

UNITED NATIONS DEVELOPMENT PROGRAMME
Project of the Government of Lebanon

Number and title: LEB/97/G34/A/IG/99
 Regional: Conservation and Sustainable Use of
 Dryland Agro-biodiversity of the Near East

Duration: 5 years

Project site: Lebanon: Baalbek; Aarsal

ACC/UNDP sector & sub-sector: 0430 - Biological Resources

Government implementing agency: Agricultural Research Institute

Executing agency: Agricultural Research Institute
 ICARDA (Regional component)

Co-operating agencies: ACSAD, IPGRI

Estimated starting data: September 1998

Government inputs:
 (In kind) \$ 571,800

UNDP (in kind): \$ 145,000

UNDP and cost sharing financing

UNDP/GEF \$: 1,500,752

Brief Description:

The project will promote the conservation and preservation of important wild relatives and landraces agricultural species in Lebanon 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. The nationally executed project components will be coordinated 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.

	Signature	Date	Name title (please type)
On behalf of: The Government of Lebanon:	_____	_____	_____
Executing agency: (LARI):	_____	_____	_____
UNDP:	_____	_____	_____

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A. Context

1. Description of subsector

Global Significance of Agro-biodiversity of the Near East

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

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 center of plant diversity and endemism in the world, and especially in southwest Asia and the Middle East. Seven genera of vascular plants are endemic to this region. Moreover, drylands are most outstanding for their within-species genetic diversity. Indigenous crops and food plants of the Near East region are known for their resistance to disease and abiotic stresses, making them a valuable source of genetic material for germplasm enhancement upon which global food security depends. The present project is concerned with agricultural biodiversity, referring to biological resources of actual or potential agricultural value, and the diversity of these species within agroecosystems. 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 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.

The best example of economic value derived from genetic pasture species, whose source includes the countries/authority in and around the Near East, is the Australian ley farming system, developed since the 1930s, using medics and clovers introduced into rotation with cereals (Puckridge and French 1983). This agro-biodiversity brought to Australia is worth

hundreds of millions of dollars, in terms of meat, milk, wool, added nitrogen fertility and cereal yield sustainability. Similar annual legume exploitation has contributed or could contribute to successful pastures in Argentina, California, Oregon, Chile, North Africa, the Near East, Portugal, South Africa, Turkey, Uruguay and the European countries/authority on the northern rim of the Mediterranean Basin.

2. Host Country Strategy

Lebanon ratified the Convention on Biodiversity (CBD), in December 1994, and has completed their Biodiversity Country Studies, supported by GEF/UNEP. The Country studies documented the status of flora and fauna in Lebanon, identified endangered species and priorities for conservation, proposed measures for the conservation and sustainable use of biodiversity, and assessed the benefits of conservation of biodiversity and the cost of intervention. The reports from these studies provided significant guidance to national strategy.

The national biodiversity strategy of Lebanon started in 1997, will run for one year, and will cover the following elements; the reinforcement of the institutions involved in biodiversity conservation; land use planning; strengthening scientific research on biodiversity issues; establishment of protected areas; the restoration of the degraded natural ecosystems; biodiversity legislation; biodiversity and environmental education; public awareness and participation in biodiversity preservation; environmental impact assessment of the developmental activities; and establishment of specialized conservation and monitoring centers. In response to the strategy Lebanon is setting up a Biodiversity Committee. (See Institutional framework and subsector). The project will be implemented within the framework of the Strategy including testing proposals for biodiversity legislation and land use planning at project sites, and implementing activities to promote public awareness and provide education on environmental issues in Lebanon.

In addition to the Biodiversity Strategy and Action Plan, Lebanon has prepared a National Report on Plant Genetic Resources as part of the work being done on the Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture (1996).

GEF assistance for biodiversity conservation has been provided to Lebanon through three protected areas projects. However, these projects do not address the issue of agro-biodiversity. The conservation and sustainable use of agro-biodiversity and plant genetic resources require a totally different approach from protected areas for biodiversity at species level. The present project focuses on conserving the genetic diversity of ten target crops of global significance within two target areas in Lebanon. (Species addressed by the project are marked in bold in Annex VII).

3. Prior and ongoing assistance

The relevant and on-going natural resources projects in Lebanon are described in Annex IX and include:

The Lebanese Agricultural Institute activities

The UNDP Regional Economic and Social Development Program for Baalbeck Hermel.

The UNDP/GEF Protected Areas Project

The UNDP/GEF National Biodiversity and Action Plan project

The UNDP National Program to Combat Desertification

The EU Assistance to the Protection of the Vegetative Cover Project

The O.N.F Project to Combat Forest Fires in Lebanon

The National Remote Sensing Center (CNRS)

4. Institutional framework for subsector

In response to the recommendation from the Biological Diversity Study, a National Committee for Biodiversity Conservation has been established. It will be used as the national coordinating mechanism of the project and will be chaired by the Minister of Agriculture with members from the following ministries, universities, and organizations :

Ministry of Agriculture

Agriculture Research Institute

Green Plan

National Committee to Combat Desertification (representative)

Baalbeck / Hermel project Steering Committee (representative)

Ministry of Environment

Council for Development and Reconstruction

Ministry of National Education

Ministry of Water Resources

National Center for Scientific Research

Ministry of Higher Education

Lebanese University

American University of Beirut

St-Joseph University

Holy Spirit University

Managers of relevant on-going projects

The Committee will ensure proper co-ordination among various governmental and non-governmental institutions involved in Biodiversity conservation and management. It will be responsible for coordinating efforts between the Ministries of Environment, Agriculture, Education, Water resources, research institutions, on-going relevant projects and non-governmental organizations, and will liaise with regional and international institutions for technical and financial support.

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 summarized in the Report on the State of the World's Plant Genetic Resources (1996), as follows:

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

The Near East region supports a population of some 48 million. With an average growth rate of over 3% (3.61 % for Syria), the population is expected to more than double by 2025, reaching over 100 million. For a majority of the population in this region, agricultural production is the principal economic activity. In an effort to achieve national food self-security, agricultural land use has been intensified and expanded, leading to degradation of vegetation, soils and water. Genetic diversity is seriously eroding through the degradation of their natural habitats, intensification and expansion of cultivation and overgrazing in natural rangelands. Overgrazing is especially threatening to herbaceous crops such as wheat, barley and lentils, and their wild relatives, as it can wipe out entire populations. For tree crops and their wild relatives, regeneration can be seriously impaired as a result of overgrazing. Many of the major crops in this region (e.g. wheat, barley, medics, almond) are threatened by overgrazing, habitat fragmentation and settlement expansion (Annex VIII).

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 programs 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 mechanized harvest and increase production, also lead to serious habitat destruction and fragmentation which are seriously threatening the populations of wild wheat, barley and lentils in the region. Furthermore, wild lands are often ploughed or disturbed as a means of securing property right

by use, a tradition supported by law in many countries/authority with the Ottoman tradition.

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 are 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 (Annex VII). For example, the improved cultivar of bread wheat is now occupying 70-80% of the global wheat areas. Over time, genetic diversity has erode. Agricultural production is now based on fewer and fewer crops and, within crops, on fewer and fewer genotypes. The genetic uniformity of modern cultivates and a tendency towards monoculture make them vulnerable to disease and pest epidemics and weather extremes.

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

Urgent Need for In-situ and On-farm Conservation

Genetic materials of several agriculturally important species of the Near East, such as wheat, barley, and lentil, have been collected and characterized 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 annual legume genera, second only to the Australian holdings. 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 recognized 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 the Near East that is essential to the sustainable development of agriculture in that region, as well as to 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 communities driven initiatives will be supported by national, legislative, social and economic policies adapted to agro-biodiversity conservation during the project process, and benefit from the institutional capacity strengthened through personnel training,

and regional networking and support. The twinning of a specialized international institution such as ICARDA with national institutions participating in the project will greatly enhance the absorptive capacity of the co-operating countries/authority. Awareness promotion is a priority at all levels of the project.

The involvement of land users as primary participants is fundamental to agro-biodiversity management. Innovative approaches to in-situ and on-farm conservation will be developed alongside appropriate resource management, which will at the same time, maintain the productive capacity of the resources and secure the economic viability of the community. Focus will be given to ten target crops (or crop groups) of global significance, all of which are originated from the Near East or Central Asian region (Annex 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 ensure tight linkages complement existing agricultural development and resource management projects, as well as ex-situ conservation activities (Annex IX), to enhance the process of conservation and sustainable use of agro-biodiversity. The co-financing leveraged through this project will also support training of researchers and extension services for farmers, institutional strengthening through the provision of equipment and facilities, and networking with institutions in the region and elsewhere, all of which will contribute to future sustainability.

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

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

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

The selection of the target areas was undertaken with the aim to capture the maximum genetic diversity of the target crops in the minimal number of areas possible. The target areas were therefore selected to cover the widest possible range of topography, climate and species concerned. For example, Baalbek is characterized by a semi-arid Mediterranean climate and is very important in field crops including forage legumes.

The presence of wild relatives and landraces or local varieties of the target crops in each target area is listed in Annex VII. 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 X. 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 %. A collaborative effort through this network of representative target areas in four countries/authority of the Near East greatly increases the cost-effectiveness of this regional project.

Furthermore, the selection of the target areas has been a truly participatory process, through discussions in three workshops participated by all the concerned countries/authority. The National Plant Genetic Resources Programs were actively involved in site proposals and final selection, based on the above listed criteria, and in consultation with ICARDA, IPGRI, ACSAD, UNEP 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 require for each area are also different.

Agro-biodiversity and Socio-economic Inventory and Surveys

The information concerning wild relatives and landraces of field crops, fruit trees and forage plants is limited and scattered. This project component will be aimed at collecting, in close co-ordination with the existing on-going projects, 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 land users and representatives. ICARDA and other participating institutions will provide training in data collection and survey methodologies and will agree with local scientists a project-wide set of survey methodologies to enable the integration of data.

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 the national project

component, 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, land use, social and economic patterns change in time.

In this context, the services of the National remote sensing centre can be sought (Annexe IX) to make use of the available data, the assessment studies, maps and evaluation reports on:

Natural resources: water, soil, etc.,

Agriculture: land cover & suitability, productivity & yield, rural management, soil conservation...

