July 2006

Towards a regional strategy for the conservation of plant genetic resources in:

West Asia and North Africa (WANA)

Disclaimer

This document has been developed by an Advisory Group in close consultation with the Association of Agricultural Research Institutions in the Near East and North Africa (AARINENA). The Bioversity International, Regional Office, Aleppo, Syria, and the International Center for Agricultural Research in the Dry Areas (ICARDA), have both provided invaluable technical and logistical support.

The objective of this Strategy is to provide a framework for the efficient and effective *ex situ* conservation of the most important crop diversity collections in the WANA region, and to promote the availability of these plant genetic resources for food and agriculture.

The Global Crop Diversity Trust (the Trust) provided support towards this initiative and considers the document, particularly those portions pertaining directly to the Trust's mandated areas of interest, to be an important input to the Trust's own planning and work. We expect the Strategy to continue to evolve, as appropriate, and for the revamped regional plant genetic resources network in West Asia and North Africa (WANA) to lead this on-going process.

The Regional Strategy is the strategy of the region. The Trust does not take responsibility for its contents or for the accuracy or completeness of the information contained in the document. Please direct specific questions and comments to the regional strategy coordinator mentioned in the document.

Global Crop Diversity Trust
January 2006

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1. Coordination

Facilitator: Mohamed S. Zehni. PhD[1]
Independent Consultant

Regional Conservation Strategy Task Force:
An Advisory Group (AG) was formed to oversee the development of the Strategy. It comprises representatives of national PGR programmes and several observers – see list in Annex 1.

People Consulted in the Process:
Through country visits and correspondence, wide-range contacts were made involving national Plant Genetic Resources (PGR) programme leaders, genebank curators and relevant regional and international organizations.

The Development of the WANA Conservation Strategy is sponsored by the Global Crop Diversity Trust and is supported by CWANA-Bioversity and ICARDA

2. Executive Summary

The Global Crop Biodiversity Trust is supporting the development of regional conservation strategies that will guide the allocation of resources to the most important and needy crop diversity collections, assisting them to meet the criteria required for long term conservation funding. The conservation strategies are identifying the collections and conservation service providers that will be of highest priority for support by the Trust. The strategies are identifying appropriate roles for the holders of these collections as well as for other individuals and institutions concerned with the conservation, regeneration, documentation and distribution of crop diversity.

The WANA Conservation Strategy was developed in consultation with the Association of Agricultural Research Institutes of the Near East and North Africa (AAARINENA) and with input from a wide range of partners and stakeholders. An Advisory Group made of Plant Genetic Resources (PGR) programme leaders in the region was established to oversee the development and future implementation of the Strategy. The current version takes account of the amendments and proposals advanced at the Advisory Group meeting held in Aleppo, Syria from 29 May to 2 June 2006. It is ready now to be widely circulated among stakeholders, partners and interested parties in the Region. The Advisory Group, with the assistance of the Trust Secretariat, CWANA-Bioversity and ICARDA and in close consultation with AARINENA, would embark on concerted efforts to mobilize interest in and resources for the implementation of the Strategy.

It should be stressed that while this is an initiative of the Global Crop Diversity Trust, the Strategy eventually would be owned, further developed and implemented by governments of the region. Furthermore, the Trust had envisaged, from the beginning, that the WANA

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Strategy was to be developed and implemented in consultation with the Association of Agricultural Research Institutes in the Near East and North Africa (AARINENA). As a follow up, the Strategy was presented to the recently held General Conference of the Association where it was well received, as can be seen from the following quotation from the meeting report:

> "AARINENA at its 10th General Conference held in Sana'a, Yemen from 25 to 27 June 2006:
>
> Welcomes and supports the initiative of the Global Crop Biodiversity Trust for the development of a Regional Conservation Strategy for the WANA Region, with the widest country representation from the region,
>
> Endorses in principle the establishment of the Regional Conservation Strategy for the WANA Region under the umbrella of AARINENA allowing it to develop further with the support of AARINENA member countries,
>
> Includes the further development of the strategy and related networking capacities in future AARINENA Workplans leading to a plant genetic resources for food and agriculture (PGRFA) coordinating mechanism for the WANA Region,
>
> Urges the donors' community to secure the financial (?) for a successful implementation of the Strategy."

Furthermore, the Executive Secretariat of AARINENA has agreed to the use of the Association's Logo. It also promised to discuss with GFAR and other donors the possibility of them earmarking resources for activities relevant to the further development of the Strategy and the establishment of a regional coordination mechanism. Both CWANA-Bioversity and ICARDA supported the development of the Strategy and agreed to have their logo on the title page.

The Strategy envisaged several main outputs; the following is a brief assessment of what has been achieved to date:

Output 1: An evaluation and assessment, in consultation with representatives of the relevant networks and other stakeholders, of the collections in the WANA region of crops that are on Annex 1 of the International Treaty and that are of greatest importance regionally and globally.

> Assessment: This has been achieved to a greater extent using first hand inputs from twelve countries. Eventually, more information will be added as they become available, but this is unlikely to alter any of the major conclusions of the Strategy. It should be noted that in considering crops of key importance to the region, the Advisory Group went beyond those crops listed in Annex 1 of the treaty.

Output 2: A ranking of the collections of the crops identified above that are 'most important' in terms of size, extent of diversity, holdings of wild relatives and other relevant indicators, carried out in consultation with stakeholders in the region.

Assessment**:** The Strategy made good progress in identifying the main indicators/criteria to assign priority for the genetic conservation of crops in the various WANA sub-regions. A preliminary attempt was made to rank crops in accordance to their importance in various sub-regions and the region as a whole. Furthermore, important collections were identified, though basically on limited criteria. This part of the Strategy will eventually be aligned with the outcome of the global crop strategies.

Output 3: An indication of the upgrading needs of those collections identified as a priority to the region as well as the needs for building the capacity of the genebanks that house them.

Assessment: A preliminary assessment was made but eventually a more detailed inventory would be needed in consultation with the concerned governments.

Output 4: A strategy, endorsed by key stakeholders in the region through AARINENA, for increasing the efficiency and effectiveness of *ex situ* conservation in the region.

Assessment: As reported above, AARINENA has welcomed and supported the initiative of the Trust and endorsed the Strategy, it promised to include the further development of the Strategy and its related activities in its future work plans and it urged donors to lend support to the Strategy. Above all, it allowed its logo to appear on the title page of the Strategy.

Output 5: Regional collaborative arrangements for the rationalization of the priority collections and their management through partnerships and the sharing of responsibilities, facilities and tasks, and

Output 6: The development of proposals for ways and means of strengthening coordination within and among the countries of the Region of PGR activities, especially *ex situ* activities.

Assessment: The Strategy outlined very broadly proposals for regional collaborative arrangements and means of strengthening coordination within and among the countries of the Region of PGR activities, especially *ex situ* activities. Much will hinge on the implementation of the proposals and mainly the establishment of a regional coordinating and coordinating mechanism that is firmly endorsed and enabled by the governments of the region and other stakeholders and interested parties.

Finally, the Strategy is now fairly comprehensive in its coverage and has conceptually advanced considerably thanks to valuable inputs from many. It, nevertheless, is still evolving and would benefit from further refinement and additional inputs. Moreover, the finalisation of certain aspects of it is dependent on the outcome of other relevant initiatives. For these reasons, the title of the strategy now reads: Towards a Regional Conservation Strategy for West Asia and North Africa (WANA). This is thought to better reflect the evolving and dynamic nature of the exercise

3. Introduction

The convening of the Fourth FAO International Conference on Plant Genetic Resources for Food and Agriculture held in Leipzig, Germany, have generated much interest in the conservation and sustainable utilization of plant genetic resources (FAO 1996). However, the high expectations generated by the Global Plan of Action (GPA), emanating from the Leipzig Conference, were not meaningfully realized.

Though some progress was achieved, it is generally recognized that more efforts, at the national, regional and international level, were needed to overcome the constraints to the GPA implementation. Now that the International Treaty for Plant Genetic Resources for Food and Agriculture (IT-PGRFA) is operational and its essential element of funding: the Global Crop Diversity Trust (the Trust) is a reality, hopes are revived for promoting an effective and efficient global arrangement for plant genetic resources in general and for *ex situ* conservation, in particular. It is worth mentioning that the first countries to sign its establishment agreement were from the WANA region (see Annex 2). Countries in the region welcomed the establishment of the Trust and expressed their readiness to actively collaborate with it.

Through the Treaty, countries agreed to establish an efficient, effective and transparent Multilateral System to facilitate access to plant genetic resources for food and agriculture, and to share the benefits in a fair and equitable way. The Treaty calls on countries to cooperate to promote the development of an efficient and sustainable system of *ex situ* conservation. The goal of the Global Crop Diversity Trust is to support such a system by providing a secure and sustainable source of funding for the world's most important crop diversity collections. To that end, the Trust has embarked on an important two-pronged initiative:

1) to identify key *ex situ* collections of globally important crops on a region-by-region basis, and
2) to prioritize collections for funding on a crop-by-crop basis at the global level.

Together, the two aim at the establishment of a rational global system for the conservation of important crop diversity. This document is part of the first initiative, and specifically aims at the development of a regional strategy for the sustainable conservation and utilization of crop genetic diversity in the West Asia and North Africa Region (WANA).

The Region is alternatively known as the West Asia and North Africa Region (WANA) by the CGIAR circles, and as the Near East and North Africa Region (RNE) by FAO and some other UN bodies, each having different country composition. Even within the CGIAR Centres, the composition of the WANA Region may differ as a result of including or excluding certain countries for practical or mandate-related reasons. This discrepancy in delineating the Region could lead to the use of incomparable aggregate data, and while this is not always avoidable, care must be exercised in quoting aggregate data and it would be helpful to indicate the countries included in such data. For the purpose of this exercise, the Bioversity definition of the WANA Region is adopted, which comprises the following countries: Afghanistan, Algeria, Bahrain, Cyprus, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Pakistan, Palestine Authority, Qatar, Saudi Arabia, Sultanate of Oman, Syria, Turkey,

Tunisia, United Arab Emirates and Yemen. However, in any future development of a regional PGR network, Sudan, Malta, Mauritania and Somalia would need to be included[2].

The WANA region spreads over two large continents: Africa and Asia, and though predominantly dry, it is relatively rich in plant diversity. The Region has one of the world's three nucleus centres of origin of agricultural crops and three Vavilovian centres of crop diversity. Two of these centres (the Mediterranean Region and the Near Eastern Region) are considered the centres of origin of more than 150 grown plant species. Some ten thousand years ago, the WANA / Near East region was the centre of domestication (origin of agriculture) for wheat, barley, lentil, forage species and many fruit trees that still support today's agriculture. It is estimated that the species, which originated from this area, are feeding over 38 % of the world's population. Wheat alone accounts for about one-third of the global food production.

Plant genetic resources programmes in the Region are at different stages of development, depending on country size, resources and on government policy. A number of countries in the region (e.g. Egypt, Iran, Morocco, Pakistan and Turkey) have long history of attention to genetic resources especially in the more systematic collecting efforts and the establishment of operational genebanks. Several other countries (e.g. Tunisia, Algeria and Morocco) have recently embarked on constructing specially equipped buildings to house *ex situ* collections of important crops for their medium and long term storage and safe keep, as well as performing other related activities of evaluation, regeneration, documentation etc. On the other hand, several countries including Syria, Jordan and Libya have functional facilities but are aspiring to upgrade them, especially the long-term storage facilities. Apart from infrastructure and buildings, what's remarkable about many of the counties in the region is their richness in genetic resources which in most cases is not fully tapped particularly genetic resources in the wild, which need to be secured in the in *ex situ* conservation activities[3].

Regional collaboration in PGR has not been very successful despite the formation in 1992 of the West Asia and North Africa Network (WANANET) with membership of thirteen countries. Initially, the network played an important role in strengthening national programmes by reinforcing the role of the national plant genetic resources committees and encouraging coordination between different institutions within each country and among programmes throughout the region. This was due perhaps to the momentum built by the preparations for the Leipzig Conference and the development of the GPA. However, the inability of the network to be self-sustainable and lack of enthusiasm on the part of its member countries to implement its recommendations led to its failure to achieve its mission and goals. The poor regional coordination is, in a way, a reflection of lack of adequate national coordination. In many countries of the Region, the lack of coordination among different institutions dealing with PGR activities is "a major impediment to programme development" and in some countries has 'led to dispersal of resources' (FAO 1998).

The success of any conservation strategy for the WANA Region hinges on strengthening coordination within and among countries of the region. Coordination will be discussed in some detail in a later section with proposals for improving the situation, including the establishment of a new network with new orientation and mode of operation. A network that is primarily concerned with plant genetic resources for food and agriculture (PGRFA) and act

[2] In welcoming and supporting the initiative of the Global Crop Biodiversity Trust for the development of a Regional Conservation Strategy for the WANA Region, AARINENA General Conference, held in Sana'a, Yemen from 25-27 June 2006, emphasized the need for the "widest country representation from the region" in the Strategy.

[3] This brief account of the PGR in the region does little justice to national programmes. However, it is beyond the scope of this report to deal, on country-by-country basis, with the richness of plant genetic resources and the national efforts to conserve them.

as an instrument in advancing long-term regional strategy and framework for action for *ex situ* conservation in accordance with the International Treaty and the Global Plan of Action, with primary focus on activities and actions that support crops in Annex 1 of the Treaty.

4. The Global Crop Diversity Trust

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. 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 on Plant Genetic Resources for Food and Agriculture (ITPGRFA)
- 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

To achieve this ultimate 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, assisting them to meet the criteria required for long term conservation funding. The conservation strategies are proposing the collections and conservation services and providers of priority for support by the Trust. 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 (of 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. The strategy should consider the most appropriate approach to managing the key collections, given their location and available resources, and the standards they should be expected to fulfil 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. 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.

