



# Global Environment Facility

**MOHAMED T. EL-ASHRY**  
CHIEF EXECUTIVE OFFICER  
AND CHAIRMAN

September 2, 1998

Dear Council Member,

UNDP, as the Implementing Agency for the project entitled, *Regional: Conservation and Sustainable Use of Dryland Agro-biodiversity*, has submitted the attached proposed project document<sup>1</sup> for CEO endorsement prior to final approval of the project document in accordance with UNDP procedures. Please note that the document has been sub-divided by components to highlight how project resources would be directed at regional and country-level implementation.

Over the next four weeks, the Secretariat will be reviewing the project document to ascertain that it is consistent with the proposal included in the work program approved by the Council in October 1997, and with GEF policies and procedures. The Secretariat will also ascertain whether the proposed level of GEF financing is appropriate in light of the project's objectives.

If by September 30, 1998, I have not received requests from at least four Council Members to have the proposed project reviewed at a Council meeting because in the Member's view the project is not consistent with the Instrument or GEF policies and procedures, I will complete the Secretariat's assessment with a view to endorsing the proposed project document.

Sincerely,

**Attachment:**

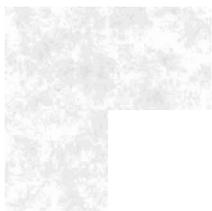
✓ *Regional: Conservation and Sustainable Use of Dryland Agro-biodiversity in Jordan, Lebanon, the Palestinian Authority and Syria*

**Sub-components:**

- *Jordan, Conservation and Sustainable use of Dryland Agro-biodiversity*
- *Lebanon, Conservation and Sustainable use of Dryland Agro-biodiversity*
- ✓ *Palestinian Authority, Conservation and Sustainable use of Dryland Agro-biodiversity*
- ✓ *Syria, Conservation and Sustainable use of Dryland Agro-biodiversity*

cc: Alternates, Implementing Agencies, STAP

<sup>1</sup> As the project's sub-components are basically identical, we are attaching only the regional component together with one complete country component (Jordan), as an example, and extracts from the rest of the three other components. The documents are available in their entirety at the GEF website: [www.gefweb.com](http://www.gefweb.com)





**United Nations Development Programme**  
GLOBAL ENVIRONMENT FACILITY (GEF)

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Date: 10 August 1998

Dear Mr El-Ashry

**Subject: Project Document: Conservation and Sustainable use of Dryland  
Agro-biodiversity in the Near East**

I am pleased to submit to you five project documents of the above project, entitled: Conservation and Sustainable Use of Dryland Agro-biodiversity in the Near East, for final circulation to the Council. These are one regional component, executed by ICARDA, and four national components executed by the Governments of Jordan, Syria, Lebanon and the Palestinian Authority. In addition, please also find the Incremental Costs Analysis, attachment 1 to the package of five documents. You will recall that splitting the project into five national components at your request was to ensure that project resources will be focused in-country, and directed to the identified conservation activities at project sites.

Thank you in advance for expediting the review and approval of this project.

Yours sincerely,

Emma Torres  
Deputy Executive Coordinator

Mr Mohamed El-Ashry  
Chief Executive Officer  
Global Environment Facility  
Room G6005  
1176 G Street  
Washington, D.C. 20433



**UNITED NATIONS DEVELOPMENT PROGRAMME**

**Project number and title:** RAB/97/G32/A/1G/71  
 Conservation and Sustainable Use of Dryland  
 Agro-biodiversity in Jordan, Lebanon, Syria and the Palestinian  
 Authority (Regional Component)

**Duration:** 5 years

**Project site:** Jordan: Ajlun; Muwaqqar  
 Lebanon: Baalbek; Aarsal  
 Palestinian Authority: Hebron; Jennin  
 Syria: Slenfe; Sweida

**ACC/UNDP sector & subsector:** 0430 - Biological Resources

**Implementing agency:** ICARDA

**Executing agency:** ICARDA

**Co-operating agencies:** ACSAD, IPGRI

**Estimated starting date:** September 1998

ICARDA inputs:  
 (in kind) \$4,873,809

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ACSAD inputs:  
 (in kind) \$495,000

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IPGRI inputs:  
 (in kind) \$441,020

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<u>UNDP and cost sharing financing</u>	
UNDP/GEF	<u>USD: \$ 1,123,979</u>

**Brief Description:**

The project will promote the conservation and preservation of important wild relatives and landraces agricultural species in Syria, Jordan, the Palestinian Authority, and Lebanon, by introducing and testing *in situ* and on-farm mechanisms and techniques to conserve and sustainably use agro-biodiversity. ICARDA and the co-operating agencies, IPGRI and ACSAD, will provide technical assistance through; (1) integration of nationally executed project components through co-ordination, networking and raising awareness; (2) technical backstopping, capacity building and training in in-situ and on-farm conservation and sustainable use of agro-biodiversity; and (3) monitoring of project activities and their impact for lessons learned and adaptive project planning.

On behalf of:	Signature	Date	Name/title (please type)
Government	_____	_____	_____
Executing agency: (ICARDA)	_____	_____	_____
UNDP:	_____	_____	_____

United Nations official exchange rate at date of last signature of project document: 1\$ 1.0 0=SP 45.00

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## A. Context

### 1. Description of subsector

The modern territories of the Near East (including Jordan, Lebanon, the Palestinian Authority, Syria, southeast Turkey and southern Iran) encompass an area of megadiversity of important food crop and pasture species. It is one of the few nuclear centres where numerous species (notably wheat, barley, lentil, pea and vetch) of temperate-zone agriculture originated 10,000 years ago, and where their wild relatives and landraces of enormous genetic diversity are still found. Many fruit trees such as almond, olive and pistachio are also originated from this region and have dominated its traditional agricultural systems (Harlan, 1975). They are present as a diverse range of wild relatives and local varieties. Cultivated olive, for example, exists as fifty different clones in the region; while almond, one of the most widely cultivated fruit trees in the Mediterranean, exist as more than fifteen local clones with distinct variations in fruit size, inflorescence, hairiness and flower colour.

The Levantine Uplands which comprise Lebanon, western Syria, small parts of Jordan and the northern Palestinian Authority, and the associated Mediterranean coasts and valleys, are considered one of the major centre of plant diversity and endemism in the world, and especially in southwest Asia and the Middle East. Seven genera of vascular plants are endemic to this region. Moreover, drylands are most outstanding for their within-species genetic diversity. Indigenous crops and food plants of the Near East region are known for their resistance to disease and abiotic stresses, making them a valuable source of genetic material for germplasm enhancement upon which global food security depends. **The present project is concerned with agricultural biodiversity, referring to biological resources of actual or potential agricultural value, and the diversity of these species within agro-ecosystems. Given that dry lands of the Near East represent the resource base for productive agriculture and given developing countries' food security priorities, the project is concerned with the conservation and sustainable use of biodiversity within agricultural systems.**

Wheat and barley, originated from the Near East, have become two major staple crops upon which a large proportion, about one third, of the world's population depends. Wheat currently occupies 16% of the world's arable land. World production of wheat averaged 550 million MT between 1992-1994, approximately 30% of the global production of all cereals, exceeding that of both rice and maize. The production of barley, averaged at 165 million metric tons from over 70 million hectares of land, contributes to 20% of the global production of coarse grains. In many of the least developed countries, barley is the primary human staple although in developed countries, it is used mainly as animal feed and for brewing.

One example of economic value derived from genetic pasture species, whose source includes the countries/authority in and around the Near East, is the Australian ley farming system, developed since the 1930s, using medics and clovers introduced into rotation with cereals (Puckridge and French 1983). This agro-biodiversity is worth hundreds of millions of dollars, in terms of meat, milk, wool, added nitrogen fertility and cereal yield sustainability. Similar annual legume exploitation has contributed or could contribute to successful pastures in Argentina, California, Oregon, Chile, North Africa, the Near East, Portugal, South Africa, Turkey, Uruguay and the European countries/authority

on the northern rim of the Mediterranean Basin.

## 2. Regional Strategy

The strategy of the Implementing Agency, ICARDA, is presented in its Medium-Term Plan for 1998-2000. Biodiversity conservation at ICARDA responds to the Leipzig *Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources of NARS*. The center has shifted its emphasis from collection and *ex situ* conservation of plant germplasm, to the characterization, evaluation, documentation and use of the biodiversity held in its collections, supported by the use of DNA markers and other advanced biotechnological techniques.

Efforts to promote *in situ* conservation of naturally occurring and evolving populations of agriculturally important species through improved habitat management are being strengthened. *In situ* and on-farm conservation of agrobiodiversity is, globally, a new departure and its implementation requires innovative approaches and close collaboration with national programs and the participation of local communities. This approach is supported by the Center's activities in agroecological characterization through the use of remote sensing and GIS; participatory research approaches to developing strategies for resource management and conservation that are compatible with farmers' production objectives; and research on policy and property rights and how these affect resource use and technology adoption.

ICARDA pursues its goals of biodiversity conservation through established collaborative partnerships with national research and development institutions, international research organizations in the region, including the two cooperating agencies IPGRI (International Plant Genetic Resources Institute) and ACSAD (Arab Center for the Study of Arid Zones and Dry Lands), and advanced research institutes in the developed world.

## 3. Prior and ongoing assistance

ICARDA will support the project through its existing research programme as documented in its Medium-term Plan 1998-2000, particularly through the following projects:

### Natural Resource Management:

- Agrobiodiversity Collection and Conservation
- Agroecological Characterisation
- Water Resource Conservation and Management
- Land Management and Soil Conservation

Germplasm Enhancement: barley, bread wheat, durum wheat, lentil, chickpea, and forage and pasture legume species

### Production Systems Management:

- Improvement of sown pasture and forage production for livestock feed

- Rehabilitation and improved management of native pastures and rangelands

Socioeconomics and Policy:

- Socioeconomics of natural resource management
- Socioeconomics of agricultural production systems
- Policy and public management research

and through its research support units: computers and biometrics (including GIS applications); communication, documentation and information; and the training coordination unit.

The IPGRI-CWANA regional office has at present seven staff dealing with the collection, networking, documentation, and promoting germplasm health of neglected and under utilised agricultural and forestry genetic resources.

#### 4. Institutional framework for subsector

*International Center for Agricultural Research in the Dry Areas (ICARDA),  
Aleppo, Syria*

Established in 1977, ICARDA is one of the 16 international centers supported by the Consultative Group on International Agricultural Research (CGIAR). Based at Aleppo, Syria, the center is governed by an independent Board of Trustees. In the context of the challenges posed by the physical, social and economic environments of the dry areas, ICARDA's mission is to improve the welfare of people in the dry areas of the developing world by increasing the production and nutritional quality of food while conserving and enhancing the natural resource base. ICARDA addresses its mission through research, training and dissemination of information in partnership with the national agricultural research and development systems of the dry areas. ICARDA serves the entire developing world in the improvement of lentil, barley and faba bean; developing countries in dry areas in the improvement of on-farm water use efficiency, management and rehabilitation of rangelands, and management and nutrition of small ruminants; and the West Asia and North Africa region for the improvement of bread and durum wheat, chickpea, and the management of farming systems and the natural resources on which these are based.

The Genetic Resource Unit (GRU) was established in 1983, since when its ex situ collections of ICARDA's mandate crop genetic resources have been increased from 57,000 to 111,000 in 1996. In 1994, ICARDA, jointly with other CGIAR centers, placed its germplasm collections under the auspices of the FAO. To comply with the conditions of the agreement, ICARDA accelerated safety duplication in other gene banks of its unique accessions. The demand for germplasm from ICARDA's collections has been steadily growing. Presently, GRU annually distributes some 30,000 seed samples, of which a third is provided to ICARDA's breeding programs, a third to national programs in WANA and a third to users in other parts of the world. With completion of the IPGRI coordinated Genetic Resources Information Network (SINGER) and the introduction of the CG system's Integrated Voice and Data Network (IVDN), the GRU database of the passport and evaluation data of

the germplasm collections will be available on-line to users all over the world. To strengthen the national genetic resources programs and activities within and between NARS, ICARDA initiated in 1992, jointly with IPGRI and FAO, a regional collaborative network (WANANET) and human resource development continues to be an important component of the GRU's activities

*International Plant Genetic Resources Institute (IPGRI), Rome, Italy*

The International Plant Genetic Resources Institute's (IPGRI) strategy in Central & West Asia and North Africa (CWANA) is set out within an overall mandate and mission with the following objectives: (1) to assist countries, particularly developing nations, to assess and meet their needs for conservation of plant genetic resources, and to strengthen links to users of plant genetic resources; (2) to build international collaboration in the conservation and use of plant genetic resources; (3) to develop and promote improved strategy and technologies for plant genetic resources, and integrated methods of conservation; (4) to provide an information service on plant genetic resources; (5) to ensure conservation and use of specific gene pools specially those not covered by other CG Centers, e.g., coconut, *Musa*, cocoa and coffee.

IPGRI has located its regional office for CWANA at ICARDA's headquarters, IPGRI's scientists, in collaboration with national programs, conduct research, assist in collection, documentation, conservation, training activities which cover a range of species, including vegetables, tree crops, native shrubs, grasses and neglected and underutilized species. In May 1992, the West Asia and North Africa Plant Genetic Resources Network (WANANET) was established by the representatives of the national programs in the region and representatives of ICARDA, FAO, ACSAD and IPGRI. The objectives of the network is to identify common problems, prioritize collaboration with other network and consider possible solutions, as well as opening avenues of collaboration with other regional and international networks. The Network established a steering committee and six working groups (Cereal Crops, Food Legumes, Pasture, Forages & Rangelands, Industrial Crops, Horticultural Crops and In situ/Biodiversity) and CWANA Regional office serves as the secretariat to the network.

*The Arab Center for the Study of Arid Zones and Dry Lands (ACSAD),  
Damascus, Syria*

ACSAD, an affiliation of the Arab League, was established in 1971. The Ministries of Agriculture of 16 countries in North Africa and the Near East are members of ACSAD. Recent relevant activities include: a survey and evaluation of the landraces of wheat and barley in Arab countries and the production of improved lines; a survey of rangelands and fodder resources in Arab countries and the propagation of some 50 species of shrubs, grasses and legumes suitable for the rehabilitation of degraded rangelands and distribution of seeds to Arab countries, in addition to research on grazing management; survey and evaluation of native and exotic varieties and wild relatives of fruit trees (olive, pistachio, fig, almond and grape vine) resulting in a field gene bank of species; monitoring of desertification in Syria using GIS and satellite imagery; activities in soil and water resource management, including water harvesting; a survey of animal breeds in 13 Arab countries and further research on the genetic resources of sheep, goats and camels. ACSAD has established a databank and an extensive herbarium of arid zone plants.

## B. Project justification

### 1. Problem to be addressed; the present situation

#### *Threats to Global Agro-biodiversity*

The major causes of plant genetic erosion or loss of agro-biodiversity have been summarised in the Report on the State of the World's Plant Genetic Resources (1996), as follows:

- a. Replacement of local varieties
- b. Land clearing
- c. Over-exploitation of species
- d. Population pressure
- e. Environmental degradation
- f. Overgrazing
- h. Legislation/Policy
- i. Changing agricultural systems
- j. Pests/weeds/diseases
- k. Civil strife
- l. Reduced fallow

The Near East region supports a population of some 48 million. With an average growth rate of over 3% , the population is expected to more than double by 2025, reaching over 100 million. For a majority of the population in this region, agricultural production is the principal economic activity. In an effort to achieve national food self-security, agricultural land use has been intensified and expanded, leading to degradation of vegetation, soils and water. **Genetic diversity is seriously eroding through the degradation of their natural habitats, intensification and expansion of cultivation and overgrazing in natural rangelands.** Overgrazing is especially threatening to herbaceous crops such as wheat, barley and lentils, and their wild relatives, as it can wipe out entire populations. For tree crops and their wild relatives, regeneration can be seriously impaired as a result of overgrazing. Many of the major crops important in this region (e.g. wheat, barley, medics, almond) are threatened by overgrazing, habitat fragmentation and settlement expansion.

The result is that now, wild relatives of crop species grow only in marginal land areas such as field borders, shallow soil and remnants of natural vegetation. The type of habitat supporting these precious resources is either patchy or degraded. During the last four decades, forest cover has continued to decrease in Syria despite substantial afforestation effort (5-25 million trees per year). Furthermore, afforestation programmes often fail to re-create the lost natural habitats of many wild relatives. Intensive agricultural practices, such as "de-stoning" fields using heavy machinery prior to planting to facilitate subsequent mechanised harvest and increase production, also lead to serious habitat destruction and fragmentation which are seriously threatening the populations of wild wheat, barley and lentils in the region. Furthermore, wild lands are often ploughed or disturbed as a means of securing property right by use, a tradition supported by law in many countries/authority.

Traditionally, farming systems have maintained diversity in order to preserve stability of production under climatic, disease and pest risks. Wild relatives of fruit trees used to be left growing on field borders to supply seeds or rootstocks for planting. **The replacement of the traditional farming system by modern agricultural practices is endangering these wild relatives. Food demands and market forces have encouraged the replacement of the locally adapted varieties (landraces and local varieties) of both fruit trees and field crops with higher-yielding cultivars, hence hampering the gene pools of these crops.** For example, the improved cultivar of bread wheat is now occupying 70-80% of the global wheat areas. Over time, genetic diversity has eroded. Agricultural production is now based on fewer and fewer crops and, within crops, on fewer and fewer genotypes. The genetic uniformity of modern cultivars and a tendency towards monoculture make them vulnerable to disease and pest epidemics and weather extremes.

Demands for higher-yielding food crops that must also be adapted to the ever changing weather and biotic stresses, and are disease- and pest-resistant, requires continuous and reliable access to genetic resources that can be used to impart such superior qualities. The loss of traditional agriculture to modern monoculture takes away with it the associated and potentially beneficial insects (pests and predators) and micro-organisms, as well as the invaluable traditional knowledge on the distinct qualities, uses and growth requirements of wild relatives and landraces. Addressing the current loss of agro-biodiversity in developing countries of the Near East is of global importance.

#### *Urgent Need for In situ and On-farm Conservation*

Genetic materials of several agriculturally important species of the Near East, such as wheat, barley, and lentil, have been collected and characterised in terms of the diversity of their responses to environmental factors such as cold, heat and drought stresses, resistance to disease pathogens, insect pests, as well as potential to increasing yield. Though still far from completion, substantial germplasm banks have been created as a means of *ex situ* conservation. This is especially important for a number of species with only scattered and small wild populations which are unlikely to be viable, and which can be more effectively conserved through *ex situ* conservation. ICARDA holds approximately 6500 *Medicago*, 3500 *Trifolium*, 1500 *Lathyrus*, 3000 *Vicia* and 5000 accessions from other pasture and forage legumes. However, the richness of many pasture and forage legume species in the Near East are now under threat due to unmanaged overgrazing, especially those species with larger seeds.

