

UNITED NATIONS DEVELOPMENT PROGRAMME
Project of the Government of the Syrian Arab Republic

Project number and title: SYR/97/G34/A/1G/99
Conservation and Sustainable Use of Dryland Agro-Biodiversity in Syria
Duration: 5 years
Project site: Syria: Slenfe & Sweida

ACC/UNDP sector & sub-sector: 0430 - Biological Resources
Government Executing Agency: Ministry of Agriculture and Agrarian Reform

Implementing Agency: Scientific Agricultural Research Directorate

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Brief Description:

The project will promote the conservation and preservation of important wild relatives and landraces agricultural species in the Syrian Arab Republic by introducing and testing *in-situ* and on-farm mechanism and techniques to conserve and sustainably use agro-biodiversity, through five components; (1) to conduct eco-geographic surveys of crop target species; (2) to promote alternative landuse practices at project sites to conserve and sustainably use agro-biodiversity; (3) increase national capacity to provide training in *in-situ* and on-farm conservation techniques; (4) to modify existing legislation and land use rights where necessary and in the national interest to promote the conservation and sustainable use of agro-biodiversity; and (5) monitor the impacts of project activities for lessons learned and adaptive project management. This nationally-executed project components will be co-ordinated and integrated by ICARDA into the regional component covering Syria, Jordan, the Palestinian Authority and Lebanon. In addition ICARDA and the co-operating agencies, IPGRI and ACSAD, will provide training and technical assistance for the introduction and testing of *in-situ* and on-farm mechanisms and techniques to conserve and sustainably use agro-biodiversity.

On behalf of:	Signature	Date	Name/title (please type)
The Government of the Syrian Arab Republic	_____	_____	_____
Executing agency: (Ministry of Agriculture & Agrarian Reform)	_____	_____	_____
UNDP:	_____	_____	_____

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A. Context

1. Description of sub-sector

Global Significance of Agro-biodiversity of the Region:

The territories of the Region (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 (Annex X). 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 centres of plant diversity and endemism in the world, and especially in south west 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.

2. Host Country Strategy

Syria has ratified the Convention on Biodiversity (CBD) and has established a Supreme Council for Biodiversity (see section 4 below). Syria has completed a Biodiversity Country Study, supported by

GEF/UNEP, to document the status of flora and fauna, identify endangered species and priorities for conservation, propose measures for the conservation and sustainable use of biodiversity, and assess the benefits of conservation of biodiversity and the cost of intervention. The reports from these studies will provide significant guidance to official policies as well as the planning and implementation of subsequent projects dealing with biodiversity and environment.

The Syrian Arab Republic has completed (April 1998) a draft of the Environmental Action Plan under the UNDP financed project "Strengthening National Capacity for Environmental Affairs in Syria" (SYR/94/001), and provided support to strengthen the General Commission for Environmental Affairs at central and regional levels, and the local environment committees to implement the Environmental Action Plan (EAP).

In addition UNDP/GEF will be assisting the Syrian Arab Republic (BSAP) with the elaboration of their Biodiversity Strategy and Action Plan, mid 1998. The BSAP will define priorities to conserve and sustainably use biodiversity in the context of economic development, within the framework of the EAP. Outputs of the project will be; an assessment of the existing information and the institutional framework related to biodiversity; to identify gaps and options for sustainable management and conservation of biodiversity; to develop a National Biodiversity Strategy and Action plan; and the preparation of a National Report for submission to the Conference of the Parties. The project will be nationally executed by the National Unit of Biodiversity of the newly strengthened, General Commission for Environmental Affairs.

3. Prior and ongoing assistance

Major relevant and on-going natural resources projects in Syria are listed in Annex VIII.

4. Institutional framework for sub-sector

The Ministry of Agriculture and Agrarian Reform has established a Supreme Council for Biodiversity and Genetic Resources in the Syrian Arab Republic, comprising the:

Minister of Agriculture and Agrarian Reform (MAAR), President
Deputy Minister of Higher Education, Coordinator
Director of Scientific Agricultural Research Directorate of MAAR Secretary

Other members include:

Deputy Minister of Environmental Affairs
Deputy Minister of Agriculture and Agrarian Reform
Director of Statistics and Planning
Director of *Badiya* (Steppe Directorate)
Director of Forestry and Afforestation
Director of Agriculture and Irrigation in the State Planning Commission

The responsibilities of the Supreme Council include: plans and programs for the conservation, management and sustainable use of biodiversity and genetic resources of plants and animals, and the formation of technical committees necessary for their implementation; supervision of projects related to biodiversity; and coordination with other ministries and national institutions, and with regional and international organizations.

Under this GEF project, the Scientific Agricultural Research Directorate (SARD) of the Ministry of Agriculture and Agrarian Reform (MAAR) has been designated as the Implementing Agency, and will be responsible for coordination of project activities in Syria.

At present, SARD is carrying out the following activities: national gene bank management; exchange of genetic resources; collection, documentation and *ex-situ* conservation of genetic resources of field crops, food and forage legumes; live collections of the local varieties of field crops, fruit trees and forest trees in ten Agricultural Research Stations throughout Syria; Quneitra Agricultural Research Station specializes in genetic resources of wild and cultivated plants with a 50 hectare live gene bank; a botanic garden near Damascus; fencing and protection of wild relatives in Yahmoul, Aleppo; and evaluation of landraces.

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

With an average growth rate of over 3.29%, the population in the Syrian Arab Republic is expected to reach 18.9 million in 2005 and 32.5 million by the year 2025. With the pressure exerted by high

population growth and the expansion and intensification of agricultural and other activities, it is likely that the degradation of resources (vegetation, soils and water) will continue. **Genetic diversity is seriously eroding particularly through the degradation of 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 (Annex IX).

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.

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 root stocks 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 mono-culture 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, require continuous and reliable access to genetic resources that can be used to impart such superior qualities. The loss of traditional agriculture to modern mono-culture 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 is therefore 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.

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 heterogeneous 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 Syria that is essential to the sustainable development of agriculture, as well as to regional and global food security and production.

At the completion of project activities, the following will have been achieved:

- (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 program through institution strengthening and training of the staff working in agro-biodiversity conservation;

- (d) ultimately, the entire population (and future generations) of the country 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 locally driven initiatives will be supported, whenever necessary and feasible, 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 local farmers 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 approximately ten target crops (or crop groups) of global significance, all of which are originated from the Near East or Central Asian region (Annex VII). 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 heterogeneous 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 VIII), 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.

Two target areas (Slenfe and Sweida) where *in situ* and on-farm conservation activities will be carried out through this project have been selected in Syria, 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, Sweida 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 VII).

Target Areas Descriptions

1. Slenfe: It is located to the east of Latakia. 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. The climate is humid and sub-humid mountainous Mediterranean. About 1200 ha consist of indigenous forest. The remaining area is mixed dryland farming and 70% of the land is privately owned.

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 (Annex VII). 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*.

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.

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

2. Sweida: This site consists 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. The area is characterised by hills, a mountain range and plains. Jabal-el-Arab is a basalt mountain, reaching 1500 m in altitude. The region is formed from basalt rock.

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.

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 (Table 3). 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.

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.

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.

The presence of wild relatives and landraces or local varieties of the target crops in each target area is listed in Annex VIII. 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 (Annex VII). The 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 a network of representative target areas in four countries/authority greatly increase the cost-effectiveness of the related regional project.

The selection of the target areas has been a truly participatory process, through discussions in three workshops¹ attended by the concerned countries/authority participating in the regional project. 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 at the different target areas, the activities required for each area are also different.

Agro-biodiversity and Socio-economic Inventory and Surveys

¹ ICARDA, 1995. Dryland Biodiversity Conservation through Natural Resource Management - Summary Proceedings of a Workshop 5-9 February 1995, Amman, Jordan. Sponsored by UNEP, ICARDA, IPGRI and ACSAD.

The information concerning wild relatives and landraces of field crops, fruit trees and forage plants is limited and scattered. This project will be aimed at collecting eco-geographic survey data of agro-biodiversity in the selected target areas, as well as land use practices which are contributing to the maintenance or loss of agro-biodiversity, during the course of agricultural development. Assessment will be made on the threats to agro-biodiversity to wild relatives and "progenitors" of the target crops in their original habitat and farmers' landraces of the target crops. Local scientists will carry out survey activities in close consultation with local farmers and representatives. ICARDA and other participating institutions will provide training in data collection and survey methodologies and will agree with local scientists on a project-wide set of survey methodologies to enable the integration of data under the regional project.

Results from the inventory activities will contribute to the databases and baseline mapping of the target areas. These will be integrated into a GIS system and database, containing information obtained from the above surveys, as well as existing data generated by other projects and institutions on the biological, soil and water resources, ecology, land tenure and land use practices etc. This integrated mapping and database will be stored and analysed by this national project, as well as being passed to Regional Project Co-ordinator, to allow integration at the project-wide level. Survey data will provide the baseline for monitoring and improving the effectiveness of agro-biodiversity management, as agricultural, landuse, social and economic patterns change in time.

Community-based Agro-biodiversity Management

Globally important agro-biodiversity has been evolving as a part of the Near East landscape over the centuries. The objective of this activity is to maintain sufficient heterogeneity in farming systems and provide the necessary habitats to sustain agro-biodiversity. Technology plays a role in improving sedentary farming and rangelands farming systems, but the role of management is also crucial. Top-down approaches have proved to be ineffective in regulating land use and allowing sustainable agro-biodiversity management and conservation within agro-ecosystems. On the contrary, farmers-based management will generate widespread efforts in sustainable management of agro-biodiversity, given substantial efforts for public awareness, transfer of the needed know-how, and partnership building.

One main, overarching issue related to genetic erosion is the breakdown of traditional agricultural systems. Mechanisation, increased transportation means, land reclamation (stone removal) and irrigation have expanded agricultural production through area expansion and intensification. While these activities can be used to the advantage of agro-biodiversity, the current management is working against it, as it removes all rocky field border habitats and maximises repeated ploughing under orchards. In addition, as cultivation has generally expanded to its limit, grazing pressures from small ruminants are intensifying, seriously threatening pasture biodiversity as a whole.

The issue of balancing agricultural production with agro-biodiversity conservation is a challenge, when economic and sustainable production systems have to be maintained. In low rainfall areas, farmers are slow to adopt modern varieties (especially of barley), preferring to use better adapted local landraces,

and hence contribute to agro-biodiversity. However, the relatively low production has also led to increasing habitat destruction for agricultural expansion. Creation of alternative livelihoods, incentives or compensations, is needed to reduce the pressure on the land by needy people and to promote the cultivation of the less productive wild relatives and landraces.

Regional, in-country training, demonstrations, and extension assistance of practice and techniques to integrate *in-situ* on-farm conservation and sustainable uses of agro-biodiversity into agricultural practices, will be provided by ICARDA, IPGRI and ACSAD, and other participating national institutions including national universities, and educational institutions.

Increased national capacity to provide training in the conservation and sustainable use of agro-biodiversity.