Environment: land degradation, soil erosion, forestry, biodiversity, coastal deterioration, and natural disasters...


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, land user-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 lacking in the region. In addition to the provision of short term training being provided by the project, post graduate 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 in co-ordination with the Ministry of Higher Education, 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 tribal institutions that once regulated grazing or water rights have been broken down or undermined by government nationalisation of land. 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 Lebanon 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 Government 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 Lebanon targeted at agro-biodiversity conservation a yet there no holistic plan (including land use planning) for its implementation yet in place.

Both Baalbek and Aarsal are agro-biodiversity rich, while Aarsal is an upland sites adjacent to rangelands. The rangeland 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 Lebanon 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. Some Governments buy 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; 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). The Lebanese national component will be executed by the Government of Lebanon under UNDP National Execution arrangements. The Ministry of Agriculture designated the Lebanese Agricultural Research Institute (ARI) as the Lead Executing Agency for Lebanon.

LARI is an autonomous public institution for agricultural research and is supervised by the Ministry of Agriculture. It is governed by a board of directors and a Director General with 336 employees out of whom 19 researchers, 27 research assistants, 14 lab technicians and 70 technicians. LARI staff is distributed among its seven stations all over the country. The project will be executed by LARI main station in the Beqaa Area which has 10 departments namely Arable crops, fruit trees, plant breeding, plant protection, soil sciences, irrigation and meteorology, animal health, agricultural mechanization, rural economy and tissue culture.

The regional component will be executed by ICARDA with cooperative support from IPGRI and ACSAD in the implementation of the regional component (identified roles of the 3 agencies is described in the regional component document p18 & p44). The regional component will co-ordinate the implementation of nationally executed components, provide technical training and backstopping and reporting for the project, ensuring tight linkages among the four national projects and enhance the positive impacts from networking and exchange in experience and expertise. These arrangements will ensure that the bulk of the GEF resources will be programmed, managed and spent on activities in the participating countries/territory. Project related committees are outlined below, terms of reference are listed in annex VI.

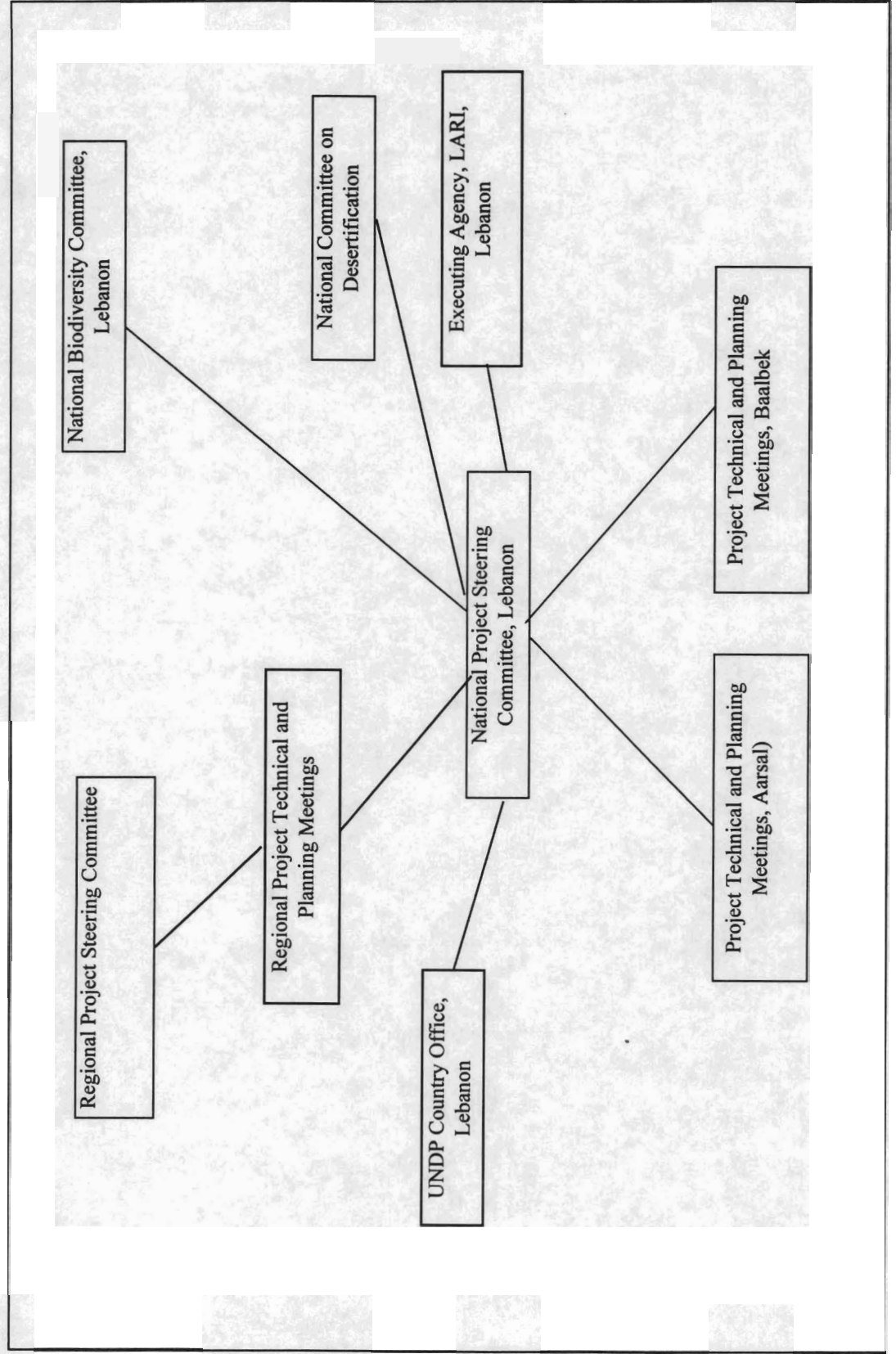
- A Regional Steering Committee will be established, comprised of the four National Co-ordinators/ Project Manager, the Designated representatives of the

four National Executing Institutions, the Regional Co-ordinator, representatives from IPGRI and ACSAD, and a representative from the UNDP Syrian Country office, as the principle participating representative. The Steering Committee will meet at least once a year, at a time and place to be agreed by the members. Steering Committee meetings, to be chaired by the representative of the government of the country/authority hosting the meeting, will rotate between the four countries/authority. The Committee will finalise and approve the detailed work plans and budget of all project components for the coming year recommended by the annual Regional Technical Co-ordination meeting (see below).

- Annual Regional Technical Co-ordination and Planning Meetings will be held prior to meetings of the Regional Steering Committee. They will include the National Co-ordinators/ Project Manager and relevant technical and scientific staff participating in the project. Results of the previous year's work, annual national Work Plans and budgets for the next year's work, will be presented and regional compatibility and integration of the national components will be discussed and recommendations will be submitted to the Regional Project Steering Committee.
- The existing National Desertification Steering Committee, chaired by the Minister of Agriculture, will consider the Work Plans and recommendations on the project technical committees and make recommendations on issues relating to drylands. These recommendations will be passed to the National Project Steering Committee for consideration and integration into the National Work Plans.
- Site Level Planning Meetings will be held at least once every year and prior to the Annual Regional Technical Co-ordination and Planning Meetings, to develop the annual National Work Plans and budget. The meetings will be chaired by the Project Manager, representatives from local participating units of the Ministry of Agriculture, NGO's, Universities and local stakeholder groups. The function of the meetings will be to assist the Project Manager in drawing up the coming year's National Work Plan and Budget. Meeting members will provide the Project Manager with advice on the progress of activities, technical and resources issues for planning the coming year's activities.
- Additional site meetings will be held as part of the participatory approach for the implementation of project activities, on an ad hoc basis. These are detailed within the activities of the project, and act as a mechanism for participatory planning and will involve local stakeholder groups and technical project staff.

Site level Planning Meetings and ad hoc site meetings will closely involve the existing NGOs and local Committees established by the Baalbeck/Hermel project given their acquired experience in coordinating similar projects at the field level

National Implementation Structure



5. Reasons for assistance from UNDP/executing agency:

The project is developed closely in line with the GEF Operational Program for Arid and Semi-Arid Ecosystems of the Biodiversity focal area which emphasizes the "prevention and control of land degradation through development of sustainable use methods for biodiversity conservation..." The Operational Program also calls for special attention for the "demonstration and application of techniques, tools, and methods to conserve traditional crops, forest and animal species in their original habitats", and "Promotion of sustainable production and use 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. project responds to the Convention on Biological Diversity and its concern that (i) biological diversity is being significantly reduced by certain human activities, (ii) the fundamental requirement for conservation of biological diversity is the in-situ conservation of ecosystems and natural habitats, and (iii) the traditional dependence of local communities on biological resources are recognized.

Lebanon has ratified the Convention on Biological Diversity. 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. 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 utilization of local and regional expertise, and addresses the following

program priorities as expressed by COP94:

- a- Strengthening conservation, management and sustainable use of ecosystems and habitats in accordance with Article 7 of the CBD, particularly with regard to species and communities of wild relatives of domesticated and cultivated species and species which are of agricultural value (Annex VII);
- b- Identification and monitoring of wild and domestic biodiversity components and implementation of measures for their conservation and sustainable use;
- c- capacity building, including human resource development and institutional strengthening;
- d- strengthening the involvement of local people in the conservation of biological diversity and the sustainable use of its components; and
- e- Promoting the conservation and sustainable use of biological diversity in environmentally vulnerable arid and semi-arid areas.

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

6. Special considerations

The project has four nationally executed components and one regional co-ordination component. The Regional Coordinator will need to pay particular attention to ensure compatibility between all areas of data collection and handling to allow collection of this data, and a project wide understanding of the issues, impacts and lessons emerging from project activities.