5. Process of Developing the Strategy

Due to the fact that there is currently no functioning regional PGR network in WANA, the Trust opted for a different approach to that followed by other regions, where established regional and sub-regional networks took the lead in the development of their respective strategies.

Instead, the Trust appointed a senior consultant as a Facilitator to lead the development of a strategy for the creation and implementation of an efficient and effective system for conserving the crop genetic resources of the WANA Region. The Facilitator has conducted the study in close consultation with the Association of Agricultural Research Institutions in the Near East and North Africa (AARINENA) and national, regional and international organizations concerned with PGR conservation in the region as well as other relevant institutions and stakeholders. The consultation process has involved visits to a number of national programmes (Egypt, Tunisia, Libya, Syria) as well as discussions with FAO and Bioversity in Rome and ICARDA and Bioversity Regional Office in Aleppo, Syria.

In addition, the Facilitator contacted, by email and other means, WANA National Coordinators, Focal Points and Policy Makers in some twenty countries providing them with background information on the initiative of developing a WANA Conservation Strategy and inviting their collaboration by providing information on their collections and the status of their PGR programmes. Twelve countries have kindly provided the required information mainly using a Form specially prepared for this purpose by the Trust Secretariat (see Annex 4).

In consultation with the Trust Secretariat and AARINENA, an Advisory Group (AG) was established comprising PGR leaders from nine representative countries, Bioversity and ICARDA. The task of the Advisory Group is essentially to oversee the development of the strategy and approve a draft to be presented to the AARINENA General Meeting. The mode of operation of the Advisory Group is mainly through correspondence culminating in a meeting to conclude the process.

The preparation of the present document has proceeded as follows:

- February- Early March 2006: First draft to be presented to the Trust Secretariat for their review and eventual circulation to members and observers of the Advisory Group,
- Mid May 2006: Preparation of a second draft taking into account comments received from the Trust Secretariat, Advisory Group and others,
- May 29 to June 2, 2006: Meeting of the Advisory Group to discuss the strategy and agree on follow-up steps,
- 25-27 June 2006: Presentation of the Strategy to AARINENA General Meeting to be held in Sana'a -Yemen seeking the Association guidance and support,
- Mid July 2006: the current document incorporates the views and proposals made at the Aleppo meeting of the Advisory Group and the AARINENA General Conference held from 25-27 June in Sana'a, Yemen.

As an interim measure and until such a time a regional coordinating/collaborating mechanism is formally established, the Advisory Group (AG) is to continue functioning mainly in a virtual mode, though it maybe possible for it to meet should the need arises and funds become available. Dr Tawil (Syria) was elected Convener of the Advisory Group with the Trust secretariat, Bioversity-CWANA and ICARDA providing technical backstopping and logistic support. To facilitate communication and exchange of information among the AG members and stakeholders in the region, a portal website has been developed thanks to Bioversity-CWANA.

The following are the agreed Terms of Reference (TOR) of the Advisory Group, which would need to be revisited in light of gained experience and emerging situations:

- To oversee the further development of the strategy and follow up steps in consultation with the stakeholders in harmony with the relevant global crop conservation strategies,

- To explore with relevant national professionals and policy makers opportunities for the establishment of a regional coordination mechanism including the definition of national needs and obligations,
- To establish links with the development of the relevant global crop conservation strategies and feedback into the regional process,
- To mobilizes interest in, and as feasible funding for, the Strategy in the various sub-regions and the Region as a whole.

6. Goal Statement of the Strategy

The ultimate goal of the Regional Strategy is the sustainable conservation and utilization of crop genetic diversity in the WANA Region.

The goal could be achieved through promoting efficient and effective *ex situ* conservation of crop collections of prime importance to the Region and encouraging partnerships and sharing facilities and tasks, in accordance with the International Treaty and the Global Plan of Action.

To facilitate partnership and sharing facilities and tasks on a sustainable basis, the Strategy aims at stimulating efforts by national PGR leaders to establish a formal regional coordination body that serves as an instrument in advancing long-term regional strategy and framework for action, *inter alia*, for *ex situ* conservation and sustainable use. The regional body, if and when established, is expected to reflect and promote networking at the sub-region level as the need may arise.

7. Objectives of the Regional Conservation Strategy

The main objective of the WANA Conservation Strategy is to promote the development of an effective and efficient system for the conservation of the most important crop diversity collections in the region. Specifically, the Strategy aims to:

- Evaluate and assess the collections in the WANA region of crops that are on Annex 1 of the International Treaty and that are of greatest importance regionally and globally[4];
- Identify those collections that should be included in such a system and propose priorities for addressing their most urgent upgrading and capacity building needs;
- Promote a greater rationalization of the collections and their management through, inter alia, strengthening partnerships and encouraging the sharing of responsibilities, facilities and tasks.

The overall objective of the strategy is in conformity with the relevant activities of the GPA, the IT-PGRFA and in line with the Trust's objectives. However, to achieve this objective, the strategy needs to address broader issues that go beyond 'important collections of priority crops'. This should be done for at least two main reasons; one is based on general considerations and the other is, to a great extent, specific to the WANA Region.

Most collections are multi-crop collections held collectively in 'genebanks' with very few, if any, crop/species collections. The wellbeing of the 'identified collections of priority crop/s' is dependent on the overall physical, technical and managerial condition of the genebank as a whole. Ensuring a viable and sustainable *ex situ* setup should be part of the objectives of the

[4] While priority will be given to crops on Annex 1 of the Treaty, other crops of importance to the Region will not be excluded.

Strategy. This situation is, of course, not specific to the WANA Region but rather is common to all genebanks and regions.

Much of the success in achieving the main objectives of the Strategy hinges on having reasonable functional links between the relevant national institutions, as well as on forming a suitable mutually accepted arrangement for regional collaboration and exchange of experience and knowledge among the countries of the region. This makes an important part of the proposed strategy since collaboration is a key principles and any identified priority collection would have to have a well-recognized government support and therefore be well linked to other national institutes.

Though there is no apparent conflict between the two sets of objectives, it is fair to state that any costs that may result from broadening the objectives of the strategy, in the way described above, should not necessarily be borne by the Trust. However, it could and should assist in the efforts of enabling the countries of the region to achieve these objectives.

8. Outputs Expected

The main proposed outputs of the Strategy are:

- An evaluation and assessment, in consultation with representatives of the relevant networks and other stakeholders, of the collections in the WANA region of crops that are on Annex 1 of the International Treaty and that are of greatest importance regionally and globally;
- A ranking of the collections of the crops identified above that are 'most important' in terms of size, extent of diversity, holdings of wild relatives and other relevant indicators, carried out in consultation with stakeholders in the region;
- Regional collaborative arrangements for the rationalization of the priority collections and their management through partnerships and the sharing of responsibilities, facilities and tasks;
- An indication of the upgrading needs of those collections identified as a priority to the region as well as the needs for building the capacity of the genebanks that house them;
- A strategy, endorsed by key stakeholders in the region through AARINENA, for increasing the efficiency and effectiveness of *ex situ* conservation in the region;
- The development of proposals for ways and means of strengthening coordination within and among the countries of the Region of PGR activities, especially *ex situ* activities.

9. Crops of Greatest Importance

As stated earlier, the ultimate goal of the WANA Regional Strategy is the sustainable conservation and utilization of crop genetic diversity in the Region through promoting efficient and effective *ex situ* conservation of crop collections of prime importance to the Region and encouraging partnerships and sharing facilities and tasks, in accordance with the International Treaty and the Global Plan of Action.

This requires, inter alia, the identification of priority crops at the regional level as well as those collections that should be included in such a system and propose priorities for addressing their most urgent upgrading and capacity building needs. The identification of crops of priority to the Region, the subject of this section, is based on two main sources: a) an ICARDA study of agricultural research priorities for the Central and West Asia and North

Africa Region (ICARDA and UNEP 2002), and b) information provided by relevant institutions in twelve countries in response to a questionnaire sent to PGR focal points in the Region.

9.1 Countries Input

An important input to the process of identification of crops of priority to the Region was the responses kindly provided by relevant institutions in twelve countries (Algeria, Egypt, Iran, Jordan, Libya, Morocco, Oman, Pakistan, Syria, Tunisia, Turkey and Yemen) to a Questionnaire (see Annex 4) prepared by the Trust Secretariat.

The questionnaire was sent by the report writer to the PGR focal points in some twenty countries to solicit their views on what may be crops of most importance for the WANA Region and to seek information on their collections of the crops on Annex 1 of the Treaty. Replies received were very helpful regarding important collections in the region and have provided an indication of the status of the *ex situ* efforts in the various countries.

Though the data gathered is not inclusive of all countries of the Region or, indeed, the totality of PGR resources in many of the responding countries, it, nevertheless, revealed an impressive picture. As it turned out, these twelve countries/institutes are holding among them some 133 434 accessions of 59 out of the 64 crops listed in Annex 1 of the Treaty with twenty of those amounting to 94% of the total accessions. The data on crops and their accessions is reviewed in great details in Section 9.

9.2 The ICARDA Priority Study

The other basis for the identification of crops of priority to the Region was the ICARDA study, which took more than two years of bottom-up participatory priority setting throughout the region, involving the NARS, NGOs, farmer organizations, private sector and the regional fora, along with scientists from the CGIAR centres active in the region. Throughout the exercise, ICARDA maintained close collaboration with the Association of Agricultural Research Institutes in the Near East and North Africa (AARINENA). Regional priorities were identified for five major clusters; of direct interest to this report is cluster 1: germplasm management and specifically the sub-cluster, crops.

In view of some inconsistency between figures, the study warns, “caution must be taken before drawing conclusions on the basis of such results”. If anything, this shows just how difficult it is to get consensus on prioritizing crops importance in a vast and diverse region as WANA. However, imperfect as it may, the ICARDA study is the best available for an in depth analysis of agricultural research priorities and commodities in the Region.

It should be noted that the ICARDA study was comprehensive in its geographic coverage since it dealt with the whole region of CWANA, which includes WANA countries as well as Central Asia and the Caucuses countries. Furthermore, it included crops not listed in Annex 1 of the Treaty: vegetables, industrial crops, Fruit trees (date, olives, nuts), forest species, and medicinal aromatic and herbal plants. Table 1, modified from the original as to be limited to WANA and to the crops on Annex 1 of the Treaty, shows the priority crops as identified by the ICARDA study. As expected, the relative importance of crops varied from one sub-region to another revealing in some cases ‘interesting and rather unexpected results’. For example, the rather “high percentage (over 80%), of Arabian Peninsula respondents assigning a low importance to cereal crops represents further indication of the extreme heterogeneity of the region”. Another interesting case is of the food legumes where less than one third of

respondents assign a high importance to food legumes. The survey results are even more puzzling with respect to the relatively high percentage of respondent assigning low importance to food legumes. The ranking among food legume crops varied in the various sub-regions, but overall scoring favoured Chickpea, followed by Lentil and Faba Beans.

Table 1: Priority crops ranked according to their importance

Crop	AP	NA	WA	NVRS	WANA
Wheat	5	1	1	1	8
Forages	2	2	1	3	8
Legumes	4	2	1	2	9
Barley	4	1	2	3	10
Maize	5	3	2	2	12
Potato	3	4	3	3	13
Sorghum/Millet	3	5	5	2	15
Rice	5	5	3	3	16

Modified from ICARDA, 2003
Note 1: Low numbers are a high priority (1=highest priority).
Note 2: AP: Arabian Peninsula, NA: North Africa, WA: West Asia, NVRS: Nile Valley and Red Sea

According to the ICARDA study, forages were given high priority at the regional level equal in aggregate to that assigned to wheat, but there was no breakdown of the forages within the study. The information gathered from the responses to the above referred to Questionnaire shows that the twelve countries held a total of 16099 accessions of 27 out of the 29 forage crops listed in Annex 1 of the treaty. However, Medicago and Trifolium alone represent over 62% of all holdings of forage crops. Judging from the size and number of collections held by the various countries, Medicago and Trifolium deemed to be of priority importance to the region, and were accordingly added to the list of important crops.

Based on ICARDA's priority setting exercise and as adjusted for forage crops, eleven crops seem to top the list of priority crops for the region as a whole, not withstanding the sub-regional differences. To test how this tallies with the importance given to crops by countries as reflected in the size of accessions they hold, the eleven crops with the largest reported number of accession were compared with the eleven crops chosen as priority in the ICARDA study.

Table 2 shows a very high congruence between the two approaches; nine out the eleven crops were the same in both lists, though their ranking is slightly different. However, the ICARDA list has two crops, Potato and Sorghum, which rank very low in the accessions held by the respondent countries. On the other hand, Beans rank 11th in size of accession, but it is held almost entirely by two countries, Turkey (2479 accessions) and Iran (2000 accessions, and may not qualify as regional priority crop, but should not be ruled out at this stage. By removing these from the list and by averaging the ranking of crops in the two lists, a likely composition and ranking of priority crops is as follows: Wheat, Chickpea, Medicago, Barley, Lentil, Trifolium, Faba Beans, Maize, Rice and Oat. Together, these ten crops have some 107,758 out of 135 434 total accessions held by the nine reporting countries (81%).

Table 2: Eleven top priority crops according to ICARDA study and to size of accessions.

Note: crops common to both are bolded.

ICARDA	Accessions Size
Wheat	**Wheat**
Medicago	**Barley**
Trifolium	**Chickpea**
Chickpea	**Lentil**
Lentil	**Rice**
Faba Beans	**Medicago**
Barley	**Maize**
Maize	**Faba Bean**
Potato	Oat
Sorghum	**Trifolium**
Rice	Beans

Obviously the priority crops and their ranking above are subject to debate, especially if more data on accessions from more countries were received, this is further complicated by the interplay among national, subregional and regional order of priority as well as global importance. It is further suggested that ten other crops could be considered as possible candidates for a secondary priority ranking, these are beans, sorghum, Brassica complex, sunflower, citrus, pearl millet, Lathyrus, apple, rye and pea. They amount to 17124 accessions and together with the ten top priority crops make 94% of the total accessions of Annex 1 crops held by the reporting countries. These crops vary in their relative importance to the various countries and subregions as well as in the factors/indicators decide their importance as shown in Annex 5.