ACSAD's field gene bank contains more than 420 native and exotic varieties of drought hardy species of fruit trees, including 130 sources of almond (*Amygdalus* sp.), 74 varieties of olive, 108 varieties of fig, 22 varieties of pistachio, and 77 varieties of vine grape, in addition to a few wild relatives of various multiple-use trees, such as *Ziziphus jujuba*, *Ceratonia siliqua*, and *Crataegus* sp. Many native and exotic ecotypes of *Salsola*, *Atriplex*, *Lathyrus*, *Vicia*, *Stipa*, *Oryzopsis*, and *Agropyron* are conserved in Wadi Al-Azeeb range gene bank. The biodiversity program at ACSAD is supported by a herbarium containing more than 14,000 specimens collected from various habitats of Arab arid zones, and the Arab Data Base for Arid Zones Plants (ADAP) which contains comprehensive information on more than 1,500 species.

Moreover, germplasm banks are only part of the process of maintaining agro-biodiversity. For large and highly varied populations, it is impossible to obtain a representative sample. For example, in 1992, fifty plants of *Triticum dicoccoides* were sampled on a transect of 500 m from one of the wild populations in southern Syria. Gliadin fingerprinting revealed that none of the plants was identical; instead, 50 distinct banding patterns were distinguished. It is increasingly recognised that *ex situ* conservation has the limitations that only a small proportion of existing genetic resources may be sampled, and, as genetic make-up is not static but evolves in response to environmental changes, collections may represent only the variation present at one point in time. Naturally occurring and evolving populations must be maintained *in situ* within their environments; this aspect of conservation has received much less attention than collection and *ex situ* storage.

Degradation of biodiversity is attributed to the destruction of natural habitats, largely through human activity. However, in developing countries/authority of the Near East, these same habitats represent the resource base for productive agriculture, the livelihood of farmers and pastoralists. Large exclusionary "reserves" to preserve biodiversity, which remove land from productive use and do not take account of local needs, will not be acceptable. In addition, indigenous knowledge about cultivated species and their wild relatives, and traditional agricultural practices and systems of land and water management, is an invaluable resource in the search for new and appropriate ways of conserving and using genetic resources. Landraces which have been developed over the centuries by farmers' selection for desirable traits, are usually genetically more heterogenous and highly adapted to their specific agro-ecological environment. The conservation of the valuable and highly diverse genetic resources carried by these landraces can only be achieved through on-farm conservation and continuous use of these landraces in traditional farming systems. Conservation of the genetic diversity of many crops such as wheat, barley and lentil, as well as a number of forage and fruit species, therefore requires both *in situ* and on-farm strategies, the success of which depends a great deal on community-based management.

Furthermore, exclusion by means of protected areas is not necessarily the best means of species or genetic resource conservation. For many species and environments, active management (often involving restoration or creation of niches and habitats within agricultural systems, promotion of traditional land management practices, or reform of social and economic policies) is required to conserve their population and the genetic diversity.

## 2. Expected end of project situation

The overall, long-term, global objective of the project is to ensure the continuous availability of agro-biodiversity in Jordan, Lebanon, the Palestinian Authority and Syria that is essential to the sustainable development of agriculture in that region, as well as to global food security and production. As a result of the project:

- (a) Information on the distribution and abundance of genetic diversity in the target areas, and the socioeconomic circumstances of communities and land users in the target areas,

will be available in national and regional databases, integrated within GIS, for use in long-term monitoring and impact analysis.

- (b) Wild relatives of agricultural species will be conserved in identified locations through the adoption of community based habitat management and modified or alternative land use practices, including, as and where appropriate, local water-harvesting, soil conservation measures, grazing management and protection of corridors, habitat strips and uncultivated patches.
- (c) Alternative income-earning opportunities based on the above conservation of wild species, and alternative land use practices, will have been identified and adopted by communities, thereby providing sources of income that are compatible with the objectives of conservation and sustainable use of agro-biodiversity;
- (d) Land races of target species will be conserved on-farm through the full participation of farmers in the selection of adapted land races and mixtures with preferred attributes and qualities for desired end uses;
- (e) The cultivated target species will have been integrated into existing or alternative crop rotations that promote the maintenance of soil fertility;
- (f) Field gene-banks of vulnerable fruit tree wild relatives and perennial rangeland species will have been established, providing seed and root stock to communities both within and beyond the target sites;
- (g) Community managed pasture nurseries will have been established on common land, providing seed and rootstock of important and threatened locally adapted project target pasture and forage wild species and/or land races to communities both within and beyond the target sites for use in rehabilitating degraded common lands;
- (h) Both the field gene-banks and the community managed pasture nurseries will provide another source of income to the communities in which they are established, through the sale of seed and root stock;
- (i) National agricultural, environmental and land use policies and legislation, and their implications for agro-biodiversity conservation, will have been analyzed; where necessary, alternative policy and legislative options will have been developed and, where feasible, tested at the project sites; and, where appropriate and in the national interest, these options will have been presented to the appropriate authorities for legislative reform.
- (j) Interventions developed within the project target sites will have been communicated to other communities and land users through organized field visits and demonstrations of the management techniques and uses of field gene-bank, pasture nurseries, water harvesting and soil conservation structures, and the sale and exchange of locally adapted root stocks and seed;
- (k) Public awareness of the importance of biodiversity conservation and environmental degradation will have been increased through public open days, media events, dissemination of information packets and school syllabus material;
- (l) National capacities in the conservation and use of agro-biodiversity will have been strengthened through the graduate and short-term training of national staff provided during the project;
- (m) Regional cooperation and the exchange of experiences in the conservation of agro-

- biodiversity will have been strengthened through the project;
- (n) Options for extending the project activities to other sites within the countries involved, and to other countries in the region, will have been identified;
  - (o) Lessons learned during the project will have been disseminated internationally through publications, a project web-site, and other international media.

### 3. Target beneficiaries:

The target beneficiaries include:

- (a) immediately, the communities within the target sites whose livelihoods depend on the sustainable use of the genetic resources of the target species in agricultural production;
- (b) in the longer term, through extension of the project's experiences, other rural communities whose livelihoods depend on the sustainable use of the genetic resources of the target species in agricultural production;
- (c) national programs of the participating countries/authority, through institution strengthening and training of the staff working in agro-biodiversity conservation
- (d) ultimately, the entire population (and future generations) of the countries/authority will benefit from the sustainable *in situ* conservation of the plant genetic resources of important agricultural species.

### 4. Project strategy and implementation arrangements

#### Project strategy

The project strategy is to develop community driven *in situ* and on-farm agro-biodiversity conservation initiatives in representative, targeted areas of global agro-biodiversity significance. These community-driven initiatives will be supported by national, legislative, social and economic policies adapted to agro-biodiversity conservation during the project process, and benefit from the institutional capacity strengthened through personnel training, and regional networking and support. The twinning of specialised international and regional institutions such as ICARDA, IPGRI and ACSAD with national institutions participating in the project will greatly enhance the synergism of the project. Awareness promotion is a priority at all levels of the project.

The involvement of land users as primary participants is fundamental to agro-biodiversity management. Innovative approaches to *in situ* and on-farm conservation will be developed alongside appropriate resource management, which will at the same time, maintain the productive capacity of the resources and secure the economic viability of the community. Focus will be given to ten target crops (or crop groups) of global significance, all of which are originated from the Near East or

Central Asian region (Annex VI). Both wild relatives and landraces of the selected crops will be studied and managed, incorporating indigenous knowledge and traditional practices, such as farmers' selection for desirable traits, which have over the years, generated genetically heterogenous crops and landraces which are highly adaptive to their specific agro-ecological environments.

The project activities will complement existing agricultural development and resource management projects, as well as *ex situ* conservation activities (Annex VII), to enhance the process of conservation and sustainable use of agro-biodiversity. The co-financing leveraged through this project will also support training of researchers and extension services for farmers, institutional strengthening through the provision of equipment and facilities, and networking with institutions in the region and elsewhere, all of which will contribute to future sustainability.

A step-wise, long-term approach is needed to build the national capacity needed for the development and sustainability of the project. The project will strengthen institutional and community capacity, in order to phase in a progressively greater national contribution to agro-biodiversity conservation and management. The project implementation will focus on indigenous technical knowledge in communities concerning the target crops and their uses, build trust and bring people and government institutions into a collaborative mode of work. Issues concerning indigenous property rights will also be addressed in the process.

Eight target areas where *in situ* and on-farm conservation activities will be carried out through this project have been selected in the four countries/authority, based on the following criteria:

- a. Wild "progenitors" of globally important crops
- b. Wild relatives of globally important crops
- c. Populations of high genetic diversity
- d. Presence of more target species
- e. Endangered populations
- f. Species which are difficult to conserve *ex situ*
- g. Traditional agricultural systems
- h. Traditional germplasm (landraces, breeds)
- i. Linkage with agricultural development projects

The selection of the target areas was undertaken with the aim to capture the maximum genetic diversity of the target crops in the minimal number of areas possible. The target areas were therefore selected to cover the widest possible range of topography, climate and species concerned. For example, Ajlun is a mountainous area 500-1250 m with steep slopes and valleys and is rich in both field and fruit crops diversity; Baalbek is characterised by a semi-arid Mediterranean climate and is very important in field crops including forage legumes; Hebron Area which has a sub-humid Mediterranean climate and is especially diverse in fruit crops (e.g. grape and almond); and Sweida which is largely devoted to dryland farming and grazing, and is extremely important as 34 *Trifolium* spp., 6 *Aegilops* spp., 10 *Allium* spp. and 10 *Medicago* spp., as well as the close relative of almond and rootstocks species for cultivated pistachio and pear are found (Annex VI)

The presence of wild relatives and landraces or local varieties of the target crops in each target area is listed in Annex VI. Together, the target areas are able to capture significant fractions of the genetic diversity within the globally important target crops. Existing data indicate that 30-40% of the world's wild "progenitors" and wild relatives of wheat (*Triticum spp.*) and barley (*Hordeum spp.*) can be protected through this system of target areas. Amount of genetic diversity of wild pear and wild pistachio that can be protected is estimated at 30 % and that for wild medics is 25 %. Collaborative efforts through this network of representative target areas in four countries/authority greatly increase the cost-effectiveness of this regional project.

Furthermore, the selection of the target areas has been a truly participatory process, through discussions in three workshops (ICARDA 1995), in which all the concerned countries/authority participated. The National Plant Genetic Resources Programmes were actively involved in site proposals and final selection, based on the above listed criteria, and in consultation with ICARDA, IPGRI, ACSAD and UNDP. All the sites were visited by at least one person from each of the other countries/authority to encourage exchange. Due to the presence of different target crops, differing range and intensity of threats, and varying socio-economic conditions in the different target areas, the activities required for each area are also different.

The regional component will facilitate the attainment of the end of project situation listed above through three immediate objectives as follows.

#### *Regional integration of nationally executed activities*

The nationally executed project components will benefit from the integration of activities and the sharing of experiences. Integration will start through regional planning activities to ensure compatibility between national project components. Of particular importance is the harmonisation of survey data collection and use. Data collated at the regional level, will facilitate comparative analysis between national components to assist in the analysis of the root causes of agro-biodiversity degradation, and the process of identifying practices for sustainable utilisation of agro-biodiversity; and enable national components to take advantage of practices successfully established in other national components.

The exchange and development of best practices will be further encouraged, where possible, through the exchange of project staff between national components. Regional problem solving meetings will also be held during the project, bringing together project staff, to utilise the range of their experiences in solving problems, and the ongoing exchange of ideas will be encouraged through electronic bulletin boards and a web site, to follow up meeting discussions, as well as new arising areas of concern. In areas where access to e-mail and the internet is difficult, the regional component will disseminate project briefs on project progress and technical issues to keep project staff abreast of the activities, and possibility for the exchange of best practices, between national components.

The regional component will also have an outward looking emphasis, to raising awareness of the collective activities of the national components, in the region and internationally, through media coverage, a web site, and links to existing relevant networks. This proactive approach for the

replication of project best practices outside of the project, will provide interested parties, including other national programmes, international development agencies, and international agricultural research centres, with access to emerging best practices for in-situ conservation.

*Capacity building to promote the integration of sustainable use and conservation of agro-biodiversity into agriculture*

The immediate objective will increase national access to the expertise found in ICARDA, IPGRI and ACSAD, and provide necessary capacity for the implementation of project activities, by the national components. Technical courses and on-the-job training will be provided in eco-geographic and socio-economic survey methods and the collection, documentation and analysis of information on genetic diversity and the distribution of target species, socio-economic factors, land use and indigenous knowledge. Such training will ensure that all data is stored and documented in compatible formats so that it may be collated and analysed in an integrated manner at the project-wide level.

Regional training will also be provided on the principles of land use and natural resource management. Combined with the analysis of the baseline data from the surveys, this will provide the basis for the development of plans, within the nationally executed components, for habitat management and the conservation and sustainable use of agro-biodiversity.

ICARDA will promote the use of a bottom-up participatory approach throughout the nationally executed components. Long-term improvements in the conservation and management of habitats and agro-biodiversity can be achieved only with the consent and active participation of land-users. It is essential that local communities, farmers, pastoralists and other land users be involved from the outset in identifying the problems and in developing community-based plans for the conservation and sustainable use of agro-biodiversity in the target sites.

ICARDA, IPGRI and ACSAD conduct on-going research in natural resource management and the conservation and sustainable use of agro-biodiversity, and maintain regional networks and links with other national, regional and international institutions. Their research, and those of their partners, will be fed into training, ensuring that the national components have access to a far wider pool of experience.

Upon request by governments, ICARDA, IPGRI and ACSAD will assist in placing national candidates at international centres of excellence for studies, in project related subjects, to further promote the capacity of the national components to implement project activities. Placed candidates will conduct part of their training at project sites, and continue to work with the project after completing their studies. This will more closely involve university staff and resources in the project. Both project staff and academic staff will supervise candidates during the in-project studies, and candidates will have access to university facilities during their studies. This inter-action will provide additional opportunities for co-operation between universities and the project.

*Project progress and impact monitoring*

A fundamental element of project intervention will be to introduce practices for the sustainable use and conservation of agro-biodiversity, without economic costs to local beneficiaries. As such the project will monitor the impact of intervention, both on the welfare of beneficiaries and agro-biodiversity. Project staff from the national components will be provided with training for monitoring the impacts of the project on agro-biodiversity and the economic impact on local beneficiaries. As with the first immediate objective, monitoring data will be brought together at the regional level for comparative analysis. Collated results will be fed back to the national project components for adaptive planning of project activities. Impact monitoring will also provide the source of information to identify project best practices. The success of project activities depends heavily on the context in which they are being implemented. Lessons learned series notes will document project failures and successes, in the context of their implementation, providing essential information for the replication of project activities.

#### Implementation arrangements:

The project is funded by the Global Environment Facility (GEF). Four national components will be executed by the Governments of Jordan, Lebanon, Syria and the Palestinian Authority. The fifth regional component, to co-ordinate between the nationally executed components, will be executed and implemented by ICARDA. In addition, ICARDA, IPGRI and ACSAD will provide technical assistance and training

The project will be managed as five components such that there will be a nationally executed component for each of the four participating countries/territory, and a regional component executed by ICARDA. This arrangement will ensure that the bulk of the GEF resources will be programmed, managed and spent on activities in the participating countries/territory. The regional component will ensure tight linkages among the four national projects and enhance the positive impacts from networking and exchange in experience and expertise.

Each country component of the project will be nationally executed in collaboration with ICARDA, IPGRI and ACSAD. National authorities will designate one representative jointly with UNDP, in each country as the National Co-ordinator of the institutions participating in the project at the designated sites. These National Co-ordinators will co-ordinate on-site activities to be carried out by the various, project staff, national institutions and NGOs as well as forming the linkages with the regional activities.

As the executing agency of the regional component of the programme, ICARDA will be responsible for planning and co-ordination of the regional activities, notably networking and training. In consultation with the participating countries/authority, ICARDA will recruit a Regional Co-ordinator, jointly with UNDP, who will be responsible for these activities as well as the provision of overall project co-ordination, monitoring and technical reporting. In addition, ICARDA, IPGRI and ACSAD will provide technical assistance and training. The Regional Co-ordinator will be located at ICARDA's Headquarters, at Aleppo in Syria, to take advantage of its regional and international linkages and facilities for administrative and logistical support.

Coherence across activities and partners will be achieved through the following:

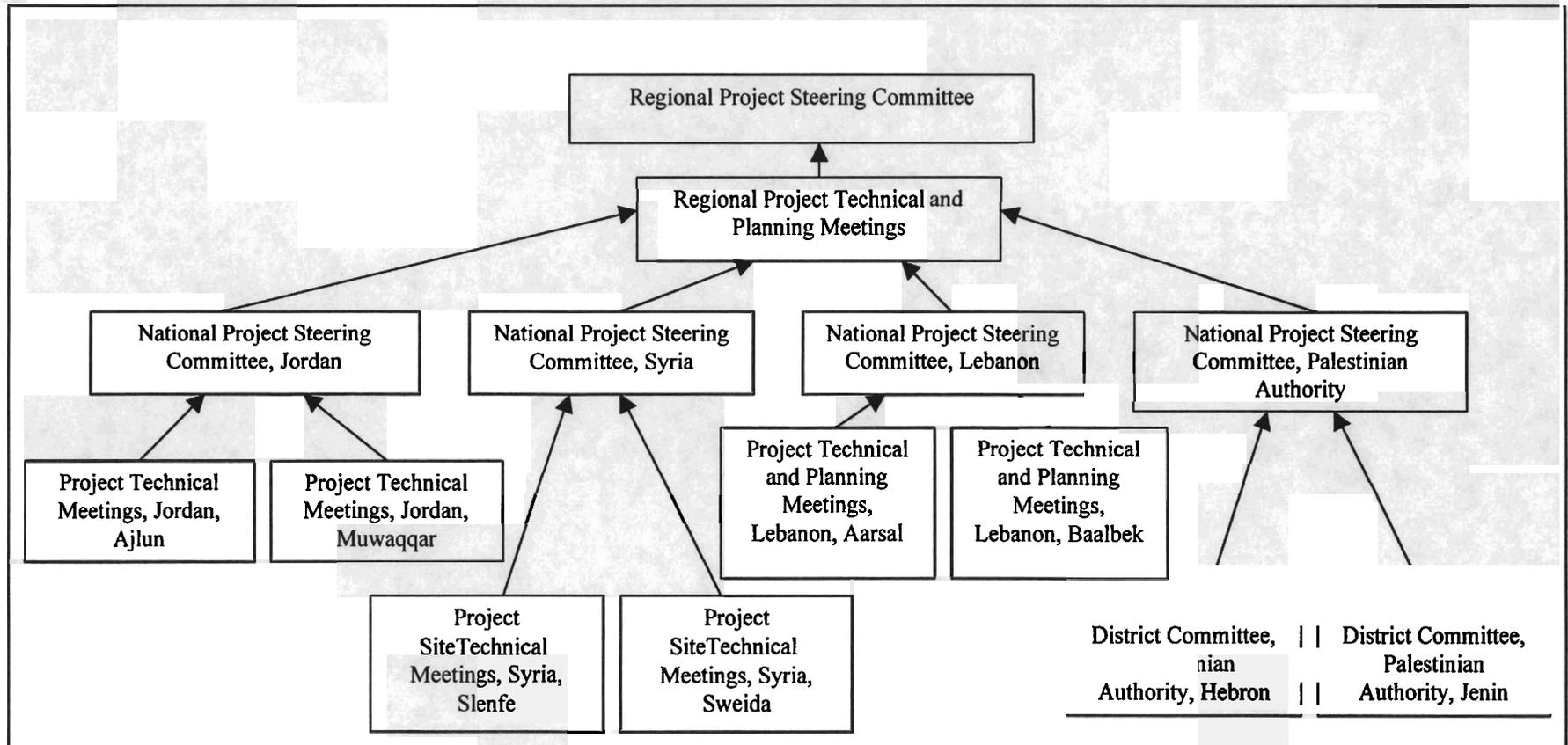
- A Regional Steering Committee will be established, comprised of the four National Co-ordinators, the Designated representatives of the four National Executing Institutions, the Regional Co-ordinator, representatives from IPGRI and ACSAD, and a representative from the UNDP Syrian Country office, as the principle participating representative. The Steering Committee, to be chaired by the representative of the government/authority hosting the meeting, will meet at least once a year, at a time and place to be agreed by the members. Steering committee meetings will rotate between the four countries/authority. The Committee will finalise and approve the detailed work plans and budget of all project components for the coming year recommended by the annual Regional Technical Co-ordination meeting (see below).
- Annual Regional Technical Co-ordination and Planning Meetings will be held prior to meetings of the Regional Steering Committee. They will be chaired by the Regional Co-ordinator, and representatives will include the National Co-ordinators and relevant technical and scientific staff participating in the project. Results of the previous year's work, annual national Work Plans and budgets for the next year's work, will be presented and regional compatibility and integration of the national components will be discussed, and recommendations will be submitted to the Regional Steering Committee meeting.
- National Project Steering Committee meetings will be held once a year prior to the Annual Regional Technical Coordination and Planning meetings. The committee will review technical and monitoring reports of the project, finalise and approve the annual national Work Plan and budget. The Committees will be chaired by the designate of the National Executing Agency, and include the National Co-ordinator as secretary of the Committee, the Regional Co-ordinator, the UNDP/GEF focal point, and a representative of the UNDP Country Office.
- Project site technical meetings/ District Committee meetings will be held once a year prior to the National Project Steering Committee meetings. However ad hoc meetings will be called by the National Co-ordinator when necessary. The meetings will be chaired by the National Co-ordinator, and involve the Regional Project Co-ordinator, representatives from institutions and groups participating in the project, including local beneficiaries, and other relevant ongoing projects. These meetings should be held at project sites to facilitate the process of local beneficiary representation in project planning. ICARDA, IPGRI and ACSAD will provide technical support where requested. The meetings will provide the inputs for the development of the detailed annual national Work Plans, and budget, including the results from the last planning period. The meetings will provide the National Co-ordinator to consult all stakeholders during the development of the annual work plan, including training programmes for the next planning period.