Skilled human resources are insufficient in the region. In addition to the short term training being provided by the project, post graduate training opportunities will also be given to promote the long term sustainability of national capacity, as a mechanism to “train the trainers”, that in turn will provide land use managers and farmers with training in conservation and sustainable uses of agro-biodiversity. These include specialised training in plant identification of wild relatives and landraces, *in situ* and on-farm conservation, agro-ecosystem ecology, population genetics, and agricultural socio-economics. Project funded post graduate training will serve two functions; to conduct thesis activities to meet a range of project needs; and for qualified graduates to work directly with other project staff and the farming community. Activities will involve, national universities and educational institutions, more closely in project activities through; the supervision of post graduates in their thesis work; and contributions of expertise to the project through in-kind and contractual arrangements.

Social Economic Policy and Property Rights

Promising technologies exist for better management of agro-biodiversity, water, soil, land and cropping systems but their adoption has been inhibited by disincentives to rational and sustainable use of these natural resources, both in the settled areas and in the rangelands. Uncertainties over property rights among users of the natural grazing and water catchments, as well as economic distortions, are often the main obstacles against proper land and resource management. Some rangelands are being privately appropriated through new settlement and conversion to cropping while many are open access areas where users have neither the incentive to improve productivity or conserve agro-biodiversity.

The main priority of the Government of the Syrian Arab Republic has been to support and improve agricultural production, since this region has some of the highest population growth rates in the world and a widening trade gap in food and agricultural products. Of prime concern to the Governments is agricultural production. Hence policies which negatively impact agro-biodiversity conservation tend to be those directed primarily at enhancing agricultural productivity. Although there are limited policies in the Syrian Arab Republic targeted at agro-biodiversity conservation, yet there is no strategic plan (including land use planning) for its implementation.

Both Sweida and Slenfe are an agro-biodiversity rich, while Slenfe is an upland site adjacent to rangelands. The rangelands users are increasingly dependent on the target areas for supplementary feed and forage supplies, or for dry-season grazing on crop residues. This is causing significant competition for resources, hence, any policy changes must take into account the spatial and temporal linkages among the production systems, both in and outside the target areas.

It is recognised by the Government of the Syrian Arab Republic that changes are needed but they will take time to implement. The strategy is therefore to place a strong emphasis on the communities as land managers, and to modify current government incentives for the benefit of agro-biodiversity conservation. In Syria the Government buys strategic crops (wheat, barley, cotton, sugar beet) at attractive prices; taxes on agricultural vehicles are lower than for non-agricultural ones; feed concentrates are distributed at cost through farmers co-operatives; the Government controls the price of meat; and there is no tax on agricultural land. Some of these policies may be modified after the demonstration of feasible policy alternatives through the project.

Project progress and impact monitoring

To understand more clearly the impact of project intervention on agro-biodiversity and landusers at project sites, the project will closely monitor the impact of project activities. As lessons and best practices emerge, these will be compiled and fed back into the adaptive project planning process. Lessons and best practices will also be disseminated locally, regionally and internationally as part of a pro-active strategy to replicate the integration of practices to sustainably use and conserve agro-biodiversity into agriculture. Lessons learned and best practices will document the context under which activities have been successful and contribute to an understanding and provide guidance on the necessary conditions under which activities can be replicated successfully.

Implementation arrangements

The project is funded by the Global Environment Facility (GEF). There are five components to the project, one regional component and four national components.

This component will be nationally executed by the Ministry of Agriculture and Agrarian Reform, who has appointed the Scientific Agricultural Research Directorate as the National Implementing Agency. A National Co-ordinator will be jointly selected by UNDP and the National Executing Agency. He will be responsible for: planning and co-ordination of project staff, participating national institutions and organisations, other nationally executed project components, UNDP, and the Regional Project Co-ordinator, to ensure the timely implementation of activities according to methodologies agreed with the Regional Co-ordinator; the provision of training for project staff supplementary to training provided under the regional component, and the submission of requested reports and data. The duties of the National Project Co-ordinator are more fully documented in Annex VI.

ICARDA and the co-operating agencies, IPGRI and ACSAD, will provide technical assistance through:
i) integration of the nationally executed project components through coordination, networking and

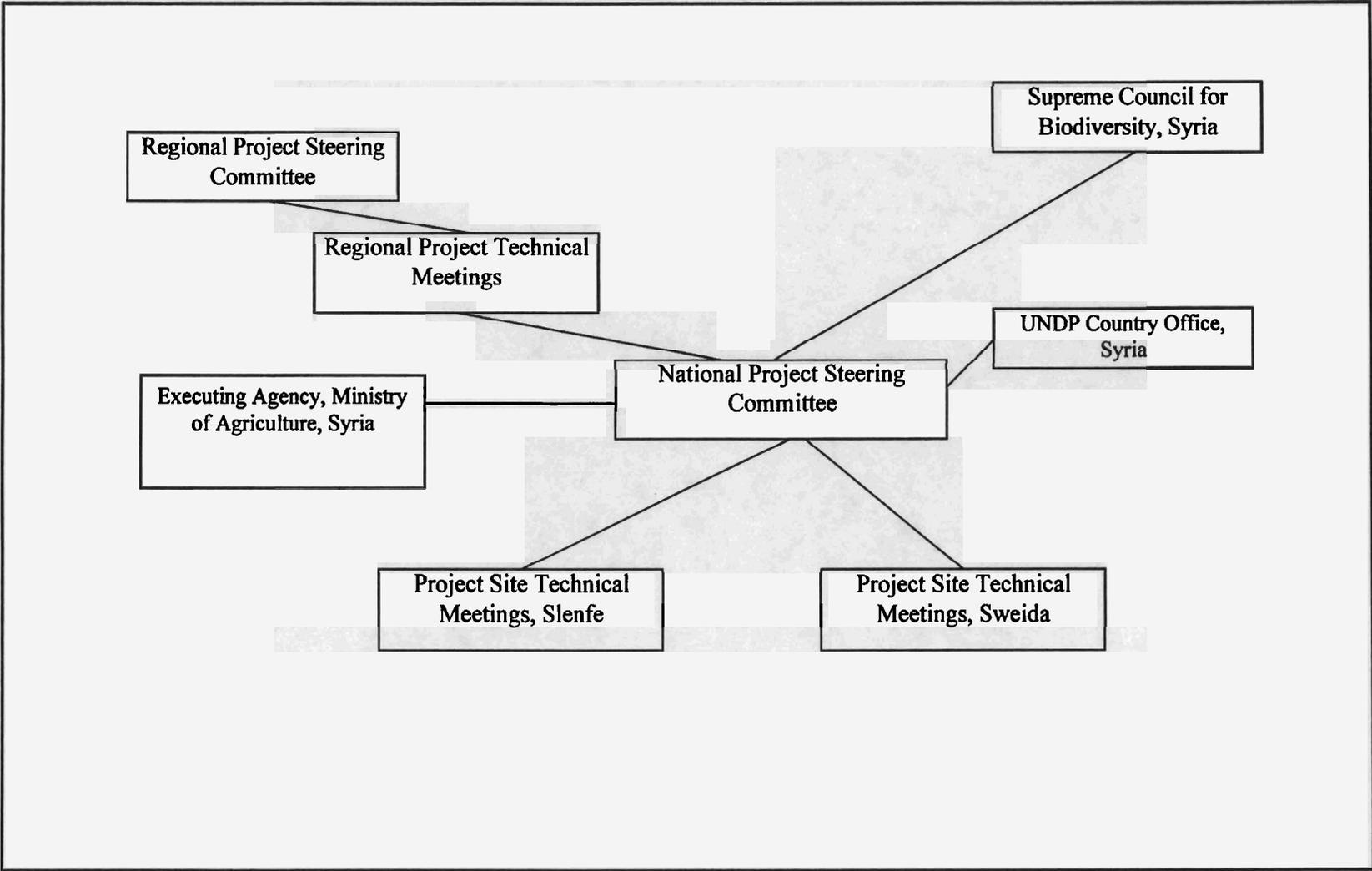
raising awareness; ii) technical backstopping, capacity building and training in in-situ and on-farm conservation and sustainable use of agro-biodiversity; and iii) monitoring of project activities and their impact for lesson learned and adaptive project planning.

The regional component will be executed by ICARDA and will be implemented by ICARDA, and IPGRI and ACSAD as co-operating agencies. ICARDA will recruit a Regional Project Co-ordinator who will be responsible for: planning and co-ordinating, at a regional level, the activities of the nationally executed components, promoting integration and complementarity where possible; the provision of technical training and backstopping to national project staff; conducting public awareness activities of project activities and biodiversity issues at the regional and international level; collating and conducting regional analysis of data collected by the national components and providing project wide reporting for the project. The Regional Project Co-ordinator will be located at ICARDA's Headquarters at Aleppo to take advantage of its regional and international linkages and facilities for administrative and logistical support.

This arrangement will ensure that the bulk of the GEF resources will be programmed, managed and spent on activities in the country itself, while the regional component will ensure tight linkages among the national project components, enhancing the positive impacts from networking and exchange in experience and expertise.

The project wide implementation structure is documented in Annex VII, along with terms of reference for each of the committees and meetings. Below is a summary of the implementation arrangements and the links to National level Committees and other project components.

National Implementation Structure



national components will be discussed and recommendations will be submitted to the Regional Project Steering Committee.

- As listed under project activities, and in addition to the above meetings and committees, the National Coordinator 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.

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 agro-biodiversity 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 which take into account the objectives and constraints of farmers, pastoralists, forest dwellers, and other stakeholders, to be used (ii) distortions introduced by inappropriate policies, including price policies, macro-economic 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. Furthermore, Component 1 of the project - Agro-biodiversity and Socio-economic Inventory and Monitoring - provides the "normal information needs" which are "an integral part of the project", and should not be confused with targeted research.

The Syrian Arab republic has 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 farmers 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 that 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 project beneficiaries 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 local farmers, will contribute to the identification and development of economically and socially appropriate incentive or compensatory measures for local farmers participating in biological conservation, according to Article 11 of the CBD.

6. Special considerations

A core element of the project will be to implement project activities through a participatory approach with local farmers. For the long term adoption and integration of conserving and sustainable uses of agro-biodiversity, it is essential that the benefits of these alternative agro-biodiversity management practices are demonstrated to local farmers and encouraged to adopt these practices through consultation and the development of a close working relationship.

7. Co-ordination arrangements

At the national level the responsibility of co-ordination lies with the National Co-ordinator, for co-ordination with other nationally executed project components; the Regional Co-ordinator and national institutions and organisations participating in project activities. This will complement the role of the National Project Steering Committee, Regional Technical Coordination and Planning Meetings, and technical meetings at site level. Integration of nationally executed project activities will be provided by ICARDA's Regional Co-ordinator. The Regional Co-ordinator 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 and of relevance to the project. The Regional Co-ordinator will co-ordinate 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 Co-ordinator will co-ordinate exchange programmes and communications between project staff of nationally executed components.

8. Counterpart support capacity

The Syrian Arab Republic is undertaking the development of a framework for plant genetic resource conservation and activities in *ex situ* and *in situ* conservation. However, new and additional skills are needed in a number of disciplines related to natural resource management in general, and allowance is made in the project for a strong institutional strengthening programme, particularly of the human resource base through appropriate training.

The following Units of the Ministries of Agriculture and Environment, and other participating organisations will provide counterpart support to project activities.