In further consideration of priority crops in the region, the Advisory Group considered in great details the criteria/indicators to assign priority for the genetic conservation of crops in the sub-regions of WANA. It, also, considered crops of key importance based on criteria it adopted. The Advisory Group reached a preliminary agreement on crops of key important as shown below (those between two brackets are not part of Annex 1 crops):

- Cereals: barley, wheat, oat, maize
- Fruit trees: citrus, apple, (Date palm), (Figs), (Olive), (Vitis), (Prunus, (Pistachio), (Pomegranate), (Mango)
- Forage legumes: Medicago, Trifolium, Lathyrus, Vicia
- Food legumes: Chickpea, Faba bean, lentils, Vigna, Beans, pea
- Others: (Onion), (Garlic), (Lettuce), (Cucurbit) (Safflower)

The methodology adopted by the Advisory Group is detailed in Annex 6.

10. Collections of Key Importance of the Crops of Priority

The following review is based on information and data received from twelve countries in response to a questionnaire, prepared by the Trust Secretariat, sent by the report writer to the PGR focal points in twenty countries of the Region. The review is augmented with information gathered from literature and insight gained during visits to a number of countries.

The questionnaire (see Annex 4) posed 14 questions on three broad areas:

1) national programme structure: seeking basic information on coordination of PGR activities in the country,
2) PGR collections: providing information on the current status of PGR collections and documentation, and
3) type of data available: indicating the estimated proportion of the total number of the accessions for which there is information on passport, characterization/ evaluation, indigenous knowledge and distribution. In addition, the respondents were asked to provide information on the number of accessions they hold of the 64 crops on Annex 1 of the Treaty.

Seeking information through the Focal Points was carried out with the expectation of obtaining information on the collective national *ex situ* activities in a given country. As it turned out, the 'focal points' in most cases have provided information mainly on their own institutes activities and holdings of crop collections.

These institutes may well be the main holders of collections of crops on Annex 1 of the Treaty, but it is important to bear in mind that the figures reported here do not necessarily represent in all cases the totality of national holdings. As can be seen from Table 5, the number of institutes with *ex situ* PGR collections varied from one country to another ranging from one to ten.

The twelve respondent institutes were: INRAA (Algeria), NGB (Egypt), NPGB (Iran), NCARTT (Jordan), ARC (Libya), INRA (Morocco), MAF (Oman), NARC (Pakistan), GCSAR (Syria), MOA (Tunisia), AARI (Turkey) and AREA-NGRC (Yemen). The present study will no doubt be far more complete if and when data and information are eventually added from such countries as Iraq, Lebanon, Saudi Arabia and Afghanistan. Countries with modest *ex situ* programmes such as Bahrain, Cyprus, Kuwait, Palestine, Qatar and United Arab Emirates are, at this stage, outside the scope of determining important collections of priority crops. However, they should be considered in any strategy aiming at strengthening overall PGR capacity in the Region.

According to the FAO report on the state of the world's plant genetic resources for food and agriculture (FAO 1998), germplasm collecting in the Region has been strong since the beginning of the century. 'Countries in this region pay great attention to collecting and conserving indigenous plant genetic resources, especially of crop species.

During the last decade, collecting missions in most countries and territories have been frequent and are based on serving national genetic resources and breeding programmes'. Collecting activities have mainly been undertaken by national institutions in collaboration with international centres and institutes, such as ICARDA, IBPGR/Bioversity, and institutions from developed countries, e.g. Australia, Canada, France, the United Kingdom, USA, Japan, Germany, Russia, and others (ICARDA and UNEP 2002). Collections are kept in national genebanks, agricultural research institutions, and universities and with private breeders, as well as duplicates kept in regional genebanks and some developed countries genebanks.

Since a regional documentation system on plant genetic resources does not exist, no reliable figures are available for the total number of accessions of food and forage crops and their wild relatives held by all the countries in the Region. The number must be considerable judging from the fact that twelve countries included in this study have reported 201500 total accessions of which 135 434 are accessions of Annex 1 crops. However, the number of duplications and accessions originating from the WANA region is mostly unknown. To this

considerable number of accessions must be added the valuable germplasm holdings of ICARDA of over 131 000 accessions of cereals, food legumes, forages and rangeland and their wild relatives (50% originated from the WANA Region). A significant portion of ICARDA's germplasm holdings originating from the WANA region (32 %) is collected by the Centre itself in joint collecting missions with the national programmes (Table 3), the rest is a donation from many countries and organizations. It is not clear how much of that represents backup duplicates kept on behalf of countries of the WANA Region. When the national programs develop a storage facility for long-term conservation of plant genetic resources, ICARDA repatriates all germplasm of the country origin to the national genebank jointly with the passport information and retains a backup duplication.

Table 3: Proportion of germplasm collected by ICARDA

Group	Crop Name	Global holdings			WANA holdings		
		ICARDA-collections	Crop total	% Collected	ICARDA-collections	Crop total	% Collected
Cereals	Aegilops	2333	3851	61	1583	2359	67
Cereals	Barley	1396	24301	6	1173	7819	15
Cereals	Bread wheat	907	12640	7	462	7653	6
Cereals	Durum wheat	511	19138	3	475	11912	4
Cereals	Primitive wheat	83	833	10	11	392	3
Cereals	Wheat hybrids	12	58	21	7	12	58
Cereals	Wild Hordeum	497	1836	27	382	1584	24
Cereals	Wild Triticum	427	1572	27	393	1470	27
Food legumes	Chickpea	1084	12180	9	838	5495	15
Food legumes	Faba bean	838	10800	8	356	2462	14
Food legumes	Lentil	1041	9997	10	819	3487	23
Food legumes	Wild Cicer	45	268	17	43	111	39
Food legumes	Wild Lens	280	583	48	262	418	63
Forage & range	Forage and range	3555	5590	64	3127	3665	85
Forage legumes	Lathyrus	1259	3208	39	967	1462	66
Forage legumes	Medicago annual	4804	8364	57	4618	6902	67
Forage legumes	Pisum	366	6120	6	158	1063	15
Forage legumes	Trifolium	3479	4503	77	3159	3628	87
Forage legumes	Vicia	2747	6109	45	2171	3792	57
Total		**25664**	**131951**	**19**	**21004**	**65686**	**32**

10.1 The Status of National Collections

All countries, with one exception, reported that their PGR activities are coordinated at national level, but several are yet to formally establish national programmes. The majority of countries have genebanks with national PGR responsibilities. One half of the countries have established national inventories (NIs), but few of those are available on the web. The number of institutes with *ex situ* PGR collections varies considerably among countries. The estimated total number of PGR accessions is apparently that held by the reporting institute. The number of institutes and accessions need clarification. The majority of the countries reported having some form of national documentation system using standard descriptors for passport data for documenting accessions. Several countries reported high proportions of existing PGR

information that are available in electronic format. Several others are just beginning to establish such a system. Characterization/evaluation represents a serious constraint with several of the respondents: only two countries reported 80% of the job done, the others had still much to do. The estimated proportion (%) of the total number of the PGR accessions for which there is indigenous knowledge is clearly disappointing with the highest 30% (three countries did not address this point), while figures for distribution are much better at least in four countries reporting between 80 to 100% of distribution information available/recorded. Tables 4, 5 and 6 below show detailed tabulation of the responses to the fourteen questions posed by the questionnaire

Table 4: National Programme Structure

Enquiry	DZ	EG	IR	LY	JO	MA	OM	PK	SY	TN	TR	YE
1. PGR activities coordinated at national level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
2. National Programme formally established	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes
3. Genebanks with national PGR responsibilities exists	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes
4. National Inventory (NI)** exists	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No	No	Yes	No
5. NI available on the web	No	Yes	No	No	No	Yes	No	Yes	Yes	No	Yes	No

Table 5: Status of Documentation of PGR Collections

Enquiry	DZ	EG	IR	JO	LY	MA	OM	PK	SY	TU	TR	YE
6. Number of institutes with *ex situ* PGR collections	Five	One	Two	Two	One	Four	One	One	One	Ten	2-16[5]	Five
7. Estimated total number of PGR accessions held by the institutes	n.a.	20K	60K	4.5K	0.6K	22K	0.9K	23K	11K	n.a.	56K	3K
8. National PGR documentation System exists	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes
9. Use of standard descriptors for passport data for documenting accessions	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes
10. Estimated proportion (%) of existing PGR information available in electronic format	1-10%	10-30%	70-90%	70-9-%	0-10%	100%	0-10%	70-90%	70-90%	0-10%	100%	50-70%

Table 6: Type of Data Available in Genebanks (figures in %) of accessions held

Type of data available	DZ	EG	IR	JO	LY	MA	OM	PK	SY	TR	TN	YE
11. Passport	90	80	60	90	100	100	? %	100	75	100	n.a.	100
12. Characterization / Evaluation	70	80	50	50	0	30	? %	80	30	10	25	15
13. Indigenous knowledge	50	20	? %	30	10	? %	? %	5	10	5	3	25
14. Distribution records *	n.a.	20	20	80	n.a.	100	n.a.	100	n.a.	100	n.a.	30

* Note: Information/record is available on the distribution of each accession, but respondents may have misinterpreted this as the availability of material to be distributed.

[5] Turkey has one National Genebank for seed and one-genebank facilities for safe duplicates of base collection. Additionally for vegetatively propagated plant species (like fruits, mint, garlic so on 16 institutes responsible for conservation of vegetatively propagated species in field gene banks (16 field gene banks).

10.2 Number of Total PGR and Annex 1 Crops Accessions

As shown in the Table 7, the total number of PGR accessions held by the reporting institutes is 201 500 accessions (no data for total accessions is available for Tunisia and Algeria). Iran is holding the largest total number of PGR accessions followed by Turkey, Pakistan, Morocco, Egypt, Syria, Jordan, Yemen, Libya and Oman. Of the total number of PGR accessions, 133025 accessions are of crops on Annex 1 representing and average of 61.1% of the total. Iran is holding the largest number of accessions of Annex 1 crops followed by Turkey, Pakistan, Morocco, Egypt, Syria, Tunisia, Yemen, Jordan, Algeria, Libya and Oman.

Table 7: Total number of accession held by countries of all crops and those of Annex 1

Holders	All Crops	Annex 1 Crops	%
Iran, NPGB	60000	49079	81.80%
Turkey, NGB-AARI	56000	25620	45.80%
Pakistan, NARC	23000	15835	68.80%
Morocco, INRA	22000	15405	70.00%
Egypt, NGB	20000	12127	60.60%
Syria, GCSAR	11500	8252	71.80%
Jordan, NCARTT	4500	2301	51.10%
Yemen, AREA-NGRC	3000	2571	85.70%
Oman, MAF	900	259	28.80%
Libya, ARC	600	328*	54.70%
Tunisia, MOA	n.a.	3132	--
Algeria, INRAA	n.a.	525*	--
Total	**201500**	**135 434**	**Average 66.2%**

* Some countries have a good part of their holdings deposited for the time being in regional genebanks for save keep or till they build additional storage capacity. It is reported that Algeria has some 3000 accessions kept at ICARDA, Libya likewise has some of its holdings with Bari, Italy Regional Genebank.

10.3 Annex 1 Crops Maintained by the Reporting Institutes

As mentioned above, the reporting institutes are holding between them some 135 434 accessions of 59 out of the 64 crops listed in Annex 1 of the Treaty. However, the largest proportion of the total number of accessions (94%) belongs to twenty crops, while the other 39 crops have between them the remaining 6% of the total number of accessions. As can be seen below of the reported total accessions, three crops have 52%, seven crops have 29%, ten crops represented 13%, nineteen crops represented 6% and twenty crops represented less than 0.1%.

- **3 crops** have between them 70593 accessions representing 52% of the total number of accessions, these are: Wheat, Barley and Chickpea.
- **7 crops** have between them 37192 accessions representing 28% of the total number of accessions, these are: 28% Lentil, Rice, *Medicago* spp, Maize, Faba Beans/V, *Trifolium* spp. and Oat.
- **10 crops** have between them 17124 accessions representing 13% of the total number of accessions, these are: 14% Beans, Sorghum, Brassica, Sunflower, *Citrus* spp, Pearl Millet, *Lathyrus* spp, Rye, Apple and Pea.
- **19 crops** have between them 8152 accessions representing 6% of the total number of accessions, these are: 06% *Onobrychis* spp, *Astragalus* spp, Beet, Cowpea, Grass Pea,

Lupinus spp, *Lolium* spp, Eggplants, Potato, Carrot, *Hedysarum* spp, *Dactylis* spp. *Festuca* spp, *Lotus* spp, *Phalaris* spp, Triticale, *Melilotus* spp, *Agropyron* spp and *Coronilla* spp

- **13 crops** have between them 339 accessions representing less than 0.1% of the total number of accessions, these are: Poa, *Atriplex* spp, *Phleum* spp, *Alopecurus* spp, *Salsola* spp, Banana, *Eleusine* spp, *Prosopis* spp, sweet potato, *Agrostis* spp, *Ornithopus* spp, coconut and pigeon pea
- **7 crops** have between them 33 accessions representing almost 0% of the total number of accessions, these are: *Asparagus* spp, Strawberry, *Andropogon* spp, *Canavalia* spp, *Arrhenetherum* spp, *Pueraria* spp and Major Aroids

Details of number of accessions per crop can be found in Annex 7

10.4 Food versus Forage Crops of Annex 1

Table 8 shows that out of the 59 crops of Annex 1 that are maintained by the reporting institutes, 32 are of food crops representing 54% of the total number of crops and 27 of forage crops representing 46% of the total. However, when it comes to total number of accession, food crops holdings come to 88% of the total number of accessions (119 335 accessions), while forage crops have 12% (16 099 accessions). The food crops collections are dominated by three crops (wheat, barley, chickpea) having among them 70 557 accessions representing over 60% of all accessions of food crops. In the case of forage crops, Medicago and Trifolium having between them 10 076 accessions representing over 62% of the total number of all forage crops accessions.