- As listed under project activities, and in addition to the above meetings and committees, the National Co-ordinator and project staff will conduct consultations with project stakeholders in the development and implementation of project activities, as a first stage in the participatory process of the implementation of the project.

The budget of the regional component provides for the organisation and facilitation of the regional activities, while the nationally executed project components cover the actual expenditures for the involvement of their respective participants in the regional activities.

The costs incurred by ICARDA, IPGRI and ACSAD in providing technical assistance to national project activities and national specialised training will be covered from the budgets of the Nationally Executed Components. The annual budget for this technical assistance will be worked out in details during the National and Regional Technical Co-ordination/Planning Meetings for approval by the Regional Steering Committee Meetings.

*Structure of Project Committees and Meetings*



## 5. Reasons for assistance from UNDP/executing agency

The project is developed closely in line with the GEF Operational Programme for Arid and Semi-Arid Ecosystems of the Biodiversity focal area, which emphasises the prevention, and control of land degradation through development of sustainable use methods for biodiversity conservation...". The Operational Programme also calls for special attention for the "demonstration and application of techniques, tools, and methods to conserve traditional crops and animal species in their original habitats", and "Promotion of sustainable production and use of natural products, such as non-timber forest products, wild relatives of domesticated species, and agrobiodiversity related products, including the development and implementation of sustainable harvesting and marketing regimes."

The GEF Scope and Preliminary Operational Strategy for Land Degradation highlights "*In situ* conservation of genetic varieties of plants (grasses, shrubs and trees), insects, birds, worms, and micro-organisms (e.g. root bacteria like rhizobium, mycorrhiza and other useful fungi) by improving management practices, institutional arrangements, policies and incentives, and community participation", as one of the GEF-funded activities in the interface between prevention and control of land degradation, and promotion of biodiversity conservation and sustainable use. The present project targeting at the genetic diversity of ten major crops in the Near East, with an integrated approach to grazing and farming management, falls well within this interface. The above mentioned Land Degradation paper was further elaborated at a STAP workshop on land degradation held in 1996. The Follow-up Action to the STAP Workshop which was endorsed at the May 1997 Council, proposed a set of principles relating to project development in the field of degradation. Among these are (i) participatory approaches to be used, which take into account the objectives and constraints of farmers, pastoralists, forest dwellers, and other stakeholders; (ii) distortions introduced by inappropriate policies, including price policies, macroeconomic policies, and the legal setting, to be addressed; (iii) data collection, analysis and dissemination, and monitoring of on-going efforts based on well defined indicators must be improved, etc. The present project follows all these principles.

Lebanon, Jordan and Syria have all ratified the Convention on Biological Diversity. The project responds to the Convention on Biological Diversity and its concern that (i) biological diversity is being significantly reduced by certain human activities, (ii) the fundamental requirement for conservation of biological diversity is the *in situ* conservation of ecosystems and natural habitats, and (iii) the traditional dependence of local communities on biological resources are recognised. The project also addresses the concern of Article 20.7 of the CBD providing for particular consideration of the countries/authority with arid and semi-arid areas and experiencing desertification and drought.

The project, in accordance with the policy and strategy regarding access to financial resources, will build co-operation at the sub-regional, regional and international levels and promote utilisation of local and regional expertise, and addresses the following programme priorities as expressed by COP94:

- a) Strengthening conservation, management and sustainable use of ecosystems and habitats in

accordance with Article 7 of the CBD, particularly with regard to species and communities of wild relatives of domesticated and cultivated species and species, which are of agricultural value (Annex I of CBD);

- b) Identification and monitoring of wild and domestic biodiversity components and implementation of measures for their conservation and sustainable use;
- c) capacity building, including human resource development and institutional strengthening;
- d) strengthening the involvement of local people in the conservation of biological diversity and the sustainable use of its components; and
- e) promoting the conservation and sustainable use of biological diversity in environmentally vulnerable arid and semi-arid areas.

The proposed participatory approach actively involving land users will contribute to the identification and development of economically and socially appropriate incentive or compensatory measures for local communities participating in biological conservation, according to Article 11 of the CBD.

#### 7. Co-ordination arrangements

Integration of nationally executed project activities will be provided by ICARDA's regional coordinator. The Regional Coordinator will be responsible for integrating all project collected data and disseminating the regional results to UNDP/GEF, the nationally executed project components and other interested parties including the Annual Performance Report, the Project Implementation Review and project impact monitoring reports, and policy, economic and legislative reports pertaining to agro-biodiversity. The Regional Coordinator will coordinate training and capacity building activities to ensure that the national project staff are able to implement all project activities. As part of this function the Regional Coordinator will coordinate exchange programmes and communications between project staff of nationally executed components.

#### 8. Counterpart support capacity

ICARDA, IPGRI and ACSAD have the capacity and specialised expertise and will provide the necessary technical backstopping, advice and training in support to the nationally executed project components, in GIS and database management and collection of survey data; on-farm conservation and modified land use practices; agricultural legislation and economic and policy modifications.

ICARDA will support the project through its existing research programme as documented in its Medium-term Plan 1998-2000, particularly through the following projects:

**Natural Resource Management:**

- Agrobiodiversity Collection and Conservation  
Agroecological Characterization  
Water Resource Conservation and Management
- Land Management and Soil Conservation

**Germplasm Enhancement:** barley, bread wheat, durum wheat, lentil, chickpea, and forage and pasture legume species

**Production Systems Management:**

- Improvement of sown pasture and forage production for livestock feed
- Rehabilitation and improved management of native pastures and rangelands

**Socioeconomics and Policy:**

- Socioeconomics of natural resource management
- Socioeconomics of agricultural production systems
- Policy and public management research

Support will also be provided through ICARDA's research support units in: computers and biometrics (including GIS applications); communication, documentation and information; and the training co-ordination unit.

In addition to ICARDA's work on cereals and legumes, IPGRI and ACSAD will provide support on the conservation and sustainable management techniques of tree crops and native shrubs and grasses. IPGRI-CWANA regional office has at present staff dealing with Genetic Resources, Genetic Diversity, Collection, Neglected & Underutilized species, Training, Networking, Documentation, Forestry and Germplasm Health.

ACSAD complements ICARDA's expertise in soil and water management, including water harvesting; use of GIS and remote sensing; and rangeland rehabilitation and grazing management. In addition, ACSAD offers the resources of three specialized training centers established in Syria, each with a capacity of hosting 10-20 trainees: one at Izra'a, for fruit trees and field crops; one at Wadi Azib for rangeland management; and one at Deir Ez Zor for water and soil management.

There are significant physical and human resources which the four participating countries/authority will contribute to the project, such as technical, administrative and support staff (part time), physical facilities (offices, laboratories, etc) of the implementing institutions, and extension and other public awareness agencies. The governments of the four countries/authority will provide all means that may facilitate the project implementation.

**C. Development objectives**

The promotion and sustainable conservation and utilization of agro-biodiversity in the Near

East through farmer based *in situ* conservation of significant endemic wild relatives and land races.

**D. Immediate objectives, outputs and activities**

**1. Immediate objective:** Regional integration of nationally executed activities through proactive regional support to promote conservation and sustainable use of agro-biodiversity

**1.1. Output:** Project coordination between nationally executed project components, and ongoing relevant international and regional organizations and programmes.

**1.1.1. Activity:** Organize an Annual Regional Technical Coordination and Planning Meeting to present and discuss the results of the activities of the previous planning period and develop National Work Plans for the next planning period.

**1.1.2. Activity:** Prepare a detailed draft annual Regional Work Plan in collaboration with the National Coordinators, and according to National Work Plans, laying out the needs and means for the regionally executed project component.

**1.1.3. Activity:** Organize an Annual Regional Steering Committee Meeting to review progress in project activities budget utilization, and to approve national and regional workplans, including training programs, and budgets for the next planning period

**1.1.4. Activity:** Review and recommend amendments, where necessary, to methodologies proposed by nationally executed project components for: data recording, collection and analysis for project site eco-geographic, genetic diversity, socio-economic surveys and traditional land use and indigenous knowledge of agro-biodiversity; setting up and adapting GIS/RS and electronic database for storing and analyzing project survey data. Methodologies should be: compatible with other host country national components; be able to integrate remote sensing data; track changes in agro-biodiversity abundance and distribution of wild relatives and land races of target crops; provide practical data for gene-bank accession activities, plant breeders and farmers on the growth and genetic characteristics of wild relatives and land races of target crops; contribute to an understanding of the causes of agro-biodiversity degradation of the wild relatives and land races of target crops in project areas; identify traditional land use practices and indigenous knowledge of agro-biodiversity and its use; and record data for registering genetic and intellectual property rights.

**1.1.5 Activity:** In participation with the National Coordinators, ensure through advice compliance with international agreements and national legislation when transferring genetic materials.

**1.1.6. Activity:** Based on national program needs and requests, provide coordination and transfer of genetic materials between nationally executed project components and

field gene-banks and breeding programmes.

**1.2. Output:** Project wide networking

**1.2.1. Activity:** Write and distribute project briefs twice a year to project participants and other interested parties, on the implementation progress, successes, and failures of ongoing activities and useful technical material developed by the project for sharing between nationally executed project components.

**1.2.2. Activity:** Set up project wide e-mail, project staff directory and project electronic bulletin board for communication between project staff of nationally and regionally executed project component.

**1.2.3. Activity:** Arrange for exchanges between project staff of nationally executed components to promote co-operation and share experience, best practices and project implementation lessons between nationally executed project components.

**1.2.4. Activity:** Arrange regular technical solution orientated workshops on specific subjects, bringing together key project staff to discuss project implementation issues. Workshops should particularly focus on project implementation lessons; causes of agro-biodiversity degradation and emerging best practice operational solutions. These should be fed back into project planning.

**1.3. Output:** Awareness of agro-biodiversity issues emerging from project activities.

**1.3.1. Activity:** Provide guidance and work with nationally executed project components to analyze and prepare policy options, based on project data and experiences, for the national programmes to submit to national policy makers and donor organizations for consideration, particularly in support of Immediate Objective 4 of the nationally executed project components. Guidance options should stress the costs and benefits of proposed policy measures, and experiences from their implementation.

**1.3.2. Activity:** In consultation with the national programs concerned, prepare and deliver news releases for media coverage for newspapers, TV and radio to raise community awareness of important agro-biodiversity issues arising resulting from project implementation.

**1.3.3. Activity:** In collaboration with national project staff, through the National Coordinators, prepare project information packs in Arabic for community groups, NGOs, agricultural co-operatives, schools, and farmers to raise awareness of project activities and objectives.

**1.3.4. Activity:** Provide guidance to the national programs in ensuring the preparation of syllabus and teacher training materials in Arabic for schools, on agro-biodiversity

issues emerging from project activities, including traditional land use practices and indigenous knowledge relating to the sustainable use and conservation of agro-biodiversity.

**1.3.5. Activity:** Identify and link to subject related networks, and other relevant national or regional networks, e.g., WANANET (West Asia and North Africa Plant Genetic Resources Network), to disseminate the aggregated project data on changes to abundance and distribution of target crop wild relatives and land races and the causes for these changes; and indigenous practices and knowledge relating to the sustainable use and conservation of agro-biodiversity.

**1.3.6. Activity:** Set up project web site to make technical and public awareness material more widely available.

**2. Immediate objective:** Integrate the conservation and sustainable use of agro-biodiversity into agricultural activities in the project target areas through capacity building and training.

**2.1. Output:** Project capacity to collect, record and analyze data at project sites for causal factors of agro-biodiversity degradation and facilitate appropriate land use modifications, through training courses as requested by National Project Components.

**2.1.1. Activity:** Provide a short-term regional training course to project staff in ecogeographic survey techniques, plant taxonomy, and plant population dynamics. Together with existing project capacity and training being given under the baseline programmes, project staff will be able to carry out eco-geographic surveys and record diversity of project target crops, and monitor changing distribution patterns and diversity of target crops at project sites and the causal factors.

**2.1.2. Activity:** Provide a short-term regional training course in GIS/Remote Sensing to project staff. Training will emphasize the need for compatibility between GIS/RS in the national project components and will enable project staff to set up or adapt existing GIS/RS, and store and analyze baseline data collected in project target areas. In particular project staff should be able to store, retrieve and analyze data to determine changing distribution patterns, morphological characteristics and growth characteristics of project target species.

**2.1.3. Activity:** Provide a short-term regional training course to project staff on principles of land and water management; conservation management and protection measures; rehabilitation and maintenance of natural vegetation; conservation management and utilization of agro-biodiversity in dry areas; and *in situ* conservation measures. Project staff will be able to provide extension services to farmers and landowners at project sites to enable the adoption of modified and alternative land use practices.

**2.1.4. Activity:** Provide information and access to project staff on annual training

programs provided by ICARDA, IPGRI and ACSAD, including, for example, molecular markers; plant genetic resource conservation; rangeland rehabilitation; computer applications and biometrics; water harvesting techniques; seed production.

**2.1.5. Activity:** Cooperate with National Coordinators in placing selected M.Sc. candidates at international, regional and national universities, and provide co-supervision for M.Sc. thesis research conducted within the project.

**2.2. Output:** Enhanced project capacity through specific national training, technical backstopping and joint activities with national teams as requested by the National Project Components to meet project objectives.

**2.2.1. Activity:** Provide follow-up in-country and other specific national training within the nationally executed project components, for example, in survey methodologies, setting up and adapting GIS/RS and electronic databases,

**2.2.2. Activity:** Provide necessary technical backstopping and assistance in the implementation of the project activities within the nationally executed components, as and when requested.

**2.2.3. Activity:** Provide technical assistance in nationally executed project training workshops, field days, and on-the-job training for project staff, NGOs, local community groups, agricultural co-operatives and farmers involved in project activities.

**3. Immediate objective:** Proper execution of the project through monitoring of progress of project activities and the impact of project interventions on the agro-biodiversity in project sites and on the welfare and equity within local communities.

**3.1 Output:** Aggregation and dissemination of project-wide progress and impact monitoring data.

**3.1.1 Activity:** Collate and store project-wide eco-geographic agro-biodiversity and socio-economic data from target areas, provided by the national programs, on a central electronic project data base for analysis through GIS/RS and other means.

**3.1.2. Activity:** Conduct project-wide regional analysis of these data, focusing particularly on tracking changes in agro-biodiversity abundance and distribution of wild relatives and land races of target crops; the causes of agro-biodiversity degradation in project areas.

**3.1.3. Activity:** Share the results of the project-wide regional analysis with the nationally executed project components and other parties involved in the project

**3.1.4. Activity:** Agree on a project-wide standard set of impact indicators and

methodologies with National Executing Agencies that will monitor the impact of project activities on the agro-biodiversity of wild relatives and land races of target crops, in isolation from non-project activities, and assess the effect of project interventions on the welfare and equity within local communities.

**3.1.5. Activity:** Where necessary provide technical backstopping and in-country follow-up training to assist nationally executed project components to implement impact monitoring and to ensure compatibility of data between national executed project components.

**3.1.6. Activity:** Prepare and submit all impact monitoring and progress reports to UNDP/GEF, including the Annual Project Report and the Project Implementation Review.

**3.1.7. Activity:** Prepare a series of notes on the lessons learned in the implementation of the project make these available to the national project staff, UNDP/GEF and other interested parties. These notes will include technical and operational advice to nationally executed project components in order that the lessons learned are incorporated into project planning and management.