- *Ministry of Agriculture and Agrarian Reform*
 - Directorates of: Agricultural Scientific Research,
 - Directorate of Soil and Land Use
 - Directorate of Irrigation and Water Use
 - Directorate of Agricultural Extension
 - Directorate of Training and Human Capacity
 - Steppe Directorate
 - Forestry Directorate
 - Directorate of Agriculture and Agrarian Reform in Latakia
 - Directorate of Agriculture and Agrarian Reform in Sweida
 - Directorate of Agricultural Affairs
 - Directorate of Apiculture
- *Ministry of Environmental Affairs*
 - Agricultural Group
 - Directorate of Environmental Affairs in Coastal Area
 - Directorate of Environmental Affairs in Southern Area
- Public Organizations

The Directorate of Agricultural Extension of MAAR and the Division of Public Awareness of the Ministry of Environmental Affairs will provide extension services and awareness raising support.

Expertise not available in the Ministries will be sought from universities and other national institutions.

C. Development objectives

The promotion and sustainable conservation and utilization of agro-biodiversity in the Syrian Arab Republic through farmer based *in-situ* conservation of significant endemic wild relatives and land races.

D. Immediate objectives, outputs and activities

1. Immediate objective: The development of a better understanding of the causes of agro-biodiversity degradation at project sites.

1.1. Output: A comprehensive package of data and information on eco-geographic, genetic diversity, socio-economic, indigenous knowledge and land use practices on project sites.

1.1.1. Activity: Recruit project staff for data recording, collection, storage and analysis.

Parties responsible: National Coordinator, UNDP

1.1.2. Activity: Provide short term training to project staff on methodologies for data collection, recording, electronic storage and analysis to conduct eco-geographic, genetic diversity and socio-economic surveys.

Parties responsible: ICARDA, IPGRI, ACSAD.

1.1.3. Activity: Review existing data on the wild relatives and land races of target crops in project sites, socio-economic factors, indigenous knowledge and land use practices to agro-biodiversity degradation, sustainability and conservation in consultation with the national authorities concerned.

Parties responsible: socio-economist, GIS analyst expert, database expert, remote sensing analyst, agronomist, plant taxonomists, plant geneticist, ecosystem manager,

1.1.4. Activity: Define and agree with Regional Coordinator on the necessary data recording, collection, storage and analysis methodologies. The methodologies should be: compatible with other host country national components; storable in GIS and electronic database; be able to incorporate remote sensing data; track changes in agro-biodiversity abundance and distribution of wild relatives and land races of target crops in project areas; contribute to an understanding of the causes of agro-biodiversity degradation; and record data for registering genetic property rights.

Parties responsible: socio-economist, GIS analyst expert, database expert, remote sensing analyst, agronomist, plant taxonomists, ecosystem manager.

1.1.5. Activity: In collaboration with the Regional Coordinator, set-up/adapt GIS at the Soil Directorate/Ministry of Agriculture and Agrarian Reform and electronic database to store and analyze project survey data.

Parties responsible: GIS analyst expert, database specialist, remote sensing analyst

1.1.6. Activity: In participation with local farmers, and in consultation with the national authorities concerned, collect and record eco-geographic data, genetic diversity, and socio-economic data according to agreed methodologies and survey traditional land use practices and indigenous knowledge of project target crops, and the reasons for the demise of these practices.

Parties responsible: socio-economist, agronomist, plant taxonomists, plant geneticist, genetic morphological documentation and application specialist, ecosystem manager, documentation technicians

1.1.7. Activity: Enter data in GIS (at the Soil Directorate in MAAR) and database and track changes in agro-biodiversity abundance and distribution of wild relatives and land races of target crops; assess the possible causes of these changes.

Parties responsible: GIS analyst expert, database specialist, GIS data entry/ digitizing technician

1.1.8. Activity: Analyze data and develop overall framework of potential target areas for alternative and modified land uses.

Parties responsible: socio-economist, GIS analyst expert, database expert, agronomist, plant taxonomists, ecosystem manager, soil and water manager, natural habitat manager, in-situ conservation manager, species manager, genetic resource evaluation specialist

2. Immediate objective: Promote modified and alternative land-use practices, through on-farm habitat and species management, for the sustainable use and conservation of the agro-biodiversity of the wild relatives and land races of project target crops, through awareness and capacity building measures.

2.1. Output: Specific areas and local farmers with which to implement modified and alternative land uses identified.

2.1.1. Activity: Through field visits and activities to raise awareness among local farmers of the importance of agro-biodiversity conservation.

Parties responsible: National coordinator, socio-economist, agronomist, plant taxonomists, ecosystem manager, soil and water manager, natural habitat manager, in-situ conservation manager, species manager

2.1.2. Activity: Based on survey data in immediate objective one, work with local farmers to identify and agree on sites designations within target areas for modifying and implementing alternative livelihoods including; water harvesting and soil conservation structures; habitat strips, corridors and uncultivated patches; field gene-banks; pasture nurseries; grazing management and other alternative livelihoods.

Parties responsible: socio-economist, agronomist, plant taxonomists, ecosystem manager, soil and water manager, natural habitat manager, in-situ conservation manager, species manager

2.2. Output: Community level small scale water management and harvesting and soil conservation improved, and the conservation of agro-biodiversity at the project target crops promoted.

2.2.1. Activity: Recruit project staff to provide technical assistance in soil and water management.

Parties responsible: National Coordinator, UNDP.

2.2.2. Activity: Arrange workshops for project staff in water resource and soil management use techniques of relevance to the project objectives and needs.

Parties responsible: National Coordinator, ICARDA.

2.2.3. Activity: Arrange site visits, for participating local farmers to demonstrate the uses and benefits of small scale water harvesting and land management structures, such as dykes, buns, terraces and contour grading, and provide technical assistance in their construction and in other soil and water management techniques, and in the alternative sources of income that can derived from these improved resource management strategies while promoting conservation and sustainable use of target species, such as the production of rooting stock. Only those structures that are of direct relevance to the project objectives will be undertaken and all activities will be conducted in consultation with the national authorities concerned

Parties responsible: Farmers' Unions, Soil and Water manager, in-situ conservation manager, habitat manager.

2.3. Output: On-farm conservation and management of target crop landraces and improved soil fertility.

2.3.1. Activity: Through links with baseline project activities work with local farmers to introduce soil improving rotation practices of target crop land races, with other crops, including weedy fallow where appropriate.

Parties responsible: Farmers' Union, extension agency staff, plant breeder, ecosystem manager, rangeland ecologist manager, pasture forage manager, agronomist

2.3.2. Activity: Conduct workshops and field visits with extension units staff, NGO's, and agricultural cooperatives and farmers to explain and demonstrate the principles and benefits of improving on-farm crop land races through community based management and breeding programmes.

Parties responsible: Farmers Union, extension agency staff, plant breeder, ecosystem manager, rangeland ecologist manager, pasture forage manager, agronomist

2.3.3. Activity: Work with extension agency staff and farmers to introduce crop mixtures with land races of crop target species as part of rotation management practices

Parties responsible: plant breeder, ecosystem manager, rangeland ecologist manager, pasture forage manager, agronomist

2.4. Output: Corridors, habitat strips and uncultivated patches to increase in-situ agro-biodiversity of wild relatives and land races of project target crop species.

2.4.1. Activity: Provide technical assistance including workshops and field visits for farmers to demonstrate the benefits and uses of corridors, patches of uncultivated land and work with communities in the implementation of management techniques.

Parties responsible: natural habitat manager, in-situ conservation manager, agronomist, plant breeder, genetic resource evaluation specialist, plant taxonomist, ecosystem manager

2.4.2. Activity: Pursue with local planning authorities legal designation of corridors and habitat strips.

Parties responsible: natural habitat manager, in-situ conservation manager, agronomist, genetic resource evaluation specialist, ecosystem manager

2.5. Output: Field gene-banks to conserve vulnerable fruit tree wild relatives and perennial rangeland species and provide seed and root stock for other project activities (The number of gene banks will depend on the number of target sites agreed upon under objective 2)

2.5.1. Activity: Arrange workshops and on-site training for local farmers, agricultural co-operatives, and NGO's to raise awareness of the benefits, and management techniques of field gene-banks to grow vulnerable crops or wild species for resale and use of native trees or adapted root stock in field margins and rehabilitated and improved habitats.

Parties responsible: ACSAD, plant taxonomist, in-situ conservation manager, natural habitat manager, agronomist, horticulturalist.

2.5.2. Activity: Provide ongoing extension assistance and advice to farmers in setting up and managing field gene-banks, and deriving alternative income from them.

Parties responsible: extension agencies, plant taxonomist, in-situ conservation manager, natural habitat manager, agronomist, horticulturalist

2.5.3. Activity: Promote participatory breeding and selection of important seed and root stock of locally adapted project target crops, and promote the exchange of seed and root stock between farmers and with breeding programmes and gene-banks, where applicable and upon approval of the national program.

Parties responsible: plant breeder, horticulturalist, agronomist, plant taxonomist

2.6. Output: Locally managed pasture nurseries on common land for seed and rootstock of important locally adapted project target pasture and forage wild species and or land races through selection practices and seed multiplication

2.6.1. Activity: Through discussion with local farmers, identify project beneficiaries for the management of pasture nurseries.

Responsible parties: Rangeland ecologist, plant taxonomist, plant breeder, horticulturalist, pasture forage consultant

2.6.2. Activity: Provide training and extension advice to pasture nursery managers in the selection and multiplication of important pasture seed and root stock of locally adapted project target crop wild relatives and land races.

Parties responsible: Rangeland ecologist, plant breeder, horticulturalist, pasture forage consultant

2.6.3. Activity: Promote the exchange of seed and root stocks of threatened pasture seed and root stock of locally adapted project target crop wild relatives and land races, between local farmers.

Responsible parties: rangeland ecologist, plant breeder, horticulturalist, and agronomist.

2.7. Output: Community based grazing management practices, in common land and modified habitats, promoting conservation and sustainable use of pasture and forage wild species of crop target species.

2.7.1. Activity: In participation with local farmers explore options for alternative grazing management systems in common lands and modified habitats and identify incentives for their implementation.

Responsible parties: Local extension staff, Farmers Union, land use legal consultant, rangeland ecologist/ manager, agronomist.

2.7.2. Activity: Work with local farmers in implementing grazing practices

Responsible parties: extension staff, Farmers Union, land use legal consultant, rangeland ecologist/ manager, ecosystem manager, agronomist.

2.8. Output: Alternative livelihoods and sources of income developed.

2.8.1. Activity: Raise awareness among farmers of the benefits of apiculture and identify farmers interested in apiculture as an alternative source of income in viable areas and

Parties responsible: agronomist, apiculturalist, in-situ conservation manager

2.8.2. Activity: Provide technical assistance for the introduction of apicultural techniques.

Parties responsible: apiculturalist

2.8.3. Activity: In participation with local farmers, and using survey data, explore options for alternative livelihoods including traditional land use and indigenous knowledge.

Parties responsible: socio-economist, agronomist, land use legal consultant

2.9. Output: Open days and school visits for education and awareness raising

2.9.1. Activity: Work with the Regional Coordinator in the development of project information packs.

Parties responsible: Editor/ educational specialist

2.9.2. Activity: Arrange public open days and events to demonstrate the management techniques and uses of field gene-bank, pasture nurseries, water harvesting and soil conservation, and the sale and exchange of locally adapted root stocks and seed.