Table 8: Holdings of Food and Forage Crops

Food Crops		Accessions	Forages		Accessions
1.	Wheat	41697	1.	Medicago	5956
2.	Barley	17766	2.	Trifolium	4120
3.	Chickpea	11094	3.	Lathyrus	1261
4.	Lentil	7355	4.	Onobrychis	826
5.	Rice	6905	5.	Astragalus	714
6.	Maize	4428	6.	Lupinus	508
7.	Faba Bean/ Vetch	4348	7.	Lolium	507
8.	Oat	4089	8.	Hedysarum	386
9.	Beans	4776	9.	Dactylis	366
10.	Sorghum	2729	10.	Festuca	246
11.	Brassica	2115	11.	Lotus	243
12.	Sunflower	2055	12.	Phalaris	225
13.	Citrus	1516	13.	Melilotus	211
14.	Pearl Millet	1403	14.	Agropyron	140
15.	Apple	1103	15.	Coronilla	114
16.	Rye	1094	16.	Poa	60
17.	Pea	1072	17.	Atriplex	54
18.	Cowpea	663	18.	Phleum	37
19.	Beet	660	19.	Alopecurus	35
20.	Eggplant	620	20.	Salsola	33

Food Crops		Accessions	Forages		Accessions
21.	Grass pea	618	21.	Prosopis	18
22.	Potato	482	22.	Agrostis	14
23.	Carrot	402	23.	Ornithopus	10
24.	Triticale	249	24.	Andropogon	6
25.	Banana	22	25.	Canavalia	4
26.	F. Millet	20	26.	Arrhenatherum	3
27.	S. Potato	16	27.	Pueraria	2
28.	Asparagus	11			
29.	Coconut	10			
30.	Pigeon Pea	10			
31.	Strawberry	6			
32.	Maj. aroids	1			
Total Food Crops		**119335**	**Total Forages**		**16099**
Food crops		**88%**	**Forages**		**12%**
Grand Total					**135 434**

10.5 Wild Relatives of Crops

The wild relatives of crop plants, which include the progenitors of crops, as well as species more or less closely, related to them, constitute an increasingly important resource for improving agricultural production and for maintaining sustainable agro-ecosystems. They have contributed many useful genes to crop plants, and modern varieties of most crops now contain genes from their wild relatives. The wise conservation and use of crop wild relatives are essential elements for increasing food security, eliminating poverty, and maintaining the environment. Several of the respondents to the questionnaire provided some useful, though incomplete, data crop wild relatives; the subject needs to be further reviewed, however. This perhaps will be taken up in more details during the global crop conservation strategy development.

10.6 Factors/criteria for assessing importance of collections

For the time being, the size of the accession was used here, as a preliminary indication of importance of a collection, which, though important, size is only a single measure among several to be taken in consideration. Large collection size is the better for capturing the greatest variability and ensuring having samples from different locations. Obviously, this is an arbitrary criterion but is helpful for directing the attention to potential collections in the Region for further evaluation and scrutiny. As shown in Annex 8, it can be preliminarily surmised that there are collections of Annex 1 crops, which highly deserve to be considered further to ascertain their importance. These collections are[6]:

- Crops of Primary Importance: wheat (8 collections), barley (9), Chickpea (5) lentil (6), rice (5), Medicago (7), maize (7), Faba beans (7), Trifolium (5) and oat (4).
- Crops of Secondary Importance: Beans (2 collections), Sorghum (5), Brassica (3), sunflower (40), citrus (4), Pearl millet (2), Lathyrus (4), apple (3), rye (4) and pea (3).

[6] In paragraph 8.11 other crops/group of crops not listed in Annex 1 of the Treaty were identified as of priority importance to the region. These include: Date palm, Figs, Olive, Vitis, Prunus, Pistachio, Pomegranate, Mango, Onion, Garlic, Lettuce, Cucurbit and Safflower. However at this stage no information is available on the state of their collections in the Region. In further development of the strategy, attention should be paid to them.

Assessing the importance of the collections and ranking them for their value, quality and other parameters would require further analysis and consultation. As a first step in this direction, the WANA Strategy Advisory Group at its meeting in Aleppo, Syria (29 May-1 June 2006), agreed on the following factors/criteria to be taken into consideration in assessing and/or determine the importance of key collections:

- Size of the collection (number of accessions)
- Geographic coverage
- Extent and origin of diversity
- Holdings in collection of wild relatives and landraces / Indigenous species to the region such as landraces and wild relatives
- Status and extent of documentation (minimum required data available)
- Accessibility and availability
- Utilization/usability (actual and potential use) of collection
- Degree and threat of genetic erosion
- Uniqueness of the diversity (such as tolerance to abiotic stresses etc.)
- Viability and quantity of the material (storage conditions and regeneration standards)

To conclude, the preceding review of priority crops and important collections was based on firsthand information provided by national institutions involved in PGR in general and in *ex situ* activities in particular. Only twelve institutions from as many countries have provided information: in several cases, limited to their own institutes' activities and holdings. The review, therefore, remains incomplete, but partial as it may be, it showed a wide ranging *ex situ* activities and revealed the existence of rather sizable holdings of key crops in the Region of global importance. As such it serves the purpose of this stage of the development of the WANA Conservation Strategy.

11. Collections of Priority for Support

The determination of collections of priority for support is an important aspect of the current strategy. However, the task is demanding and could not dealt with satisfactorily without detailed information on each specific crop collections, which eventually will be complemented with the global crop strategies. Therefore, the final determination of collections of priority for support needs further review and consultation among collection holders to ensure consensus among countries in the region.

As a guide for further consideration of the subject by the Advisory Group, the approaches adopted by two regions for setting criteria for identifying collections of greatest importance and priority for support are summarized below:

- From Eastern Africa: Collections of priority were determined based on the scores received for 'threats' though the analysis of the metadata for the criteria: No. Of accessions requiring immediate regeneration and safety duplication, age of equipment, power supply and available resources - human as well as financial.
- From South, Southeast and East Asia (SSEEA): The Country Coordinators in different countries from the three networks were consulted. Based on the information provided by the Country Coordinators of the countries in the region, the collections of greatest importance and priority for support were identified as 'most important' in terms of size, extent/scope of diversity as defined by the network members and other experts.

Participants in the development of the SSEEA strategy has developed the following useful set of criteria for identifying collections, which are of high priority for long- term support:

- Collections in public domain
- Distinct collections (landraces, wild relatives)
- Collections under threat
- Collections with specific traits and from specific ecologies
- Collections that meet all the eligibility criteria
- Collections with sufficient eco-geographical representation/ Size of the collections
- Collections from institutions where regional /international collaborations are on-going
- Collections representing interdependence for germplasm at regional and global level to support food and nutritional security
- Collections represented by materials which are readily available for exchange as determined by plant health and quarantine requirements
- Collections having at least the minimum passport data

The above criteria were suggested in-group discussions at the SSEEA strategy taking examples of three crops, namely, rice, *Vigna* and Citrus. In addition to these generic criteria, some will be crop specific, for example, in the case of citrus the urgency and need to move collections from high risk field collections to seed genebanks and cryobanks. For legumes such as *Vigna*, the sustainability of collections to environment and agricultural system conditions can be additional criteria.

It is important to note that it was also agreed that these criteria will not be used in isolation but in combination with the other sets of criteria in the list and as qualitative information."

12. Collaboration for Effective and Efficient Conservation

Key objective of the newly established Global Crop Diversity Trust is to promote an effective and efficient global arrangement for *ex situ* conservation in accordance with the International Treaty and the Global Plan of Action. The intention is to build towards such an arrangement gradually, by putting into place rational strategies for conservation at the regional level and contributing to the conservation of crop genepool at global level. For such a system to work, the following are deemed critical:

- Credibility and trust amongst the collection holders in the region,
- Willingness to collaborate with partners within and outside of the region,
- Links with existing collaborative frameworks such as networks,
- Adequate funding to support the system,
- Agreed conservation standards and strong links to users,
- Effective mechanisms for monitoring and evaluation of technical and financial indicators
- Sharing of conservation responsibilities amongst partners for activities such as: storage, documentation, regeneration, characterization and evaluation, strategies and methodologies to enhance use of *ex situ* collections, safety duplication, germplasm health, germplasm exchange and distribution, training and technology transfer.

With its immense PGR heritage and potential and the many constraints that frustrate the full realization of such potential, the WANA is perhaps the region that requires most a rational strategy for conservation at the regional level. As seen earlier (chapters 8 and 9), most countries in the region have so far made good progress in collecting and conserving PGRFA, but crop diversity remains at risk making the case for the need for efforts to sustain important crop collections. This can be achieved through developing a strategy that conserves existing important crop diversity over the long-term and one that meets agreed standards of management as well as national, regional and global needs. In addition, such a strategy should lead to a situation where collections would have minimum unplanned duplication and

satisfactory safety back-up arrangements. It should also ensure availability and access to the conserved material through having comprehensive and easily accessible common or linked information systems.

It is very encouraging, however, to note from country visits and correspondence with leaders of major PGR programmes, that countries are willing to forge collaborative links with partners within and outside of the region[7]. The task of building a rational conservation at the regional level demands firm commitment backed by political will and readiness to share responsibilities. Much also hinges on having reasonable functional links between the concerned national institutions, as well as a suitable mutually accepted regional arrangement for collaboration and exchange of experience and knowledge. While all agree that the onus is on the countries themselves for fulfilling maximum cooperation at national and regional level, the support of regional and international organizations and donors will continue to be crucial for success.

12.1 Coordination at National Level

Efficient germplasm maintenance and use require active interaction among a multidisciplinary team of scientists including gene bank curators, plant biologists, plant breeders, socio-economists and users. In short, successful national PGR programmes require high degree of coordination at technical and management level. The report on the State of the World Plant Genetic Resources for Food and Agriculture (FAO1998) stated that the "lack of coordination between different institutions dealing with plant genetic resources activities is a major impediment to programme development" and it has "led to dispersal of resources" in some countries in the WANA Region. Similar concerns were reiterated in a recent report on genebanks in the Arab countries (ICARDA and UNEP 2002).

12.2 Measures to Strengthen National Programmes

The alleviation of the constraints such as those mentioned in the above paragraph depends on countries' policies and the importance they attach to plant genetic resources conservation and their sustainable use. There are no easy solutions and each country must decide for itself the measures and solution most suitable for its specific circumstances. They can also benefit from the collective wisdom in the region, especially of countries in similar conditions, as in the case of the regional meeting to promote implementation of the Global Plan of Action (GPA) for the Conservation and Use of Plant Genetic Resources for Food and Agriculture in the WANA region held in Aleppo, Syria in June 1998 (quoted by ICARDA and UNEP 2002). It made a number of recommendations for strengthening national programs, most of which are still valid:

- Each country should formulate a national strategy and /or plan on PGRFA, particularly for the implementation of the GPA according to the national needs and that this plan should be in harmony with national biodiversity strategy and action plans,
- National PGRFA plans and strategies should also be integrated in national development and agricultural sector plans,
- All countries should have National Plant Genetic Resources (PGR) Committees, or similar coordinating mechanisms involving all concerned parties. The committee should have clear terms of reference and regular meetings,

[7] A good example of inter-country collaboration is the Memorandum of Understanding (MoU) of Regional Alliance for promoting conservation and exchange of GR between the Ministers of Agriculture of Jordan, Lebanon, Palestinian Authority and Syria signed in June 2005 where countries commit themselves to collaborate in research and development of PGR and exchange of germplasm. ICARDA, Bioversity, ACSAD and others are party to this MoU.

- PGR units or facilities should be improved where required to meet national needs. They should have clear responsibilities, and be coordinated with other parts of the national programs,
- Appropriate legislation on PGR should be developed,
- Human resources development should be strengthened to improve availability of qualified staff, through training programs and use of experts from the region,
- National programs require secure and sustainable finance, drawing upon national and international sources.

12.3 Coordination at the Regional Level

Regional collaboration in PGR has not been very successful despite the formation of the West Asia and North Africa Network (WANANET) to promote such collaboration among countries of the region. The West Asia and North Africa Plant Genetic Resources Network (WANANET) was established in 1992 with an initial membership of thirteen countries and sponsorship of Bioversity (then IBPGR), ICARDA and FAO.

The main objectives of the network were to assist NARS in developing plant genetic resources programmes, formulate and prioritize collaborative research and strategies for collection, conservation, documentation, germplasm exchange and training, and to formulate recommendations for specific regional cooperative programmes. The Network was made up of a Plant Genetic Resources Committee (WANA PGRC), Steering Committee and 5 Crop Working Groups, plus an *in situ* and Biodiversity Working Group. The Network secretariat was housed at the Bioversity WANA Office.

Initially, the network played an important role in strengthening national programmes by reinforcing the role of the national plant genetic resources committees, encouraging coordination between different institutions within each country and among programmes throughout the region. WANANET was completely dependent on Bioversity for funding, which all went into meetings of the various working groups producing reports and recommendations with little, if any, follow-up on their implementation, with the exception of establishing new *ex situ* facilities.