The project will be seeking to implement innovative in-situ conservation measures that in many cases, require capacity building in the four participating countries. Particular attention will be paid to providing resources for training and technical backstopping efforts, from ICARDA, IPGRI and ACSAD as well as other national and international institutions to provide support for the effective implementation of these activities. Detailed description of the technical backstopping is further elaborated in the regional project document (Annex III)

To provide sustainability to the adoption of in-situ conservation and sustainable use of agrobiodiversity activities by local communities, initiated by the project, the Awareness, Extension Rural Development and Natural Resources Departments of the Ministry of Agriculture, will participate closely with project staff in the field during the project and will continue activities and extension advice after the end of the project.

7. Co-ordination arrangements

The Project Manager will be responsible for coordinating with the Regional Coordinator. In Cooperation with project staff the Project Manager will prepare the annual National Work Plans, for consideration by the National Steering Committee and the Regional National Project Steering Committee. The National Steering Committee will be represented by participating national organizations and will provide advice on the amendment of the National Annual Work Plans.

Integration of nationally executed project activities will be provided by ICARDA's Regional Coordinator. The Regional Coordinator will be responsible for integrating all project collected data and disseminating the regional results to UNDP/GEF, the nationally executed project components and other interested parties including the Annual Performance Report, the Project Implementation Review and project impact monitoring reports, and policy, economic and legislative reports pertaining to agro-biodiversity. The Regional Coordinator will 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 Coordinator will co-ordinate exchange programs and communications between project staff of nationally executed components.

8. Counterpart support capacity

Lebanon 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 program, particularly of the human resource base through appropriate training.

The Ministry of Agriculture will provide experts in irrigation; rural economics; forestry management; animal nutrition; apiculture; topographic mapping; meteorology; and plant breeding. However in many cases these experts will need additional training in techniques for conservation and sustainable use of agro-biodiversity. Training courses that will be provided by project funding are listed in annex III. The Ministry of Agriculture will in addition continue to provide ongoing training to their experts in; forestry management; apiculture; irrigation; and fruit tree management.

The Ministry of Agriculture, through the Agriculture Research Institute, will provide offices and laboratory equipment for project activities, both in Beirut for the Project Manager and at the project sites and incentives to farmers for their participation in project activities.

The Lebanese University of Beirut and the American University of Beirut have technical expertise in; plant breeding; irrigation; and GIS. These universities will be able to provide additional expertise in these areas for training to project staff, and local communities.

C. Development objectives

The promotion and sustainable conservation and utilization of agro-biodiversity in the Near East through farmer based in-situ conservation of significant endemic wild relatives and land races.

D. Immediate objectives, outputs and activities

1. Immediate objective: Survey and monitoring data to understand the causes of agro-biodiversity degradation at project sites.

1.1. Output: Eco-geographic, genetic diversity socio-economic, indigenous knowledge and land use practice data on project sites.

1.1.1. Activity: Recruit a Project Manager

Parties responsible: UNDP, LARI

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

Parties responsible: Project Manager, LARI, UNDP

1.1.3. 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

1.1.4. Activity: Review and investigate existing data from existing projects (ex. Baalbeck/Hermel project, NCSR, Protected Areas project) on the wild relatives and land races of target crops in project sites, and socio-economic, indigenous knowledge and land use practice data relevant to agro-biodiversity degradation, sustainability and conservation.

Parties responsible: socio-economist, agronomist, GIS/ database expert, taxonomist, *in-situ* conservation manager, soil and water management specialists, plant geneticist.

1.1.5. Activity: Agree with Regional Coordinator, data recording, collection, storage and analysis methodologies. The methodologies should be: compatible with other host country national components; able to be stored 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; provide practical data for gene-bank accession activities, plant

breeders and farmers on the growth and genetic characteristics of wild relatives and landraces of target crops; contribute to an understanding of the causes of agrobiodiversity degradation of the wild relative and land races of target crops in project areas; and record data for registering genetic property rights.

Parties responsible: socio-economist, agronomist, GIS/ database expert, taxonomist, *in-situ* conservation manager, soil and water management specialists, plant geneticist.

1.1.6. Activity: In collaboration with the Regional Coordinator, set up or adapt GIS and electronic database to store and analyze project survey data.

Parties responsible: GIS/ database expert, data entry technician

1.1.7. Activity: Collect and record eco-geographic data, genetic diversity, and socio-economic data according to agreed methodologies and work with local communities to 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, GIS/ database expert, taxonomist, *in-situ* conservation manager, soil and water management specialists, legislative expert, seed collectors, plant geneticist.

1.1.8. Activity: Enter data in GIS and database and track changes in agrobiodiversity abundance and distribution of wild relatives and land races of target crops; assess the possible causes of these changes and provide data in agreed formats to ICARDA on an ongoing basis.

Parties responsible: GIS/ database expert, data entry technician.

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

Parties responsible: GIS/ database expert, socio-economist, agronomist, ecologist, water and soil management specialists, plant geneticist.

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

2.1. Output: Identify areas and communities with which to implement modified and alternative land uses.

2.1.1. Activity: Through field visits and community activities raise awareness

among communities of the project's objectives.

Parties responsible: socio-economist.

2.1.2. Activity: Based on survey data in immediate objective one, work with local communities to identify and agree 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; community based grazing management and other alternative livelihoods.

Parties responsible: Agronomist, taxonomist, *in-situ* conservation manager, soil and water management specialists, legislative expert, seed collectors, plant geneticist.

2.2. Output: Community level small scale water harvesting infrastructure for alternative sources of income, improved soil, water and agro-biodiversity conservation of project target crops.

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

Parties responsible: Project Manager.

2.2.2. Activity: ... workshops management

1. Rehabilitation wood lot
2. Conservation of Kibira Game (refuge)
3. Community instruments in future mpt / design policies 4
① day

4, 5, 6 mpt
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Sept 20 - Oct 3
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rooting stock.

ement specialists, agronomist, socio-

of target cropland races and

2.4. com races,
... baseline project activities work with
... ing rotation practices of target crop land
... weedy fallow where appropriate.

Parties responsible: Agronomist, in-situ conservation manager, soil management specialist, extension officers, plant geneticist.

2.3.2. Activity: Conduct workshops and field visits with local extension agency staff, NGO's, 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 programs.

Parties responsible: Agronomist, in-situ conservation manager, soil management specialist, extension officers, plant geneticist.

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

Parties responsible: Agronomist, in-situ conservation manager, soil management specialist, extension officers, plant geneticist, plant breeders.

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

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

Parties responsible: agronomist, *in-situ* conservation manager, plant geneticist, taxonomist, extension officers,

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

Parties responsible: legislative expert, agronomist, socio-economist

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.

2.5.1. Activity: Arrange workshops and on-site training for local community groups, agricultural co-operatives, and NGO's and farmers 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

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: Fruit tree specialist, extension officers, agronomist, and plant breeder

2.5.3. Activity: Promote community based breeding and selection activities of important and threatened seed and root stock of locally adapted project target crop wild relatives and land races, for use, and promote the exchange of seed and root stock between communities and with breeding programs and gene-banks, where applicable.

Parties responsible: plant breeders, extension officers, agronomist, fruit tree specialist.

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

2.6.1. Activity: Through community discussion and activities promote the benefits of rehabilitating degraded common lands and the uses of pasture nurseries.

Responsible parties: socio-economist, property rights specialist, agronomist, rangeland manager, plant breeder, and plant geneticist.

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

Parties responsible: socio-economist, property rights specialist, agronomist, rangeland manager, plant breeder, plant geneticist, extension officers

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 communities.

Parties responsible: plant breeder, plant geneticist, extension officers

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 communities explore options for alternative

grazing management systems in common lands and modified habitats and identify incentives for their implementation.

Responsible parties: animal nutritionist, property rights specialist, rangeland manager, agronomist, soil and water management specialists

2.7.2. Activity: Work with the communities in implementing grazing practices

Responsible parties: animal nutritionist, property rights specialist, rangeland manager, agronomist, soil and water management specialists, extension officers

2.8. Output: Alternative livelihoods and sources of income that conserve and sustainable use agro-biodiversity of the wild relatives and land races of project target species.

2.8.1. Activity: Raise awareness of the benefits of apiculture through community discussion and activities and identify farmers, individuals and community groups interested in apiculture, as an alternative source of income in viable areas and

Parties responsible: apiculturalist, socio-economist, and agronomist

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

Parties responsible: apiculturalist.

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

Parties responsible: socio-economist, agronomist, property rights specialist. *in-situ* conservation manager, and extension officers.

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

2.9.1. 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 structures, and the sale and exchange of locally adapted root stocks and seed.

Parties responsible: extension officers, fruit tree specialist, plant breeders, plant geneticist

2.9.2. Activity: Work with the Regional Coordinator in close coordination with the Ministry of Education in the development of project information packs.

Parties responsible: Educational specialist, editor

2.9.3. Activity: Disseminate project information packs.

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 training.

3.1.1. Activity: Identify, in collaboration with the Ministry of Higher Education and local universities and draw up frameworks for Msc. studies to meet identified project needs and the needs of project.

Parties responsible: Project Manager

3.1.2. Activity: In close coordination with the Ministry of Higher education and local universities, advertise projects scholarships for university courses, interview and select candidates for university placement, taking into account the host university requirements.

Parties responsible: Project Manager

3.1.3. Activity: Assist in the placement of selected candidates at host universities.

Parties responsible: Project Manager

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

Parties responsible: Project Manager, UNDP, hosting university

3.2. Output: Agro-biodiversity issues promoted at local schools

3.2.1. Activity: Consult with local educational authorities (Ministry of Education) over the introduction of courses relating to agro-biodiversity in local schools

Parties responsible: Educational specialist

3.2.2. Activity: Develop teaching and learning materials for schools in agro-

biodiversity

Parties responsible: Educational specialist

3.2.3. Activity: Provide instruction to local schoolteachers in the use of agro-biodiversity syllabus materials

Parties responsible: Educational specialist

4. Immediate objective: Policy reform, of agricultural and related policies to promote agro-biodiversity in project target areas, without social cost and in the national interest.

Output 4.1: Reform of national policy alternatives which take account of social, economic and cultural factors to promote the maintenance of plant genetic resources.