Parties responsible: Farmers Union, National Coordinator, horticulturalist, rangeland ecologist, plant breeder, soil and water management specialist, ecosystem manager, in-situ conservation manager.

2.9.3. Activity: Disseminate project information packs.

Parties responsible: Educational specialist

2.10. Output: In-kind support scheme to farmers/landusers for alternative and modified land uses at project sites

2.10.1. Activity: Review existing practices and consult with local local farmers on suitable mechanisms to manage the support scheme envisaged.

Parties responsible: socio-economist

2.10.2. Activity: Identify local representative group to manage the support scheme, agree on general terms and conditions.

Parties responsible: socio-economist

2.10.3. Activity: Monitor the disbursement and use of materials to farmers/landusers.

Parties responsible: socio-economist

3. Immediate objective: Increase national capacity to deliver project training needs, for conservation and sustainable use of agro-biodiversity.

3.1. Output: National capacity in conservation and sustainable use of agro-biodiversity strengthened

3.1.1. Activity: Identify universities and draw up frameworks for Msc. studies to meet identified project needs and the needs of project Designated National Agro-biodiversity Training Centres.

Parties responsible: National Coordinator, UNDP

3.1.2. Activity: Identify and select project scholarships for university courses, interview and select candidates for university placement, taking into account the host university requirements.

Parties responsible: National Coordinator, UNDP

3.1.3. Activity: Place the selected candidates at host universities.

Parties responsible: National Coordinator, UNDP

3.1.4. Activity: Draw up binding agreement between the selected candidates and the Executing Agency to adhere to framework drawn up under this output to conduct research on project related needs and work with the project.

Parties responsible: National Coordinator, Ministry of Agriculture and Ministry of Higher Education, host university.

3.1.5. Activity: Adapt and disseminate school syllabus training materials to secondary schools and provide training for the use of these materials.

Parties responsible: editor/ educational specialist

4. Immediate objective: Agricultural and related legislative proposals, where appropriate and in the national interest, considered and adopted.

Output 4.1: National legislative and government management proposals relating to economic and cultural factors, to promote the maintenance and use of plant genetic resources, considered by the Ministry of Agriculture and Agrarian Reform, the Ministry for the Environment, and the Supreme Council for Biodiversity and Genetic Resources for adoption.

4.1.1. Activity: Analyse the interactions among local farmers, economic development and government management of agriculture and natural resources as they affect continued use of landraces, rangelands and forest resources.

Parties responsible: National Coordinator, property rights expert, agricultural sector

economist, land use legal consultant

4.1.2 Activity: Assess the impact of government policies on natural resources and, if necessary, analyse whether these could be modified to better address maintenance of agro-biodiversity.

Parties responsible: National Coordinator, property rights expert, agricultural sector economist, land use legal consultant

4.1.3. Activity: Where appropriate and in the national interest, develop agricultural and economic management proposals, related to agro-biodiversity conservation in the target areas, for consideration by the Ministry of Agriculture and Agrarian Reform, the Ministry for the Environment, and the Supreme Council for Biodiversity and Genetic Resources.

Parties responsible: National Coordinator, property rights expert, agricultural sector economist, land use legal consultant

Output 4.2: Legislative proposals for the management of habitats of agro-biodiversity in the project target areas that balance the perspectives of local farmers and future generations, considered by the Ministry of Agriculture and Agrarian Reform, the Ministry for the Environment, and the Supreme Council for Biodiversity and Genetic Resources, for adoption.

4.2.1. Activity: Analyse government agricultural legislation to determine whether these have an impact on habitat management by local farmers and, if necessary, assess alternative legislative proposals that would encourage habitat conservation.

Parties responsible: National Coordinator, property rights expert, agricultural sector economist, land use legal consultant

4.2.2. Activity: Test proposals at project sites and make results available to national decision-makers for their consideration and action

Parties responsible: Provincial Party Unit, National Coordinator, property rights expert, agricultural sector economist, land use legal consultant

4.2.3. Activity: Where necessary, develop national agricultural, economic and development legislative proposals for consideration by the Ministry of Agriculture and Agrarian Reform, the Ministry for the Environment, and the Supreme Council for Biodiversity and Genetic Resources.

Parties responsible: National Coordinator, property rights expert, agricultural sector economist, land use legal consultant

Output 4.3: Proposals for land use arrangements for profitable and sustainable production and to enhance conservation measures considered by the Ministry of Agriculture and Agrarian Reform, the Ministry for the Environment, and the Supreme Council for Biodiversity and Genetic Resources for adoption.

4.3.1. Activity: Analyse whether existing land use and management arrangements have an impact on agro-biodiversity.

Parties responsible: National Coordinator, property rights expert, agricultural sector economist, land use legal consultant, socio-economist.

4.3.2. Activity: Where appropriate, explore local farmers' attitudes to communal methods of land management that would contribute to conservation of natural resources and test options for communal land management.

Parties responsible: National Coordinator, property rights expert, agricultural sector economist, land use legal consultant, socio-economist.

4.3.3. Activity: Develop supporting management proposals for legislative consideration by the Ministry of Agriculture and Agrarian Reform, the Ministry for the Environment, and the Supreme Council for Biodiversity and Genetic Resources.

Parties responsible: National Coordinator, property rights expert, agricultural sector economist, land use legal consultant, and socio-economist.

5. Immediate objective: Establishment of mechanisms for continuous monitoring of the agro-biodiversity status at project sites, including an assessment of the impact of the project on agro-biodiversity and local farmers/landusers.

5.1. Output: A sustainable monitoring system (Methodologies, benchmarks, database, trained staff) fully operational.

5.1.1. Activity: Train extension agency staff and project staff in techniques for long term monitoring of the impacts of project activities, including the identification of impact indicators and techniques for data collection, analysis and presentation of results.

Parties responsible: socio-economist, ecosystem manager, plant taxonomist, plant geneticist, agronomist, GIS analyst expert, database specialist, remote sensing expert, property rights expert.

5.1.2. Activity: Agree with the Regional Coordinator on the methodology for impact monitoring. The methodology should be compatible with those of other project host countries/ authority to allow aggregation of data at the project level; agree on impact monitoring indicators; and where possible utilize data gathered by project survey activities. Impact monitoring will be able to: monitor the immediate impact of project activities on the agro-biodiversity of wild relatives and land races of target crops, in isolation of non-project activities; and assess the costs and benefits to local farmers in the project areas. Impact monitoring methodologies and processes will make provisions for long term impact monitoring after the life of the project.

Parties responsible: National Coordinator, socio-economist, ecosystem manager, plant taxonomist, plant geneticist, agronomist, GIS analyst expert, database specialist, remote sensing expert, property rights expert.

5.1.3. Activity: Conduct annual monitoring of project activities, and present results to ICARDA for aggregation, and national project committees for consideration.

Parties responsible: socio-economist, ecosystem manager, plant taxonomist, plant geneticist, agronomist, GIS analyst expert, database specialist, remote sensing expert, property rights expert.

5.1.4. Activity: Participate in annual regional and technical meetings to discuss lessons learned and best practices identified from the monitoring data.

Parties responsible: National Coordinator, socio-economist, ecosystem manager, plant taxonomist, plant geneticist, agronomist, GIS analyst expert, database specialist, remote sensing expert, property rights expert.

E. Inputs

Government In-Kind Inputs

- Physical facilities: Offices, laboratories, workshops, communication facilities
- Project technical and administrative staff
- Financial and administration facilities
- Support services and utilities
- Field equipment
- seed medium term cold storage
- GIS equipment
- Computers
- Soil analysis and classification equipment
- Vehicles
- Survey equipment

total cost \$ 585,302

UNDP /GEF Inputs

UNDP/GEF will contribute USD 1,998,960 in incremental costs to the project as follows (for more details, see the budget in section j):

International Experts & Consultants	\$ 327,641
Duty Travel	\$ 110,000
Evaluation missions	\$ 30,000

National Personnel/Experts	\$ 310,604
Fellowships	\$ 160,000
Group Training	\$ 300,200
Conf. & Meetings	\$ 62,000
Equipment (Incl. Operation & Maintenance)	\$ 561,836
Misc- Reporting	\$ 78,457
Project support costs 3%	\$ 58,222
Total	\$ 1,998,960

F. Risks

The success of the project depends upon the project staff developing a close working relationship with local farmers, through a participatory approach. Where national capacity regarding participatory approach methodologies are not developed, the project will need to provide this capacity to project staff through training and technical backstopping. Project staff will work directly with the participating stakeholders, with strong extension and outreach components, in order to ensure that these potential obstacles can be overcome and that on-going dialogue is maintained.

In some participating countries expertise in social sciences to elucidate local farmers' 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 is not well developed. Where necessary the project will develop or provide these capacities.

It is necessary that the project leverages government/authority reform with respect 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 in this area, based on the lessons learnt in the selected target areas. However, as with any reform process, it is already clear that this will involve a number of competing interests, and the project will therefore have to ensure a transparent and participatory process as far as the various governmental/ authorities are concerned and further ensure an active dialogue on the lessons learnt from the activities of the target sites for proposing broader policy reform, 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.
- The Government's willingness and intent to continue long term impact monitoring of project activities beyond the life of the project.
- The Government's willingness to consider and implement, where appropriate and in the

national interest, legislation to meet immediate objective 4 of the project.

- The Government's commitment to provide all the in-kind contributions mentioned in Section E, in a timely manner.
- The opening by the executing agency of a separate bank account to receive and manage project funds in accordance with the National Execution Guidelines.

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 (joint review by representatives of the government, executing agency, ICARDA and UNDP) at least once every 12 months, preferably in conjunction with the National Steering Committee meetings. The first such meeting to be held within the first 12 months of the start of full implementation. The national executing agency shall prepare and submit to each tripartite review meeting an Annual Performance Report (APR). Additional APR's may be requested, if necessary, during the project.

The National executing agency 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 and technical clearance by the concerned 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.

The National Executing Agency will submit monthly one page description of implementation progress to the UNDP Country Office in addition to the Inception report, in-depth evaluation reports, Annual Progress Reports and Project Implementation Review and terminal report. (copies of which ICARDA will be a regular recipient).

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

The National Executing Agency will also prepare every quarter financial reports according to UNDP guidelines and submit these to the UNDP Country Office.

I. Legal context

This project document shall be the instrument referred to as such in Article 1 of the Standard Basic Assistance Agreement between the Government of the Syria Arab Republic and the United Nations Development Programme, signed by all the parties on 12 March 1981. The host country implementing agency shall, for the purpose of the Standard Basic Assistance Agreement, refer to the Government co-operating agency described in that agreement.

The following types of revisions may be made to this project document with the signature of the UNDP Resident Representative only, provided that the other signatories of the project document have no objection to the proposed changes:

- Revisions in, or addition of the annexes of the project document;
- Revisions which do not involve significant changes in the immediate objectives, outputs or activities of the project, but are caused by the rearrangement of inputs already agreed to, or by costs increase due to inflation;
- Mandatory annual revisions which rephrase the delivery of the agreed project inputs, or other costs due to inflation, or to take into account agency expenditure flexibility.