It is generally accepted that the inability of the network to be self-sustained and the failure of its member countries to implement its recommendations are among the main reasons for its ineffectiveness. Other contributing factors are on one hand weak links to breeders at national level who saw these genebanks as ‘unnecessary’ competitors to their working collections and on the other weak links to policy makers. Quite often, such initiatives are normally created without the prior endorsement and commitment by the national competent policy and decision makers, and accordingly no resources are earmarked for it activities, and so once external support ceases, the whole project falls through.

12.4 Need for Renewal of Regional Collaboration

Given the positive development as shown by growing number of genebanks/ national PGR programmes in WANA and the impetus generated by the current regional conservation strategy process, it is generally agreed that now is indeed the right time to consider the establishment of a PGR regional network de novo: a network that is country driven, self-sustained and broad-based. The new network should be part of AARINENA, which is the official Association representing the region in the Global Forum for Agricultural Research (GFAR) and is made of the agricultural research institutions in WANA that are housing the bulk of the plant genetic resources collections in the region. Membership of the Network

should be broad so as to include in addition to public institutions, NGOs, private sector and farmers associations. Membership should also be subject to formal endorsement by the highest competent authority in the country that is seeking membership, possibly through signing a letter/memorandum of understanding spelling out benefits and obligations.

The Network should be primarily concerned with the sustainable conservation and use of plant genetic resources for food and agriculture (PGRFA) in keeping with the FAO International Treaty, to which the countries of the Region are formally associated. Specifically, the Network is to be instrumental in developing [and executing?] long-term regional strategies and frameworks for action for *ex situ* conservation and use including demonstrating benefits of these *ex situ* collections in terms of food and nutrition security, improving agricultural productivity, farmers income and people's livelihoods in accordance with the International Treaty and the Global Plan of Action, with primary focus on activities and actions that support crops in Annex 1 of the Treaty. The network will play an instrumental role in promoting inter-regional cooperation on PGRFA and raising public awareness on the importance of PGRFA targeting particularly National Governments and Donor Community at large.

The new network should be country driven to further strengthen national and regional genetic resources programmes with the following objectives:

- Foster the conservation and sustainable use of PGR in the region,
- Promote the exchange of PGR scientific and technical experience and information,
- Strengthen national PGR research capacities for providing timely and necessary data and information to policy-makers
- Encourage the establishment of appropriate cooperative PGR research and training programmes in accordance with identified regional, bilateral or national needs and priorities,
- Strengthen cross-linkages between national, regional and international research centres and organizations, including universities, through involvement in jointly planned PGR research and training programmes, and
- Assist in the mobilization of financial and other forms of support to all efforts aiming at strengthening PGR conservation and sustainable use for development in the Region.

12.5 Areas for Collaboration

An important basis of a rationally developed regional collaboration is the sharing of conservation activities, expertise and experience. Based on comparative advantage, willingness to collaborate, and commitment to the cause of the Regional strategy, countries should further discuss collaboration on well-identified and focused activities. The Advisory Group identified five sets of broad areas for collaboration in sharing of experience and resources to be addressed, among others, by future arrangement for regional collaboration:

1. Germplasm Management
    - Regeneration / multiplication
    - Characterization and evaluation
    - Documentation
    - Utilization genetic resources

2. Storage/Field Facilities
    - Seed Storage
    - Field genebanks
    - In vitro Conservation

- Multi-location evaluation of germplasm

3. Germplasm Movement
   - Safety duplication
   - Germplasm health (standards and monitoring) / safe and healthy movement of germplasm
   - Germplasm exchange and distribution of material

4. Capacity Building / Knowledge
   - Training
   - Technology transfer
   - Policy and legislation

5. Joint Research Projects and Ventures
   - Collection missions
   - Joint publications/knowledge
   - Regional scientific meetings
   - Public awareness

12.6 Collaboration with international/regional organizations

Numerous international and regional organizations have traditionally played a major role in supporting PGR activities in the region, a fact that is highly appreciated by the countries of the region. It is hoped that they will continue to lend their technical and financial support. To name but few: all CG centres (particularly Bioversity, ICARDA, CIMMYT, ICRISAT, CIP, IRRI), GFAR, ACSAD, GEF, UNDP, UNEP, FAO, JAICA, USAID, IDRC, IFAD, IDB, AFSED, ICUC, CIHEAM, OPEC, Global Crop Diversity Trust and several others. It is important that any future network to endeavor to attract the support of these and other sponsors, especially from outside the region such as the Nordic Countries Genebanks as well as seeking sponsorship from major NGO or private sector entities in the region. The network should articulate and develop the notion of sponsorship to turn it into an effective instrument of support, oversight and advice. It may think of technical sponsorship (e.g. Bioversity, ICARDA, ACSAD, the Trust) and political/policy sponsorship (FAO, GFAR and AARINENA).

12.7 Next Steps

Caution and time are needed in establishing the new network. Experience shows that it is not sufficient for a few dedicated and enthusiastic individuals to get together and decide on the establishment of a network encouraged by the willingness of an organization to provide funding to get things moving. Eventually there comes a time when the organization is unable or unwilling to continue the financial support indefinitely. To avoid such a situation, there is a need in the first place for countries' formal endorsement and firm commitment. The enthusiasm and dedication of individuals is essential but it has to be backed by unambiguous endorsement by the competent national authorities. It is suggested that such endorsement takes the form of a letter/memorandum of understanding, which spells clearly the benefits to and obligations of the country wishing to join the Network.

To avoid past shortcomings, the establishment and launching of the new network should be orderly and professionally executed. It is suggested that an Executing Agency/Organization be appointed by the mother organization (ARRINENA) to undertake all operational and legal steps leading to the establishment of the network. The tasks include: finalizing the Network's

charter and getting it approved, obtaining governments endorsement, call for first inaugural meeting and handing over the responsibilities to an elected governing body. The Executing agency should be enabled and resourced (in addition to what it may volunteer to undertake from its own resources) to undertake the described tasks efficiently and timely.

Conserving plant genetic resources for food and agriculture in the region is a lofty cause, which should find appeal and support of eminent and highly dedicated persons; a case for patronage at highest level possible. It is suggested to explore the possibility of having a 'patron' for the cause of establishing and supporting the strategy and the establishment of the network by some well-known and respected personality from the region. It is, also, suggested to explore the idea of having a small team of high ranking well known persons to act as "delegation of good will" to contact relevant authorities and organizations, in and outside the region, to promote interest in the intended initiative. This was done with success in the past and some of the individuals who took part in it then may be willing to help once again. It would be good to involve private sector/ some foundations/ NGOs in the initial steps of the establishment of the Network[8].

As has been indicated earlier, ARRINENA has decided on having the new Network under its umbrella and it will try to mobilize interest and funds for the initial steps needed to establish and launch the process leading to the establishment of the network. The Association will endeavour to set the matter in motion to work out the objective, management and mode of operation and other details of the setting of the Network. The Strategy Advisory Group discussed, in a preliminary way, the type of network is needed and what organizational form it should take. It considered the likely geographical and subject-wise coverage of the future network and, without prejudging future discussions, it agreed that what was needed is an evolving network starting perhaps as a central network and eventually establish subregional chapters as need may arise and interest shown by the countries of the sub-region. On the same token, the network may start as subject-wise network and gradually develop crop specific activities. The network should start with well-defined and focused activities where members of the network can contribute to and benefit from.

13. Policy and Legal Issues

After protracted negotiations, the FAO Conference adopted in November 2001 the legally binding International Treaty on Plant Genetic Resources for Food and Agriculture, which eventually entered into force in June 2004 (see the status of WANA countries with signatures and ratification of the IT-PGRFA in Annex 3). Through the Treaty, countries agreed to establish an efficient, effective and transparent Multilateral System to facilitate access to plant genetic resources for food and agriculture, and to share the benefits in a fair and equitable way. The Multilateral System applies to over 64 major crops and forages. The Treaty stipulates that the Contracting Parties shall develop and maintain appropriate policy and legal measures that promote the sustainable use of plant genetic resources for food and agriculture. It, furthermore, calls on countries to cooperate to promote the development of an efficient and sustainable system of *ex situ* conservation, giving due attention to the need for adequate documentation, characterization, regeneration and evaluation, and to advance the development and transfer of appropriate technologies for this purpose with a view to improving the sustainable use of plant genetic resources for food and agriculture.

[8] A prominent PGR leader in the region was asked whether the idea was feasible, he answered: "I think it is possible and should be tried. I am optimistic if the 'the patron' and 'core group' are well selected as leaders who could influence institutions and policies".

The Treaty spells out the national commitments and international cooperation. For the former, it stipulates that each Contracting Party shall, as appropriate, integrate into its agriculture and rural development policies and programmes, activities specified in the Treaty, and cooperate with other Contracting Parties, directly or through FAO and other relevant international organizations, in the conservation and sustainable use of plant genetic resources for food and agriculture. On the other hand, the Treaty states that international cooperation shall be directed, inter alia, to: a) establishing or strengthening the capabilities of developing countries with respect to conservation and sustainable use of PGRFA; b) enhancing international activities to promote conservation, evaluation, documentation, genetic enhancement, plant breeding, seed multiplication, and providing access appropriate information and technology, and C) implement the funding strategy articulated in the Treaty.

The following is a brief review of national commitments and international cooperation, technical assistance, benefit sharing in the Multilateral System as stipulated in the International Treaty. The purpose of bringing these here is to help better understand both the commitments and responsibilities of the countries of WANA and the benefits they can accrue as a result of being part of the Treaty and its Multilateral System. These need to be eventually factored in the final and approved WANA Strategy.

13.1 National Commitments and International Cooperation

Each Contracting Party shall integrate into its agriculture and rural development policies and programmes, and cooperate with other Contracting Parties in the conservation and sustainable use of plant genetic resources for food and agriculture. On the other hand, international cooperation shall be directed to:

- Establishing or strengthening the capabilities of developing countries and countries with economies in transition with respect to conservation and sustainable use of plant genetic resources for food and agriculture;
- Enhancing international activities to promote conservation, evaluation, documentation, genetic enhancement, plant breeding, seed multiplication; sharing, providing access to, and exchanging, in conformity with Part plant genetic resources for food and agriculture and appropriate information and technology;
- Maintaining and strengthening the institutional arrangements provided for in the Treaty; and
- Implementing the funding strategy as stated in the Treaty.

13.2 Technical Assistance

The Contracting Parties agree to promote the provision of technical assistance to Contracting Parties, especially those that are developing countries or countries with economies in transition, either bilaterally or through the appropriate international organizations, with the objective of facilitating the implementation of this Treaty.

13.3 Benefit-sharing in the Multilateral System

Facilitated access to plant genetic resources for food and agriculture constitutes itself a major benefit of the Multilateral System and accruing benefits shall be shared fairly and equitably in accordance with the provisions of this Article. Benefits arising from the use, including commercial, of plant genetic resources for food and agriculture under the Multilateral System shall be shared fairly and equitably through the following mechanisms: exchange of information, access to and transfer of technology, capacity-building, sharing of monetary and

other benefits of commercialization. These are spelled out in great details in the Treaty and need to be fully understood.

In considering the above developments, the Advisory Group is of the view that the countries of the region, individually and collectively, need to put their act together if they were to meet their obligations towards the Treaty and to benefit from the opportunities it offers; national commitment is also an opportunity to be a participant in and beneficiary of the Treaty. Otherwise there is a risk of being only a provider of resources. National coordination will be essential to fulfil obligation and to monitor them; designation of focal points of the Treaty is therefore very important; coordination at national and regional level is no more a choice but an absolute necessity. Legislation is singled out as very important and accordingly harmonization of legislature and procedures in the region is of significant importance. The status of legislations in the region is still believed to be weak and needs to be consistent with the international agreements. The region should strengthen its capacity to deal with this issue.

14. Capacity-building and Upgrading Requirements

The Treaty expounds on the benefit sharing in the Multilateral System such as: the exchange of information, access to and transfer of technology and capacity building, the latter is the subject of this section. According to the Treaty, the Contracting Parties agree to give priority to:

- Establishing and/or strengthening programmes for scientific and technical education and training in conservation and sustainable use of plant genetic resources for food and agriculture,
- Developing and strengthening facilities for conservation and sustainable use of plant genetic resources for food and agriculture, in particular in developing countries, and countries with economies in transition, and
- Carrying out scientific research preferably, and where possible, in developing countries and countries with economies in transition, in cooperation with institutions of such countries, and developing capacity for such research in fields where they are needed.

National capacities, infrastructures and facilities in the WANA Region vary from one country to another but it is safe to assume that they require upgrading/building in almost all the countries of the region. Likewise, human resource capacities need to be developed by way of education and training programmes in most of, if not all, the countries. Investment in training and education particularly in *ex situ* sector is significantly low, a matter which requires more attention by decision makers of the importance of the national collections and PGR activities in general. Expertise in curating and management of *ex situ* conservation activities is lacking (total range of activities in maintaining PGR including documentation, characterization/evaluation, collecting, distribution, germplasm health, regeneration).

During country visits, enhancing human resources capacities was singled out as an important requirement for strengthening PGR activities in general and *ex situ* activities in particular. Many countries in the region are developing fairly advanced *ex situ* programmes and facilities and so their need for a more specialized cadre through more advanced training. The issue of training was discussed during visits to in Aleppo. Both ICARDA and CWANA-Bioversity had over the years contributed, individually and together, to training efforts in the Region. They collaborate with other regional organizations (e.g. ACSAD) and a number of universities in the region (e.g. Aleppo University, Damascus University, AUB University,

Jordan University) and outside the region (University of Birmingham). Annex 9 gives a brief account of training and education opportunities in the Region.

To put all efforts of capacity-building and upgrading requirements, particularly for human resources in context, there is a need for a comprehensive assessment of national, sub-regional and regional staffing requirements in areas PGR conservation to help Universities and advanced training institutions to plan how to meet future demands, both quantitatively and qualitatively. Likewise there is a need for systematic needs assessment, for example, of long-term storage, laboratories and field genebanks. However, it should be emphasized that the conservation strategy is not aiming necessarily at encouraging all countries to have full conservation capacity for all of the crops. In order to understand the potential for regional collaboration, it will be important to know who already has good capacities and what are the strengths and the comparative advantages of each country to possibly take on a responsibility at the regional and international level.