E. Inputs

*1 Inputs Provided by ICARDA*

The figures below are the estimated value, in US dollars, of the inputs provided in-kind by the host institution, ICARDA, based on the Center's Medium-term Plan.

a) Personnel Total value: US\$ 2,125,100

Proportional contribution of ICARDA staff to the project, including:

- Senior scientists
- Technical support staff
- Administrative and operations support staff
- Travel on complementary and associated projects

b) Training Total value: US\$ 778,130

Partial contribution of ICARDA's existing training program, including regular training courses of relevance to the project and the provision of staff and support services of the training co-ordination unit.

c) Equipment Total value: US\$ 302,730

Valued as the depreciation on the partial contribution of equipment and vehicles used by

personnel involved in the project.

d) **Miscellaneous** **Total value: US\$ 1,667,850**

**Value of related services and supplies, including:**

**Office accommodation and facilities;**

**Casual labour;**

**Field, office and laboratory materials and supplies;**

**Logistical and administrative support: personnel services, financial services, travel services, purchasing and supplies unit, operations;**

**Computer support unit;**

**Information, publications and library services.**

**2. *Inputs provided by UNDP/GEF***

a) **Personnel** **US\$ 608,772**

i) **Suitably qualified Regional Co-ordinator (all activities)**

ii) **Duty travel of the Regional Co-ordinator**

b) **Training** **US\$ 245,400**

i) **Under Output 2.1: Regional Group Short-term Training Courses:**

**Ecogeographic botanic survey techniques**

**Principles of soil and water management**

**GIS/remote sensing, documentation and database management**

**In situ conservation and field gene bank management**

ii) **Workshops, Conferences and Meetings**

**Workshop on agricultural policy analysis (Activity 1.3.1)**

**Specialized and thematic workshops (Activity 1.2.4)**

**Annual Regional Technical Coordination/Planning Meeting (Activity 1.1.1)**

**Annual Regional Steering Committee Meeting (Activity 1.1.3)**

c) **Equipment** **US\$ 10,500**

i) **expendable equipment: software and updates for use by Regional Coordinator**

ii) **non-expendable equipment: one lap-top computer and accessories for use of Regional Coordinator**

d) **Miscellaneous:** **US\$ 130,000**

i) **Technical reporting (Activities 1.2.1; 3.1.6; 3.1.7)**

- ii) Public awareness (Activities 1.3.2 – 1.3.6)
- iii) Communications (Activities 1.2.2; 1.2.3; 1.3.6)

e) Project Support costs US\$ 129,307

Partial compensation for logistic and administrative support provided by host institution

## F. Risks

The success of the project depends upon the full participation of the communities in the target areas in the development and implementation of *in situ* agro-biodiversity conservation practices. Consequently, the project staff need to develop a close working relationship with local land users early in the project, to ensure that they participate in all stages of appraisal, planning and development. Such participatory approaches to resource management and conservation are still novel; no standardised methodology has been developed. Thus, the project will need to strengthen the capacity of project staff both through training and technical backstopping.

Expertise in social sciences is needed to elucidate land users' production objectives, the factors influencing and constraining production and farm resource management decisions, and the rules or patterns in social behaviour governing the utilisation of common resources. In some participating countries, the social sciences are not well developed, or are not in the mandate of the implementing agency. Where necessary, the project will develop these capacities through on-the-job training, or will include suitably qualified staff from appropriate national institutions.

One objective of the project is to leverage government/authority legislation or policy reform if this is found to be a constraint to securing *in situ* agro-biodiversity conservation. Through the preparation of the present project, the authorities in question have already signified their willingness to institute reforms, if needed, based on the lessons learned in the selected target areas. However, it is recognised that legislation in this area will involve a number of competing interests. The project will, therefore, have to ensure that (a) the analysis of the policies and legislation that may have an effect of agro-biodiversity conservation is robust and transparent, and (b) that an active dialogue is maintained with the authorities concerned on the lessons learned from the activities of the target sites so that, where necessary, legislation or policy reform can be proposed, initially for the target areas, but eventually for wider adoption in the countries/authority.

## G. Prior obligations and prerequisites

Prior obligations

- Ensure project activities comply with all national and international agreements on genetic and intellectual property right

#### H. Project review, reporting and evaluation

A time schedule of reviews, reports and evaluations is attached to this document as Annex II.

The project will be subject to tripartite review (an annual joint review by representatives of the government of the participating country, ICARDA and UNDP, to consider the project as a whole) at least once every 12 months. The first such meeting to be held within the first 12 months of the start of full implementation. In the case of this project, the Regional Project Steering Committee meeting will serve as the forum for the Tripartite Review, to review all regional and national components of the project. ICARDA shall prepare and submit to the tripartite review meeting an Annual Performance Report (APR) that summarizes all national and regional APRs. Additional APR's may be requested, if necessary, during the project. ICARDA shall also prepare and submit an Annual Project Implementation Review, covering all components of the project, on request from UNDP/ GEF.

ICARDA will prepare a project terminal report for consideration at the terminal tripartite review meeting. It shall be prepared in draft sufficiently in advance to allow review by all concened parties at least 4 months prior to the terminal tripartite review.

The project shall be subject to in-depth evaluation 36 months after the start of full implementation and 6 months prior to the scheduled termination.

ICARDA will submit monthly a short two page description of implementation progress to the appropriate UNDP Country Office in addition to the Inception report, in-depth evaluation reports, Annual Progress Reports and Project Implementation Review and terminal report.

The National Executing agency will keep project performance records, as requested by the UNDP Country Office and ICARDA, to assist in the preparation of these reports and reviews.

UNDP will advance funds quarterly to ICARDA, whom in turn, will report on and justify expenditures, in order to receive further releases of funds according to UNDP guidelines and procedures. ICARDA will establish and maintain a separate bank accounts for the receipt and disbursement of UNDP funds.

Within two months of the completion of the project, ICARDA will submit a final Financial Report on the use of UNDP funds, as well as an inventory of supplies and equipment. .

#### I. Legal context

This project document shall be the instrument referred to as such in Article I of the Standard Project Cooperation Agreement between the International Center for Agricultural Research in

**Dry Areas/ ICARDA and the United Nations Development Programme (to be signed before starting the project activities).**

The following types of revisions may be made to this project document with signature of the UNDP resident representative only, provided he or she is assured that the other signatories of the project document have no objections to the proposed changes:

- (a) Revision in, or addition of, any annexes of the project document
- (b) Revisions which do not involve significant changes in the immediate objectives, outputs or activities of a project, but are caused by the rearrangement of inputs already agreed to or by cost increase due to inflation; and
- (c) Mandatory annual revisions which rephase the delivery of agreed project inputs, or reflect increased expert or other costs due to inflation, or take into account agency expenditure flexibility.

J. Budgets

UNDP Budget

BL	Description	Total (USD)	Year 1		Year 2		Year 3		Year 4		Year 5	
			p/m	USD								
<b>10.00</b>	<b>PROJECT PERSONNEL</b>											
11.00	International experts	478,772	60	92,000	12	93,840	12	95,717	12	97,631	12	99,584
11.01	Regional Co-ordinator											
<b>11.99</b>	<b>Subtotal international experts</b>	<b>478,772</b>	<b>60</b>	<b>92,000</b>	<b>12</b>	<b>93,840</b>	<b>12</b>	<b>95,717</b>	<b>12</b>	<b>97,631</b>	<b>12</b>	<b>99,584</b>
15.00	Duty Travel											
15.01	Duty Travel of Regional Coordinator	100,000		20,000		20,000		20,000		20,000		20,000
<b>15.99</b>	<b>Subtotal duty travel</b>	<b>100,000</b>		<b>20,000</b>								
16.00	Evaluation	30,000						15,000				15,000
16.01	Evaluation missions							15,000				15,000
<b>16.99</b>	<b>Subtotal Evaluations</b>	<b>30,000</b>						<b>15,000</b>				<b>15,000</b>
<b>19.00</b>	<b>component total: personnel</b>	<b>608,772</b>		<b>112,000</b>		<b>113,840</b>		<b>130,717</b>		<b>117,631</b>		<b>134,584</b>
<b>30.00</b>	<b>TRAINING</b>											
32.00	Regional Group Short-term Training	18,000		18,000								
32.01	Principles of water and soil management			20,000								
32.02	Eco-geographic botanic survey techniques	20,000										
32.04	GIS/RS, documentation and database management	18,000				18,000						
32.07	In situ conservation and field gene bank management	19,000						19,000				
<b>32.99</b>	<b>Subtotal: Group Training</b>	<b>75,000</b>		<b>38,000</b>		<b>18,000</b>		<b>19,000</b>		<b>0</b>		<b>0</b>

BL	Description	Total (USD)	Total p/m	Year 1 p/m	USD	Year 2 p/m	USD	Year 3 p/m	USD	Year 4 p/m	USD	Year 5 p/m	USD
33.00	<u>In-service training (see Note 1 below)</u>												
33.99	<b>Subtotal: In-service Training</b>	<b>0</b>			<b>0</b>								
34.00	<u>Workshops, Conference and Meetings</u>												
34.01	Ag policy/ economics/ property rights workshops	20,000							20,000				
34.02	Specialised and thematic workshops (see Note 2)	80,000			20,000		20,000		20,000		20,000		
34.04	Annual Regional Technical Coordination Meetings	65,000			13,000		13,000		13,000		13,000		13,000
34.05	Annual Steering Committee Meeting	5,400			5,400								
34.99	<b>Subtotal: conferences and meetings</b>	<b>170,400</b>			<b>38,400</b>		<b>33,000</b>		<b>53,000</b>		<b>33,000</b>		<b>13,000</b>
31.99	<b>component total: training</b>	<b>245,400</b>			<b>76,400</b>		<b>51,000</b>		<b>72,000</b>		<b>33,000</b>		<b>13,000</b>
40.00	<b>EQUIPMENT</b>												
41.00	<u>Expendable equipment</u>												
41.01	Software & updates	5,000			5,000								0
41.99	<b>Sub-total: expendable equipment</b>	<b>5,000</b>			<b>5,000</b>		<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>
42.00	<u>Non-expendable equipment</u>												
42.01	Portable (lap-top) computer and accessories	5,500			5,500								
42.99	<b>Subtotal: non-expendable equipment</b>	<b>5,500</b>			<b>5,500</b>								
49.00	<b>component total: equipment</b>	<b>10,500</b>			<b>10,500</b>		<b>0</b>		<b>0</b>		<b>0</b>		<b>0</b>
50.00	<b>MISCELLANEOUS</b>												
52.00	<u>Reporting costs</u>												
52.01	Technical reporting	50,000			10,000		10,000		10,000		10,000		10,000
52.02	Public awareness (incl web-site, publications)	50,000			10,000		10,000		10,000		10,000		10,000
52.03	Communications (e-mail, etc)	30,000			6,000		6,000		6,000		6,000		6,000
52.99	<b>Subtotal reporting costs</b>	<b>130,000</b>			<b>26,000</b>								

BL	Description	Total (USD)	Total p/m	Year 1		Year 2		Year 3		Year 4		Year 5	
				p/m	USD								
59.00	component total: miscellaneous	130,000		26,000		26,000		26,000		26,000		26,000	
93.00	<u>Agency support costs (13%)*</u>	129,307		29,237		24,809		29,733		22,962		22,566	
	<b>TOTAL</b>	<b>1,123,979</b>		<b>254,137</b>		<b>215,649</b>		<b>258,450</b>		<b>199,593</b>		<b>196,150</b>	

**Notes**

- 1. Specialized national training courses and in-service training: costs to be covered by Nationally Executed Project Components**
  - 2. Travelling workshops and other specialized or thematic workshops on specific subjects that involve the four countries and the international/regional institutions**
- \* Agency support costs include 3% for UNDP, Syria and 10% for ICARDA**

ICARDA – In-kind contribution

BL	Description	Total (USD)	Total p/m	Year 1 p/m	USD	Year 2 p/m	USD	Year 3 p/m	USD	Year 4 p/m	USD	Year 5 p/m	USD
<b>10.00</b>	<b>PERSONNEL</b>												
11.01	Senior Scientists and Technical Support Staff	1,288,219	24	12	237,840	12	247,354	12	257,248	12	267,538	12	278,239
11.02	Administrative and Operational Support staff	541,698	24	12	100,012	12	104,013	12	108,173	12	112,500	12	117,000
<b>11.99</b>	<b>Sub-total: international experts</b>	<b>1,829,917</b>			<b>337,852</b>		<b>351,367</b>		<b>365,421</b>		<b>380,038</b>		<b>395,239</b>
15.00	Travel on complementary projects	295,179			54,498		56,678		58,945		61,303		63,755
<b>19.00</b>	<b>Component total: Personnel</b>	<b>2,125,096</b>			<b>392,350</b>		<b>408,045</b>		<b>424,366</b>		<b>441,341</b>		<b>458,994</b>
<b>30.00</b>	<b>TRAINING</b>												
31.00	Partial contribution of existing training program	778,131			143,664		149,411		155,387		161,602		168,067
<b>31.99</b>	<b>Component total: training</b>	<b>778,131</b>			<b>143,664</b>		<b>149,411</b>		<b>155,387</b>		<b>161,602</b>		<b>168,067</b>
<b>40.00</b>	<b>EQUIPMENT</b>												
41.00	Depreciation on equipment and premises	302,730			55,892		58,128		60,453		62,871		65,386
<b>49.00</b>	<b>Component total: equipment</b>	<b>302,730</b>			<b>55,892</b>		<b>58,128</b>		<b>60,453</b>		<b>62,871</b>		<b>65,386</b>
<b>50.00</b>	<b>MISCELLANEOUS</b>												

BL	Description	Total (USD)	Total p/m	Year 1		Year 2		Year 3		Year 4		Year 5	
				p/m	USD	p/m	USD	p/m	USD	p/m	USD	p/m	USD
51.00	Value of related supplies and services	1,667,852		307,931		320,248		333,058		346,380		360,235	
59.00	Component total: miscellaneous	1,667,852		307,931		320,248		333,058		346,380		360,235	
	<b>TOTAL</b>	<b>4,873,809</b>		<b>899,837</b>		<b>935,832</b>		<b>973,264</b>		<b>1,012,194</b>		<b>1,052,682</b>	

K.    Annexes

## Work Plan

Project Intervention	Year 1				Year 2				Year 3				Year 4				Year 5			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>1. IMMEDIATE OBJECTIVE:</b> Regional integration of nationally executed project components																				
<b>1.1. Output:</b> Project co-ordination of nationally executed project components																				
<b>1.1.1. Activity:</b> Organize an Annual Regional Technical Coordination and Planning Meeting																				
<b>1.1.2. Activity:</b> Prepare a detailed annual Regional Work Plan																				
<b>1.1.3. Activity:</b> Organize an annual Regional Steering Committee Meeting																				
<b>1.1.4. Activity:</b> Review and, where necessary, recommend amendments to methodologies proposed by nationally executed project components																				
<b>1.1.5. Activity:</b> Ensure compliance with international agreements and national legislation when transferring genetic materials																				
<b>1.1.6. Activity:</b> Co-ordinate transfer of genetic materials																				
<b>1.2. Output:</b> Project wide networking																				
<b>1.2.1. Activity:</b> Write and distribute project briefs twice a year																				
<b>1.2.2. Activity:</b> Set up project wide e-mail, electronic bulletin board and staff directory																				
<b>1.2.3. Activity:</b> Arrange exchanges between project staff of nationally executed project components																				
<b>1.2.4. Activity:</b> Arrange regular project wide technical solutions workshops on specific subjects																				
<b>1.2.5. Activity:</b> Assist National Coordinators to place international MSc Candidates																				
<b>1.3. Output:</b> Awareness of agrobiodiversity issues emerging from project activities																				

Project Intervention	Year 1				Year 2				Year 3				Year 4				Year 5			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<u>1.3.1. Activity:</u> Provide guidance to nationally executed project components in analyzing and preparing policy options																				
<u>1.3.2. Activity:</u> In consultation with national programs, prepare news releases for media coverage																				
<u>1.3.3. Activity:</u> In collaboration with national project staff, prepare project information packs to promote public awareness																				
<u>1.3.4. Activity:</u> Provide guidance to national programs in preparation of syllabus and teacher training materials for schools																				
<u>1.3.5. Activity:</u> Identification of and linkages to subject related networks to disseminate project data																				
<u>1.3.6. Activity:</u> Set up project web site																				
<b>2. IMMEDIATE OBJECTIVE:</b> Integrate the conservation and sustainable use of agrobiodiversity into agricultural activities through capacity building and training																				
<b>2.1. Output:</b> Project capacity to collect, record and analyze data at project sites																				
<u>2.1.1. Activity:</u> Short-term regional training in ecogeographic survey techniques, plant taxonomy and plant population dynamics																				
<u>2.1.2. Activity:</u> Short-term regional training course in GIS/remote sensing and database management																				
<u>2.1.3. Activity:</u> Short-term regional training course in the principles of land and water resource management																				
<u>2.1.4. Activity:</u> Short-term regional training course in <i>in situ</i> conservation and management of field gene banks																				
<b>2.2. Output:</b> Enhanced project capacity through specific national training																				

Project Intervention	Year 1				Year 2				Year 3				Year 4				Year 5			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<u>2.2.1. Activity:</u> Provide follow-up in-country and other specific training within nationally executed project components																				
<u>2.2.2. Activity:</u> Provide necessary technical backstopping and assistance in the implementation of project activities in the nationally executed project components																				
<u>2.2.3. Activity:</u> Provide technical assistance in nationally executed project training workshops, field days and on-the-job training																				
<b>3. IMMEDIATE OBJECTIVE:</b> Proper execution of the project through monitoring of progress of project activities and the impact of project interventions																				
<b>3.1. Output:</b> Aggregation and dissemination of project-wide progress and impact monitoring data																				
<u>3.1.1. Activity:</u> Collate and store, in an electronic data base, project- wide ecogeographic agrobiodiversity and socioeconomic data from the target areas																				
<u>3.1.2. Activity:</u> Project-wide regional analysis of these data																				
<u>3.1.3. Activity:</u> Share results of the project-wide regional with nationally executed project components																				
<u>3.1.4. Activity:</u> Agree on project-wide standard set of impact indicators and methodologies to monitor impact of project activities																				
<u>3.1.5. Activity:</u> Where necessary, provide technical backstopping to assist nationally executed project components in impact assessment																				
<u>3.1.6. Activity:</u> Prepare and submit all impact monitoring and progress reports to UNDP/GEF																				
<u>3.1.7. Activity:</u> Prepare a series of notes on the lessons learned in the implementation of the project and make these available to national project staff																				

II Project Reviews Reporting and Evaluation

Activity/ Report	Year 1				Year 2				Year 3				Year 4				Year 5				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Inception report	◆																				
Monthly Progress Reports <sup>11</sup>	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Quarterly Financial Reports	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Annual Progress Report (APR)					◆				◆				◆				◆				
Project Implementation Review (PIR)			◆			◆				◆				◆				◆			
Tripartite reviews						◆				◆					◆				◆		
In-Depth Evaluation Reports																				◆	
Terminal Report																					◆

<sup>11</sup> A Short two page description of implementation progress every month to the UNDP Country Office. The UNDP Country Office will copy this to UNDP/GEF in New York.

### III. Training Programmes

#### 1. *Eco-geographic botanic survey techniques*

Location: ICARDA headquarters, Aleppo, Syria  
Date: Year 1  
Duration: two weeks  
Lecturers: ICARDA (6), IPGRI-CWANA (3), and ACSAD (2), international expert consultants (2)  
Participants: national staff of Jordan (3), Syria (3), Lebanon (3) and the Palestinian Authority (3)

#### Participation requirements:

- B.Sc. in agriculture or plant sciences;
- English capability;
- involvement in the project ecogeographic survey activities.

#### Course description:

The participants will receive theoretical and practical training in plant taxonomy and identification of target species, their wild relatives, other useful and/or common Near East wild plants. The course will also include work with local floras, herbarium sheets, and databases of botanical and ecogeographic information. Other lectures will cover essential activities to be done before, during and after the survey missions. Legal and ethical principles relating to the ecogeographic survey activities, e.g. to plant collection and local knowledge gathering, will be covered in a separate lecture. The training will include two field trips to different ecosystems in northern Syria. The participants will carry out practical ecogeographic survey activities on the site.