J. Budgets

UNDP/GEF Budget

BL	Description	Total (USD)	Year 1		Year 2		Year 3		Year 4	
			p/m	USD	p/m	USD	p/m	USD	p/m	USD
10.00	PROJECT PERSONNEL									
11.50	<u>International consultants</u>									
11.51	Soil and water management specialist	38,877	5	7,500	1	7,500	1	7,725	1	7,957
11.52	Pasture forage consultant	38,877	5	7,500	1	7,500	1	7,725	1	7,957
11.53	Rangeland ecologist/ manager	38,877	5	7,500	1	7,500	1	7,725	1	7,957
11.54	Horticulturalist/ crop breeder	38,877	5	7,500	1	7,500	1	7,725	1	7,957
11.55	GIS specialist	31,377	4	7,500	1	7,725	1	7,957	1	8,195
11.56	Plant taxonomist/ geneticist	23,182	3	7,500	1	7,725	1	7,957	1	8,195
11.57	Socio-economist/ agronomist	47,319	6	15,000	1	7,725	1	7,957	1	8,441
11.58	Land use legal consultant	31,377	4	7,500	1	7,725	1	7,957	1	8,195
11.59	Agricultural sector economist	38,877	5	7,500	1	7,500	1	7,725	1	7,957
11.98	Sub-total international consultants	327,641	42	75,000	9	68,400	9	70,452	8	64,370
11.99	Subtotal international consultants/ experts	327,641	42	75,000	9	68,400	9	70,452	8	64,370
15.00	<u>Duty Travel</u>									
15.01	Regional/international travel	30,000		7,500		7,500				7,500
15.02	Local Travel	80,000		15,000		15,000		15,000		15,000
15.99	Subtotal duty travel	110,000		22,500		22,500		15,000		22,500
16.00	<u>Evaluation</u>									
16.01	Evaluation missions	30,000						15,000		15,000
16.99	Subtotal evaluation	30,000						15,000		15,000
17.00	<u>NPPP National experts</u>									
17.01	National Coordinator	89,193	60	16,800	12	17,304	12	17,823	12	18,358
17.02	Plant taxonomist (Wild cereal food/forage)	9,556	60	1,800	12	1,854	12	1,910	12	1,967

BL	Description	Total (USD)	Year 1		Year 2		Year 3		Year 4			
			p/m	USD	p/m	USD	p/m	USD	p/m	USD		
17.03	Plant taxonomist (fruit trees)	9,556	60	1,800	12	1,854	12	1,910	12	1,967	12	2,026
17.04	Plant geneticist (classification/ description)	9,556	60	1,800	12	1,854	12	1,910	12	1,967	12	2,026
17.05	Genetic resource evaluation specialist (landraces)	9,556	60	1,800	12	1,854	12	1,910	12	1,967	12	2,026
17.06	Genetic/ morph documentation & applic. specialist	9,556	60	1,800	12	1,854	12	1,910	12	1,967	12	2,026
17.07	In-situ conservation manager	19,113	120	3,600	24	3,708	24	3,819	24	3,934	24	4,052
17.08	Natural habitat manager	19,113	120	3,600	24	3,708	24	3,819	24	3,934	24	4,052
17.09	Remote sensing analyst	4,778	30	900	6	927	6	955	6	983	6	1,013
17.10	Botanical manager	3,185	20	600	4	618	4	637	4	656	4	675
17.11	GIS analyst expert	4,178	26	300	6	927	6	955	6	983	6	1,013
17.12	Database specialist	9,556	60	1,800	12	1,854	12	1,910	12	1,967	12	2,026
17.13	Soil and water manager	7,531	48	1,800	12	1,854	12	1,910	12	1,967	12	2,026
17.14	Socio-economist	10,681	68	3,600	12	1,854	12	1,910	12	1,967	8	1,351
17.15	Property rights expert	8,956	56	1,200	12	1,854	12	1,910	12	1,967	12	2,026
17.16	Plant breeder (cereals/ forage/legumes/ fruit trees)	15,061	96	3,600	24	3,600	24	3,708	24	3,819	24	3,934
17.17	Agronomist	4,778	30	900	6	927	6	955	6	983	6	1,013
17.18	Apiculturalist	3,765	24	900	6	900	6	927	6	955	6	983
17.19	Editor (awareness raising)	2,333	15	450	3	450	3	464	3	477	3	492
17.20	Agricultural sector economist	3,260	21	450	6	900	4	618	4	637	4	656
17.21	Documentation technical assistant	6,371	60	1,200	12	1,236	12	1,273	12	1,311	12	1,351
17.22	Genetic classification technical assistant	6,371	60	1,200	12	1,236	12	1,273	12	1,311	12	1,351
17.23	Genetic resource evaluation technical assistant	6,371	60	1,200	12	1,236	12	1,273	12	1,311	12	1,351
17.24	GIS data entry/ digitising technician	12,742	120	2,400	24	2,472	24	2,546	24	2,623	24	2,701
17.25	Apicultural assistant	6,371	60	1,200	12	1,236	12	1,273	12	1,311	12	1,351
17.26	Agricultural technicians	6,371	120	1,200	24	1,236	24	1,273	24	1,311	24	1,351
17.27	Laboratory technicians	6,371	120	1,200	24	1,236	24	1,273	24	1,311	24	1,351
17.28	Field technicians	6,371	120	1,200	24	1,236	24	1,273	24	1,311	24	1,351
17.99	Sub-total National Experts/ consultants	310,604	1,814	54,000	373	61,725	371	63,268	371	65,166	367	66,445
19.00	Personnel component total:	778,245		151,500		152,625		163,720		162,036		158,364
30.00	TRAINING											
31.00	Fellowships											

BL	Description	Total	Total	Year 1		Year 2		Year 3		Year 4			
		(USD)	p/m	p/m	USD	p/m	USD	p/m	USD	p/m	USD	p/m	USD
45.24	Electrophoreisis	25,000			25,000								
45.25	Sample divider	2,000			2,000								
45.26	Bulk thresher	4,000			4,000								
45.27	Single spike thresher	2,000			2,000								
45.28	Seed Cleaner(Air Blast)	3,000			3,000								
45.29	Seed drier	5,000			5,000								
45.30	Laboratory garvity seperator	7,000			7,000								
45.31	Moisture meters	2,000			2,000								
45.32	Plant growth cabinet	8,000			8,000								
45.33	Germination cabinet	6,000			6,000								
45.34	Seed Viewer	1,000			1,000								
45.35	Television monitor	1,000			1,000								
45.36	Video cameras	1,200			1,200								
45.37	Video recorders/players	1,800			1,800								
45.38	Data show	2,000			2,000								
45.39	Operations and maintenance of equipment	62,500			12,500		12,500		12,500		12,500		12,500
45.40	Parts and supplies	55,336			5,000		5,336		10,000		15,000		20,000
45.99	Component total: Equipment	561,836			411,500		32,836		37,500		42,500		37,500
50.00	MISCELLANEOUS												
52.00	<u>Reporting costs and publications</u>												
52.01	Reporting costs	25,000			5,000		5,000		5,000		5,000		5,000
52.02	Public awareness/publications, etc	52,457			10,000		14,000		10,000		14,000		4,457
52.03	Sundries	1,000			200		200		200		200		200
52.99	Sub-total Reporting and publications	78,457			15,200		19,200		15,200		19,200		9,657
59.00	Component total: Miscellaneous	78,457			15,200		19,200		15,200		19,200		9,657
5400	Project support services	58,222			22,500		12,278		8,131		7,780		7,534
	GRAND TOTAL	1,998,960			772,500		421,539		279,150		267,116		258,655

Government In kind contributions

BL	Description	Total (USD)	Total p/m	Year 1 p/m	USD	Year 2 p/m	USD	USD/m	USD	Year 4 p/m	USD	Year 5 p/m	USD
10.00	PROJECT PERSONNEL												
13.00	<u>Admin. support personnel</u>												
13.01	Typists/ secretaries (x5)	15,927	300	60	3,000	60	3,090	53	3,183	60	3,278	60	3,377
13.02	Office assistance	3,185	60	12	600	12	618	53	637	12	656	12	675
13.03	Messengers	3,185	60	12	600	12	618	53	637	12	656	12	675
13.04	Finance officer	9,556	60	12	1,800	12	1,854	159	1,910	12	1,967	12	2,026
13.05	Drivers	12,600	252	48	2,400	60	3,000	50	2,400	48	2,400	48	2,400
13.99	Subtotal admin. support	31,855	360	72	3,600	72	7,416	106	3,819	72	3,934	72	8,104
17.00	<u>National experts</u>												
17.01	Senior scientists	16,724	105	21	3,150	21	3,245	159	3,342	21	3,442	21	3,545
17.02	Field technicians	5,575	105	21	1,050	21	1,082	53	1,114	21	1,147	21	1,182
17.03	Laboratory technicians	11,149	105	21	2,100	21	2,163	106	2,228	21	2,295	21	2,364
17.49	Subtotal national experts	33,448	315	63	6,300	63	6,489	318	6,684	63	6,884	63	7,091
19.00	Component total: Personnel	65,302	675	135	9,900	135	13,905	424	10,503	135	10,818	135	15,194
34.00	<u>Conferences and meetings</u>												
34.01	National conferences and meetings	25,000			5,000		5,000		5,000		5,000		5,000
34.99	sub total: conferences	25,000			5,000		5,000		5,000		5,000		5,000
39.00	Component total: training	25,000			5,000		5,000		5,000		5,000		5,000
40.00	EQUIPMENT												
41.00	<u>Expendables</u>												
41.01	Communication facilities	25,000			5,000		5,000		5,000		5,000		5,000
41.02	Maps	5,000			5,000								
41.03	Genetic resource data	25,000			25,000								
41.99	Sub total: expendables	55,000			35,000		5,000		5,000		5,000		5,000

BL	Description	Total (USD)	Total p/m	Year 1 p/m	Year 1 USD	Year 2 p/m	Year 2 USD	Year 3 USD/m	Year 4 p/m	Year 4 USD	Year 5 p/m	Year 5 USD
42.00	Non-expendables											
42.01	Field equipment	5,000			5,000							
41.02	Seed medium term cold storage	5,000			1,000					1,000		1,000
41.03	GIS equipment	5,000			1,000					1,000		1,000
41.04	Computers	7,500			1,500					1,500		1,500
41.05	Soil analysis and classification equipment	102,500			25,000					25,000		2,500
41.06	Vehicles	100,000			20,000					20,000		20,000
41.07	Survey equipment	15,000			3,000					3,000		3,000
42.99	Sub total: non-expendables	240,000			56,500					51,500		29,000
49.00	Component total: equipment	295,000			91,500					56,500		34,000
50.00	MISCELLANEOUS											
51.00	Operations and Maintenance	0										
51.01	Office, laboratory, workshops, garage building	0										
51.02	and maintenance, project site facilities	100,000			20,000					20,000		20,000
51.03	Water, gas, heating and fuel	50,000			10,000					10,000		10,000
51.04	tax exemption for equipment imports	50,000			10,000					10,000		10,000
59.00	Component total: miscellaneous	200,000			40,000					40,000		40,000
	TOTAL	585,302	675	146,400	115,405	112,003	112,318	40,000	40,000	94,194		