14.1 Areas in need for upgrading/building

Meanwhile, the Advisory Group identified a broad range of requirements in a variety of areas as follows:

Identified areas for overall capacity building and upgrading:
- Upgrading Management/documentation Systems
- Upgrading and maintaining Infrastructures and Facilities
- Maximizing utilization
- Public awareness
- Policy and legislations
- Technical and research abilities

Identified areas for training and education:
- Strengthening in-country/on the job courses/training
- Short, medium, long-term plans for training including the contributions from each country
- Sub-region and regional training organized by the more advanced national systems
- Coordinated country needs assessment/inventory, commitment and programme approach and maintenance of skills

Identified areas for upgrading management systems:
- Development of common information platforms for sharing such as common descriptors, data standards, protocols on conservation such as genebank management systems, performance monitoring, quality management and good practices;
- Harmonization of regulations especially on facilitating PGR exchanges;
- Biotechnology laboratory skills
- Databases management
- Strengthening links with users through increased availability and accessibility of information on the collections.

Identified areas for upgrading infrastructures and facilities:
- Support to field genebanks for crops and regional collaboration for sharing responsibilities (eg. Iran for pistachio, Morocco for olive, regional pomegranate collection in Tunisia etc., Oman for date palms, Pakistan and grapes, Syria and apple, Jordan and apple and almond)
- Support to in vitro base collection of priority for vegetatively propagated crops
- Upgrading conservation facilities of priority crop and seed collections

15. Eligibility Analysis for Global Crop Diversity Trust Support

The establishment of the Global Crop Diversity Trust, as an independent international organization, represents a major step forward as an important element in funding the strategy of the International Treaty. The goal of the Trust is to provide a secure and sustainable source of funding for the world's most important crop diversity collections. There are more than 1400 crop diversity collections in more than 100 countries around the world. These collections are the best source of the raw material farmers and breeders need to develop hardy, dependable, productive and nutritious crops. They contain traits that will allow crops to cope with climate change, pests and disease, as well as to increase crop yields to feed the ever-growing human population. However, there is a general agreement on the need for rationalization of all these collections since it is well known that there is a high level of duplication. This, of course, will be only possible if there was a good documentation of the concerned collections.

The present strategy, part of several regional strategies stimulated by the Trust, aims at the efficient, effective and sustainable conservation and utilization of crop genetic diversity in the West Asia and North Africa Region (WANA). An important part of all the regional strategies is the identification of the most important crop collections in a given region, determining the collaborative arrangement for effective and efficient conservation and the determination of priority and eligibility for funding support by the Trust. 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.

Eventually, the determination of eligibility of a collection for support by the Trust will be based, inter alia, on its conservation objective, its scope and commitments of the holder of collection and its role within a global conservation system. The Eligibility Principles and Criteria, as they stand, relate to the collections and not to a country. However, since most of the collections identified so far are in the public sector with individual governments taking almost entire responsibility for them, the principles and criteria are evaluated against each country as they would be de facto applicable to the collections[9].

The germplasm holders in most countries 'need support for developing basic capacity of human resources and management systems to maintain their plant genetic resources and to achieve the conformity with agreed scientific and technical standards of management, and the facilities to effectively maintain the collections, while other countries need to develop capacity for more modern techniques for characterization, evaluation and utilization'. These needs should, of course, be assessed in relations to taking on regional and international responsibilities, particularly that some countries currently have the genebanks capacities and the standards and could make those capacities benefit the region.

[9] In line with conclusions of other regional strategies, especially of SSEEA

In Section 9, an attempt was made to identify collections of greatest importance of the priority crops in the Region. However, this is a partial conclusion since responses are still awaited from other countries. More importantly, information provided by several respondent institutes refers only to the collections held by them; other institutes in the country may hold some important collections. A second round of fact-finding may prove necessary; especially for courtiers that have reported more than one institute having PGR *ex situ* collections (Iran reported 2, Morocco 4,Tunisia 10 and Turkey 2 for seed and 16 for field collections with a National coordination). It is not clear whether universities have eligible collection or for that matter the private sector. However, along with identifying the specific collections, the regional collaborative arrangements need to be identified and agreed.

References

Several publications by Bioversity, FAO, ICARDA and the Global Crop Biodiversity Trust were consulted.

Likewise several national publications were very helpful in understanding the PGR situation in the countries that provided documentation

The main source of data and information regarding the status of PGR activities and collections of crops on Annex 1 of the Treaty was the questionnaire completed by Algeria, Egypt, Iran, Jordan, Libya, Morocco, Oman, Pakistan, Syria, Tunisia, Turkey and Yemen.

FAO (1996) International Technical Conference on Plant Genetic Resources, Leipzig, Germany 1996

FAO (1996) Global Plan of Action for the Conservation and Utilization of Plant Genetic Resources for Food and Agriculture, Rome, Italy

FAO (1998) The State of the World's Plant Genetic Resources for Food and Agriculture, Rome, Italy

FAO (2004) The International treaty for Plant genetic Resources for Food and Agriculture, Rome, Italy

ICARDA and UNEP (2000) Feasibility Study on Establishment of a Genebank for Plant Genetic Resources in the Arab World, Aleppo, Syria

Annex 1: Participants at the Advisory Group Meeting of the Regional Conservation Strategy for WANA, June 2006

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Note: Dr. Tyfer Tan (Turkey) is a member of the Advisory Group who could not attend the Advisory group Meeting; she has contributed valuable comments on the Drafts of the Strategy

Annex 2: Signature to the Treaty by countries of the WANA Region (update 30 May 2006)

	Participant	Signature	Ratification	Accession
1.	Algeria			13/12/2002
2.	Cyprus	12/6/2002	15/9/2003	
3.	Djibouti			8/5/2006
4.	Egypt	29/8/2002	31/3/2004	
5.	Eritrea	10/6/2002	10/6/2002	
6.	Iran, Islamic Republic	4/11/2002	28/4/2006	
7.	Jordan	9/11/2001	30/5/2002	
8.	Kuwait			2/9/2003
9.	Lebanon	4/11/2002	6/5/2004	
10.	Libyan Arab Jamahiriya			12/4/2005
11.	Morocco	27/3/2002		
12.	Oman			14/7/2004
13.	Pakistan			2/9/2003
14.	Saudi Arabia			17/10/2005
15.	Sudan	10/6/2002	10/6/2002	
16.	Syrian Arab Republic	13/6/2002	26/8/2003	
17.	Tunisia	10/6/2002	8/6/2004	
18.	Turkey	4/11/2002		
19.	United Arab Emirates			16/2/2004
20.	Yemen			1/3/2006

Annex 3: List of Annex 1 crops covered under the multilateral system of exchange of the IT-PGRF

	Crop	Genus	Observations
1.	Breadfruit	*Artocarpus*	Breadfruit only
2.	Asparagus	*Asparagus*	
3.	Oat	*Avena*	
4.	Beet	*Beta*	
5.	Brassica complex	*Brassica et al.*	Genera included are: Brassica, Armoracia, Barbarea, Camelina, Crambe, Diplotaxis, Eruca, Isatis, Lepidium, Raphanobrassica, Raphanus, Rorippa, and Sinapis. This comprises oilseed and vegetable crops such as cabbage, rapeseed, mustard, cress, rocket, radish, and turnip. The species *Lepidium meyenii* (maca) is excluded.
6.	Pigeon Pea	*Cajanus*	
7.	Chickpea	*Cicer*	
8.	Citrus	*Citrus*	Genera Poncirus and Fortunella are included as root stock.
9.	Coconut	*Cocos*	
10.	Major aroids	*Colocasia, Xanthosoma*	Major aroids include taro, cocoyam, dasheen and tannia.
11.	Carrot	*Daucus*	
12.	Yams	*Dioscorea*	
13.	Finger Millet	*Eleusine*	
14.	Strawberry	*Fragaria*	
15.	Sunflower	*Helianthus*	
16.	Barley	*Hordeum*	
17.	Sweet Potato	*Ipomoea*	
18.	Grass pea	*Lathyrus*	
19.	Lentil	*Lens*	
20.	Apple	*Malus*	
21.	Cassava	*Manihot*	*Manihot esculenta* only.
22.	Banana / Plantain	*Musa*	Except *Musa textilis*.
23.	Rice	*Oryza*	
24.	Pearl Millet	*Pennisetum*	Except *Phaseolus* polyanthus.
25.	Beans	*Phaseolus*	
26.	Pea	*Pisum*	
27.	Rye	*Secale*	
28.	Potato	*Solanum*	Section tuberosa included, except *Solanum phureja*.
29.	Eggplant	*Solanum*	Section melongena included.
30.	Sorghum	*Sorghum*	
31.	Triticale	*Triticosecale*	
32.	Wheat	*Triticum et al.*	Including *Agropyron, Elymus,* and *Secale*.
33.	Faba Bean / Vetch	*Vicia*	
34.	Cowpea et al.	*Vigna*	
35.	Maize	*Zea*	Excluding *Zea perennis, Zea diploperennis*, and *Zea luxurians.*

	Genera	Species
Legume Forages		
1.	*Astragalus*	*chinensis, cicer, arenarius*
2.	*Canavalia*	*Ensiformis*
3.	*Coronilla*	*Varia*
4.	*Hedysarum*	*Coronarium*
5.	*Lathyrus*	*cicera, ciliolatus, hirsutus, ochrus, odoratus, sativus*
6.	*Lespedeza*	*cuneata, striata, stipulacea*
7.	*Lotus*	*corniculatus, subbiflorus, uliginosus*
8.	*Lupinus*	*albus, angustifolius, luteus*
9.	*Medicago*	*arborea, falcata, sativa, scutellata, rigidula, truncatula*
10.	*Melilotus*	*albus, officinalis*
11.	*Onobrychis*	*Viciifolia*
12.	*Ornithopus*	*Sativus*
13.	*Prosopis*	*affinis, alba, chilensis, nigra, pallida*
14.	*Pueraria*	*Phaseoloides*
15.	*Trifolium*	*alexandrinum, alpestre, ambiguum, angustifolium, arvense, agrocicerum, hybridum, incarnatum, pratense, repens, resupinatum, rueppellianum, semipilosum, subterraneum, vesiculosum*
Grass Forages		
16.	*Andropogon*	*Gayanus*
17.	*Agropyron*	*cristatum, desertorum*
18.	*Agrostis*	*stolonifera, tenuis*
19.	*Alopecurus*	*Pratensis*
20.	*Arrhenatherum*	*Elatius*
21.	*Dactylis*	*Glomerata*
22.	*Festuca*	*arundinacea, gigantea, heterophylla, ovina, pratensis, rubra*
23.	*Lolium*	*hybridum, multiflorum, perenne, rigidum, temulentum*
24.	*Phalaris*	*aquatica, arundinacea*
25.	*Phleum*	*Pratense*
26.	*Poa*	*alpina, annua, pratensis*
27.	*Tripsacum*	*Laxum*
Other Forages		
28.	*Atriplex*	*halimus, nummularia*
29.	*Salsola*	*Vermiculata*

Annex 4: Survey on Status of *ex situ* PGR Collection in Country X

Dear Colleague,

In order to update existing information concerning the status of plant genetic resources collections, the Global Crop Diversity Trust and the members of the Regional Network would be grateful if you could complete the information below, as best of your knowledge.

Country: _____
Date:_____
Sources of info:_____

National Programme structure: please provide some basic information in order for us to understand the coordination of PGR activities in your country

.

1	PGR activities coordinated at national level	Yes [ ] No [ ]
2.	National Programme formally established: if YES, please specify the date	Yes [ ] No [ ]
3.	Genebanks with national PGR responsibilities exist	Yes [ ] No [ ]
4.	National Inventory (NI)[10] exists	Yes [ ] No [ ]
5.	NI available on the web. If yes, please provide the web site address:	Yes [ ] No [ ]

PGR Collections: please provide information on the current status of PGR collections and documentation, as best of your knowledge

6.	Number of institutes with *ex situ* PGR collections in the country	
7.	Estimated total number of PGR accessions held by the institutes	
8.	National PGR documentation system exists	Yes [ ] No [ ]
9.	Use of standard descriptors for passport data used by all or most of the institutes for documenting accessions	Yes [ ] No [ ]
10.	Estimated proportion (%) of existing PGR information available in electronic format	0-10% [ ] 10-30%[ ] 30-50%[ ] 50-70%[ ] 70-90% [ ] Nearly 100%[ ]

Type of data available: please indicate the estimated proportion (%), as best of your knowledge, of the total number of PGR accessions for which there is the following type of information

11.	Passport	%
12.	Characterization / Evaluation	%
13	Indigenous knowledge	%
14.	Distribution	%
15.	Comments:	

[10] Defined as the list of designated *ex situ* PGR accessions maintained in the different institutes across the country to be considered as part of national collections

Crops on Annex 1 of the International Treaty on PGRFA: Please complete this table for each of the maintaining institutes in the country, the number of accession for the following crops on the Annex 1.