#### Course budget:

1. Lecturers (ACSAD (2 persons), IPGRI (1 person))	US\$
Per diem and hotel accommodation (10 days, 3 persons)	3,000
Travel	100
2. Consultants	
Per diem and hotel accommodation (10 days, 2 persons)	2,000
Consultants' fee (\$250 per day)	5,000
International travel	4,000
3. Local transportation	500
4. Participants insurance (12 x 60 US\$)	720
5. Training materials and other miscellaneous expenses	4,140
<b>Total</b>	<b>19,460</b>

## 2. *Geographic information systems (GIS), remote sensing (RS) and database management*

Location: ICARDA headquarters, Aleppo, Syria  
Date: Year 2  
Duration: two weeks  
Lecturers: ICARDA (5), IPGRI-CWANA (2), and ACSAD (2), NARS Expert; RS international expert consultant, GIS international expert consultant.  
Participants: National staff of Jordan (2), Syria (2), Lebanon (2) and the Palestinian Authority (2)

### Participation requirements:

- B.Sc. in agriculture or other relevant field;
- knowledge of English;
- involvement in the project baseline definition, survey and monitoring data management, project GIS/RS development and management

### Course description:

The participants will receive theoretical and practical training in the principles and applications of GIS and RS in biodiversity and natural resources conservation project management. Training will emphasize the need for compatibility between GIS in the national project components and will enable project staff to set up or adapt the existing GIS, store and analyze baseline data collected in project target areas. In particular, the trainees should be able to store, retrieve and analyze changing distribution pattern of target species, including habitat changes and modifications.

### Course budget:

1. Lecturers (ACSAD)	US\$
Per diem and hotel accommodation (10 days, 2 persons)	200
Travel	100
2. Consultants	
Per diem and hotel accommodation (10 days, 2 persons)	2,000
Consultant's fee (\$250 per day per consultant)	5,000
International travel	5,000
3. Local transportation	500
4. Participants insurance (8 x 60 US\$)	480
5. Training materials and supplies	2,760
<b>Total</b>	<b>17,840</b>

## 3. *Principles of sustainable water and soil management and landscape modeling*

Location: ACSAD, Damascus, Syria

**Date:** Year 1  
**Duration:** two weeks  
**Lecturers:** ICARDA (6), ACSAD (4), international expert consultants (2)  
**Participants:** national staff of Jordan (2), Syria (2), Lebanon (2) and the Palestinian Authority (2)

**Participation requirements:**

- B.Sc. in agriculture, plant ecology, hydrology, soil science or other relevant field;
- knowledge of English;
- involvement in the project water, soil and habitat management activities at the community level

**Course description:**

The participants will receive theoretical and practical training in the principles of small-scale, community-based water, soil and habitat management activities aimed at the agrobiodiversity enhancement and conservation and/or increased livelihood of local communities. In addition to a series of lectures on water harvesting and soil conservation, training will provide the essential knowledge on plant population dynamics in space and time to understand the consequences of habitat modification on biodiversity at ecosystem/species/gene level. Two field trips to water harvesting and soil reclamation project sites will demonstrate the impact of habitat modifications on agrobiodiversity.

**Course budget:**

1. Lecturers (ICARDA)	US\$
Per diem and hotel accommodation (10 days, 6 persons)	7,500
Travel	100
2. Consultants	
Per diem and hotel accommodation (5 days, 2 persons)	1,000
Consultant's fee (\$250 per day per consultant)	2,500
International travel	4,000
3. Local transportation	1,000
4. Participants insurance (8 x 60 US\$)	480
5. Training materials and supplies	2,760
<b>Total</b>	<b>17,340</b>

**4. *In situ Conservation and Field Gene-bank Management***

**Location:** ACSAD headquarters, Damascus, Syria  
**Date:** Year 2  
**Duration:** two weeks  
**Lecturers:** ICARDA 1, IPGRI-CWANA (3), IPGRI-HQ (2) and ACSAD (4)

**Participants:** national staff of Jordan (3), Syria (3), Lebanon (3) and the Palestinian

### Authority (3)

#### Participation requirements:

- B.Sc. in agriculture or plant sciences;
- knowledge of English;
- involvement in the project activities.

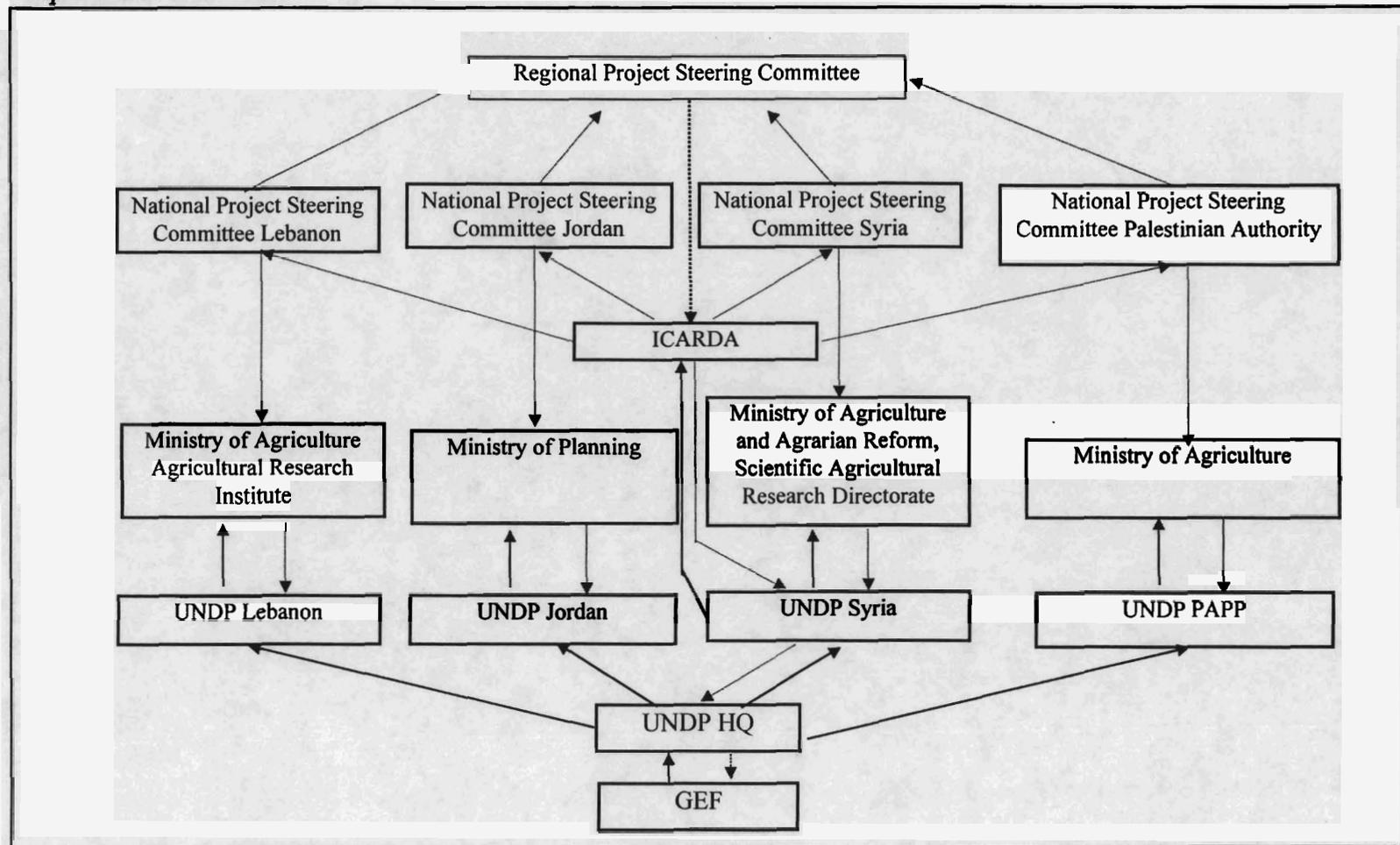
#### Course description:

It is planned to conduct a regional group short-term training course on *In situ* Conservation and Field Gene-bank Management for the participation countries in the project during the second year at Damascus, Syria. The course will cover the thematic and practical topics related to in situ conservation and field gene-bank management of cultivated and wild species including fruit trees. The complimentary conservation strategy and different methodologies for field gene-bank management will be the main theme of the course. A total of 12 participants (3 participant/country) will be invited to the course, the course will be given by the staff of ICARDA, ACSAD and IPGRI-CWANA and staff from IPGRI-HQ. The objectives of the course are to provide guidelines for in situ conservation and field gene-bank management activities within the project.

#### Course budget:

1.	Lecturers (ICARDA (1) IPGRI-CWANA (2) & IPGRI-HQ (2) person)	US\$
	Per diem and hotel accommodation (10 days, 5 persons)	8,000
	International travel (IPGRI-HQ (2) persons)	3,000
2.	Travel (local)	200
2.	Local transportation	2,000
3.	Participants insurance (12 x 60 US\$)	720
4.	Training materials and other miscellaneous expenses	2,500
5.	Contingencies	2,000
	<b>Total</b>	<b>18,420</b>

IV. Framework for effective participation of national and international staff  
*Implementation Structure*



Key : = Project Reporting

= Financial flow

## **Regional Project Steering Committee:**

### Terms of Reference

The Regional Steering Committee will supervise the execution of the project. Steering Committee meetings, to be chaired by the representative of the government/authority hosting the meeting, will rotate between the participating Countries/Authority. The Regional Steering Committee will meet annually, or more often if deemed necessary. Where feasible, the Committee will convene immediately following the Annual Regional Technical Coordination and Planning Meeting.

The committee will be comprised of:

A representative from the Executing Agency (ICARDA): The Director of International Cooperation or his nominated representative

The Regional Coordinator, who will be an ex officio member and will act as Secretary to the committee.

The Director General, or his designated representative, of the Executing Agency in each country /authority (Syria, Jordan, Lebanon, Palestine Authority)

The appointed National Coordinators from each Nationally Executed Component (Jordan, Syria, Lebanon and Palestinian Authority)

Representatives from both Co-operating Agencies (ACSAD, IPGRI)

A representative from the Syrian UNDP Country Office.

The Regional Steering Committee will meet annually, or more often if deemed necessary.

The Regional Steering Committee will be responsible for:

- 1) Oversight of the project activities including monitoring and evaluation of progress and achievements made;
- 2) Review and approval of annual reports for submission to the donor;
- 3) Review and approval of national annual work plans and training programme and, where necessary, recommend changes to better meet the project objectives;
- 4) Review and approval of regional annual work plan and training programme, where necessary, recommend changes to better meet the project objectives;
- 5) Review budget utilization and approve annual budgets for the coming planning period.

## **Regional Technical Co-ordination and Planning Meetings:**

### **Terms of Reference**

Regional Technical Co-ordination and Planning Meetings will be held prior to Regional Project Steering Committee meetings to discuss operational, planning, and co-ordination issues relating to the coming year's Project Work Plans, budgets, technical and monitoring reports. In particular these meetings will discuss and modify the operational and technical aspects of the Regional and National Work plans to facilitate:

Complementarity and co-ordination between project components;  
Ensure that sufficient technical backstopping and assistance will be given to the nationally executed project components;  
Provide advice on the appropriateness of project activities in the regional context, in the light of project technical and monitoring reports.

Meeting members:

Regional coordinator  
National coordinators  
Concerned Scientist from participating organizations.

### ***National Steering Committee: Terms of Reference***

A National Steering Committee will be established in each participating country/ territory. The Committees will meet at least once a year prior to the Regional Project Technical Meeting. The committee's responsibilities will include:

- 1) Review the Annual Performance Report, and other impact and monitoring reports;
- 2) Review of technical reports and recommendations for the next year's project planning;
- 3) Review, consider, the national annual work plan and budget and where appropriate recommend changes to better meet the project objectives in the national context, and in the light of monitoring report; and
- 4) Assist in the identification and allocation of national resources needed by the project to meet its objectives.

### ***Committee members***

It is unlikely that the expertise needed for the activities of the project will be found in any single institution, but will need to be drawn from several NRIs and NGOs. The committee will be chaired by the National Co-ordinator and will be made up of representatives of participating institutions as follows:

- **The Designated representative of the Executing Agency**
- **The Regional Co-ordinator**
- **The National Co-ordinator**
- **The GEF Operational Focal Point**
- **The Implementing Institution**
- **The UNDP Representative of that country**

## V. Job description

### *Regional Project Co-ordinator*

The Regional Co-ordinator will be responsible for the day-to-day management and timely execution of the agreed planned activities of the regional project component, co-ordination between ICARDA, IPGRI and ACSAD in providing the planned support within the regionally executed component, and co-ordination with the National Co-ordinators and participating national institutions in the nationally executed components of the project. In particular the Regional Co-ordinator will be responsible for:

- Drawing up, in consultation with project staff and the National Steering Committees, detailed Annual Work Plans and budgets for the regionally executed project component;
- Maintaining and monitoring financial records required for project reporting on the regionally executed component;
- Preparing Annual Performance Reviews, Project Implementation Reviews, and Impact Reports for submission to UNDP Country Office
- Convening the Annual Regional Technical Co-ordination/Planning Meetings and the Annual Regional Steering Committee Meetings. The Regional Co-ordinator will act as Secretary to the Regional Steering Committee.
- Overall co-ordination and regional integration of the implementation of project activities;
- Ensuring that data arising from the activities of the project conform with agreed project wide methodologies and formats;

### *Required qualifications of the Regional Project Coordinator*

- Earned PhD in plant genetics, plant ecology or a related area in plant sciences;
- At least five years international experience in *in-situ* genetic resources conservation, preferably in the Near East region.
- Familiarity with the socio-economic and environmental issues involved in *in-situ* and on-farm conservation of plant genetic resources;
- Experience in participatory methodologies and their application;
- Experience in project management, monitoring and evaluation;
- Knowledge of computers and data base management and;
- Fluency in English; Arabic capability preferred

### *Duty Station and Duration*

- Five years: 1998-2002

The Regional Coordinator will be located at ICARDA's headquarters at Tel Hadya, Aleppo, Syria

## VI. Cultivated Plants Originating in the Near East

A short list of cultivated plants identified as originating in the Near East. The list is intended to be indicative, not exhaustive. Based on J.R. Harlan (1975) *Crops and Man*. 2nd Edition. pp. 69-70. (GEF Project will address species marked in **bold** and with an **asterisk**)

### Cereals

<i>Avena</i> spp.	Oats
<b>*<i>Hordeum vulgare</i></b>	<b>Barley</b>
<i>Secale cereale</i>	Rye
<b>*<i>Triticum</i> spp.</b>	<b>Wheat</b>
<b>*<i>Aegilops</i> spp.</b>	

### Pulses

<i>Cicer arietinum</i>	Chickpea
<i>Lathyrus sativus</i>	Chickling
<b>*<i>Lens esculenta</i></b>	<b>Lentil</b>
<i>Lupinus albus</i>	Lupin
<i>Pisum sativum</i>	Pea
<i>Vicia ervilia</i>	Bitter vetch
<i>Vicia faba</i>	Broadbean/Faba
bean	

### Root and Tuber Crops

<i>Beta vulgaris</i>	Beet
<i>Brassica rapa</i>	Turnip
<i>Daucus carota</i>	Carrot
<i>Raphanus sativus</i>	Radish

### Oil Crops

<i>Brassica napus</i>	Rapeseed
<i>B. nigra</i>	Mustard
<i>Carthamus tinctorius</i>	Safflower
<i>Linum usitatissimum</i>	Flax, Linseed
<b>*<i>Olea europaea</i></b>	<b>Olive</b>
<i>Papaver somniferum</i>	Poppy

### Fruits and Nuts

<i>Corylus</i> spp.	Hazelnut
<i>Cucumis melo</i>	Melon
<i>Cydonia oblonga</i>	Quince
<b>*<i>Ficus carica</i></b>	<b>Fig</b>
<i>Juglans regia</i>	Walnut
<i>Phoenix dactylifera</i>	Date palm
<b>*<i>Pistacea vera</i></b>	<b>Pistachio</b>
<b>*<i>Prunus</i> spp.</b>	<b>Plum; Apricot;</b>
	<b>Cherry; Almond</b>
<i>Punica granatum</i>	Pomegranate
<b>*<i>Pyrus communis</i></b>	<b>Pear</b>
<i>Vitis vinifera</i>	Grape vine

### Vegetables, Herbs and Spices

<i>Asparagus</i> spp.	Asparagus
<b>*<i>Allium</i> spp.</b>	<b>Onion; Garlic;</b>
<b>Leek</b>	
<i>Arctium graveolens</i>	Dill
<i>Brassica oleracea</i>	Cabbage, etc.
<i>Capparis</i> spp.	Caper

<i>Carum carvi</i>	Caraway
<i>Ceratonia siliqua</i>	Carob
<i>Coriandrum sativum</i>	Coriander
<i>Cuminum cyminum</i>	Cumin
<i>Foeniculum vulgare</i>	Fennel
<i>Lactuca sativa</i>	Lettuce
<i>Lepidium sativum</i>	Garden Cress
<i>Petroselinum sativum</i>	Parsley
<i>Pimpinella anisum</i>	Anise
<i>Portulaca oleracea</i>	Purslane
<i>Trigonella foenumgraecum</i>	Fenugreek

### Fiber Plants

<i>Cannabis sativa</i>	Hemp
<i>Linum usitatissimum</i>	Flax

### Forage Crops

<i>Agropyron</i> spp.	Wheatgrasses
<i>Agrostis</i> spp.	Bentgrasses
<i>Bromus inermis</i>	Brome grass
<i>Dactylis glomerata</i>	Cocksfoot
<i>Festuca arundinacea</i>	Fescue
<i>Lolium</i> spp.	Ryegrasses
<b>*<i>Medicago</i> spp.</b>	<b>Alfalfa/Lucerne;</b>
<b>Medics</b>	
<i>Melilotus</i> spp.	Clovers
<i>Onobrychis viciifolia</i>	Sainfoin
<i>Phalaris</i> spp.	
<i>Phleum pratense</i>	Timothy
<i>Sorghum halepense</i>	Johnson grass
<b>*<i>Trifolium</i></b>	<b>Clovers</b>
<b>*<i>Vicia</i> spp.</b>	<b>Vetches</b>

### Drugs, Medicinal Plants

<i>Atropa belladonna</i>	Belladonna
<i>Digitalis purpurea</i>	Digitalis
<i>Glycyrrhiza glabra</i>	Licorice
<i>Hyoscyamus muticus</i>	Henbane
<i>Papaver somniferum</i>	Codeine, morphine, opium
<i>Platago psyllium</i>	Psyllium

## VII. Relevant On-going Research and Development Projects

### A. ICARDA

**Project 1.1. Barley improvement (participatory breeding and on-farm conservation of land races)**  
Budget 1998-2002 USD 638,468

#### Objectives

This project aims at achieving sustainable increases in barley productivity by adapting the crop to the different farming systems in developing countries, with special emphasis on those areas where the crop is grown by resource-poor farmers. Barley improvement is currently being implemented through a process of decentralized breeding, involving national agricultural research systems (NARS) scientists as equal partners in the entire breeding scheme—from the selection of parents, to the design of crosses, choice of selection and breeding methods, and actual selection in each individual country. ICARDA will maintain the responsibility for generating a continuous flow of genetic variability using both conventional and advanced methods (genetic engineering), while selection will be done by NARS in the target environments. A major new direction is the participation of farmers, both men and women, in early selection of segregating populations in order to better exploit specific adaptation.