K. Annexes

I. Workplan

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
1. IMMEDIATE OBJECTIVE: Survey and monitor project sites to understand causes of agro-biodiversity degradation.																				
1.1. Output: Eco-geographic, genetic diversity, socio-economic surveys																				
1.1.1. Activity: Recruit project staff for data recording collection, storage and analysis	■																			
1.1.2. Activity: Short term training	■																			
1.1.3. Activity: Review existing data		■																		
1.1.4. Activity: Agree survey methodologies		■	■																	
1.1.5. Activity: Set-up/adapt GIS and database for survey data		■	■																	
1.1.6. Activity: Collect additional survey data			■	■					■				■				■			
1.1.7. Activity: Enter survey data into GIS and database					■					■				■				■		
1.1.8. Activity: Analyze data						■					■				■				■	
2. IMMEDIATE OBJECTIVE: Alternative Land uses through on-farm sustainable use and conservation of agro-biodiversity																				
2.1. Output: Identify areas and communities for intervention																				
2.1.1. Activity: field visits and community activities to raise project awareness			■	■																
2.1.2. Activity: Community consultation to agree target areas			■	■																
2.2. Output: Community level water harvesting and soil conservation structures, and/or land use management strategies																				
2.2.1. Activity: Recruit Small scale water/land management specialists				■																
2.2.2. Activity: Workshops in water resource and soil management				■						■				■						
2.2.3. Activity: Site visits and technical assistance for construction of small scale water harvesting and soil				■	■					■				■			■			

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
conservation structures																				
2.3. Output: On-farm conservation and management practices to improve soil management																				
2.3.1. Activity: Links with baseline activities to rotation farm landraces through management and breeding programmes																				
2.3.2. Activity: Workshops field visits to demonstrate on-farm landraces through management and breeding programmes																				
2.3.3. Activity: Introduce landraces with rotation management																				
2.4. Output: Corridors and uncultivated patches and habitat strips established.																				
2.4.1. Activity: Training in management of habitat strips, corridors and uncultivated patches for farmers																				
2.4.2. Activity: Pursue legal designation of corridors and habitat strips, and habitat strips.																				
2.5. Output: Field gene-banks																				
2.5.1. Activity: Training in benefits and management of field gene-banks																				
2.5.2. Activity: Extension assistance in setting up and managing field gene-banks																				
2.5.3. Activity: promote participatory breeding and selection																				
2.6. Output: Pasture nurseries																				
2.6.1 Activity: Consultation to identify project beneficiaries for the management of pasture nurseries																				
2.6.2. Activity: Training and extension in pasture nursery management and community based breeding and selection																				
2.6.3. Activity: exchange of seed and root stock																				
2.7. Output: Communal grazing management practices																				
2.7.1. Activity: Explore options for grazing management																				
2.7.2. Activity: Work with local farmers in implementing grazing management techniques																				
2.8. Output: Alternative source of income																				

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
2.8.1. Activity: Raise farmers' awareness of benefits of apiculture					■	■														
2.8.2. Activity: technical assistance in apiculture						■			■	■			■	■						
2.8.3. Activity: Explore alternative livelihood options						■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2.9. Output: Local farmers' awareness raised																				
2.9.1. Activity: Develop information packs							■		■		■		■				■			
2.9.2. Activity: Public open days						■														
2.9.3. Activity: Disseminate information packs			■	■						■	■									
2.10. Output: In-kind support scheme																				
2.10.1. Activity: Review available support schemes and design and agree suitable one				■																
2.10.2. Activity: set up support scheme					■															
2.10.3. Activity: monitor disbursement of supports								■				■				■				■
3. IMMEDIATE OBJECTIVE: Increase national capacity to deliver training needs																				
3.1. Output: National capacity in agro-biodiversity conservation and sustainable use strengthened																				
3.1.1. Activity: Identify universities and draw up study frameworks		■																		
3.1.2. Activity: Advertise and select candidates for project funded scholarships			■	■																
3.1.3. Activity: Assist in placing study candidates				■																
3.1.4. Activity: Draw up binding agreement between study candidate, and the executing agency and the Ministry of Higher Education			■	■																
3.1.5. Activity: develop and disseminate training materials to secondary schools								■		■	■					■				
4. IMMEDIATE OBJECTIVE: Consideration of legislative proposals by government bodies																				
4.1. Output: Identified legislative proposals that promote agro-biodiversity conservation.																				
4.1.1. Activity: Analyse interactions among local farmers,		■	■																	

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
economic development and government agricultural management as they affect landraces, rangeland and forest resources.																				
4.1.2. Activity: Assess impact on natural resources of government policies in rural development																				
4.1.3. Activity: Develop agricultural legislative and management proposals for consideration by government bodies																				
4.2. Output: Identified legislative proposals to promote natural resource management in project areas																				
4.2.1. Activity: Analyse agricultural policies relating to soil, water and natural vegetation management																				
4.2.2. Activity: Test management options at project sites and make results available for legislative consideration																				
4.2.3. Activity: Develop agricultural legislative and management proposals for consideration by government bodies																				
4.3. Output: Identified options for land use arrangements to enhance conservation measures																				
4.3.1. Activity: Analyze the effects of current land use and management on agro-biodiversity																				
4.3.2. Activity: Explore local farmers attitudes to communal methods of land management and agree options for testing.																				
4.3.3. Activity: Develop supporting legislative proposals																				
5. IMMEDIATE OBJECTIVE: Project impacts and progress monitoring																				
5.1. Output: Project impact monitoring																				
5.1.1. Activity: Training in impact monitoring																				
5.1.2. Activity: Agree methodology for impact monitoring																				
5.1.3. Activity: Conduct monitoring activities																				
5.1.4. Activity: Participate in regional and technical meetings to discuss emerging results and best practices.																				

II. Schedule for 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 ²	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Quarterly Financial Reports	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Annual Progress Report (APR)					◆				◆				◆				◆				
Project Implementation Review (PIR)			◆			◆				◆				◆				◆			
IN-Depth Evaluation Reports										◆										◆	
Terminal Report																					◆

² A Short one 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

Short term courses (in addition to those budgeted under the regional component)

Agroecological characterization and GIS Basics (ICARDA/ ACSAD)

- training provided by ICRDA or ACSAD at regional centres

Plant Genetic Resources, identification, collection, management, and analysis (international)

- 10 days courses 2 people at international institutions (universities) of excellence

Molecular Markers (ICARDA/ other institutions)

- 10 day course 1 person

Plant genetic Resources: documentation ,data management and analysis (Directorate of Agricultural Scientific Research)

- 15 day course, each year (5 years), for 15 project staff
- Principles of morphological documentation, management and analysis of plant genetic resources at project sites and in the laboratory.
- Principles of genetic characterization
- Equipment demonstration and application for seed and genetic resource analysis (including sampling, characterization and evaluation)

Participatory plant breeding and on farm conservation of land races and other germ plasm. (ICARDA/ Directorate of Agricultural Scientific Research)

- 1 week per year for 5 years for project staff and farmers
- Fieldwork and lectures to demonstrate participatory breeding techniques, including crossing, selection and multiplication.

Utilization of wild species of cereal. (ICARDA/ ACSAD Directorate of Agricultural Scientific Research/)

- 2 week each year for 5 Project staff and farmers
- Traditional and modern uses, values of landraces and their marketing.

Utilization of wild species of cereal. (International university)

- 2 project staff for three months
- advanced studies in-situ sustainable use techniques of wild species.

Project management, monitoring and evaluation (National and Regional centers)

- 2 project staff for 2 weeks
- Identification of impact indicators
- Methodologies for impact monitoring for agro-biodiversity and the welfare of beneficiaries resulting from project activities

Plant Taxonomy (national)

- 3 project staff for 10 days each year
Fieldwork at project sites for morphological identification and differentiation between crop

target species



IV. Equipment requirements

Tractors

- HP, Diesel engine X 2
- wheel drive

Rotivator

- width 1.5 metres
- tractor drawn

Seed Drill

- Self propelling
- planting width 1.8 metres; 2-12 rows
- For small seed

Plot harvester

- self propelling, diesel engine
- harvesting width 1.8 metres
- cutting and threshing (wheat, barley, lentil, chic pea, fava bean and other crops)

Collecting machine for forage legume pods (for collection, documentation and analysis of genetic materials)

- Vacuum operated

Pod thresher (for forage legume, threshing and cleaning seed)

Sowing machine for small seed (pasture nurseries and degraded rangeland)

Mounted mower and double knife cutter bar (pasture nursery management and grazing management)

Batch laboratory treater (for protection after planting seed and for exchange between countries)

- all seed sizes (113g - 2.2kg)
- Compressed air injection of protective coat

Laboratory gravity separator (sorts and grades seeds of different size and weight)

- interchangeable screen
- feed device
- compressor
- fluidised bed

Moisture meters (characteristics of land races seed, including drought tolerance)

Seed viewer

- Morphological seed characterisation
- Lit under surface
- Plastic surface

Germination chamber (to test the viability of seed)

- temperature, air movement and light regulation

Plant growth chamber (for growth characteristics under regulated conditions)

- temperature, air movement and light regulation

Laboratory freezer (short term storage during analysis of genetic material, and of multiplied seed)

Field vehicle

- 4x4 wheel drive
- Diesel engine
- Capacity 8 people

Double cabin pickup

- 4X4 wheel drive
- Diesel engine
- Capacity 5 people
- 750 kg load

Micro-bus

- capacity 24 people
- Diesel engine

Personnel Computer with printer

- Pentium II (160 Mhz processor)
- 1 GB minimum hard disk capacity
- 15'' screen,
- Windows 97 software
- Laser jet 6 printers

Portable computers

- Pentium (160 Mhz) processor
- 2GB hard disk,
- color screen.

Photocopier

- 30 copies per minute
- Automatic paper feed

Sensitive balance (morphological seed characterisation)

- capacity 9/10 kilograms
- accuracy 0.01 gram
- electronically powered

Infra red protein analyser (seed characterisation)

- protein/ moisture measurement in pollen grains and flowers

Seed Counter

- Counting range (0.3-15 mm)
- Automatic feed

Electrophoresis unit (for genetic identification and analysis of protein bands)

- Vertical slab gel unit
- micro-centrifuge (max speed 14000 rpm)
- Magnetic stirrer
- cooling apparatus
- micro-tubes and funnels
- mounted camera
- light box
- chemicals

Sample divider (representative samples of genetic material for analysis)

- for all types of seed

Bulk thresher

- 15 heads of small grain
- self cleaning and mobile

Single spike thresher

- threshing wheat and barley and other crops
- air operated

Seed cleaner (cleaning for seed sample)

- Air blast
- table top model

Seed drier (drying seed genetic materials)

- Oven

Television monitor and video player (training and awareness)

- colour 24 inch screen

Video camera (training and awareness)

Data show

- for screening computer graphics and data.

V. Job Description

National Project Co-ordinator

The National Project Co-ordinator will be responsible for the day-to-day management and timely execution of agreed planned activities of the national project component, co-ordinate with project staff, and participating national institutions in the nationally executed component and project staff in other national components and the Regional Project Co-ordinator. In particular the National Co-ordinator will be responsible for:

- Drawing up, in consultation with project staff and the Regional Project Co-ordinator, the detailed Annual Project Work Plans and budget;
- Keeping financial and monitoring records for required project reporting;
- Make request from UNDP for; financing on a quarterly basis; for direct payment for equipment; and advances according to UNDP procedures.
- Preparing Annual Performance Reviews, Project Implementation Reviews, and Impact Reports, with co-operation from project staff, for submission to the UNDP Country Office and the Regional Project Co-ordinator
- Overall planning and management of the implementation of project activities of the project;
- Formulating job descriptions and defining the scope of work for project staff and consultants, and participating in the hiring and selection process under UNDP guidelines;
- Liaising with organisations participating in the project and ongoing programmes relevant to the project and local stakeholders at project sites;
- Ensuring that data arising from the activities of the project conform with agreed project wide methodologies and formats;
- Calling the National Project Steering Committee and site planning meetings, preparing the agenda and other required documentation;
- Follow up with Ministries and legislative bodies regarding the consideration of agricultural and economic policies proposed by the project for introduction.