4.1.1. Activity: Recruit agricultural policy expert, property rights, and agricultural sector economist.

Parties responsible: Project Manager

4.1.2. Activity: Analyze the interactions among communities, economic development and national agricultural policies as they affect continued use of landraces, rangelands and local forest resources.

Parties responsible: socio-economist, agronomist, property rights specialist

4.1.3 Activity: Assess the impact on natural resources from national rural development initiatives and policies that could be modified to better address maintenance of biodiversity in both natural vegetation and farming systems.

Parties responsible: Agricultural sector economist.

4.1.4. Activity: Present costed, national agricultural, economic and rural development, identified win/win policy options to the Ministries of Agriculture and environment, assist in drafting policy, legislative and economic reforms, and pursue the introduction of legislation for reforms, by parliament.

Parties responsible: legal expert, agronomist, socio-economist, agricultural sector economist

Output 4.2: Reform of national policy where needed through considerations of policy options by the Ministries of Agriculture, Environment and water resources, for the management, use and conservation of soil, water and natural vegetation in the selected ecosystems of the target areas that balance the perspectives of land users, the nation and future generations.

4.2.1. Activity: Analyze national agricultural policies that lead to unsustainable management of soil, water and natural vegetation by land users and assess policy options that would encourage conservation of these resources by land users.

Parties responsible: agricultural policy expert, property rights, agricultural sector economist.

4.2.2. Activity: Present costed agricultural, economic and rural development policy options, to the Ministries of Agriculture, Environment, and Water Resources.

Parties responsible: agricultural policy expert, property rights, agricultural sector economist.

4.2.3. Activity: Test agreed policy options at project sites, and based on results assist in drafting policy, legislative and economic reforms, and pursue the introduction of legislation for reforms, by parliament.

Parties responsible: agricultural policy expert, property rights, agricultural sector economist.

Output 4.3: Reform of land tenure arrangements, where needed, through alternative management options for use of land for profitable and sustainable production and for the introduction of conservation measures.

4.3.1 Activity: Analyze the effect of land ownership and tenurial arrangements on Agro-biodiversity.

Parties responsible: socio-economist, agronomist, property rights expert, agricultural sector economist.

4.3.2 Activity: Explore land users' attitudes to communal methods of land management that would contribute to conservation of natural resources pursue the consent of the Ministry of Agriculture to test modified tenure options.

Parties responsible: agricultural policy expert, property rights, agricultural sector economist.

4.3.3. Activity: Based on the tests of modified land tenure options assist in drafting policy, legislative and economic reforms, and pursue the introduction of legislation for reforms, by parliament.

Parties responsible: agricultural policy expert, property rights, agricultural sector economist.

5. Immediate objective: Project impact monitoring for project planning and measuring the impact of project intervention on agro-biodiversity and local communities at project sites.

5.1. Output: Impact of project intervention on agro-biodiversity of the wild relatives and land races of target crops, the costs and benefits and redistribution of wealth to local communities, and for project planning.

5.1.1. Activity: Agree with the Regional Coordinator 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 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 short term costs and benefits to, and the effects of wealth redistribution of project activities on local communities. Impact monitoring methodologies and processes will make provisions for long term impact monitoring after the life of the project.

Parties responsible: Project Manager, socio-economist, agronomist, GIS/ database expert, rangeland manager/ ecologist, taxonomist

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

Parties responsible: Project Manager, ICARDA

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

Parties responsible: extension officers, socio-economist, agronomist, GIS/ database expert, GIS/ database expert, rangeland manager/ ecologist, taxonomist

5.1.4. Activity: Document emerging lessons learned and best practices

Parties responsible: editor

E. Inputs

1. UNDP

Sub-contracts

a. GIS Sub-contract (Activities 1.1.4; 1.1.5; 1.1.7; 1.1.8)

- Attend workshops for the development of GIS applications for project wide surveys;
- Work with other project components to develop project wide standards for data recording, storage and analysis;
- Enter eco-geographic, socio-economic, land use and indigenous knowledge survey data entry into GIS and database;
- Tracking changes in the agro-biodiversity of project target crops at project sites;
- Analyze the root causes of agro-biodiversity;
- Develop a framework for the locations and types of project interventions at project sites; and
- Co-ordinate with the Regional Coordinator for the timely submission of data in agreed formats.

b. Participatory seed and genetic material collection, characterization, documentation and multiplication sub-contract (Activities 1.1.6; 2.4.1; 2.5.3; 2.6.2; 2.6.3)

- Participate in work shops and field visits in techniques for the management of field gene banks and pasture nurseries;
- participate in the development of project wide methodologies for data collection, characterization and documentation of genetic material;
- participate in the collection of genetic material for use in field gene-banks and pasture nurseries;
- conduct ongoing work to select and multiply identified genetic materials and;
- participate in open days and the exchange and promotion of the use of genetic materials.

2. *ICARDA*

Training

a. *Regional Training*

The following are courses, which are detailed, in the regional component

- Eco-geographic botanic survey techniques; two weeks x 3 people (activity 1.1.2)
- Geographic information systems (GIS), Remote Sensing and database management; 2 weeks x 2 people (activity 1.1.5)
- Principles of sustainable water and soil management and landscape modeling; 2 weeks x 2 people
- In-situ conservation and Field Gene-bank Management; 2 weeks x 3 people (activity 2.4.1.)

In addition \$36,000 has been set aside for follow up in-country support to national staff to implement project activities.

- In country follow up assistance in implementing monitoring and surveys with NGO's and project staff (activity 5.1.2): One week x 10 people
- In country follow up training in on farm conservation techniques of landraces with project staff and local communities (activity 2.3.2): one week x 15 people
- Training in seed production techniques for project staff and local community members (activity 2.5.3.) : One week for 15 people

3. Fellowships (MSc)

Plant taxonomy (activity 3.1.1 and 3.1.2): two years

Seed technology (activity 3.1.1 and 3.1.2): two years

Plant breeding (activity 3.1.1 and 3.1.2): two years

4. Equipment

Overhead projector, Camera, Slide projector, TV / Video set, Video camera, Screen projector (activity 2.2.2, 2.3.2, 2.5.1, 2.8.1, 2.9.1, 3.2.2)

Tractor (Immediate object 2)

Computers, Uninterrupted Power Supply, printers, photocopiers, fax machine, phones, E-mail and Internet links, Vehicles (all outputs)

F. Risks

The success of the project depends upon the project staff developing a close working relationship with local land users, 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 stakeholder, with strong extension and outreach components, in order to ensure that these potential obstacles can be over and that on-going dialogue is maintained. The Participatory approach includes the close co-ordination with the existing on-going projects and the collaboration with the concerned parties to ensure the complementarity in the activities and the long term sustainability of the project.

In some participating countries expertise in social sciences to elucidate land users' production objectives, the factors influencing and constraining production and farm resource management decisions, and the rules or patterns in social behaviour governing the utilisation of common resources is not well developed. Where necessary the project will

develop or provide these capacities. In addition, Lebanon, in particular, has initiated a number of projects that involve local participation and the project will benefit from their experiences.

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 so that broader policy reform can be proposed, initially for the target areas, but eventually for wider adoption in the countries/authority.

G. Prior obligations and pre-requisites

Prior obligations

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

Confirmation of the Government's willingness and intent to conduct long term impact monitoring of project activities beyond the life of the project

- Confirmation of the Government's willingness to consider and implement where appropriate and in the national interest legislation, economic reform, property rights and tenure reform under immediate objective 4 of the project.

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 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 Lebanon, and the United Nations Development Program, signed by all the parties on 10 February 1986. 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.

J. Budgets

UNDP Budget

BL	Description	Total (US \$)	Total p/m	Year 1 p/m	Year 1 USD	Year 2 p/m	Year 2 USD	Year 3 p/m	Year 3 USD	Year 4 p/m	Year 4 USD	Year 5 p/m	Year 5 USD
10.00	PROJECT PERSONNEL												
11.00	International consultant (tech backstopping)												
11.01	Forage/ rangeland ecologist	26,250	4	1	7,500	1	7,500	0.5	3,750	0.5	3,750	0.5	3,750
11.02	Land use and soil conservation/ GIS/ RS	26,250	4	1	7,500	1	7,500	0.5	3,750	0.5	3,750	0.5	3,750
11.03	Socio economist	26,250	4	1	7,500	1	7,500	0.5	3,750	0.5	3,750	0.5	3,750
11.04	Property rights specialist	26,250	4	1	7,500	1	7,500	0.5	3,750	0.5	3,750	0.5	3,750
11.05	Water harvesting/ water shed management	26,250	4	1	7,500	1	7,500	0.5	3,750	0.5	3,750	0.5	3,750
11.06	Plant breeder	26,250	4	1	7,500	1	7,500	0.5	3,750	0.5	3,750	0.5	3,750
11.07	Agro-ecologist	26,250	4	1	7,500	1	7,500	0.5	3,750	0.5	3,750	0.5	3,750
11.08	In situ conservationist	26,250	4	1	7,500	1	7,500	0.5	3,750	0.5	3,750	0.5	3,750
11.99	Sub total: international consultants	210,000	28	8	60,000	8	60,000	4	30,000	4	30,000	4	30,000
13.00	Admin. support personnel												
13.01	Secretary	51,997	60	12	9,600	12	9,984	12	10,383	12	10,799	12	11,231
13.05	Project site assistant (x2)	90,994	120	24	16,800	24	17,472	24	18,171	24	18,898	24	19,654
13.99	Subtotal: admin. Support	142,991	180	36	26,400	36	27,456	36	28,554	36	29,696	36	30,884
15.00	Duty Travel												
15.01	International travel	30,000			6,000		6,000		6,000		6,000		6,000
15.02	Local travel	100,000			20,000		20,000		20,000		20,000		20,000
15.99	Subtotal: duty travel	130 00			26,000		26,000		26,000		26,000		26,000
17.50	National Consultants												
17.51	Project Manager	150,624	60	12	30,000	12	30,000		30,000	12	30,000	12	30,624
17.52	Agricultural Economist	20,000	10	2	4,000	2	4,000	2	4,000	2	4,000	2	4,000
17.53	Agronomist	40,000	20	4	8,000	4	8,000	4	8,000	4	8,000	4	8,000

