

TUNISIA
HERBAL AND MEDICINAL PLANTS PROJECT (HMPP)

Preparation Mission
26 February – 6 March 2002

Aide Memoire

1. A mission, comprising Messrs. Scott Christiansen, International Program Leader and Mission Leader, U.S. Department of Agriculture, Agricultural Research Service (USDA-ARS), Ibrahim Shaqir, International Affairs Specialist, Middle East and North Africa (USDA-ARS), Edward Garvey, Botanist and Plant Exchange Officer (USDA-ARS), Mustapha Bounejmate, Research Project Manager, Forage and Sown Pasture, (International Center for Agricultural Research in the Dry Areas (ICARDA)) and Mohamed El-Mourid, Regional Coordinator, (ICARDA, North Africa Regional Program) visited southern Tunisia to launch the Herbal and Medicinal Plants Project (HMPP). The mission was joined from 28 February through 1 March 2002 by Ms. Merritt Chesley, Regional Agricultural Attaché, (U.S Embassy, Morocco – also serving Algeria and Tunisia) and Mr. Salah Mahjoub, Agricultural Specialist, U.S. Embassy, Tunis. The mission worked closely with Messrs. Mohamed Neffati, HMPP Manager and Director of Research and Training, (*Institut des Régions Arides* (IRA)), Hoceine Khatteli, Director General (IRA), project team members and stakeholders.
2. The mission worked with the Project Management Unit (PMU) to reschedule the project implementation to begin officially on 1 March 2002 because of an unanticipated delay in the transfer of funds from the USDA's Foreign Agricultural Service (FAS). The mission members and project participants reviewed progress to date, planned upcoming project activities, and made recommendations for future work.
3. The mission met on 1 March with Mr. Hoceine Khatteli, Director General of IRA, to report on the mission progress and to outline the issues to be discussed in detail prior to the wrap-up meeting with the Project Manager on 2 March 2002. It was agreed to send financial and progress reports three times per year, i.e. by 30 April, 31 August and 31 December. The document sent by 31 August will also serve as the annual report for each year, as it will be in better synchrony with the Mediterranean agricultural cycle. Supervision missions will take place at least once per year.
4. The mission traveled to Tunis from 2-6 March, visiting Mr. Mohamed El-Mourid his staff at the ICARDA office who organized visits to the following institutes:
5. ***Institut National de la Recherche Agronomique de Tunisie (INRAT)*** - The mission gave presentations about the structure and organization of ARS and the National Plant Germplasm System (NPGS), toured the INRAT facilities and made several suggestions about the potential for future interaction with ARS and INRAT to Director General Netij Ben Mechlia including (a) cooperation with the USDA-ARS National Agricultural Library (NAL), (b) submission of joint research proposals to the USDA-FAS Scientific Cooperation Research Program (SCRIP), and (c) sabbatical visits from ARS scientists through a new Science Fellowship Program with U.S. Embassies and USDA-FAS-ICD-RSED.
6. ***Institution de Recherche et d'Enseignement Supérieur Agricole (IRESA)*** - The mission met President Abdelaziz Mougou and traded information of mutual benefit. Three topics of very high priority to IRESA that may be of collaborative interest to ARS are (a) problems of drought, water stress and salinity, (b) biotech research, public awareness and capacity building, and (c) aquaculture using geothermal water in the south of the country.

7. **Ministere de l'Environnement et de l'Aménagement du Territoire (MOE) and the Centre International des Technologies de l'Environnement de Tunis (CITET)** - Madames Amel Benzarti, Director General, and Amel Jrad, Laboratory Director of CITET provided a helpful overview and summary of CITET activities. Madame Zeineb Belkhir and Mssrs. Abdelhakim Issaoui and Nabil Hamada outlined many of the important tasks of the MOE, one of which is to set up a national genebank, a task well on its way to full implementation. Ideas of interest included a train-the-trainer effort to familiarize MOE staff with the "pcGRIN" software available through USDA-ARS. If resources could be raised, the U.S. side would seek the involvement of ICARDA or IPGRI to organize a follow-up activity to diffuse the skills to others in Tunisia and the region. Discussion also turned to the idea of establishing an herbal and medicinal plant garden with the University of Monastir, which is a partner in the HMPP. The USDA-ARS manages the U.S. National Arboretum and its National Herbal and Medicinal Plant Garden in Washington, DC. The Arboretum regularly organizes training courses and has taxonomists and other skilled staff available who might backstop the Tunisian initiative if resources could be developed. Finally, the mission informed Madame Belkhir that the project was being prepared in a fashion that would allow it to be transformed into a GEF project by applying for a \$50,000 GEF/PDF-Block A Grant at the end of the current phase of work. – ideas that would be brought to the attention of other decision-makers within the MOE.