**Project 2.2 Agronomic Management of Cropping Systems for Sustainable Production in Dry Areas.**

Budget 1998-2002 USD 443,516

#### Objectives

The overall objective is the development of appropriate arable systems, which make efficient and conservative use of natural resources and externally-derived inputs, for the sustainable production of field crops. Emphasis is given to research problems currently not commonly addressed by national agricultural research systems (NARS), particularly in less-favorable environments; evaluation of new alternative crops in cropping systems to increase diversification of production; characterization of cropping systems in time and space, through generalization of site-specific long-term trials to wider areas using crop models in combination with geographic information systems (GIS) technology; soil micro-nutrient imbalances affecting plant growth, and animal and human health; and, participation of farm households in adaptive research on problem-oriented technologies.

**Project 2.3 Improvement of Sown Pasture and Forage Production for Livestock Feed in Dry Areas**

Budget 1998-2002 USD 365,535

#### Objectives

The biggest obstacle to implementation of pasture-legume production continues to be seed supply. The formal seed sector focuses largely on commercial-crop seed production; pasture seed will, by necessity, be handled within the informal seed sector. Thus, transfer of appropriate and practical knowledge for pasture-seed production to the informal seed sector is a priority. To remove bottlenecks to the use of pasture and forage legumes, the Project has invested in the development and on-farm testing of machinery for introducing pasture and forage legumes into productive

farming systems. Equipment developed includes a pasture-seed sweeper, a thresher, a roller and a cutter bar-all manufactured by the local private sector. Emphasis for the immediate future is on the extension and transfer of what is known about rotations involving forage legumes, and pasture-seed production.

**Project 2.4 Rehabilitation and Improved Management of Native Pastures and Rangelands in Dry Areas.**

Budget 1998-2002 USD 467,885

**Objectives**

Work is focused on determining the productivity of rangelands improved by native and exotic fodder shrubs; monitoring the effect of stocking pressure on rangeland biomass and sustainability of livestock production, and measuring the economic returns; and developing rehabilitation techniques using direct-seeding methods. Emphasis will be given to shifting the research from on-station settings to experimentation in flocks in steppe areas, with the participation of communities, and using rangeland inventories and geographic information systems (GIS) tools to extend the work to new areas, and to enable local community planning and management.

**Project 3.1 Water Resource Conservation and Management for Agricultural Production in Dry Areas**

Budget 1998-2002 USD 726,197

**Objectives**

Within the Ecoregional Program on On-farm Water Husbandry in West Asia and North Africa (WANA), national teams are working in partnership with ICARDA on issues of water-harvesting most relevant to their needs, including indigenous systems, area potential, implementation techniques and socioeconomic components. An optimization model for the harvest, storage and use of rainfall at the watershed level has been developed in Jordan, and use of remote-sensing and geographic information systems (GIS) has been initiated in Syria. Future efforts will focus on increasing national awareness, building human capacity, demonstrating suitable techniques and integrating water-harvesting in agricultural systems, where relevant.

**Project 3.2 Land Management and Soil Conservation to Sustain the Agricultural Productive Capacity of Dry Areas.**

Budget 1998-2002 USD 131,592

**Objectives**

This Project works in spheres in which ICARDA has previously had limited activities: wind erosion; effects of the use of brackish water for supplemental irrigation on soil properties; case studies of the interrelationships between technical and socioeconomic factors involved in threats to natural resources under agricultural use and the implications for poverty alleviation.

This Project builds on these activities, strengthens their technical dimensions, initiates new studies-with linkages to other Projects-, and integrates them within a rational framework for action based upon a careful appraisal of the main land-management and soil-conservation issues. Joint work with national research and development organizations is given high priority, in order to multiply the effectiveness of this new thrust.

**Project 3.3 Agrobiodiversity Collection and Conservation for Sustainable Production.**  
Budget 1998-2002 USD 1,462,141

**Objectives**

Germplasm collection, characterization and conservation and promotion of its use are continuing tasks. However, due to the concerted efforts of ICARDA and its research partners in collecting and conserving endangered germplasm, particularly landraces, more emphasis can now be given to thorough characterization and evaluation of material to stimulate its better use. Additional collecting is still required from temperate areas and rangeland; collection missions outside the WANA region will also be conducted as dictated by the distribution of species and ICARDA's global mandate for barley, lentil and faba bean. Efforts to promote in-situ conservation by national programs will focus on improved natural-resource and habitat management. In-situ and on-farm conservation of agrobiodiversity is, globally, a new departure and its implementation will require innovative approaches and close collaboration with national agricultural research systems (NARS) and the participation of local communities.

**Project 3.4 Agroecological Characterization for Agricultural Research, Crop Management and Development Planning.**  
Budget 1998-2002 USD 268,059

**Objectives**

The Project's objective is to develop and institutionalize systems, methodologies and procedures for the quantitative description, at local, sub-national, national and regional level, of the biophysical context of agricultural environments and of its interaction with crops and production systems. The Project's output is expected to strengthen the planning of agricultural research, agricultural development, land use and environmental management in the dry areas. An improved knowledge of agricultural environments contributes to poverty alleviation and environmental protection through the more effective identification of crops, cultivars, land-use and land-management practices that are at the same time productive, economically attractive and environmentally sound.

Basic research on modeling continues, but more emphasis is given to applied and adaptive research. The Project's support function is being strengthened by consolidating existing climatic databases and making them more widely available through on-line services and CD-ROMs. Climatic databases will be integrated with land-resource databases through geographic information systems (GIS) and remote-sensing technology. The Project helps national agricultural research systems (NARS) to identify their needs in agroecological characterization and to develop custom-tailored methodologies to solve their problems; links with international organizations to develop common methodologies and standards for database and software development, and collaborates with specialized research institutions in advanced methodological development, such as crop and systems modeling, agroclimatic analysis, remote-sensing, and GIS applications.

**Project 4.1 Socioeconomics of Natural Resource Management in Dry Areas.**  
Budget 1998-2002 USD 209,573

**Objectives**

Given the location-specific nature of the research, the Project works through case studies of specific identified problems of resource management, which are conducted in close collaboration

with teams of national agricultural research systems (NARS) scientists and use a problem-solving, multidisciplinary, participatory approach. The case studies focus on communities of resource-users, particularly in sites where there is evidence that resource management is deteriorating, and investigate individuals' decision-making and cooperative behavior, with regard to the management of their resource base, in the context of the social, cultural and economic constraints operating beyond the farm boundary. Activities include: (1) market and non-market valuation of natural resources and estimation of the economic and social costs of their degradation; (2) economic assessment of the environmental impact of resource-management strategies; (3) elicitation of users' perceptions and valuations of their resource base, which contribute to decisions regarding resource-management practices; (4) identification of factors in the broader socioeconomic environment that influence individuals' resource-management decisions, including the socio-cultural organization of communities (rights of access to common-property resources); (5) based on these findings, ex-ante assessment of potential resource-management options.

Emphasis is being given to the valuation of natural resources; the development of methodologies from the case studies that are transferable to other sites; social and organizational analysis; and generalization of results from the specific case studies, through modeling and other tools.

**Project 4.3 Policy and Public Management Research in West Asia and North Africa**  
Budget 1998-2002 USD 160,835

**Objectives**

This project focuses on the analysis of policy options and other institutional reforms (with information on land tenure and rights of access to common-property resources from Project 4.1), which influence land users' investment and management decisions on farmland, rangeland and water. The aim is to generate and expose analyses, in collaboration with national agricultural research systems (NARS) and national policy-makers, which quantify the likely consequences of policy options in terms of efficiency, equity and environmental sustainability. By necessity, the research is primarily conducted in collaboration with NARS. ICARDA's advantage is in providing a forum for synthesis of the research, enabling cross-country analyses and ensuring that comparative methods of analysis are used. Research is focused on: (1) identification and review of economic policies and institutional changes that influence farmers' investment and management decisions; (2) analysis of the effects of market liberalization on farmers' investment and management decisions, including sector analysis and multi-market modeling; and economic assessment of public and private drought-management measures; (3) community modeling, to assess the effects of policy and institutional changes on resource allocation, productivity and management of communal resources; (4) commodity and trend analysis.

Attempts to introduce new agricultural technologies or management strategies in the West Asia/North Africa (WANA) region have often failed due to institutional constraints beyond the control of individual land-users or communities, or because of the lack of appropriate policy and legislative support. Moreover, in the current rapidly changing international economic environment, national structural-adjustment programs and macroeconomic policies may conflict with specific sectoral or development programs aimed at improving agricultural production, farm incomes and resource management. National policies in the region tend to be directed toward supporting agricultural productivity in the more favored areas, with a view to maintaining food security. However, if social and environmental benefits are considered in addition to productivity gains, then it is possible that appropriate policy amendments and public investments could be

introduced for low-rainfall areas that are competitive with investments in the high-potential agroecological zones.

## **B. IPGRI**

**Project C05:** Support to Plant Genetic Resources Programmes and Regional Networks in Central & West Asia and North Africa

Activity A: Strengthening of Plant Genetic Resources Activities in Central & West Asia and North Africa

Activity B: Networking in Central Asia

Activity C: Coordination of WANANET

Activity D: Documentation and Information Management

1998-2002 Budget: US\$ 333,333

This project aims to assist and strengthen the plant genetic resources activities of national Programmes in the area of collection, conservation, evaluation and exchange of plant genetic resources in the region, and will assist in the establishment of national Programmes in the countries of Central Asia. It will also promote crop networking for the efficient exchange and utilization of crop germplasm and provide support for the documentation of plant genetic resources at the national and regional levels and raise public policy awareness on plant genetic resources issues in the region.

Project activities will produce: trained national programme staff; maps showing the extent of genetic diversity throughout the region; reports from WANANET and CAN/PGR Working Groups; recommendations from Steering Committee meetings both in WANA and Central Asia; an information management system; catalogues; inventories, regional newsletter in English and Arabic; proceedings of meetings on economically useful crops in the region, documentation training materials; electronic data on crop germplasm evaluation for biotic and abiotic stress; application software.

**Project C07** Global Forest Genetic Resources Strategies

Activities B: locating and Assessing Diversity in Tropical Forests

1998-2002 Budget: US\$ 26,687

Current activities are twofold. One of the activities is the identification of relevant existing activities and key partner institutes on forestry and forest genetic resources in the region, and in particular Syria and Lebanon. This activity consists of a desk study to the activities of the different institutes involved in forestry as well as visit to these institutes.

The second activity concerns the preparation for a workshop on the development of an approach for integrated genetic conservation and use strategies. This includes a literature research to the ecology, genetic diversity and use of the main tree species in Syria and Lebanon.

Future activities will include research to the ecology, genetic diversity and socio-economical values of some target species, in collaboration with national partners, in Syria and Lebanon. It will also include making and maintaining contacts with institutes working on forestry and forest genetic resources in the region.

## **Project C12 Integrated Conservation and Use**

**Activity D: Strengthening the Conservation & Sustainable Use of Underutilized/Neglected Species**

1998-2002 Budget: US\$ 81,000

The project is concerned with the specific issues involved in maintaining diversity through use, with regard to the role played in different production systems by neglected and underutilized species (NUS). For these species resources for deliberate conservation are extremely limited and continued maintenance in agricultural production by farmers and communities constitutes an essential element of an effective conservation strategy. NUS offer additional sources of income to farmers and thereby contribute to the much-sought agricultural diversification. They also contribute to diet diversification, to lower food costs and imports and to the better use of marginal lands. The project, which represents a contribution towards the implementation of the FAO Global Plan of Action within the CWANA region, aims at promoting NUS conservation through their sustainable use. Promotion of use will be achieved through better understanding and documenting their diversity in different agro-ecological niches, increasing the availability of diversity and information on traditional uses through germplasm collecting missions, enhance use through research activities on the domain of characterization, evaluation and documentation. Training and public awareness initiatives to widen the knowledge on NUS and gain greater support from policy makers and donors are also important components of the project.

## **C. ACSAD**

### **1. Water Resource Studies**

Development of water models plotting demand for water from different land uses and water supply by region and the establishment of water resource data bank and documentation centre. Much of this information is useful for integrating with GIS.

### **2. Soil and Agro-climate studies**

The development of soil maps for the region through survey collection. The data is being used in GIS and is contributing to analysis and definition of appropriate land uses geographically.

### **3. Plant studies and conservation management**

Eco-geographic surveys of species distribution and diversity are contributing to the appropriateness of management and conservation practices. For example ACSAD manages field gene-banks of rare and threatened agricultural species, and in particular fruit tree species.

Total estimated in-kind contribution (through ongoing activities and direct project contributions to the project) USD 495,000

## IX Target Areas Descriptions

### A. JORDAN

#### 1. **Ajlun**

**Location:** North Jordan, 75 km north of Amman. Two nature reserves exist near this site, Zobia for its flora and fauna and Dibbine for the flora.

**Topography:** It is a mountainous area ranging from 500 - 1250 m above sea level, with steep slopes, valleys, and numerous springs.

**Climate:** It has a sub-humid Mediterranean climate, situated within Jordan's highest rainfall region (300-600 mm). Highest temperatures occur in August (mean maximum 34°C) and lowest temperatures in January (mean minimum -4.2°C). The mean annual relative humidity is 63%.

**Soil:** Eighty percent of the soils in this region are shallow. High rainfall has leached most of the calcium carbonate. On the flat sites true vertisols exist.

**Land use:** The area consists of indigenous forest (14,225 ha) planted forests (665 ha), cultivated areas and rangelands. Fruit tree cultivation (olives, grapes, figs, pomegranate and almond) and dryland farming of wheat barley, food and feed legumes are practiced. Both goats and cattle graze the rangeland. 65% of the land is privately owned .

#### *Flora and Agrobiodiversity Significance:*

This area has the highest forest cover in Jordan. In the indigenous forest where *Pinus* sp., *Quercus* sp. and *Ceratonia* sp. predominate, wild relatives of pistachio, apricot and almond are still found. Ancient local cultivars of fruit trees, especially olives, are grown in cultivated areas. Wild relatives of wheat, barley and forage species are also abundant. Local varieties of onion and garlic can be found in irrigated fields.

**Threats:** Deforestation and overcutting are major threats to the wild fruit trees in this area. Overgrazing is not a serious problem here. Replacement by improved, cultivated varieties is a common, widespread threat to almost all the landraces and local varieties of the target crop species (cereal, forage and fruit/nut crops) which occur here.

**Incremental Activities:** - *In-situ* conservation of wild relatives, especially in the natural forest.  
- On farm conservation of landraces and local varieties.  
- Forest rehabilitation and soil conservation in deforested areas.  
- Others.

## 2. Muwaqqar

**Location:** This site, referred to as Muwaqqar, is in two parts, both close to Amman. One part is located 30 km southeast of Amman while the other is a western extension located south of Amman in an east-west orientation (also referred to Amman S-W).

**Topography:** The site southeast of Amman is undulating and hilly with differences in soil and moisture content along the slopes. This site represents the steppe zone in the region which covers 13% of Jordan. A similar ecosystem exists in the western extension. In addition, this area includes a plateau area and a more hilly area, representative of other ecosystems found widely in Jordan and other areas of the Fertile Crescent. The entire area ranges from 300 m to 950 m.

**Climate:** The steppe zone is arid, with rainfall which fluctuates from year to year and generally occurs and high intensity thunderstorms. Mean maximum and minimum air temperatures during January are 13°C and 3°C respectively, and in August 33°C and 17°C respectively. Absolute maximum and minimum temperatures in August and January respectively are 41°C and -3°C. On the plateau, rainfall is much higher, reaching 370 mm; in the hilly area, 250-300 mm.

**Soil:** Soils are highly calcareous and fragile in the steppe zone. Gypsum is found in soils at high topographic positions. The soil occurring in this area has been modified and eroded by wind and water, accentuated by overgrazing. This is also the situation in the hilly areas of the extension zone where soil erosion has been accentuated by terrace building. Soils on the plateau are deep and red.

**Land use:** Open grazing is the predominant land use of the steppe zones, especially in spring, when the natural rangeland is heavily used. In dry years, grazing includes also barley from dry farming fields, while in good years, the barley is cropped and the herds graze the crop residues. Around the settlement areas, there are supplementary irrigated orchards with olive, apricot, onion and garlic and other vegetables. Along the valleys, a variety of fruit trees are grown using traditional irrigation practices. 95% of the entire area is privately owned.

### *Flora and Agrobiodiversity Significance:*

A 1000 ha of indigenous forest exist in the area although plant cover is sporadic in the steppe zone. Short grasses and small xerophilous shrubs predominate along waterways and depressions. Wild forage species of *Vicia* and *Lathyrus*, which have potential for rehabilitation of this kind of rangeland, still survive in overgrazed areas. Wild barley occurs in abundance and its landraces which are resistant to drought and adapted to steppe conditions are cultivated. Local varieties of olive, grapes, figs, pomegranate, almonds and dates are grown in valleys. Crops grown around the settlements are valuable local cultivars.

**Threats:** Overgrazing is a key threat to this area although replacement of landraces and local varieties threatens all the target crops concerned in this area. The plateau area is heavily cultivated.

### *Incremental Activities:*

- Rehabilitation of degraded rangeland by controlled grazing to encourage indigenous forage legume species which still exist in the soil seed bank. Research indicates good potential for the recovery of this zone.
- On farm conservation of local varieties of fruit and vegetable species in the hilly area and surrounding steppe settlements. Develop small scale water harvest to assist this. The closeness of this site from the capital Amman, will give these products relatively high economic value.

## **B. LEBANON**

### **1. Baalbek**

*Location:* This area extends from the town of Baalbek in a semi-circle of 15 km radius to the north, south and west.

*Topography:* The area is made up of a flat plateau rising steeply on one side to an elevation of 1500m.

*Climate:* It has a semi-arid Mediterranean climate, with a gradient of rainfall related to altitude. Average annual rainfall ranges from 350-550 mm.

*Soils:* Soils are highly calcareous and of a light texture.

*Land use:* The agro-ecosystem includes both dryland farming (wheat, barley, food and feed legumes) and irrigated crops (potatoes, onions and other vegetables, forage crops as alfalfa and maize and recently tobacco). 70% of the land area is privately owned.

### *Flora and Agrobiodiversity Significance.*

The flora of the site harbours more than 500 plant species of which 60 are endemic. Landraces of crops are commonly grown, while border fallow strips along the fields support wild relatives of crops, including the wild relatives of wheat, barley, lentils and forage legumes, such as *Aegilops* sp., *Hordeum* sp. and *Medicago* sp. Trees are found on the mountain slopes, particularly *Quercus* spp. Parts of an exploited, degraded oak forest still remains.

*Threats:* Replacement of landraces by improved varieties is the main threat to many of the target crops, while habitat fragmentation and loss is threatening the wild "progenitors" and wild relatives. Indigenous oakwood is processed as charcoal, leaving the soil vulnerable to erosion.