BL	Description	Total (USD)	Total p/m	Year 1 p/m	Year 1 USD	Year 2 p/m	Year 2 USD	Year 3 p/m	Year 3 USD	Year 4 p/m	Year 4 USD	Year 5 p/m	Year 5 USD
17.54	Editor	20,000	10	2	4,000	2	4,000	2	4,000	2	4,000	2	4,000
17.55	Soil management specialist	20,000	10	2	4,000	2	4,000	2	4,000	2	4,000	2	4,000
17.56	In-situ conservation manager	28,000	14	2	4,000	3	6,000	3	6,000	3	6,000	3	6,000
17.57	Community water harvesting specialist	28,000	14	2	4,000	3	6,000	3	6,000	3	6,000	3	6,000
17.58	Taxonomist	40,000	20	4	8,000	4	8,000	4	8,000	4	8,000	4	8,000
17.59	Socio-economist	44,000	22	6	12,000	4	8,000	4	8,000	4	8,000	4	8,000
17.60	Apiculturalist	20,000	10	2	4,000	2	4,000	2	4,000	2	4,000	2	4,000
17.61	Legislative expert	10,000	5	1	2,000	1	2,000	1	2,000	1	2,000	1	2,000
17.62	Educational specialist	12,000	6	2	4,000	1	2,000	1	2,000	1	2,000	1	2,000
17.63	Evaluator	6,000	2	1	3,000	1	3,000					1	3,000
17.99	Subtotal: national consultants	438,624	203	41	88,000	41	89,000	40	86,000	40	86,000	41	89,624
19.00	Component total: personnel	9 ,615	411	85	200,400	85	202,456	80	170,554	80	171,696	81	176,508
20.00	SUB-CONTRACTS												
21.00	GIS	63,400			15,600		12 00		12,000		11,400		12,400
22.00	Participatory seed collection/multiplication	56,726			5,840		11,773		12,066		12,368		14,679
29.00	Component total: sub-contracts	120,126			21,440		23,773		24,066		23,768		2 79
30.00	TRAINING												
31.00	Fellowships												
31.01	Plant taxonomy	25,000			10,000		15,000						
31.02	Seed technology	25,000			10,000		15,000						
31.03	Plant breeding	25,000			10,000		15,000						
31.99	Sub total: fellowships	75,000			30,000		45,000						
32.00	Group training												
32.01	Eco-geographic botanic survey techniques	4,000			4,000								
32.02	GIS, remote sensing and database management	4,000					4,000						

BL	Description	Total (USD)	Total p/m	Year 1 p/m	Year 1 USD	Year 2 /m	Year 2 USD	Year 3 p/m	Year 3 USD	Year 4 p/m	Year 4 USD	Year 5 p/m	Year 5 USD
32.03	Water and soil management	4,000			4,000								
32.04	In-situ conservation/ field gene-bank management	4,000					4,000						
32.99	Sub total: group training	16,000			8,000		8,000						
33.00	<u>In-service training</u>												
33.01	Assistance on conservation techniques	12,000					12,000						
33.02	Assistance in monitoring & survey methodologies	12,000			12,000								
33.03	Seed production	12,000					12,000						
33.99	Sub total: in-service training	36,000			12,000		24,000						
34.00	<u>Conferences and meetings</u>												
34.01	Regional and National committees and meetings	40,000			8,000		8,000		8,000		8,000		8,000
34.02	Open days/ participatory consultations	40,500			7,000		8,375		8,375		8,375		8,375
34.99	sub total: conferences	80,500			15,000		16,375		16,375		16,375		16,375
39.00	Component total: training	207,500			65,000		93,375		16,375		16,375		16,375
45.00	EQUIPMENT												
45.01	Overhead projector	300			300								
45.01	Slide projector	150			150								
45.01	Internet and e-mail link	350			350								
45.01	Project screen	500			500								
45.01	Stationary	8,000			2,000		1,500		1,500		1,500		1,500
45.01	Vehicles (x2)	40,000			40,000								
45.01	Phones (x3)	1,500			1,500								
45.01	Computers (x5)	15,000			15,000								
45.01	Laser Printer (x1)	4,000			4,000								
45.01	Uninterrupted Power Supply (x4)	2,000			2,000								
45.01	Scanner	1,000			1,000								
45.01	Video Projector	5,000			5,000								

BL	Description	Total (USD)	Total p/m	Year 1		Year 2		Year 3		Year 4		Year 5	
				p/m	USD	p/m	USD	p/m	USD	p/m	USD	p/m	USD
45.01	Photo copy machine	7,000			7,000								
45.01	Photo Camera	1,500			1,500								
45.01	Video Camera	2,500			2,500								
45.01	Tractor	25,000			25,000								
45.99	Sub total: equipment	113,800			107,800		1,500		1,500		1,500		1,500
49.00	Component total: equipment	113,800			107,800		1,500		1,500		1,500		1,500
51.00	MISCELLANEOUS												
51.01	Operations and Maintenance	60,000			10,000		15,000		15,000		10,000		10,000
51.02	Reporting	30,000			5,000		5,000		5,000		5,000		10,000
51.03	Sundries	4,000					1,000		1,000		1,000		1,000
50.09	Component total: miscellaneous	94,000			15,000		21,000		21,000		16,000		21,000
54.01	Project support services	43,711			12,289		10,263		7,005		6,880		7,274
	TOTAL	1,500,752	411		421,929		352,367		240,500		236,220		249,736

UNDP Budget: Sub contract for seed collection, characterization, documentation and multiplication

BL	Description	Total (USD)	Total p/m	Year 1		Year 2		Year 3		Year 4		Year 5	
				p/m	USD	p/m	USD	p/m	USD	p/m	USD	p/m	USD
10.00	PROJECT PERSONNEL												
17.00	<u>National consultants</u>												
17.01	Seed collectors	18,467	216	24	1,920	48	3,955	48	4,074	48	4,196	48	4,322
17.02	Characterization & documentation	10,194	120	24	1,920	24	1,978	24	2,037	24	2,098	24	2,161
17.03	Plant breeder and multiplier (on farm)	16,065	192			48	3,840	48	3,955	48	4,074	48	4,196
17.99	Subtotal: personnel	44,726	528	48	3,840	120	9,773	120	10,066	120	10,368	120	10,679
	Sub component total	44,726	528	48	3,840	120	9,773	120	10,066	120	10,368	120	10,679
40.00	EQUIPMENT												
42.00	<u>Expendables</u>												
42.01	Seed and raw materials	12,000			2,000		2,000		2,000		2,000		4,000
42.99	Sub component total: expendables	12,000			2,000		2,000		2,000		2,000		4,000
49.00	Component total: equipment	12,000			2,000		2,000		2,000		2,000		4,000
	TOTAL	56,726	528	48	5,840	120	11,773	120	12,066	120	12,368	120	14,679

UNDP Budget: GIS Sub-contract

BL	Description	Total (USD)	Total p/m	Year 1		Year 2		Year 3		Year 4		Year 5	
				p/m	USD	p/m	USD	p/m	USD	p/m	USD	p/m	USD
10.00	PROJECT PERSONNEL												
17.00	<u>National consultants</u>												
17.01	GIS/ database specialist and analyst	24,000	24	6	6,000	5	5,000	5	5,000	4	4,000	4	4,000
17.02	Data entry technician	14,400	24	6	3,600	5	3,000	5	3,000	4	2,400	4	2,400
11.99	Subtotal: national consultants	38,400	48	12	9,600	10	8,000	10	8,000	8	6,400	8	6,400
	Sub component total	38,400	48	12	9,600	10	8,000	10	8,000	8	6,400	8	6,400
40.00	EQUIPMENT												
41.00	<u>Expendables</u>												
41.01	Materials & supplies	15,000			4,000		2,000		2,000		3,000		4,000
41.99	Sub total: expendables	15,000			4,000		2,000		2,000		3,000		4,000
42.00	<u>non-expendables</u>												
42.01	GIS equipment	10,000			2,000		2,000		2,000		2,000		2,000
42.99	Sub total: expendables	10,000			2,000		2,000		2,000		2,000		2,000
49.00	Component total: equipment	25,000			6,000		4,000		4,000		5,000		6,000
	TOTAL	63,400	48	12	15,600	10	12,000	10	12,000	8	11,400	8	12,400

Government In-kind contribution

BL	Description	Total (USD)	Total P/m	Year 1 p/m	Year 1 USD	Year 2 p/m	Year 2 USD	Year 3 p/m	Year 3 USD	Year 4 p/m	Year 4 USD	Year 5 p/m	Year 5 USD
10.00	PERSONNEL												
13.00	Admin support personnel	18,000	48	12	3,600	12	3,600	12	3,600	12	3,600	12	3,600
13.01	Driver												
13.99	Sub total: admin. Support	18,000	48	12	3,600	12	3,600	12	3,600	12	3,600	12	3,600
17.00	National experts (Scientists)	120,000	48	12	24,000	12	24,000	12	24,000	12	24,000	12	24,000
17.01	National Coordinator												
17.02	Plant geneticist/ plant breeder	42,000	24	6	8,400	6	8,400	6	8,400	6	8,400	6	8,400
17.03	Animal nutritionist	28,000	16	4	5,600	4	5,600	4	5,600	4	5,600	4	5,600
17.04	Agronomist	28,000	16	4	5,600	4	5,600	4	5,600	4	5,600	4	5,600
17.05	Extension officers	21,000	24	6	4,200	6	4,200	6	4,200	6	4,200	6	4,200
17.06	Rangeland ecologist/ manager	28,000	16	4	5,600	4	5,600	4	5,600	4	5,600	4	5,600
17.07	Fruit tree specialist	30,800	18	4	5,600	4	5,600	6	8,400	4	5,600	4	5,600
17.08	Technical/ field assistants	36,000	48	12	7,200	12	7,200	12	7,200	12	7,200	12	7,200
17.99	Sub total; national experts	333,800	210	52	66,200	52	66,200	54	69,000	52	66,200	52	66,200
19.99	Component: personnel	351,800	258	64	69,800	64	3,600	66	3,600	64	3,600	64	69,800
40.00	EQUIPMENT												
42.00	expendable												
42.01	Office/ premises	75,000			15,000		15,000		15,000		15,000		15,000
42.02	Vehicles	20,000			4,000		4,000		4,000		4,000		4,000
42.03	lab equipment	50,000			10,000		10,000		10,000		10,000		10,000
42.99	sub total: expendable	145,000			29,000		29,000		29,000		29,000		29,000
49.00	Component: equipment	290,000			29,000		29,000		29,000		29,000		29,000
50.00	MISCELLANEOUS												