Required qualifications of the National Project Co-ordinator

- Fluency in English and Arabic;
- Eight years experience in project financial and other resources co-ordination and management;
- At least a PhD or eight years experience in the management of plant biodiversity conservation;
- Familiarity with the national socio-economic and political context.
- Experience with the application of participatory approaches with local farmers

- Proven ability to chair meetings with senior executives, present cases and negotiate with government authorities.

Pre-requisites

- Will work full time on the project
- Willing to relocate to the Duty Station

Duty Station and Duration

- Five years, starting ---1998
- Project Site, Slenfe or Sweida

International Staff

Soil and water management specialist

Duties (Outputs 2.1 & 2.2)

- Assist national counterparts in assessing the options for small scale soil and water management infrastructure with national teams and in consultation with local farmers, through participatory approaches
- Work with national counterparts in the implementation of small scale soil and water infrastructure and management
- Provide national counterparts with access to research findings and best practices from international and regional sources to assist in the optimization of soil and water management.

Qualifications

- Ph.D. in soil and water management related subject
- Eight years experience in the implementation of soil and water management techniques in the field within the region.
- Familiarity with both traditional forms of soil and water management in the region, and current research findings in techniques for efficient soil and water management.
- Fluency in English and Arabic

Pasture forage consultant

Duties (Outputs 2.1, 2..3, 2.4, 2.6 & 2.7)

- Assist national counterparts in assessing management options for improved pasture and forage management for the conservation and sustainable use of landraces, through participatory approaches and based on survey data.
- Assist national counterparts in working with farmers to adopt modified pasture management techniques.
- Work with national counterparts and landusers to promote the adoption of on-farm pasture nurseries, uncultivated patches, habitat strips, and participatory selection and breeding of important seed and root stock, for conservation and use, particularly in rehabilitating degraded

rangeland.

- Provide national counterparts with access to best practices, and research findings to assist in the development of pasture management techniques, the management of pasture nurseries and uncultivated patches and habitat strips.
- Work with national counterpart to develop close working links with the IFAD funded Project for the Southern Region and the Project for the Central and Coastal Regions, to integrate *in-situ* conservation techniques with development activities.

Qualifications

- Ph.D. in pasture management with a focus on in-situ conservation of locally adapted land races and wild relatives.
- Eight years experience in pasture management in the field in the region or in similar ecosystems; in participatory breeding activities; and an understanding of techniques for the management of pasture nurseries and uncultivated areas, for *in-situ* conservation.
- Familiarity with the socio-economic status of local farmers at project sites.
- Familiarity with research finding in pasture and habitat management.
- Fluency in Arabic and English

Rangeland ecologist/ manager (Outputs 2.7 and 2.8)

Duties

- Work with national counterpart to identify options for rangeland management through the use of survey data and participatory approaches with local local farmers at project sites.
- Work with national counterparts and local farmers to introduce modified grazing practices and rangeland management techniques for conservation and sustainable use of agro-biodiversity, including property rights and land use arrangements.
- provide national counterparts with access to research findings in grazing practices and rangeland management for the conservation of agro-biodiversity.
- Work with national counterpart to develop close working links with the IFAD funded Project for the Southern Region and the Project for the Central and Coastal Regions, to integrate *in-situ* conservation techniques with development activities.

Qualifications

- PhD in rangeland management related subject
- Eight years experience in the implementation of modified rangeland management techniques
- Experience in participatory methods with local farmers for the identification of rangeland management techniques
- Familiarity with the socio-economic status, tenure and property rights arrangements at project sites and how these relate to the conservation and sustainable use of Agro-biodiversity.
- familiar with up to date research in the pasture and grazing management.
- Fluency in Arabic and English.

GIS specialist

Duties (Output 1.1)

- Provide on-the-job training to project staff in the use and application of GIS.

- Work with national counterpart to harmonize data recording and analysis techniques for the project, and integrate socio-economic and genetic data into existing systems.
- Make available to the National counterpart additional GIS recording and analysis techniques to increase capacity of data recording and analysis.

Qualifications

- Msc in GIS modeling
- **Five years experience** with GIS, particularly Arc Info
- An understanding of existing capacities of the GIS Division under Directorate of Soil and land Use, and their needs for implementing project activities
- Fluency in English and an ability to speak and understand Arabic.

Taxonomy/ genetic specialist

Duties (Output 1.1)

- **Work with national counterpart** to implement harmonized data collection and recording techniques for crop target species in project areas.
- Implement participatory approach for data collection and recording with local landusers, to record local farmers preferences for landraces and wild relatives, and the selection of wild relatives and land races for use.

Qualifications

- Ph.D. in plant taxonomy or genetics
- Experience in the implementation of participatory methods for data collection, recording and selection of wild relatives and landraces in the region or in similar ecosystems.
- Fluency in English and Arabic

Socio-economist

Duties (Outputs 1.1, 2.8,)

- **Work with national counterpart** in the development of agreed harmonized socio-economic data collection techniques for the project.
- Work with national counterpart and local farmers, to implement the collection of socio-economic data at project target areas.
- Work with national counterpart to implement, through participatory approaches, the collection of data on traditional land use management systems and indigenous knowledge of the uses for wild relatives and land races of crop target species.

Qualifications

- **Ph.D. or five years experience** in participatory data collection techniques with local people, including indigenous knowledge and land uses
- A detailed understanding of the socio-economic conditions of farming groups in the region.
- An understanding of traditional land uses and indigenous knowledge in the region.
- Fluency in Arabic and English

Land use legal consultant

Duties (Outputs 4.3)

- **Work with national counterpart** to assess survey data and through participatory approaches consult with landusers to explore options for alternative systems of land use that will promote the conservation and sustainable use of agro-biodiversity and natural resources.
- Work with the national counterpart to develop links with the IFAD's Regional Programme for the Development of Integrated Crop/livestock Production in West Asia and North Africa, to integrate and use collectively the recommendations of situation analysis for legislative and property rights criteria.

Qualifications

- **Ph.D. in property rights and access rights** for land and the consequences of different forms of ownership, rights and access.
- Five years experience of analysis and proposing recommendations for improving property rights and land use access for better use of natural resources and in particular flora.
- Fluency in English and Arabic

Horticulturalist/ crop breeder

Duties (Output 2.5)

- **Work with national counterpart** review survey data and through a participatory approach with local farmers identify options and sites for field gene-banks
- Work with national counterpart and landusers to implement the establishment of local farmers managed field gene-banks, and the generation of income from them for managers.

Qualifications

- **Eight years** experience in the management of field gene-banks and the generation of alternative incomes, particularly for fruit tree root stocks.
- understanding of the socio-economic conditions in the region
- Fluency in English and Arabic.

Agricultural sector economist

Duties (Outputs 4.1, 4.2)

- **Work with national counterpart** to assess existing legislation and policies relating to land use and natural resource management at project sites.
- Work with national counterpart and through participatory consultation, record reactions of local farmers to existing policies and legislation regarding natural resource use
- With national counterpart and in participation with local farmers, explore options for modifying policy and legislation to promote the conservation and sustainable use of agro-biodiversity
- Work with national counterpart to create a working relationship with similar work to review and modify legislation and policy under the IFAD funded project Regional programme for the Development of Integrated Crop/Livestock Production in West Asia and North Africa, and the National Environmental Action Plan.

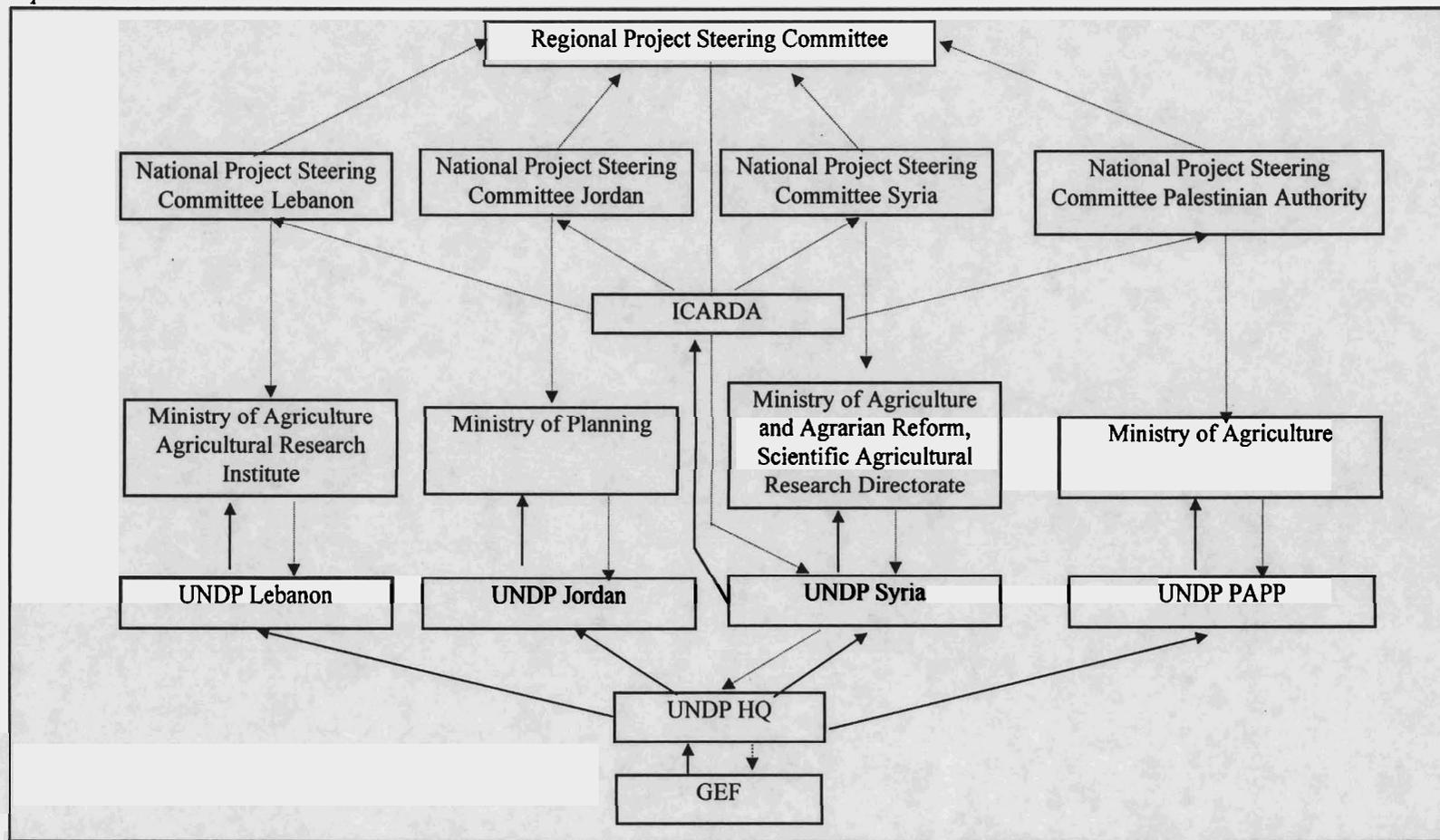
- Work with national counterpart to pursue the adoption of policy and legislative recommendations.