*Incremental Activities:* The project at this site will focus on farm conservation of landraces and rehabilitation of forest and rangelands.

## 2. Aarsal

**Location:** This site is situated North East of the Baalbek Valley, a part of the Anti-Lebanon mountain range.

**Topography:** A high plateau of 1,400-1,700 m asl.

**Climate:** The climate is arid and semi-arid Mediterranean. Rainfall fluctuates from year to year but generally averaged at 400-500 m.

**Soil:** The soil is calcareous, deep in the valleys and plains and shallow on the slopes. Alluvial soils exist in the valleys.

**Land use:** Traditionally the area is used for open grazing, and dryland farming of cereals, legumes and fruit trees. During the last ten years, horticulture (grapes and cherries) is expanding, especially where the soil is alluvial and deep. 40% of the land area is privately owned.

### *Flora and Agrobiodiversity Significance:*

The Anti-Lebanon of which this site forms part, is considered as one of the richest parts of Lebanon for endemic flora. The vegetation is mainly grassy steppe of *Aegilops* sp., *Agropyron* and *Avena* sp., with scattered trees and bushes of low palatability (*Artemesia*, *Salsola* and *Poterium*), but most importantly, wild relatives of the fruit trees *Pyrus*, *Prunus*, *Crataegus*, and *Amygdalus* (Table 3). Several important grass forage plants and legume forages, vetch, *Lathyrus* and medics are also present.

**Threats:** Deforestation and overgrazing.

### *Incremental Activities:*

The project at this site will focus on *in situ* conservation of the wild relatives of the target fruit trees, and regeneration of rangeland by promoting indigenous forage grasses and legumes, thus enhancing their conservation.

## C. PALESTINIAN AUTHORITY

### 1. Hebron Area

**Location:** This site is made up of two areas, one to the west of Hebron city towards the borders of Beit Lahem province in the north, and the armistice lines in the west, and the second, southeast of Hebron city, from the south-western borders of Hebron province including the eastern areas in Hebron province and Beit Lahem up to Wadi Nar.

**Topography:** The site to the west of Hebron city covers the mountains and the western slopes of Hebron province. The south and east area forms a gradation from the hills towards

the Dead Sea.

*Climate:* It is a mountainous sub-humid variant of the Mediterranean climate.

*Soil:* Soil in the mountainous areas is Terra rossa, but dark Rendzina can be found in certain locations. Alluvial soils exist in plains and valleys.

*Land Use:* Parts of the hilly and mountainous regions are forested, however large numbers of sheep and frequent droughts have led to overgrazing. Grazing of sheep and goats depends partly on the natural plant cover, and partly on residues of crops. Cultivated land is concentrated typically in the plains and valleys where the soil is deep and field crops such as wheat and barley). The majority of land is under fruit tree cultivation. Most of the agriculture is dryland farming. Irrigated land is only found around the villages. 75% of the land is privately owned.

*Flora and Agrobiodiversity Significance:*

This area represents the far south of eastern Mediterranean flora. In the mountainous regions (West Hebron) *Marquis* forest exists. It is rich in an array of plant species including medicinal plants and wild relatives of fruit trees notably wild pear, cherries and almond (Table 3). It is the only region which contains remnants of apple and pear trees. In addition last remnants of oak forests still exist. In the cultivated areas, ancient cultivars of olives, grapes, nuts, plum, almond, peaches and cherries are grown. There are many landraces of wheat, barley, food and feed legumes and some local varieties of vegetables.

*Threats:* Overgrazing by sheep and goats is severe. Unpalatable bushes and poisonous plants now predominate in the lower areas towards the Dead sea, where degradation through overgrazing is severe.

*Incremental Activities:*

On-farm conservation of local varieties of crop plants and fruit trees, and rangeland rehabilitation with indigenous forage grasses and legumes, will be the focus of the project at this site. However, due to the lack of baseline information on the agrobiodiversity of the area, much efforts will be devoted to inventory surveys at the initial period. Soil and water conservation will help conserve the habitats of wild species.

## **2. Jennin**

*Location:* The site extends from Abada village, southeast of Jennin city, to the main road across the Jordan River.

*Topography:* The region is hilly with a gradient down towards the Jordan Valley, at 0-300 m.

*Climate:* The site represents a gradient from semi-arid to arid climate. It is semi-arid steppe.

*Soil:* Soils in the valley plains are alluvial and on the mountain slopes a dark Rendzina with some wide pockets of Terra Rosa soil. Basaltic pockets exist at the edge of

the area with yellow soils capable of holding moisture. Soils are being lost through overgrazing.

*Land use:* The 44200 ha area is composed of 7500 ha of agricultural land; 4400 ha for wheat, barley, lentil, chickpea, *Vicia* sp., forage peas and spices (cumin, anise etc.), 1400 ha for rainfed vegetables, 1700 ha for olives and 350 ha other fruit trees. Open grazing for cattle, sheep and goats occupies a large area. In addition, closed areas and natural reserves exist in the area.

*Flora and Agrobiodiversity Significance:*

This site is an area of semi-arid steppe with scattered trees. The flora includes more than 1000 species, many of which are at risk through habitat destruction by overgrazing. Belts of Oak, Lentisk and Carob forest exist with numerous indigenous trees and shrubs although only wild Pistachia is represented among the target crop species. Wild species of wheat and barley, *Ononis* sp., *Papaver* sp. and annual legumes and forage species, wild *Vicia* and *Medicago*, also exist.

*Threats:* Overgrazing is endangering range and forage plants in this region, notably *Trifolium*, *Medicago* and *Lathyrus* species.

*Incremental Activities:*

Rangeland rehabilitation and *in situ* conservation, especially through habitat restoration and improvement, will be the focus for this site. As in the case of Hebron Area, however, much efforts will be devoted to inventory surveys at the initial period.

## D. SYRIA

### 1. Slenfe

*Location:* This site is located to the east of Latakia.

*Topography:* The site forms part of the coastal mountains above 1000 m. It includes part of the eastern slope and a bigger area on the western slope with varied topography.

*Climate:* The climate is humid and sub-humid mountainous Mediterranean.

*Land use:* 1200 ha of the area is indigenous forest. The remaining area is mixed dryland farming. 70% of the land is privately owned.

#### *Flora and Agrobiodiversity Significance:*

The vegetation includes a Cedar-Abies forest, which is considered a protected area and contains wild relatives of fruit tree species. Landraces and local varieties of cereals, food and feed legumes and fruit trees predominate in cultivated areas, notably wheat, olive, apricot and fig. Natural vegetation covers marginal areas and field borders. The flora includes more than 500 plant species, of which a dozen are endemic. It includes wild relatives of forage crops (*Vicia*, *Lathyrus*, *Medicago*) and wild relatives of fruit trees such as *Pyrus*, *Prunus*, *Pistacia* and *Amygdalus*.

*Threats:* Cutting, deforestation, fire, overgrazing and agricultural expansion are especially damaging to the wild relatives of fruit trees and field crops. Replacement by improved cultivars is the major threat to all landraces and local varieties concerned.

#### *Incremental Activities:*

Both *in situ* and on farm conservation are essential in this area, alongside with forest rehabilitation.

### 2. Sweida

*Location:* This site consist of two locations (Mshannaf-Sahwet) located in the northeast to southeast part of Sweida province, adjoining the Syrian-Jordanian border, and includes the mountain Jabal-el-Arab.

*Topography:* The area is characterized by hills, a mountain range and plains. Jabal-el-Arab is a basalt mountain, reaching 1500 m in altitude.

*Soils:* The region is formed from basalt rock.

*Land use:* Much of the area is used for dryland farming and grazing. A great part of the region is occupied by wheat cultivation with some lentils, faba beans, vetches, and orchards of grapes, almonds and apricots. Less than half of the area is private.

### *Flora and Agrobiodiversity Significance:*

There are 900 plant species registered in the flora of this region, which is more than one third of the flora of Syria, indicating the rich floristic diversity of the region. More than 25 endemic species occur in the Jabal-el-Arab region. Sweida is a major site for genetic diversity of wild relatives of wheat (*Triticum spp.*), barley (*Hordeum spp.*), food legumes (*Lens spp.*), and species of forage grasses (*Vicia*) and legumes. Ten *Allium* species, 34 *Trifolium* species, 9 *Trigonella* species, 10 *Medicago* species and 6 *Aegilops* species have been recorded. Of the fruit crops, the genetic diversity of the wild olive (*Olea oleaster*) here is estimated to be 40% of the world's wild olive known. In addition, *Amygdalus korschinki*, which is a close relative of almond is found, as is *Pistacia atlantica*, used as a rootstock of cultivated pistachio. *Pyrus syriaca* is a rootstock of cultivated pear, also found in this region. *Quercus calliprinos* forms stands of natural forest.

*Threats:* Overgrazing and agricultural expansion are the main threats to the wild relatives of the target crops here. Replacement by improved cultivar is a generic problem as in many other sites.

### *Incremental Activities:*

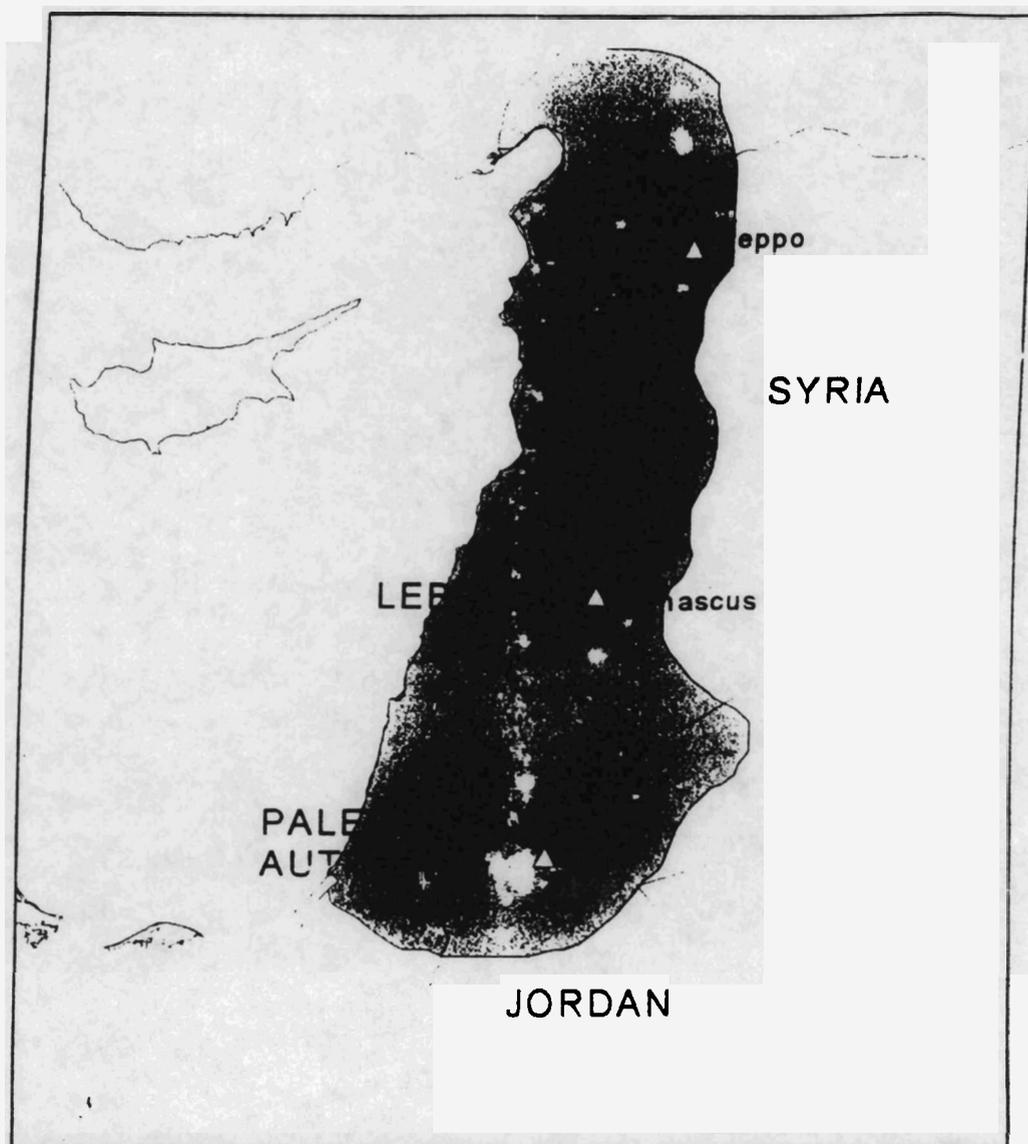
This area is vitally important for *in-situ* conservation of the genetic diversity of wild wheat, barley, food and forage legumes. On farm conservation will be launched to manage field borders rich in wild species. Rangeland rehabilitation will be another major activity for this site.

TABLE 1. TARGET AREA/CROP GERmplasm MATRIX

Crop	Germplasm	Jordan		Lebanon		Palestinian Authority		Syria	
		Ajlun	Muwaqqar	Baalbek	Aarsal	Hebron	Jennin	Stenfe	Sweida
Wheat	wild <i>Triticum</i>	XX		XX		X	X		XX
	<i>Aegilops</i> spp.	XX	X	XX	X	X	XX	X	XX
	landraces	XX		X	X	X		XX	XX
Barley	<i>H. spontaneum</i>	X	X	XX		X	X	X	XX
	landraces	XX		X		X		X	XX
Lentil	wild <i>Lens</i>	X		XX					XX
	landraces	X		X					X
Vetch	wild <i>Vicia</i>	XX	X	X	X	X	X	X	XX
<i>Lathyrus</i>	wild <i>Lathyrus</i>	X		X	X	X	X	X	X
Medics	wild <i>Medicago</i>	X	X	X	X	X	X	X	X
Clovers	wild <i>Trifolium</i>	X		X	X	X	X	X	X
Olive	<i>Olea oleaster</i>								X
	local varieties	XX	XX			XX		XX	XX
Apricot	local varieties	XX			XX			XX	XX
Cherries	local varieties				XX			XX	XX
Plum	local varieties					XX		XX	
Almond	wild <i>Prunus</i>				X	X		X	X
	local varieties	XX			XX	XX		XX	XX
Pear	wild <i>Pyrus</i>			X	X	X		X	
	local varieties				XX	XX			XX
Pistachio	wild <i>Pistacia</i>	X			X	X	X	X	X
	local varieties				X			XX	
Fig	local varieties	XX		X	X	XX		XX	XX
<i>Allium</i>	wild <i>Allium</i>			X				X	
	local varieties	XX	XX		XX			XX	XX
Total		10/7	2/4	4/10	5/11	5/12	1/7	9/11	15/6

XX = high presence; X = low presence; blank = target germplasm is absent

**X Map of target Areas: figure 1; target sites in relation to the Levantine Upland Center of Plant Diversity**



**Key:**

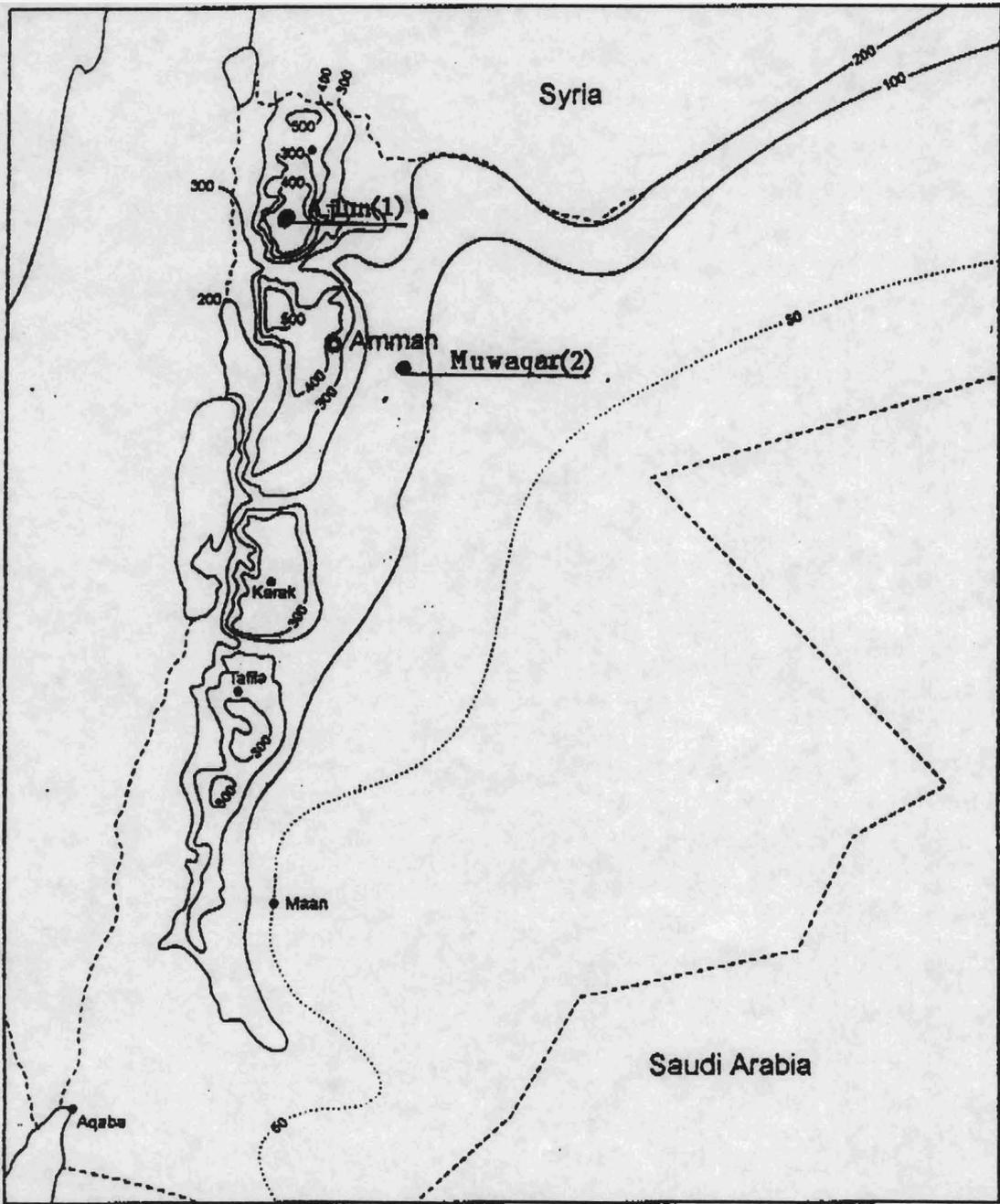
Shaded Area Levantine Uplands Centre of Plant Diversity