BL	Description	Total (USD)	Total P/m	Year 1		Year 2		Year 3		Year 4		Year 5	
				p/m	USD	p/m	USD	p/m	USD	p/m	USD	p/m	USD
51.00	Operations and Maintenance	75,000		15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
59.00	Component total: miscellaneous	75,000		15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
	Total	716,800	258	64	113,800	64	47,600	66	47,600	64	47,600	64	113,800

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, and indigenous surveys																				
1.1.1. Activity: recruit Project manager	■																			
1.1.2. Activity: Recruit project staff for data recording collection, storage and analysis																				
1.1.3. Activity: Short term training	■																			
1.1.3. Activity: Review survey data		■																		
1.1.5. Activity: Agree survey methodologies		■	■																	
1.1.6. Activity: Set, adapt GIS and database		■	■	■																
1.1.7. Activity: Collect data		■	■	■					■	■	■	■	■	■	■	■	■	■	■	■
1.1.8. Activity: Enter data into GIS and database					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1.1.9. Activity: Analyze emerging data						■	■	■		■	■	■		■	■	■		■	■	■
2. IMMEDIATE OBJECTIVE: Alternative Land uses through community based 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 raise project awareness			■	■																
2.1.2. Activity: Community consultation to agree target areas			■	■	■	■	■	■												
2.2. Output: Community level water harvesting and soil preservation infrastructure																				
2.2.1. Activity: Recruit Small scale irrigation 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
management specialists																				
<u>2.2.2. Activity:</u> Workshops in water resource and soil management																				
<u>2.2.3. Activity:</u> Site visits and technical assistance for dam, terrace and contour construction																				
2.3. Output: On-farm conservation and management																				
<u>2.3.1. Activity:</u> Links with baseline activities to rotation practices to improve soil management																				
<u>2.3.2. Activity:</u> Workshops field visits to demonstrate on-farm landraces through management and breeding programmes																				
<u>2.3.3. Activity:</u> Introduce landraces with rotation management																				
2.4. Output: Corridors, habitat strips and uncultivated habitat strips established and managed																				
<u>2.4.1. Activity:</u> Training in buffer zone management and agree buffer zone																				
<u>2.4.2. Activity:</u> Pursue legal designation of buffer zones, corridors and habitat strips.																				
2.5. Output: Field gene-banks																				
<u>2.5.1. Activity:</u> Training in benefits and management of field gene-banks																				
<u>2.5.2. Activity:</u> Extension assistance and in setting up and managing field gene-banks																				
<u>2.5.3. Activity:</u> Community based breeding and selection																				
2.6. Output: Pasture nurseries established and managed																				
<u>2.6.1. Activity:</u> Promote benefits of pasture nurseries																				
<u>2.6.2. Activity:</u> Training and extension in pasture nursery management and community based breeding and selection																				
<u>2.6.3. Activity:</u> exchange of seed and root stock																				

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
2.7. Output: Community based grazing management practices modified for sustainable use and conservation of <i>in-situ</i> genetic resources																				
2.7.1. Activity: Explore options for grazing management			■																	
2.7.2. Activity: Work with communities to implement grazing management techniques				■		■	■	■		■	■	■		■	■	■			■	■
2.8. Output: Alternative source of income																				
2.8.1. Activity: Raise community 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 community awareness raised																				
2.9.1. Activity: Public open days						■	■	■										■	■	■
2.9.2. Activity: Develop information packs						■	■	■		■	■	■		■	■	■			■	■
2.9.3. Activity: Disseminate information packs						■	■	■		■	■	■		■	■	■			■	■
3. IMMEDIATE OBJECTIVE: Increase national capacity to deliver training needs																				
3.1. Output: National capacity in agro-biodiversity conservation and sustainable use training																				
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, UNDP, and concerned universities				■																
3.2. Output: Agro-biodiversity introduced into local school syllabus																				
3.2.1. Activity: Consult with local educational authorities				■																

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
3.2.2. Activity: Develop school syllabus teaching and learning materials					■				■				■				■			
3.2.3. Activity: Provide instruction to schools teachers on the use of agro-biodiversity syllabus materials																				
4. IMMEDIATE OBJECTIVE: Policy reform at project sites to conserve and sustainably use agro-biodiversity																				
4.1. Output: Review national legislation, policy and economic instruments related to agro-biodiversity and propose reforms.																				
4.1.1. Activity: Recruit project policy legislation and economics staff.	■																			
4.1.2. Activity: Analyze interactions among communities, economic development as they affect landraces, rangeland and forest resources.		■	■																	
4.1.3. Activity: Assess impact on natural resources from rural development				■																
4.1.4. Activity: Present costed options for reform pursue legal recognition and implementation						■		■	■	■	■	■	■	■	■	■	■	■	■	■
4.2. Output: Reform of national policy options relating to soil water, and natural vegetation.																				
4.2.1. Activity: Analyze national agricultural policies relating to soil, water and natural vegetation mismanagement		■	■																	
4.2.2. Activity: Costed options for national agricultural, economic and rural development options and reach agreement for testing policy option at project sites						■														
4.2.3. Activity: Test reforms at project sites and pursue legislation							■		■	■	■	■	■	■	■	■	■	■	■	■
4.3. Output: Reform of land tenure for profitable sustainable production and the introduction of training measures																				
4.3.1. Activity: Analyze the effects of ownership and tenure arrangements		■	■																	
4.3.2. Activity: Explore land users attitudes to communal						■														

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
methods of land management and agree options for testing.						■														
4.3.3. Activity: Based on tests draft policy and pursue the introduction of legislative reform.						■		■	■	■	■	■	■	■	■	■	■	■	■	■
5. IMMEDIATE OBJECTIVE: Project impacts and progress monitoring																				
5.1. Output: Project impact measures																				
5.1.1. Activity: Agree methodology for impact monitoring		■																		
5.1.2. Activity: Training in impact monitoring			■																	
5.1.3. Activity: Conduct monitoring activities				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
5.1.4. Activity: Participate in regional 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 ¹	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Quarterly Financial Reports	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Annual Progress Report (APR)					◆				◆					◆							
Project Implementation Review (PIR)			◆							◆					◆						
In-Depth Evaluation Reports											◆								◆		
Terminal Report																				◆	

¹ 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 programs

Training from ICARDA, IPGRI and ACSAD

The following are courses are detailed in the regional component

- Eco-geographic botanic survey techniques; two weeks x 3 people
- Geographic information systems (GIS), Remote Sensing and database management; 2 weeks x 2 people
- Principles of sustainable water and soil management and landscape modeling; 2 weeks x 2 people
- In-situ conservation and Field Gene-bank Management; 2 weeks x 3 people

In addition \$36,000 has been set aside for follow up in-country support to national staff to implement project activities.

- In country follow up assistance in implementing monitoring and surveys with NGO's and project staff (activity 5.1.2): One week x 10 people
- In country follow up training in on farm conservation techniques of landraces with project staff and local communities (activity 2.3.2): one week x 15 people
- Training in seed production techniques for project staff and local community members (activity 2.5.3.) : One week for 15 people

3. Fellowships (MSc)

Three M.Sc.'s will compliment the short term training courses to conduct project activities. Masters student's will conduct studies on project related issues and contribute their expertise to project implementation after completing their courses.

MSc Plant taxonomy (activity 3.1.1 and 3.1.2): two years

MSc Seed technology (activity 3.1.1 and 3.1.2): two years

MSc Plant breeding (activity 3.1.1 and 3.1.2): two years

In-country follow up training and assistance:

\$ 246,000 has been set aside for international consultants and in-service training to provide national project staff and sub-contractors with implementation assistance. Assistance will be provided by a mix of international and national personnel, but will provide additional capacity to that which already exists

In-service training has been categorized under the following headings:

a. Assistance with implementation of project survey and monitoring techniques

- For project staff, and local community members under sub-contract during the first year of implementation;
- consolidation of agro-ecological, socio-economic and indigenous knowledge and land use survey techniques, including genetic material collection, documentation and assessment; participatory techniques for conducting household, and indigenous knowledge and land use surveys;
- Impact indicator identification, and the application of impact monitoring methodologies

b. *In-situ* conservation techniques; including field gene-bank management, pasture nursery management, soil and water management

- Participatory seed production techniques, and management and use of rooting and other genetic materials
- Assistance to local communities under sub-contract, and other participating community members.
- The application of seed and root stock selection and multiplication and marketing
- management and sustainable uses for pasture nurseries, field gene-banks, corridors, habitat strips and uncultivated patches.

Open days

With the collaboration of the specialists, the assistants could organize numerous open days in the two site in the following fields: Fruit trees, crop production, forest, grazing and pasture, animal production, irrigation and water resources.

IV. Equipment requirements

Vehicles (x2):

- Two 4x4 vehicles: 1.6 l

Phones (x3): cellular phones (72 hours capacity)

Camera: reflex body with two objectives (20-80 ; 75-200 mm)

Video Camera: HI 8 quality, Steady shot option, 3 lux min sensibility, with accessories.

Computers:

- Two Pentium II (220 Mhz processor) PC with 2 GB minimum hard disk capacity, 15'' screen, CD ROM, Laser Printer, 32000 pix Modem and other equipment.
- Three portable computers with Pentium II (220 Mhz) processor 2GB hard disk, color screen.

Two Uninterrupted Power Supply: for the computers.

One Fax machine: A4 paper size with international connection link.

One Photocopy machine: with collator.

One Slide projector: 80 slides carousel, with remote control

One Overhead projector: portable.