	Crop	Genus	Number of accessions	Estimated % of crop wild relatives
1.	Apple	*Malus*		
2.	Asparagus	*Asparagus*		
3.	Banana / Plantain	*Musa*		
4.	Barley	*Hordeum*		
5.	Beans	*Phaseolus*		
6.	Beet	*Beta*		
7.	Brassica complex	*Brassica et al.*		
8.	Breadfruit	*Artocarpus*		
9.	Carrot	*Daucus*		
10.	Cassava	*Manihot*		
11.	Chickpea	*Cicer*		
12.	Citrus	*Citrus*		
13.	Coconut	*Cocos*		
14.	Cowpea et al.	*Vigna*		
15.	Eggplant	*Solanum*		
16.	Faba Bean / Vetch	*Vicia*		
17.	Finger Millet	*Eleusine*		
18.	Grass pea	*Lathyrus*		
19.	Lentil	*Lens*		
20.	Maize	*Zea*		
21.	Major aroids	*Colocasia, Xanthosoma*		
22.	Oat	*Avena*		
23.	Pea	*Pisum*		
24.	Pearl Millet	*Pennisetum*		
25.	Pigeon Pea	*Cajanus*		
26.	Potato	*Solanum*		
27.	Rice	*Oryza*		
28.	Rye	*Secale*		
29.	Sorghum	*Sorghum*		
30.	Strawberry	*Fragaria*		
31.	Sunflower	*Helianthus*		
32.	Sweet Potato	*Ipomoea*		
33.	Triticale	*Triticosecale*		
34.	Wheat	*Triticum et al.*		
35.	Yams	*Dioscorea*		
36.	Forage - other	*Atriplex*		
37.	Forage - other	*Salsola*		
38.	Forage Grass	*Agropyron*		
39.	Forage Grass	*Agrostis*		

	Crop	Genus	Number of accessions	Estimated % of crop wild relatives
40.	Forage Grass	*Alopecurus*		
41.	Forage Grass	*Andropogon*		
42.	Forage Grass	*Arrhenatherum*		
43.	Forage Grass	*Dactylis*		
44.	Forage Grass	*Festuca*		
45.	Forage Grass	*Lolium*		
46.	Forage Grass	*Phalaris*		
47.	Forage Grass	*Phleum*		
48.	Forage Grass	*Poa*		
49.	Forage Grass	*Tripsacum*		
50.	Forage Legume	*Astragalus*		
51.	Forage Legume	*Canavalia*		
52.	Forage Legume	*Coronilla*		
53.	Forage Legume	*Hedysarum*		
54.	Forage Legume	*Lathyrus*		
55.	Forage Legume	*Lespedeza*		
56.	Forage Legume	*Lotus*		
57.	Forage Legume	*Lupinus*		
58.	Forage Legume	*Medicago*		
59.	Forage Legume	*Melilotus*		
60.	Forage Legume	*Onobrychis*		
61.	Forage Legume	*Ornithopus*		
62.	Forage Legume	*Prosopis*		
63.	Forage Legume	*Pueraria*		
64.	Forage Legume	*Trifolium*		

Annex 5: Indicators of Importance of Key Crops

Note: the table below shows crops of key importance, as discussed in Section 8 Para 8.7, arranged in decreasing order of size of accession, their relative importance to sub-regions/countries and factors/indicators of their importance

	Crops/Specie	Sub-regions/countries	Factors/indicators of importance
1.	Wheat	First priority crop for NVRS, NA, WA, AP	▪ The region is centre of origin for wheat ▪ Food security and sustainable agriculture ▪ Strategic crop ▪ Unique diversity for short duration and cold tolerance
2.	Chickpea	First priority in WA and very high priority in NVRS and NA	▪ Very important crop in the diet in most sub-regions.
3.	Medicago spp	WA, NA, AP	▪ The region is centre of origin
4.	Barley	First priority for NA and high priority for NVRS and WA	▪ The region is centre of origin for barley ▪ Dual purpose for animal feed and human food ▪ Food security and sustainable livelihoods ▪ Disease resistance and drought tolerance
5.	Lentil	First priority in WA and very high priority in NVRS and NA	▪ The region is centre of origin for lentil ▪ Important pulse crop in the region
6.	Trifolium spp	WA, NA	▪ The region is centre of origin and centre of diversity ▪ Turkey is micro centre
7.	Faba Beans/ Vetch	Mostly Mediterranean countries of WA and NA	▪ Important crop in the diet in most of the sub regions ▪ Region is centre of diversity ▪ Some parts of the Mediterranean countries are centre of origin
8.	Maize	High priority for all sub-regions except the AP	▪ Food security and sustainable agriculture ▪ Unique diversity ▪ Feed and fodder for animals, poultry ▪ Turkey is micro centre
9.	Rice	Priority crop in NVRS and WA	▪ Important for the diet of the region ▪ Good value crop
10.	Oat	WA and NA	▪ Region is centre of origin(Mediterranean and Near Eastern centres). ▪ Cultivated as Food (Breads) and feeding the animals
11.	Beans		▪ Important crop in the diet in most sub-regions. ▪ Turkey is micro centres for this crop ▪ Sources of resistance to various stresses available
12.	Sorghum		▪ Some regions of Africa are center of diversity ▪ Sources of resistance to various stresses available ▪ Dual purpose crop in water deficit areas
13.	Brassica complex		▪ Centre of diversity for many brassica spp. ▪ Important in the region for edible oil and leafy vegetables
14.	Sunflower		▪ Adaptability is high in the region and good source of edible oil
15.	Citrus		▪ Lot of diversity is available in the region ▪ Very important fruit globally ▪ Source of vitamin-C and food products

	Crops/Specie	Sub-regions/countries	Factors/indicators of importance
16.	Pearl Millet		▪ Important drought tolerant crop of the region with lot of variability for important traits
17.	Lathyrus		▪ Dual purpose crop for food and feed ▪ Suitable for marginal lands ▪ Enough diversity available in the region
18.	Apple		▪ Important center of diversity ▪ Important fruit plant at global level
19.	Rye		▪ Centre of diversity ▪ Adaptability to marginal lands
20.	Pea		▪ Secondary-Centre of diversity ▪ Important dual purpose crop

Annex 6: Methodology used by the Advisory Group for Deciding Crops of Priority for the WANA Region

In its meeting in Aleppo, Syria on 29 May-2 June 2006, the WANA Strategy Advisory Group considered in great details the criteria/indicators to assign priority for the genetic conservation of crops in the sub-regions of WANA. It, also, considered crops of key importance based on the criteria it adopted. The following is a brief account of the conclusions of the Advisory Group

The Advisory Group agreed to first identify crops of importance according to three sub-regions in WANA, noting that certain countries (e.g. Mauritania, Sudan) are part of the WANA region but for the purpose of the current exercise they are not included since they are taking part in the development of the strategy of the West Africa sub-region. The three sub-regions and their composition[11]:

- North Africa (NA): Algeria, Egypt, Libya, Morocco and Tunisia.
- West Asia (WA): Iran, Iraq, Jordan, Lebanon, Pakistan, Palestine Syria and Turkey.
- Arabian Peninsula (AP): Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates and Yemen.

Then The Advisory Group discussed at length and agreed on the main indicators/criteria to assign priority for the genetic conservation of crops in the three sub-regions as follows:

- Diversity within the crop
- Origin/center of diversity
- Food security / demand / nutrition, health and quality
- Economic value / production (actual / potential)
- Global/inter-regional importance
- Regionally important
- Adaptability to the region

The table below shows an attempt at ranking crops in accordance to their importance to the various subregions:

Note: Ranking: 1 = very important, 2 = important and 3 = moderately important (No1 = number of sub-regions that have assigned a priority 1, No2 = number of sub-regions that have assigned a priority 2, and No3 = number of sub-regions that have assigned a priority 3

No	Crop	AP	WA	NA	No1	No2	No3	Groups
1.	Citrus ssp	2	1	1	2	1		1
2.	Date palm	1	2	1	2	1		1
3.	Figs	2	1	1	2	1		1
4.	Medicago ssp.	2	1	1	2	1		1
5.	Onion	2	1	1	2	1		1
6.	Barley	3	1	1	2		1	1
7.	Olive	3	1	1	2		1	1
8.	Vitis	3	1	1	2		1	1
9.	Wheat	3	1	1	2		1	1

[11] In accordance with AARINENA sub-regional composition, Malta is added to North Africa Sub-region and Cyprus to West Asia Sub-region.

No	Crop	AP	WA	NA	No1	No2	No3	Groups
10.	Chickpea	4	1	1	2			1
11.	Trifolium ssp	4	1	1	2			1
12.	Garlic	2	3	1	1	1	1	1
13.	Apple	4	1	2	1	1		1
14.	Oats	4	2	1	1	1		1
15.	Fababeans	5	2	1	1	1		1
16.	Lentil	5	1	2	1	1		1
17.	Lettuce	5	1	2	1	1		1
18.	Prunus	5	1	2	1	1		1
19.	Pistachio	3	1	3	1		2	1
20.	Cucurbit	2	2	2		3		2
21.	Pomegranate	2	2	2		3		2
22.	Lathyrus	3	2	2		2	1	2
23.	Vicia	3	2	2		2	1	2
24.	Safflower	2	2	5		2		2
25.	Beans (common)	5	2	3		1	1	2
26.	Maize	5	2	3		1	1	2
27.	Pea	5	2	3		1	1	2
28.	Mango	4	2	5		1		2

Crops of priority for the region in Annex 1 of the IT-PGRFA

No	Crop	AP	WA	NA	No1	No2	No3	Groups
1.	Citrus ssp	2	1	1	2	1		1
2.	Medicago ssp.	2	1	1	2	1		1
3.	Barley	3	1	1	2		1	1
4.	Wheat	2	1	1	2		1	1
5.	Chickpea	4	1	1	2			1
6.	Trifolium ssp	4	1	1	2			1
7.	Apple	4	1	2	1	1		1
8.	Oats	4	2	1	1	1		1
9.	Fababeans	5	2	1	1	1		1
10.	Lentil	5	1	2	1	1		1
11.	Lathyrus	3	2	2		2	1	2
12.	Vicia	3	2	2		2	1	2
13.	Beans (common)	5	2	3		1	1	2
14.	Maize	5	2	3		1	1	2
15.	Pea	5	2	3		1	1	2

Group 1 (very important in at least one sub-region):

- Cereals: barley, wheat, oat
- Fruit trees: citrus, apple
- Forage legumes: Medicago, Trifolium
- Food legumes: Chickpea, Faba bean, lentils

Group 2 (not very important but important in at least one sub-region:

- Cereals: maize
- Forage legumes: Lathyrus, Vicia
- Food legumes: Beans, pea

By taking the above criteria/indicators and ranking in account, it was possible to reach provisional agreement on the important crops within four broad groups of crops as seen below. However, it was agreed that further consideration of the subject among members of the Advisory Group and in consultation with partners and stakeholders was necessary. The crops of key important are listed below.

- Cereals: barley, wheat, oat, maize
- Fruit trees: citrus, apple, (Date palm), (Figs), (Olive), (Vitis), (Prunus, (Pistachio), (Pomegranate), (Mango)
- Forage legumes: Medicago, Trifolium, Lathyrus, Vicia
- Food legumes: Chickpea, Faba bean, lentils, Vigna, Beans, pea
- Others: (Onion), (Garlic), (Lettuce), (Cucurbit) (Safflower)

Note: Those between two brackets are not part of Annex 1 crops

Annex 7: Size of Accessions of the 59 Crops held by the Reporting Countries

Note: As noted in section 9, the 12 reporting institutes are holding between them some 135 434 accessions of 59 out of the 64 crops listed in Annex 1 of the Treaty. Below is the total accession of each of the 59 crops arranged in decreasing order

Twenty Crops of Highest Number of Accessions (94% of total accessions)

Crop	Genus	Accessions
Wheat	*Triticum*	41697
Barley	*Hordeum*	17766
Chickpea	*Cicer*	11094
Lentil	*Lens*	7355
Rice	*Oryza*	6905
Forage Legume	*Medicago*	5956
Maize	*Zea*	4428
Faba Bean / Vetch	*Vicia*	4348
Forage Legume	*Trifolium*	4120
Oat	*Avena*	4089
Beans	*Phaseolus*	4776
Sorghum	*Sorghum*	2729
Brassica complex	*Brassica et al.*	2115
Sunflower	*Helianthus*	2055
Citrus	*Citrus*	1516
Pearl Millet	*Pennisetum*	1403
Forage Legume	*Lathyrus*	1261
Apple	*Malus*	1103
Rye	*Secale*	1094
Pea	*Pisum*	1072

Second Group of Twenty Crops (6% of total accessions)

Crop	Genus	Accessions
Forage Legume	*Onobrychis*	826
Forage Legume	*Astragalus*	714
Cowpea	*Vigna*	663
Beet	*Beta*	660
Eggplant	*Solanum*	620
Grass pea	*Lathyrus*	618
Forage Legume	*Lupinus*	508
Forage Grass	*Lolium*	507
Potato	*Solanum*	482
Carrot	*Daucus*	402

Crop	Genus	Accessions
Forage Legume	*Hedysarum*	386
Forage Grass	*Dactylis*	366
Triticale	*Triticosecale*	249
Forage Grass	*Festuca*	246
Forage Legume	*Lotus*	243
Forage Grass	*Phalaris*	225
Forage Legume	*Melilotus*	211
Forage Grass	*Agropyron*	140
Forage Legume	*Coronilla*	114

Crops with Small number of Accessions (less than 1% of total accessions)

Crop	Genus	Accessions
Forage Grass	*Poa*	60
Forage - other	*Atriplex*	54
Forage Grass	*Phleum*	37
Forage Grass	*Alopecurus*	35
Forage - other	*Salsola*	33
Banana	*Musa*	22
Finger Millet	*Eleusine*	20
Forage Legume	*Prosopis*	18
S. Potato	*Ipomoea*	16
Forage Grass	*Agrostis*	14
Asparagus	*Asparagus*	11
Coconut	*Cocos*	10
Pigeon Pea	*Cajanus*	10
Forage Legume	*Ornithopus*	10
Strawberry	*Fragaria*	6
Forage Grass	*Andropogon*	6
Forage Legume	*Canavalia*	4
Forage Grass	*Arrhenatherum*	3
Forage Legume	*Pueraria*	2
Major aroids	*Colocasia, X*	1

Annex 8: Number of accessions of important crops held by the 12 reporting institutions/countries

The collections are ranked according to size of collections. The bolding is an arbitrary delineation of importance of collections based on their size.