Qualifications

- PhD in Agricultural macro-economics/policy
- Five years **experience in agricultural/ rural development** sector analysis
- Track record of policy and legislative proposals to improve the sustainable use and conservation of agro-biodiversity and follow through for the adoption of policy and legislation.
- Fluency in Arabic and English

VI Framework for effective participation of national and international staff

Implementation Structure



.....> = Reporting flow

————> 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. Where feasible, the Committee will convene immediately following the Annual Regional Technical Coordination and Planning Meeting.

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 (Chair)
National coordinators
Concerned Scientist from participating organizations.

National Project Steering Committee:

Terms of Reference

A National Steering Committee will be established in each participating country within the region to co-ordinate activities among participating institutions within that country. The committee 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; and
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 and other reports;
4. Assist in the identification and allocation of national resources needed by the project to meet its objectives.

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.

National Project Steering Committee members

The committee will be made up of representatives of participating institutions as follows:

- Deputy Minister of Agriculture and Agrarian Reform (Chairman)
- Director of Directorate of Agricultural Scientific Research
- Director of Planning and Statistical Agriculture
- Head of the Agricultural Group, Ministry for Environmental Affairs
- Director of Agriculture and Agrarian Reform, Latakia
- Director of Agriculture and Agrarian Reform, Sweida
- The GEF Operational Focal Point
- The UNDP Representative of that country
- Project Regional Co-ordinator
- National Co-ordinator for Syria, who will be an *ex officio* member and will act as Secretary to the Committee.

Technical Meetings at Project Sites

Terms of reference

Site level planning meetings will be held at least once a year and prior to the National Project Steering Committee Meetings. The National coordinator will work with project staff, supporting national agencies, participating and local stakeholders to develop national work plans for the coming year. These will be based on the previous year progress and achievements and project objectives. These meetings will:

- provide the input for developing a detailed work plan of activities for the coming year;
- provide technical and operational guidance on the progress of activities to facilitate adaptive planning; and
- provide the inputs for national resources allocations and budgeting.

Meeting Members

The meetings will be chaired by the Directors of the Ministry of Agriculture and Agrarian Reform for Latakia, and Sweida with co-ordination being provided between the two meetings. The National Project Co-ordinator will serve as the meeting secretary. Members include;

- local participating unit representatives from the Ministry of Agriculture and Agrarian Reform, including the; Directorate of Agricultural Scientific Research; Directorate of Soil and Land Use; Directorate of Irrigation and Water Use; Directorate of Agricultural Extension; Directorate of Training and Human Capacity; Steppe Directorate; Forestry Directorate; Directorate of Agriculture and Agrarian Reform in Latakia; Directorate of Agriculture and Agrarian Reform in Sweida; Directorate of Agricultural Affairs; Directorate of Apiculture.
- The Ministry of Environmental Affairs, including the; Agricultural Group; Directorate of Environmental Affairs in Coastal Area; Directorate of Environmental Affairs in Southern Area;

-
- The Regional Project Co-ordinator
 - Agricultural College, University of Damascus.
 - Agricultural College, University of Aleppo.
 - Agricultural College, University of Tichrin.
 - Local Farmers Unions Branch.
 - Local Youth Union Branch
 - Provincial Party Units
 - Local Women's Union

VII. 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**)

<u>Cereals</u>		<i>*Allium</i> spp.	Onion; Garlic; Leek
<i>Avena</i> spp.	Oats	<i>Arethum graveolens</i>	Dill
*Hordeum vulgare	Barley	<i>Brassica oleracea</i>	Cabbage, etc.
<i>Secale cereale</i>	Rye		
*Triticum spp.	Wheat	<i>Capparis</i> spp.	Caper
*Aegilops spp.		<i>Carum carvi</i>	Caraway
		<i>Cerantonia siliqua</i>	Carob
<u>Pulses</u>		<i>Coriandrum sativum</i>	Coriander
<i>Cicer arietinum</i>	Chickpea	<i>Cuminum cyminum</i>	Cumin
<i>Lathyrus sativus</i>	Chickling	<i>Foeniculum vulgare</i>	Fennel
*Lens esculenta	Lentil	<i>Lactuca sativa</i>	Lettuce
<i>Lupinus albus</i>	Lupin	<i>Lepidium sativum</i>	Garden Cress
<i>Pisum sativum</i>	Pea	<i>Petroselinum sativum</i>	Parsley
<i>Vicia ervilia</i>	Bitter vetch	<i>Pimpinella anisum</i>	Anise
<i>Vicia faba</i>	Broadbean/Faba bean	<i>Portulaca oleracea</i>	Purslane
		<i>Trigonella foenumgraecum</i>	Fenugreek
<u>Root and Tuber Crops</u>		<u>Fiber Plants</u>	
<i>Beta vulgaris</i>	Beet	<i>Cannabis sativa</i>	Hemp
<i>Brassica rapa</i>	Turnip	<i>Linum usitatissimum</i>	Flax
<i>Daucus carota</i>	Carrot		
<i>Raphanus sativus</i>	Radish		
		<u>Forage Crops</u>	
<u>Oil Crops</u>		<i>Agropyron</i> spp.	Wheatgrasses
<i>Brassica napus</i>	Rapeseed	<i>Agrostis</i> spp.	Beatgrasses
		<i>Bromus inermis</i>	Brome grass
<i>B. nigra</i>	Mustard	<i>Dactylis glomerata</i>	Cocksfoot
<i>Carthamus tinctorius</i>	Safflower	<i>Festuca arundinacea</i>	Fescue
<i>Linum usitatissimum</i>	Flax, Linseed	<i>Lolium</i> spp.	Ryegrasses
*Olea europea	Olive	*Medicago spp.	Alfalfa/Lucerne; Medics
<i>Papaver somniferum</i>	Poppy	<i>Melilotus</i> spp.	Clovers
		<i>Onobrychis viciifolia</i>	Sainfoin
<u>Fruits and Nuts</u>		<i>Phalaris</i> spp.	
<i>Corylus</i> spp.	Hazelnut	<i>Phleum pratense</i>	Timothy
<i>Cucumis melo</i>	Melon	<i>Sorghum halepense</i>	Johnson grass
<i>Cydonia oblinga</i>	Quince	*Trifolium	Clovers
*Ficus carica	Fig	*Vicia spp.	Vetches
<i>Juglans regia</i>	Walnut		
<i>Phoenix dactylifera</i>	Date palm	<u>Drugs, Medicinal Plants</u>	
*Pistacea vera	Pistachio	<i>Atopa belladonna</i>	Belladonna
*Prunus spp.	Plum; Apricot; Cherry;	<i>Digitalis purpurea</i>	Digitalis
	Almond	<i>Glycyrrhiza glabra</i>	Licorice
<i>Punica granatum</i>	Pomegranate	<i>Hyoscyamus muticus</i>	Henbane
*Pyrus communis	Pear	<i>Papaver somniferum</i>	Codeine, morphine, opium
<i>Vitis vinifera</i>	Grape vine	<i>Platago psyllium</i>	Psyllium
<u>Vegetables, Herbs and Spices</u>			
<i>Asparagus</i> spp.	Asparagus		

VIII. Relevant On-going Research and Development Projects

1. **IFAD (International Fund for Agricultural Development). SYR 92/034. Project for the Southern Region.**

Syrian Ministry of Agriculture and Agrarian Reform (SMAAR). Sweida, Darra and Damascus Provinces.

1993-2000

US\$ 40 million

Project activities include: reclamation of agricultural land (removal of rocks and stones), in order to enhance agricultural productivity and enable farmers to grow cereals, legumes and fruit trees; improvement of extension services; support to low income farmers; loans to women and low income farmers; development of small ruminant production.

Both the UNDP Technical Assistance and the Southern IFAD projects relate directly to target site Sweida. The proposed GEF project would operate in liaison with this project, ensuring their activities provide for *in-situ* conservation of biodiversity within an agriculturally productive system.

2. **IFAD (International Fund for Agricultural Development). SYR 393. Project for the Central and Coastal Regions.**

Syrian Ministry of Agriculture and Agrarian Reform (SMAAR). Tartous and Lattakia Provinces.

1995-2002

US\$ 20 million.

Project activities include: land reclamation, including terraces and embankments establishment, in order to enhance agricultural productivity and enable farmers to grow cereals, legumes and fruit trees; country roads; development of silk work industry; development of animal production; modernization of irrigation systems.

This project relates directly to target site Slenfe & Haffe. The proposed GEF project would operate in liaison with this project, ensuring their activities provide for *in-situ* conservation of biodiversity within an agriculturally productive system.

3. **AFESD/IFAD. Regional Programme for the Development of Integrated Crop/Livestock Production in West Asia and North Africa. Phase II**

1998 -2001.

US\$ 7 million.

Participating countries: Iraq, Jordan, Lebanon, Syria; Algeria, Libya, Morocco, Tunisia. A regional project implemented by NARS in collaboration with ICARDA and IFPRI (International Food Policy Research Institute) with the overall objective: the integration of feed crop-livestock production, both within and across production systems, and the development of productive and sustainable livestock-based systems.

The research programme includes:

- (i) Research and technology transfer to improve pasture, crop and livestock productivity and facilitate the development of sustainable systems of land use in these low rainfall areas.
- (ii) Amendment of agricultural sector policies that distort domestic livestock production and land use decisions, and the amendment of policy distortions so as to improve incentives for farmers to invest in technologies that increase the productivity of local sources of livestock feed.
- (iii) Changes in land management and/or in local and public institutions that regulate use of rangelands, to create incentives for farmers to invest in pasture improving technologies and to regulate grazing intensity.

4. UNDP/ National Unit of Biodiversity: Biodiversity Strategy and Action Plan and Report to the CBD

1998-1999

\$ 194,000

The BSAP will define priorities to conserve and sustainably use biodiversity in the context of economic development. Outputs of the project will be; an assessment of the existing information and the institutional framework related to biodiversity; to identify gaps and options for sustainable management and conservation of biodiversity; to develop a National Biodiversity Strategy and Action plan; and the preparation of a National Report for submission to the Conference of the Parties. The project will be nationally executed by the National Unit of Biodiversity of the General Commission for Environmental Affairs.

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)¹. 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

¹FAO, *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 ICARDA² and IPGRI-WANA³, 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

²International Center for Agricultural Research in the Dry Areas.

³International 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
TOTAL	8.124

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.	Knowledge base essential for <i>in-situ</i> and on-farm conservation 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 improved, community-based species and habitat management.	Conservation & longterm availability of dynamic and evolving genetic resources of globally significant agricultural species, 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 agrobiodiversity conservation <i>in-situ</i> and on farm, by bringing about financial sustainability.	Transferable socio-economic policy measures for <i>in situ</i> and on farm conservation 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)		
Totals	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/Livesock 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.