8. The mission is grateful to IRA, ICARDA and their staff in Medénine and Tunis, respectively for support and cooperation that permitted the mission to meet its goals in a short period of time. The aide-memoire reflects the findings of the mission, objectives, progress and lists jointly agreed upon next steps in the implementation of activities designed to yield desired outputs by the end of February 2004.

9. **Project objectives:** The overall objective of the project is to improve livelihoods in rural areas through sustainable use, conservation, management, and marketing of herbal and medicinal plants in southern Tunisia. The project's specific objectives are to:

- (i) Prepare a national database on indigenous medicinal and herbal plants, starting with southern Tunisia, with a view to assess their use and status within key ecosystems;
- (ii) Conserve, manage, and sustainably use, both *in situ* and *ex situ*, medicinal, herbal and aromatic plants in arid and semi-arid areas;
- (iii) Strengthen collaborating partnerships to form a coalition of stakeholders, i.e. farmers, agricultural associations, extension services, NGOs, scientific research institutes, faculties of pharmacy, universities, etc. to add value to medicinal, herbal and aromatic plants through processing, chemical analysis and marketing; and
- (iv) Improve public awareness of the importance of medicinal plants and build on traditional knowledge and cultural heritage.

10. **Project description:** The HMPP will permit project participants to test and validate widely agreed-upon activities for commercialization and conservation of several key species, i.e. allium, caper, rosemary and artemisia and a longer list of 10 or so species that will be developed as "pipeline" species for future work, grown within three main land tenure categories, i.e., (a) privately held land, (b) common land managed by a community and (c) state land set aside as forests or protected areas. In addition to developing practical models of plant exploitation, the project will conduct an analysis of the herbal and medicinal plant sector and develop a consortium of stakeholders to define constraints and market opportunities. The current phase would last two years and be supported by U.S. owned Tunisian Dinars (PL480 Section 108-f); however, the effort is expected to continue as a development project lasting five years. Current and future project activities will be organized according to the following components:

11. **Component 1: Socioeconomic analyses.** The project will provide for a social, economic, and market analysis at the international, national and local level. The project team agreed to summarize existing information and analyze current consumption and use, farming systems and marketing channels for producing and selling herbal and medicinal plants. In addition, IRA scientists will assemble and

present GIS layers to characterize the climate (temperature, precipitation), soils, topography, land tenure, demography and farming systems in the target areas selected for the project.

12. **Component 2: Genetic resources management.** The project will: (a) collect and conserve herbal and medicinal plants by means of both *ex-situ* (short-term, long-term, black box) and *in-situ* methods for plant genetic resource conservation; (b) develop a database modeled after the USDA-ARS Genetic Resource Information System (GRIN), and (c) multiply plant materials that will enable them to be tested in practical systems of production (Component 4). GIS layers will characterize the collection missions to date, including collection sites and frequency of the herbal and medicinal target species found within the relevant phyto-geographical zones.

13. **Component 3: Institutional assessment and project partnership arrangements.** The project will include participation of partners for the following functions: (a) project management (IRA); (b) agricultural association(s) that represent farmers (UTAP); (c) extension agencies (CFRA, CRDA, IRA) (d) food science institutions; (e) pharmacists from the university and private sector (f) marketers and exporters from the private sector; and (g) development agencies. Relative levels of participation were discussed for various aspects of the project and listed in Appendix 1.