Number of accessions of primary priority crops

Crop	Holder	Accession
Wheat	NGB Iran	**20000**
	NGB Egypt	**6500**
	NGB-AARI Turkey	**5803**
	NARC Pakistan	**2974**
	GCSAR Syria	**2928**
	INRA Morocco	**1686**
	NCARTT Jordan	**895**
	MOA Tunisia	**409**
	AREA-NGRC Yemen	161
	ARC Libya	101
	MAF Oman	98
Barley	NGB Iran	**7600**
	INRA Morocco	**3738**
	NGB Egypt	**1750**
	NARC Pakistan	**1274**
	NGB-AARI Turkey	**1223**
	GCSAR Syria	**1221**
	NCARTT Jordan	**428**
	MOA Tunisia	**265**
	AREA-NGRC Yemen	**175**
	ARC Libya	51
	MAF Oman	20
	INRAA Algeria	20
Chickpea	NGB Iran	**5600**
	NARC Pakistan	**2243**
	NGB-AARI Turkey	**2066**
	GCSAR Syria	**676**
	INRA Morocco	**332**
	NGB Egypt	80
	NCARTT Jordan	34
	MOA Tunisia	25
	MAF Oman	20
	ARC, Libya	12
	INRAA Algeria	6
	AREA-NGRC Yemen	0

Crop	Holder	Accession
Lentil	NGB Iran	**3000**
	NGB-AARI Turkey	**1086**
	GCSAR Syria	**1072**
	NGB Egypt	**875**
	NARC Pakistan	**808**
	INRA Morocco	**365**
	MOA Tunisia	65
	AREA-NGRC Yemen	60
	INRAA Algeria	9
	NCARTT Jordan	8
	ARC Libya	7
	MAF Oman	0
Rice	NARC Pakistan	**2957**
	NGB Iran	**2800**
	INRA Morocco	**750**
	NGB-AARI Turkey	**297**
	NGB Egypt	**100**
	NCARTT Jordan	1
	INRAA Algeria	0
	ARC Libya	0
	MAF Oman	0
	GCSAR Syria	0
	MOA Tunisia	0
	AREA-NGRC Yemen	0
Medicago	NGB Iran	**2300**
	INRA Morocco	**1183**
	NGB-AARI Turkey	**981**
	MOA Tunisia	**579**
	NCARTT Jordan	**316**
	GCSAR Syria	**263**
	NARC Pakistan	**168**
	MAF Oman	84
	NGB Egypt	50
	AREA-NGRC Yemen	32
	ARC Libya	0
	INRAA Algeria	0
Maize	NGB-AARI Turkey	**1587**
	INRA Morocco	**1105**
	NARC Pakistan	**545**
	NGB Egypt	**425**
	GCSAR Syria	**309**
	AREA-NGRC Yemen	**248**

Crop	Holder	Accession
	NGB Iran	**190**
	INRAA Algeria	11
	ARC Libya	3
	MAF Oman	3
	NCARTT Jordan	2
	MOA Tunisia	0
Faba Beans/Vetch	NGB-AARI Turkey	**2331**
	NGB Egypt	**700**
	INRA Morocco	**372**
	NGB Iran	**280**
	GCSAR Syria	**180**
	NARC Pakistan	**172**
	MOA Tunisia	**158**
	NCARTT Jordan	95
	AREA-NGRC Yemen	35
	ARC Libya	23
	INRAA Algeria	2
	MAF Oman	0
Trifolium	NGB Iran	**1900**
	NGB-AARI Turkey	**1055**
	INRA Morocco	**513**
	Tunisia	**321**
	NGB Egypt	**275**
	NARC Pakistan	29
	NCARTT Jordan	27
	INRAA Algeria	0
	ARC Libya	0
	MOAF Oman	0
	GCSAR Syria	0
	AREA-NGRC Yemen	0
Oat	INRA Morocco	**2133**
	NGB-AARI Turkey	**814**
	NARC Pakistan	**540**
	NGB Iran	**500**
	MOA Tunisia	30
	NGB Egypt	20
	GCSAR Syria	20
	ARC Libya	18
	INRAA Algeria	9
	AREA-NGRC Yemen	3
	NCARTT Jordan	1
	MAF Oman	1

Number of accessions of secondary priority crops

Crop	Holder	Accession
Beans	NGB-AARI Turkey	**2479**
	NPGB Iran	**2000**
	NARC Pakistan	104
	AREA-NGRC Yemen	74
	MOA Tunisia	53
	GCSAR Syria	20
	INRAA Algeria	15
	NGB Egypt	15
	NCARTT Jordan	9
	INRA Morocco	7
	ARC Libya	0
	MAF Oman	0
Sorghum	AREA-NGRC Yemen	**1003**
	NARC Pakistan	**866**
	NGB Egypt	**300**
	NGB Iran	**200**
	INRA Morocco	**161**
	GCSAR Syria	93
	NGB-AARI Turkey	87
	NCARTT Jordan	12
	INRAA Algeria	5
	MAF Oman	2
	ARC Libya	0
	MOA Tunisia	0
Brassica	NARC Pakistan	**1003**
	NGB-AARI Turkey	**493**
	NGB Egypt	**450**
	NGB Iran	60
	MOA Tunisia	59
	NCARTT Jordan	16
	AREA-NGRC Yemen	13
	INRAA Algeria	12
	ARC Libya	5
	INRA Morocco	4
	MAF Oman	0
	GCSAR Syria	0
Sunflower	INRA Morocco	**1223**
	NGB Iran	**280**
	NGB-AARI Turkey	**225**
	NARC Pakistan	**184**

	NGB Egypt	75
	GCSAR Syria	64
	NCARTT Jordan	4
	INRAA Algeria	0
	ARC Libya	0
	MAF Oman	0
	MOA Tunisia	0
	AREA-NGRC Yemen	0
Citrus	NGB-AARI Turkey	**481**
	INRA Morocco	**453**
	NGB Iran	**200**
	GCSAR Syria	**118**
	NGB Egypt	70
	INRAA Algeria	67
	ARC Libya	57
	MOA Tunisia	40
	MAF Oman	16
	NCARTT Jordan	12
	AREA-NGRC Yemen	2
	NARC Pakistan	0
Pearl Millet	NARC Pakistan	**1007**
	AREA-NGRC Yemen	**360**
	NGB Iran	18
	NCARTT Jordan	6
	INRAA Algeria	5
	NGB Egypt	5
	MAF Oman	1
	NGB-AARI Turkey	1
	ARC Libya	0
	INRA Morocco	0
	GCSAR Syria	0
	MOA Tunisia	0
Lathyrus	GCSAR Syria	**568**
	NGB-AARI Turkey	**368**
	INRA Morocco	**140**
	MOA Tunisia	**126**
	NCARTT Jordan	35
	NGB Iran	16
	NGB Egypt	5
	INRAA Algeria	3
	ARC Libya	0
	MAF Oman	0
	NARC Pakistan	0

	AREA-NGRC Yemen	0
Apple	NGB-AARI Turkey	**680**
	NGB Iran	**190**
	GCSAR Syria	**120**
	INRA Morocco	38
	INRAA Algeria	30
	MOA Tunisia	28
	ARC Libya	17
	NGB Egypt	0
	NCARTT Jordan	0
	MAF Oman	0
	NARC Pakistan	0
	AREA-NGRC Yemen	0
Rye	NGB Iran	**2800**
	INRA Morocco	**750**
	NGB-AARI Turkey	**297**
	NGB Egypt	**100**
	NARC Pakistan	35
	NCARTT Jordan	1
	INRAA Algeria	0
	ARC Libya	0
	MAF Oman	0
	GCSAR Syria	0
	MOA Tunisia	0
	AREA-NGRC Yemen	0
Pea	NARC Pakistan	**421**
	GCSAR Syria	**250**
	NGB-AARI Turkey	**168**
	INRA Morocco	69
	NGB Iran	50
	MOA Tunisia	44
	AREA-NGRC Yemen	29
	NGB Egypt	20
	NCARTT Jordan	16
	INRAA Algeria	4
	ARC Libya	1
	MAF Oman	0

Annex 9: PGR-related Training and University Education in WANA

Countries in the region are developing fairly advanced *ex situ* programmes and facilities and so their growing need for a more specialized cadre through more advanced training. Both ICARDA and Bioversity had over the years contributed, individually and together, to training efforts in the Region. They collaborate with other regional organizations (e.g. ACSAD) and a number of universities in the region (e.g. Aleppo University, Damascus University, AUB University, Jordan University) and outside the region (University of Birmingham). The following is a brief review of opportunities for non- and degree training available in the region training and areas needing strengthening.

ICARDA supports a variety of courses at and outside its Headquarters. The Headquarters courses can be short-term group courses and individual degree and non-degree courses. Since the year 2000 until mid 2005, a total of 143 individuals were trained at headquarters. The non-headquarters training involved some 86 individuals for the same period. Headquarters courses are more frequent and some of the common topics for training are listed below:

- Eco-geographic and Botanical Survey
- Utilization of Wild Species of Cereal Improvement
- Conversation and Utilization of Plant Genetic Recourses
- Genetic Resources Documentation and Data Management
- Use of GIS Remote Sensing for Agro biodiversity Assessment
- Molecular Characterization for Biodiversity Studies

As a result of growing awareness and interest in agrobiodiversity and in plant genetic resources in particular, faculties of agriculture in the Region are trying to cope with the foreseen growing demand for new qualified generation to man the growing PGR programmes and facilities. Examples:

The American University of Beirut (AUB) in collaboration with BI is offering graduate studies and training programs in PGR, Conservation and Use; a two-year programme including a thesis will leads to a M.Sc. degree. Courses offered:

- Characterization of Plant Genetic Resources
- Statistical Methods
- Population Genetics
- Survey and Collection of Plant Genetic Resources
- Methods in Plant Conservation and Use
- Documentation of Plant Genetic Resources
- Global Issues in conservation

The Jordanian University for Science and Technology offers a programme for MSc. Degree on Natural Resources Management and Biodiversity Conservation. Courses offered:

- Biodiversity Conservation
- Geographic Information System for Natural Resources

The Egypt branch of the Arab Open University offers M.Sc Degree. Courses:

- Distance Learning program (Learning Online) on “PGR Documentation".

The Institute Hassan II has under preparation for development of curricula for teaching plant genetic resources in French Language for North Africa in frame of M.Sc. Course:

- PGR Agrobiodiversity for North Africa (Under development)

The Yemeni Genetic Resources Center at Faculty of Agriculture, Sana'a University is planning to offer M.Sc courses in Biodiversity of plant genetic resources. Course to be offered:

- PGR Agrobiodiversity (Under development)

Faculties of Agriculture in the Universities of Damascus and Aleppo, offer additional new courses on plant genetic resources in collaboration with Bioversity.

- Characterization of Plant Genetic Resources
- Documentation of Plant Genetic Resources

Acronyms

AARINENA	Association of Agricultural Research Institutes of the Near East and North Africa
AARD	Agency for Agricultural Research and Development
AARI	Aegean Agri- cultural Research Institute (Turkey)
ACSAD	Arab Center for the Studies of Arid Zones and Dry Lands
ADG	Assistant Director General
AFSED	Arab Fund for Economic and Social Development
AG	Advisory Group
AIAT	Assessment Institute for Agricultural Technology
AP	Arabian Peninsula
ARC	Agricultural Research Centre (Libya)
AREA-NGRC	(Yemen)
AUB	American University of Beirut
Bioversity	Bioversity International
CWANA	Central and West Asia and North Africa
CG centres	Centres of the Consultative Group on International Agricultural Research
CIHEAM	Centre International de Hautes Études Agronomiques Méditerranéennes
CIMMYT	Centro Internacional de Mejoramiento de Maiz y Trigo
CIP	Centro Internacional de la Papa
FAO	Food and Agriculture Organisation of the United Nations
GCSAR	(Syria)
GEF	Global Environment Facility
GFAR	Global Forum on Agricultural Research
GMS	Genebank management software
GPA	Global Plan of Action
IARC	International Agricultural Research Center
IBPGR	International Board for Plant Genetic Resources (formerly IPGRI)
ICARDA	International Center for Agricultural Research in the Dry Areas
ICGR	Institute of Crop Germplasm Resources
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
ICUC	International Centre for Underutilized Crops
IDB	Islamic Development Bank
IDRC	International Development Research Centre
IFAD	International Fund for Agricultural Development
INRA	Institut National de la Recherche Agronomique (Morocco)
INRAA	Institut National de la Recherche Agronomique d'Algerie
IRRI	International Rice Research Institute
IT-PGRFA	International Treaty for Plant Genetic Resources for Food and Agriculture
JAICA	Japanese International Cooperation Agency
MAF	Ministry of Agriculture and Forestry (Oman)
MOA	Ministry of Agriculture (Tunisia)
NA	North Africa
NARC	National Agricultural Research Center (Pakistan)
NARS	National Agricultural Research Systems
NCARTT	National Center for Agriculture Research and Technology Transfer

	(Jordan)
NGB	National Gene Bank of Egypt
NGOs	Non governmental organizations
NIs	National Inventories of PGR
NPGB	National Plant Gene Bank (Iran)
OPEC	Organization of the Petroleum Exporting Countries
PGR	Plant Genetic Resources
PGRC	Plant Genetic Resources Centres
PGRFA	Plant genetic resources for food and agriculture
PSARI	Plant Sciences and Agricultural Research Institute
RNE	Near East and North Africa Region
SC	Steering Committee
SSEEA	South, Southeast and East Asia Region
ToR	Terms of Reference
Trust	Global Crop Diversity Trust
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USAID	United Stated Agency for International Development
WA	West Africa
WANANET	West Asia and North Africa Network