One Video Projector

One Projector Screen: 2m x 3m dimensions

One tractor: 15 HP, with ploughing equipment and trailer

V Job description

Project Manager

The Project Manager 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 Project Manager 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;
- Preparing Annual Performance Reviews, Project Implementation Reviews, and Impact Reports 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;
- Formulate job descriptions and define the scope of work for project staff and consultants, and participate in the hiring and selection process under UNDP guidelines;
- Liase with organisations participating in the project and ongoing programmes relevant to the project and local village leaders in the project sites;
- Ensure that data arising from the activities of the project conform with agreed project wide methodologies and formats;
- Calling the National Project Steering Committee and National Technical and Planning Meetings, preparing the agenda and other required documentation; and
- 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;
- Experience in the use of participatory approach for project implementation;
- At least a PhD or eight years experience in the management of plant biodiversity conservation;
- Familiarity with the national socio-economic and political context.
- 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 June 1998
- Baalbek/ Aarsal project sites

International Consultants duties

Detailed terms of reference of the project staff and sub-contracts will be set out by the National Coordinator, however their main duties are outline below:

Forage/ rangeland ecologist

Provide technical support to national consultants and other project participants for the implementation of the following activities.

- Assist with the analysis of existing practices and potential modification for sustainable use and conservation of rangeland species, including conducting participatory consultations with local communities
- Providing advice on ways and means to encourage local communities to adopt identified sustainable use and conservation practices

Land use and soil conservationist/ GIS/ RS

Provide technical support to project staff and other project participants for the implementation of the following activities;

- work with sub-contractors to ensure survey data is recorded and analyzed according to agreed project wide standards;
- provide advice and assistance in the use of advanced techniques for the analysis of survey data;
- provide advice and assistance in the development of a geographical framework for focused project in-situ conservation intervention;
- provide advice and assistance for participatory consultation processes with local communities for the identification and establishment of appropriate and agreeable soil and conservation techniques and developing its role in providing alternative practices for the conservation and sustainable of agro-biodiversity.

Property right consultant

Provide technical support to project staff and other project participants for the

implementation of the following activities;

- provide assistance to project staff in conducting participatory consultations with local communities on attitudes to existing land use and access rights;
- provide assistance in the development of proposals for modified land use and access systems to promote the conservation and sustainable use of agro-biodiversity;
- assist in presenting alternative land use and access systems for legal consideration by the Ministries of Environment and Agriculture; and
- Assist in the follow-up process to facilitate the legal designation of modified land use and access systems.

Socio-economist

Provide technical support to national consultants and other project participants for the implementation of the following activities;

- Provide advice and assistance on participatory techniques for socio-economic, indigenous knowledge for the uses of agro-biodiversity and traditional land use surveys;
- Provide guidance for the analysis of the implications of survey data for project activities;
- Assist in the development of alternative livelihoods for the conservation and sustainable use of agro-biodiversity, based on survey data.
- Provide assistance in the implementation of monitoring the socio-economic impact of project activities on local communities

Water harvesting/ and water shed manager

Provide technical support to project staff and other project participants for the implementation of the following activities;

provide advice and assistance for participatory consultation processes with local communities for the identification and establishment of appropriate and agreeable water harvesting and management techniques and developing its role in providing alternative practices for the conservation and sustainable of agro-biodiversity.

Plant breeder

Provide technical support to project staff and other project participants for the implementation of the following activities;

- advice and assistance in participatory plant breeding techniques, including identification selection and multiplication of land races
- Management of wild relatives of crops in uncultivated patches, habitat strips and corridors

Agro-ecologist

Provide technical support to project staff and other project participants for the

implementation of the following activities;

- Assistance with the agro-ecological surveys, including characterization, documentation, and assessment of plant genetic resources at project sites
- Guidance on the development of impact indicators and the implementation of impact monitoring methodologies for measuring changes in the agro-biodiversity of crop target species resulting from project activities.

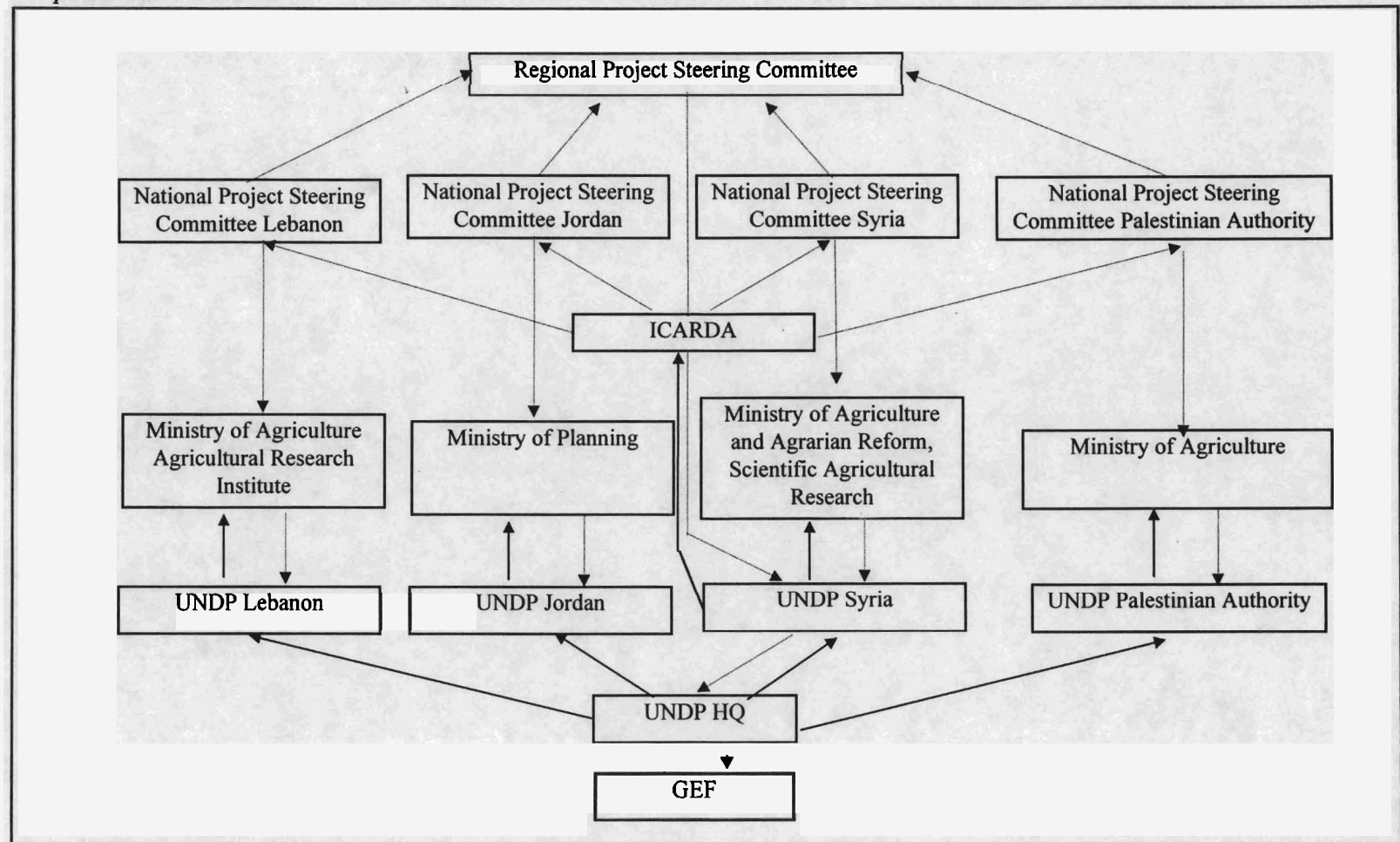
In-situ conservation specialist

Provide technical support to project staff and local stakeholders for the implementation of the following activities;

- Provide advice on uses and the development of uses for generating income from the management and conservation of the wild relatives and land races of crop target species.

VI. Framework for effective participation of national and international staff

Implementation Structure



Key : = Reporting flow : ————— = Financial flow

1.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.

2.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;

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

Meeting members

- Regional Co-ordinator (chair)
- National Co-ordinators/ Project Manager
- Concerned Scientist from participating organisations

3.National Project Steering Committee

A National Steering Committee will be established to co-ordinate and approve the project activities of the annual National Work Plan and budget. 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 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.
- 5) The National Project Steering committee will receive recommendations from time to time, from the Lebanon National Co-ordination Committee relating to other biodiversity projects to avoid overlap, and promote complimentarity, between projects.

Committee members

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

- Regional Co-ordinator
- The GEF Operational Focal Point
- The UNDP Representative of Lebanon
- Project Manager
- Designated Representative from the Executing Agency (Ministry of Agriculture) (Chair)

4.National Technical Planning Meetings

Terms of reference

National Technical Planning Meetings will be held once a year and prior to the National Project Steering Committee Meetings. The Project Manager will call additional interim meetings based upon need. The Project Manager will work with project staff, supporting national institutions, 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 the 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 resource allocations and budgeting.

Meeting Members

The meetings will be chaired by the Project Manager and include;

- Regional Co-ordinator
- Project staff, including international consultants;
- related ongoing project representatives;
- local participating unit representatives from the Ministry of Agriculture;
- Representatives from participating NGO's;
- Universities; and
- Representatives from local beneficiary groups, including local farmers co-operatives

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. (The GEF Project will address species marked in bold and with an asterisk)

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

TABLE 1. TARGET AREA/CROP GERmplasm MATRIX

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

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

VIII Target Area Descriptions

1. Baalbek

Location:

This area extends from the town of Baalbek in a semi-circle of 15-km radius to the north, south and west. The villages covered will be: Hosh Sneid, Talia, Nabi Rashade, Hosh Barada, Hosh dahab, Hosh Tal Safie, Majdaloun, Shlifa, Deir Al Ahmar, Btedeji, Mrah El Sultan, Kasr El Banat, Yammouneh, Makneh, Iaat, Kfardane, Shaat, Tahoun El Moutran, Manara.

Topography:

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

Climate:

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

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

Land use:

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

Flora and Agro-biodiversity Significance:

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

Threats:

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

Incremental Activities:

The project at this site will focus on farm conservation of landraces and rehabilitation of forest and rangelands

2. Aarsal

Location:

This site is situated north East of the Baalbek Valley, a part of the Anti-Lebanon mountain range.

