case can be made out for why it should be considered important within the context of a rational system?
- What proportion of the collection can be regarded as being genetically close to the originally collected population or bred sample?
- To what extent and where is the material duplicated? Is this part of a 'formal' scheme of safety duplication?
- Is the material viable and healthy? Is it regularly regenerated under conditions identical or similar to the conditions under which it was originally grown? Are samples regenerated in a manner which maintains their genetic integrity?

3) The legal status of the collection and holder are such that their ability to meet the eligibility principles with respect to access and benefit-sharing, and their commitment to long-term conservation are assured

The Trust needs to be assured that the collection is held in conformity with relevant international and national conventions and laws. The collection holder must be able to demonstrate an ability to meet the terms of the second eligibility principle, i.e. that the material is accessible under the terms of access and benefit sharing provided for in the multilateral system set out in the International Treaty. Furthermore, the holder should be able to demonstrate a commitment to the long-term conservation of the material in question. In order to be satisfied of these issues, questions that need to be addressed include:

- Is the country in which the collection is located a party to the International Treaty on Plant Genetic Resources for Food and Agriculture?
- Is the collection holder legally bound by the terms of the multilateral system of the Treaty at the national level, (e.g. by virtue of its status as a government institution) or, if not, are legally binding arrangements in place at the national level that will ensure conformity with these terms?
- If there is no legally binding mechanism at the national level, are other arrangements in place to ensure conformity with the terms of the multilateral system of the International Treaty with respect to access and benefit sharing, e.g. an agreement with the Governing Body of the International Treaty under Article 15 of the Treaty?
- Is there documented evidence of commitment to long-term conservation, e.g. through legal statutes, institutional constitutions or mandates, published institutional strategic plans, or national conservation strategies or action plans?

4) The recipient is willing to act in partnership with others to achieve a rational system for conserving plant genetic resources and making them available

A key objective of the Trust is to contribute to the development of an efficient and effective (i.e. rational) global system of *ex situ* conservation of plant genetic resources. A willingness to collaborate with others, e.g. through a willingness to share facilities, resources and information, is essential to achieving this objective. Partnership may also be important for carrying out certain essential services which may be performed better somewhere else than at the institution where a collection is held. An assessment of the collection holder's ability to meet this criterion, which is also enshrined in the 4th eligibility principle, will include a consideration of the following questions:

- Is the genebank/collection holder involved in collaborative activities with the holders of other collections, e.g. through national, regional or crop networks? If so, what is the extent, nature and effectiveness of this collaboration?
- Is the genebank/collection holder involved in collaborative activities with plant breeders, farmers or other users of the material, e.g. in regeneration characterization and evaluation? If so, what is the extent, nature and effectiveness of this collaboration?
- Does the holding institution have official agreements with other institutes, e.g. for safety duplication or other services such as regeneration, characterization, evaluation and information management?
- How effective is the collaboration as evaluated by the various partners concerned?

5) The recipient has the human resources and management systems needed to maintain the plant genetic resources and can demonstrate conformity with agreed scientific and technical standards of management

In order to receive long-term support from the Trust, a recipient must be able to demonstrate that the institution in question has the necessary human resources and management systems in place. Where this is not the case, but the material is otherwise judged to be eligible, the Trust will consider providing support for upgrading and capacity building. In addressing this issue the following questions will be considered:

- How many staff members are available to carry out the required work? What are their areas of expertise, level of training and experience? Are these judged to be adequate for the task at hand?
- Is the recipient able to manage the collection in conformity with the Trust's scientific and technical standards[3] with respect to all key activities including storage, regeneration, germplasm health, safety duplication, distribution, characterization, evaluation and documentation?

- Are quality control systems in place and judged to be adequate?
- Are all records of conservation, distribution and general management of the collection available and verifiable?

6) The facilities in which the collection is maintained are adequate to ensure long-term conservation

In order to receive long-term support from the Trust, a collection holder must be able to demonstrate that the facilities available are up to the task. Where this is not the case, but the material is otherwise judged to be eligible, the Trust will consider providing support for upgrading. In addressing this issue the following questions will be considered:

- Are the facilities acceptable for achieving long-term conservation of the species in question? Do the facilities meet the agreed standards[3]?
- Does the collection holder have systems in place to regularly monitor and adequately maintain the facilities?

[3]The Trust intends to produce guidelines on appropriate scientific and technical standards with respect to conservation facilities and management.