**Target Sites:**

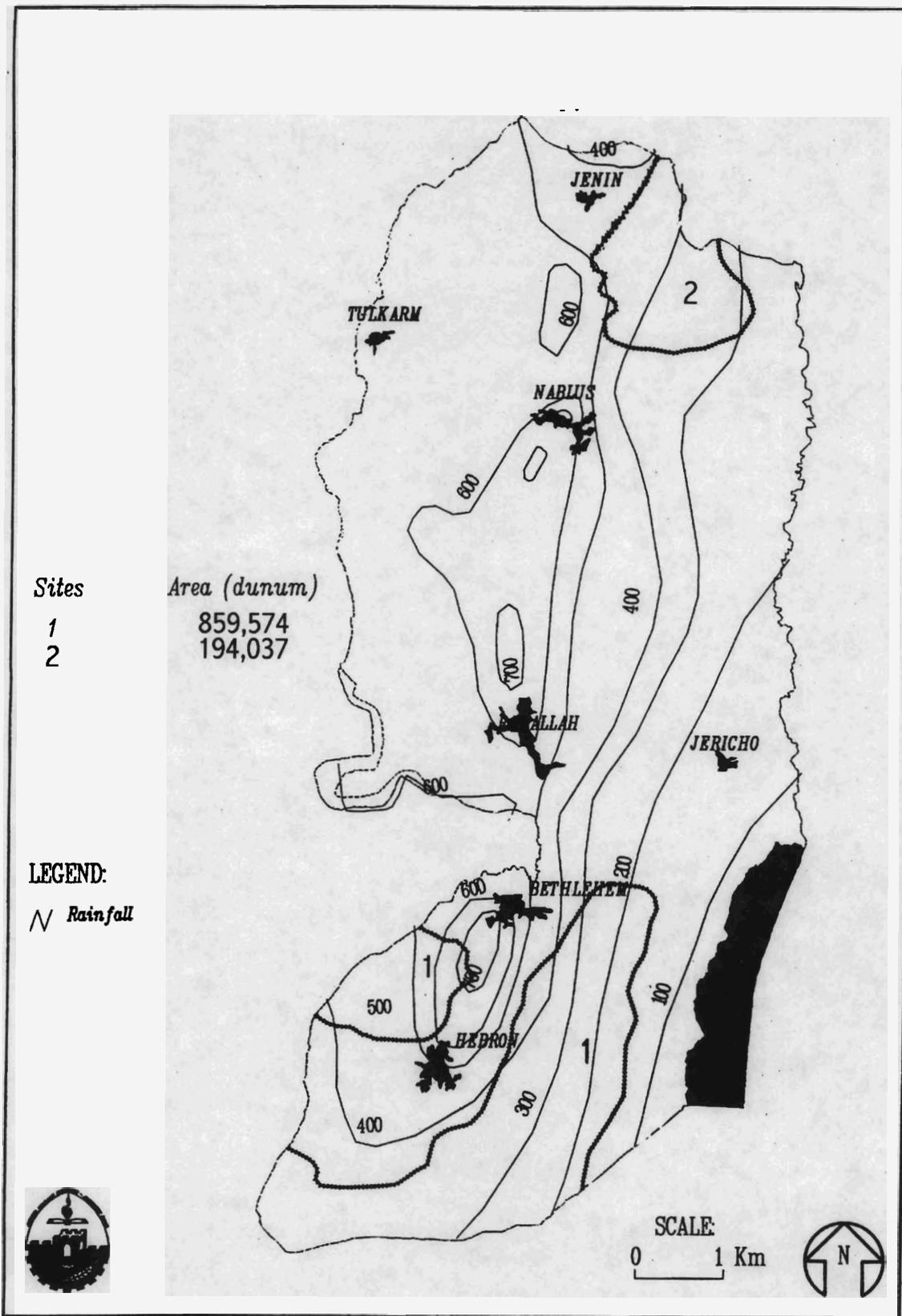
- |   |                  |   |                                    |
|---|------------------|---|------------------------------------|
| 1 | Ajlun, Jordan    | 5 | Jennin, Palestinian Authority      |
| 2 | Muwaqqar, Jordan | 6 | Hebron Area, Palestinian Authority |
| 3 | Baalbek, Lebanon | 7 | Slenfe, Syria                      |
| 4 | Aarsal, Lebanon  | 8 | Sweiaa, Syria                      |



**X Map of Target Area: Figure 2 Ajlun and Muwaqqar**



# X Map of Target Area: Figure 2 Hebron and Jenin



## ATTACHMENT 1

### INCREMENTAL COST ANALYSIS

#### Broad Development Goals

1. All four countries/authority, Jordan, Lebanon, the Palestinian Authority and Syria, have demonstrated increasing commitment to biodiversity. Conservation of biodiversity through protected areas has begun in Jordan, Lebanon and Syria. In the case of Jordan, range reserves were first established as early as 1945. In the Palestinian Authority, military zones and other delimited areas have in effect been protected and active management is currently being sought. All countries/territory have each established a Biodiversity Committee under their respective ministries and institutions, and Jordan, Lebanon and Syria have all ratified the Biodiversity Convention. The Biodiversity Country Studies in the three countries are at their final stage of completion. The findings in these country studies will provide significant guidance to official policies as well as projects related to biodiversity and environment. In the Palestinian Authority, Environmental Profiles have been prepared for Gaza and different areas of the West Bank and a Biodiversity Committee has been established.

2. In terms of the conservation and management of agrobiodiversity and plant genetic resources, the four countries/authority are in different stages of development but the three countries all expressed keen interest and commitment in their respective National Reports on plant genetic resources submitted for the Global Plan of Action for the Conservation and Sustainable Utilisation of PGR for Food and Agriculture (1996)<sup>1</sup>. Syria may be regarded as the most advanced, partly due to the longterm presence of ICARDA and IPGRI. There is good progress from *ex-situ* conservation of a few major crops to increasing accessions and field gene banks of larger variety of species, and more and more trial activities for *in-situ* and on-farm conservation. There is not yet adequate facility for *ex-situ* conservation in Jordan, Lebanon nor the Palestinian Authority. Lebanon has some temporary collections only and the Palestinian Authority has none. However, Jordan has a seed centre for forest species and has recently established a genetic resource unit at its National Centre for Agricultural Research and Technology Transfer (NCARTT). It will soon build up its own national gene banks, with assistance from the IPGRI/WANA office. No *in-situ* conservation for plant genetic resources *per se* is in place yet.

3. In all four countries/authority, agriculture is an important sector of the economy, both in terms of national production and rural livelihoods. All four countries/authority

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<sup>1</sup>FAO, *in prep.* The Global Plan of Action for the Conservation and Sustainable Utilisation of Plant Genetic Resources for Food and Agriculture. International Technical Conference on Plant Genetic Resources, Leipzig, Germany, 17-23 June 1996.

are increasingly aware of the threat to long-term agricultural productivity, due to the mismanagement and resulting degradation of the natural resource base: land, water and natural vegetation. They are also aware of the fact that sustainable development through stable agriculture production will depend largely on the conservation of plant genetic resources.

4. To be effective, any strategy for the conservation of natural resources and biodiversity must be directed towards, and implemented within, national goals of sustainable agricultural production. Agrobiodiversity conservation and sustainable use in the Fertile Crescent does not merely satisfy national priority, but will also generate significant global benefits, for it is here that many of the world's major crops originated and are still present as wild relatives and landraces (local varieties), carrying some of the world's most diverse plant genetic resources.

### **Baseline**

5. Agrobiodiversity and plant genetic resources of the world are eroding fast; the main causes being replacement by modern cultivars, land clearing and habitat destruction by expanding and heavily mechanized agriculture, overgrazing, deforestation, and loss of traditional knowledge and management. The authorities of the four participating countries/authority aim to curb natural resource degradation through sustainable management and conservation of natural resources within productive agricultural systems.

They are aware that the key to food security and sustainable agricultural production are the biological resources of agriculturally important species, and their associated insects and micro-organisms, in providing valuable sources of resistance to biotic and abiotic stresses in producing higher yielding, disease-resistant and environmentally adapted plant varieties. This requires continuous and reliable access to genetic resources, especially landraces and wild relatives of plant species.

6. Under the baseline, action for agrobiodiversity would be limited to collection, characterization, evaluation and *ex-situ* conservation of genetic resources. Comprehensive information and understanding about the status and dynamic interactions of agrobiodiversity in the different ecosystems and agro-ecosystems of the Fertile Crescent is lacking. At ICARDA<sup>2</sup> and IPGRI-WANA<sup>3</sup>, the genetic resources of some agriculturally important species have been characterized in some detail with the aim to assist developing countries/authority in the region to improve their agricultural practices and yield while maintaining their plant genetic base. For many other species however, information is virtually non-existent. Germplasm material have to be collected and characterized in terms of the diversity of its responses to environmental factors such as cold, heat and drought stresses, resistances to disease pathogens, insect pests, as well as

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<sup>2</sup>International Center for Agricultural Research in the Dry Areas.

<sup>3</sup>International Plant Genetic Resources Institute - West Asia and North Africa Program.

potential to contribute to more efficient yields. This task has begun, and substantial germplasm banks have been created, but it is far from complete.

7. The countries/authority of the Fertile Crescent and West Asia as a whole, have largely depended on these and other international institutions, though they are now allocating resources to develop or enhance their own collections. However, *ex-situ* conservation is only suitable for very small and genetically restricted populations of certain species which are unlikely to be viable in the wild. *Ex-situ* conservation has the limitation that only a small proportion of existing genetic resources may be sampled. It is impossible to maintain in germplasm banks a representative sample for large and varied populations, whose genetic make-up is constantly evolving in response to environmental changes. Such naturally occurring and evolving diversity can only be maintained *in-situ* in their natural environments or on-farm in the case of landraces and local varieties.

8. Another form of biodiversity conservation under the baseline would be protection of species within designated national parks and nature reserves which do not consider agrobiodiversity and the plant genetic resources it contains. Furthermore, it is not feasible to establish protected areas in productive agricultural areas of these developing countries/authority where rich agrobiodiversity is concentrated, because this would conflict with national goals for agricultural production. Conservation of agrobiodiversity in these areas must be based on *in-situ* and on-farm conservation and sustainable use of these biological assets. This is an area which, globally, has received much less attention than *ex-situ* conservation or protected areas management, and for which few guidelines exist. To conclude, under the current baseline, the genetic erosion of globally significant agrobiodiversity would not be tackled.

9. There is currently no *in-situ* conservation activity relating to the target species in any of the selected target areas. Wild relatives and landraces of wheat, barley and lentil and forage and pasture legume species were collected in the two Jordanian sites, in Baalbek in Lebanon and Sweida area in Syria and are now conserved in *ex-situ* collections held at ICARDA. Syrian and Jordanian germplasm is also maintained *ex-situ* at the respective national gene banks. None of the fruit tree species has even been collected in the target areas, therefore no *ex-situ* back-up exists to support the planned *in-situ* conservation activities.

### **Global Environmental Objective**

10. The global environmental objective of this project is towards conservation, enhancement and sustainable use of the biodiversity of globally agriculturally important species, and by so doing, maximizes global food security. The strategy is to focus on the development of sustainable agricultural management strategies in the agro-ecosystems of the Fertile Crescent, the center of origin for many global agricultural species whose genetically diverse wild relatives and landraces are under threat.

## **GEF Alternative**

11. Develop new, transferable, integrated approaches for the conservation and sustainable use of agrobiodiversity within agriculturally productive areas by addressing the proximate and intermediate causes of biodiversity erosion in the Fertile Crescent, and testing alternative agricultural and resource management practices through community-based, participatory actions in selected target areas in the countries/authority.

12. Through the GEF alternative, the shortcomings of national actions noted in the baseline will be overcome. In particular, the project will (i) inventorize and monitor the genetic diversity of target species of global significance in the target areas, (ii) document and map the current land use and management practices affecting agrobiodiversity, (iii) evaluate Government/Authority policies with respect to agrobiodiversity conservation, (iv) establish a GIS as a tool for analysing the above information and developing plans and guidelines to enhance agrobiodiversity on the national and regional scales, (v) develop, facilitate and test community-driven measures for the conservation and sustainable use of agrobiodiversity; (vi) promote local and national social and economic measures (policies, legislation, and public institutions) in support of agrobiodiversity conservation; and (vii) ensure sustainability of the program by strengthening national capacities in management, research and awareness, through participation, training and regional networking.

13. With the proposed GEF project focusing on Jordan, Lebanon, the Palestinian Authority and Syria, and with the existing GEF plant genetic diversity project in Turkey, the Fertile Crescent will be managed as a whole for the benefit of the globe, by securing global agrobiodiversity and food production.

## **System Boundary**

14. The geographical system boundary of this project is the modern territories of the Fertile Crescent: Jordan, Lebanon, the Palestinian Authority and Syria. Specifically, the project refers to the conservation and sustainable use of agrobiodiversity of selected target species within productive agricultural systems in these countries/authority. Since the target areas of the project are representative of the agro-ecosystems of the whole region, and because the approaches taken in this regional project aim for replicability, the impacts of the project will be seen both within and beyond the boundaries of these target areas and the participating countries/authority. To some degrees, other biodiversity (non-target plant species and associated fauna) within the agro-ecosystems concerned also benefit from the project as a result of improved habitat and resource management. With a very strong institutional and capacity building component, a highly community-driven, participatory approach, and considering the time it may take for damaged ecosystems to recover, the momentum and wide-ranging impacts of the project will go well beyond the

project period, although the present systems boundary in terms of time horizon have been set to the five year project intervention.

### **Incidental Domestic Benefits**

15. The alternative will provide the same domestic benefits as the baseline: improved agricultural production. Additional domestic benefits from the alternative will include (i) the reduction of risk in productivity in these highly variable environments, by utilizing the specific adaptation of landrace, wild relatives and other biodiversity assets in the farming systems; (ii) better managed resources, especially soil and water, for present and future agricultural development, (iii) strengthened human resources to cope with agricultural and environmental challenges, and (iv) greater public awareness of environmental and biodiversity concerns in general. These incidental domestic benefits will accrue over a longer period of time and can not be monetized within the time frame of the present project. The potential additional benefits from alternative income initiated by the project will be small and only noticeable at the village level. No immediate national benefits in monetary terms is expected.

### **7. Costs**

The GEF contribution is US\$ 8.124 million allocated as follows:

	<u>\$ (million)</u>
Agrobiodiversity and Socio-economic Inventory and Monitoring	1.370
Community-based Agrobiodiversity Management	2.215
Social Economic Policy and Property Rights	1.410
Institutional and Human Resource Capacity Strengthening	1.630
National and Regional Coordinators	1.081
Project Support Services	0.418
<b>TOTAL</b>	<b>8.124</b>

8. **Incremental Cost Matrix.** See below.

### **9. Agreement**

The technical contents of the project, including the incremental cost analysis have been negotiated with the Governments of Jordan, Lebanon and Syria as well as with representatives of the Palestinian Authority.

## Incremental Cost Matrix

Project Component	Cost Category	Cost (\$million)	Domestic Benefits	Global Environmental Benefits
Agrobiodiversity & Social Economic Inventory and Monitoring	Baseline	\$2.918	Storage, characterization and evaluation of <i>ex-situ</i> germplasm collections to provide knowledge on special characteristics and quality of tested crops.	<i>Ex situ</i> conservation of the genetic diversity of wild relatives and landraces of globally important agricultural species.
	Alternative	\$4.748	Data-gathering & analyses of agrobiodiversity in relation to agricultural & land use practices. This provide baseline for monitoring & planning framework to optimize agricultural production.	<b>Knowledge base essential for <i>in-situ</i> and on-farm conservation</b> of the genetic diversity of target crop species of global significance.
	Increment (GEF)	\$1.830 (\$1.370)		
Community-based Agrobiodiversity Management	Baseline	\$10.273	Increased agricultural productivity through the introduction of improved agricultural technology & rational land use systems.	Supply of globally important agricultural crops.
	Alternative	\$18.432	Sustainable livelihood and reduced production risk by using locally adapted landraces, local varieties & wild relatives saved by <b>improved, community-based species and habitat management</b> .	<b>Conservation &amp; longterm availability of dynamic and evolving genetic resources of globally significant agricultural species</b> , for utilization now and in the future by the global community.
	Increment (GEF)	\$ 8.159 (\$2.215)		
Social and Economic Policy Measures	Baseline	\$1.336	National agricultural policies, strategies and instruments that support sustainable agricultural production.	Tested models and policy recommendations transferable to other dry areas for sustainable agricultural production.
	Alternative	\$2.982	Integration of appropriate, additional social & economic policy measures in support of <b>agrobiodiversity conservation <i>in-situ</i> and on farm</b> , by bringing about financial sustainability.	<b>Transferable socio-economic policy measures for <i>in situ</i> and on farm conservation</b> of globally significant species.
	Increment (GEF)	\$1.646 (\$1.410)		
Institutional and Human Resource Capacity Strengthening	Baseline	\$1.500	National/regional capacities in agricultural resource management, land use and <i>ex situ</i> agro-biodiversity conservation.	Transferable knowledge and skills in agricultural resource management, land use and <i>ex situ</i> agro-biodiversity conservation.

Project Component	Cost Category	Cost (\$million)	Domestic Benefits	Global Environmental Benefits
	Alternative	\$4.079	In addition, enhanced national/regional capacities in community-based, participatory approaches to <i>in-situ</i> and on-farm agrobiodiversity conservation, research and development, through training, awareness promotion and networking.	Strengthened institutional and human capacity for conservation of globally significant agrobiodiversity; Transferable expertise, knowledge and increased awareness for <i>in-situ</i> and on-farm conservation and sustainable use of agrobiodiversity.
	Increment (GEF)	\$2.579 (\$1.630)		
Regional and National Coordination	Baseline	0		
	Alternative	\$1.351		Effective programme management to achieve global objectives of project.
	Increment (GEF)	\$1.351 (\$1.081)		
Project support services	(GEF)	(\$0.418)		
<b>Totals</b>	Baseline	\$16.027		
	Alternative	\$32.010		
	Increment (GEF)	\$15.983 (\$8.124)		

## Footnotes to Incremental Cost Matrix: Sources of Non-GEF funding

- 1. Community-based Agrobiodiversity Inventory and Monitoring**  
Baseline Government of Jordan: Genetic Resource Conservation; ICARDA's core programme (projects 3.3, 3.4, 4.1), IPGRI (project C 05), ACSAD, studies on water resources, soil and agro-climates and plant surveys.  
Alternative ICARDA; Government in-kind contributions
  
- 2. Community-based Agrobiodiversity Management**  
Baseline AFSED/IFAD Regional Programme for the Development of Integrated Crop/Livestock production in West Asia and North Africa. Phase II; ICARDA's core programme (projects 1.1, 2.2, 2.3, 2.4, 3.1, 3.2), Government of Jordan: Rangeland protection Project, IPGRI, (project C12).  
Alternative ICARDA Government in-kind contributions
  
- 3. Social, Economic and Policy Issues**  
Baseline Government of Jordan: National project on diversification of income (credit); ICARDA's on-going core programme (project 4.3)  
Alternative ICARDA; Government in-kind contributions
  
- 4. Institutional and Human Resource Capacity Strengthening**  
Baseline UNDP: Strengthening of national Capacity and grassroots in-situ Conservation for Sustainable Biodiversity in Lebanon.  
Alternative ICARDA; Government in-kind contributions
  
- 5. Programme coordination**  
Baseline none  
Alternative ICARDA, IPGRI, ACSAD & Government in-kind contributions in addition to the present project.