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

Climate:

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

Soil:

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

Land use:

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


Flora and Agrobiodiversity Significance:

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

Threats: Deforestation and overgrazing.

Incremental Activities:

The project at this site will focus on in situ conservation of the wild relatives of the target



fruit trees, and regeneration of rangeland by promoting indigenous forage grasses and legumes, thus enhancing their conservation (Table VII).

IX Relevant On-going Research and Development Projects

1. The Lebanese Agricultural Research Institute

LARI has been, since March 1996, coordinating a network activity in the village of Aarsal aiming at achieving more crop-livestock integration and improving the Rangeland productivity in collaboration with different institutions (the American University of Beirut, ICARDA, The Baalbeck Hermel project, IFAD and Aarsal Rural Development Association).

The network workplan covers the following activities:

- Testing and introducing new barley lines into 3 zones: low, medium and high elevations.
- Introducing new forage legume lines into barley-fallow rotation and fruit tree yards
- Demonstration on Rangeland management and improvement
- Reseeding, phosphate application and protection
- Shrub plantations
- Conducting a study on the economics of small ruminant production
- Conducting seminars and workshops on crop-livestock integration aspects
- Introducing feed block technology

2. Regional Economic and Social Development Program for Baalbek-El-Hermel

This program relates directly to the target site at Baalbek in Lebanon. Progress achieved in the eradication of illicit crops in the area led to the implementation of an integrated rural development program to provide immediate assistance to the small and medium scale farmers and their families. This has now evolved into a Regional Economic and Social Development Program with a budget of more than US\$ 300 million for a period of five years, financed through Government, multilateral and bilateral donors and UN agencies.

In the context of this project, several training courses were provided to different civil servants at the Ministry of Agriculture on

- Range improvement and management
- Cereals and legumes
- Water management

In addition to several in-service training carried out in collaboration with ICARDA, ACSAD and LARI on:

- Pilot area and micro-catchment farming, soil conservation & water harvesting
- Range improvement and management
- Agrologic and agricultural techniques

The same project has subcontracted ICARDA on a project that includes :

Seed increase of improved released varieties of barley and forage legumes in order to improve on crop yields

Demonstration and variety trials of released and promising varieties for further assessment, adoption, and release of improved varieties

Involvement of farmers in the assessment and selection of improved varieties through on-site training and workshops
Establishment of cooperative links between the project and ICARDA to work in the target area

3. Strengthening of national capacity and grassroots in-situ conservation for sustainable biodiversity in Lebanon

Project number: LEB/95/G31/ /1G/99

Start date: November 1996

Duration: 5 years

Financing: \$2,500,000

The project is strengthening the capacity of NGO's for the management of protected areas. Activities related to objectives of this project include; capacity building in ecological survey techniques and the use of GIS; public awareness and educational campaigns in conservation issues in Lebanon through documentaries and TV spots and educational materials; and income generation from biodiversity conservation

4. National Biodiversity Strategy and Action Plan, and Country Report to the Conference of the Parties

Project number LEB/97/G31

Starting date: October 1998

Duration: one year

Financing: \$145,000

This project follows on from the biodiversity country study project financed by UNDP. The main elements of the project include the establishment of a multi-sectoral National Steering committee, biodiversity assessment on the basis of existing knowledge, identification and analysis of options through extensive dialogue and consultation; elaboration of a National Biodiversity Strategy and Action Plan, and preparation and submission of the report to the CoP.

5. National Action Program to Combat Desertification in Lebanon

Project Number: LEB/97/014

Estimated start date: 1. 1. 1998

Duration: 2 years

Financing: \$ 275,000

The project aims at assisting the government to prepare and implement a National Action Program within the framework of the UN Convention to Combat Desertification. The NAP will define the actual state of Desertification and land use degradation, the reasons for this degradation, the strategy to be adopted and the priority actions to be undertaken at all levels of intervention.

6. EU vegetative cover project

The project, executed at the Ministry of Agriculture, aims at protecting the vegetative

cover in Lebanon especially the forests in finding the appropriate equilibrium between the natural resources and the socio-economic demand.

In this context, the project will cover the elaboration of management plans including scientific assessment and the execution of some field activities on three representative sites in the country.

7. ONF project to combat forest fires in Lebanon

Start date: 13 June 1997

Duration: 2 years

The project, executed at the Ministry of Agriculture, aims at building the capacities of forest guards and engineers of the Ministry through training, technical assistance and procurement of required equipment to combat and prevent forest fires in Lebanon

8. The National Remote Sensing Center

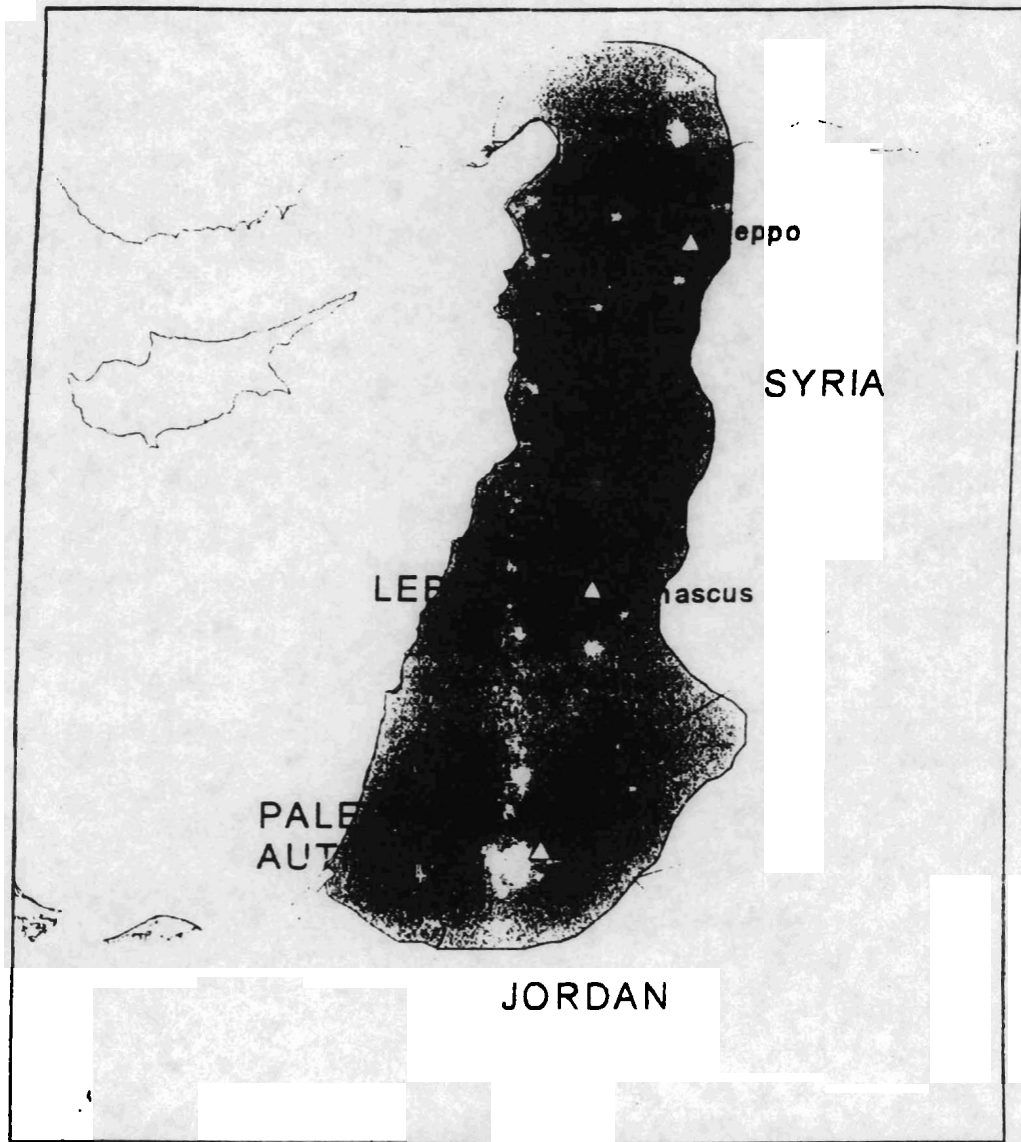
As part of the National Council for Scientific Research (CNRS), the Remote Sensing Center plays a pioneer role in securing data and structured information for developments and environmental concerns. Among his direct objectives, the following is directly correlated with this project:

- Assisting public & private organizations to plan and implement the use of remote sensing and GIS in their operations with emphasis on environmental & cultural concerns
- Securing databases from satellite imagery in different areas and disciplines
- Looking to establish the needed in-house and field support systems, laboratories and ground truthing for confirmation of sensed data
- Formulating and advising on actions and policies related to conventions, protocols, agreements, or other matters related to remote sensing with regional and international counterparts or governments.

Some on going RSC projects:

- Management, protection and sustainable use of groundwater and soil from contamination (ACSAD, Germany)- Regional
- Delineation of natural resources relating to pedology and soil conservation
- Application of remote sensing in the Baalbeck archeological area (UNESCO, Italy)

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



Key:

Shaded Area Levantine Uplands Centre of Plant Diversity

Target Sites:

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

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/Livestock production in West Asia and North Africa. Phase II; ICARDA's core programme (projects 1.1, 2.2, 2.3, 2.4, 3.1, 3.2), Government of Jordan: Rangeland protection Project, IPGRI, (project C12).
Alternative ICARDA Government in-kind contributions
- 3. Social, Economic and Policy Issues**
Baseline Government of Jordan: National project on diversification of income (credit); ICARDA's on-going core programme (project 4.3)
Alternative ICARDA; Government in-kind contributions
- 4. Institutional and Human Resource Capacity Strengthening**
Baseline UNDP: Strengthening of national Capacity and grassroots in-situ Conservation for Sustainable Biodiversity in Lebanon.
Alternative ICARDA; Government in-kind contributions
- 5. Programme coordination**
Baseline none
Alternative ICARDA, IPGRI, ACSAD & Government in-kind contributions in addition to the present project.