14. **Component 4: Systems of production.** For each of the target species, from each of the land tenure categories (i.e. private, common and state lands) the project will provide for: (a) agronomic research and extension (bulletins, farm notes, *fiche techniques*); (b) product development and marketing (collaboration with food scientists, chemists, vegetable wholesalers for fresh or dry plant materials); and (c) conservation for each of the species (inventory, *in-situ* and *ex-situ* monitoring, collection, multiplication).

15. **Component 5: Training and regional cooperation.** The project will provide (a) training to meet project objectives, (b) country-to country exchange of experience; (c) workshops focusing on special issues; and (d) coordination, planning and reporting meetings.

16. **Component 6: Project Management.** A Project Management Unit (PMU) will be established to provide for: (a) planning, implementation and reporting; (b) financial management; (c) coordination among the stakeholders (d) a periodic gathering of the Steering Committee members which will be composed of members from IRA (Director General and Project Manager), ICARDA (NARP Regional Coordinator and Research Project Manager for Sown Pasture and Forages), USDA (International Program Leader, Office of International Research Programs), and one representative each from the MOA, Ministry of Health, IRESA and UTAP.

17. **Project cost and financing:** The total project cost is estimated at about USD \$250,000 (TD 371,500). A subsequent GEF project will be formulated by completing a Project Appraisal Document (PAD) which will be requested at a level of USD \$5 million from GEF with at least an equivalent amount co-financed from Tunisian and partner resources. Throughout the cooperation, each project partner will attempt to bring additional resources to the project, which shall be discussed and approved by the Steering Committee.

18. **Next steps:** Appendix 2.

19. **Terms of reference by component during 2002-2004:** Appendix 3

20. **PAD Terms of reference:** Appendix 4.

21. **PAD Next steps:** Appendix 5.

22. **Contacts and addresses:** Appendix 6.

23. **List of acronyms:** Appendix 7.

Appendix 1: Possible HMPP participants and estimated relative degree of involvement during the project.

Participant	Project Element					
	Supervision	Training	PGR work	Target audience organization & socio-economics	Agronomy & post harvest	Public awareness & marketing
Farmer	-	X	X	XX	XXXXX	XXXX
UTAP	-	X	-	XXXXX	XX	XXX
NGO	-	XX	XX	XXX	X	XX
Agricultural credit	-	XX	-	X	XXX	X
Processing industry	-	-	-	-	XXXX	XXXX
Industrial-distillation	-	-	XX	X	XX	XX
Universities	-	XXXX	XXXX	-	XXX	X
Pharmacists	-	X	XX	-	X	X
MOA-DGF	-	X	XXX	XX	XX	X
GEF	XX	X	XXXX	XXX	XX	XXXX
BADEA	X	X	-	XX	XX	X
World Bank	XXXXX	XX	X	XXX	X	XXX
IRA	XXX	XXX	XXXXX	XXXX	XXX	XXX
ICARDA-NARP	XXXXX	X	X	X	X	X
ICARDA (Research)	X	X	XXXXX	X	XXXX	X
USDA-ARS-OIRP	XXXXX	X	XX	-	XX	XX
USDA-FAS-ICD-RSED	XXXXX	X	-	-	-	-
USDA-NGRL	-	-	XXXXX	-	XX	-
USDA-FAS-SCRIP	X	XXXX	XXXX	-	-	-
Cochran Fellowship	X	XXX	X	X	XX	XXXXX

Appendix 2: Next steps matrix

<i>Action</i>	<i>By whom</i>	<i>Action Schedule (2002)</i>
Confirm short- and long-list of target species	IRA Project Manager	Estimation 15 March; verification 15 June
Develop justification and 1 paragraph abstract for all stakeholders	IRA Project Manager IRA DG	Confirmation by 1 June
Provide fiche techniques for the model plants	IRA Project Manager	1 August
Visit relevant activities in the north of Tunisia	IRA Project Manager, ICARDA NARP RC	1 September
Initial socio-economic studies		
Local	Socio-econ Team Leader	31 December
National	Consultant from MOA	31 December
International	USDA-ARS-OIRP/NAL ICARDA, Consultant	NAL literature search by 1 July; Market study by 1 September; final 31 December
Order capital equipment	IRA Project Manager	1 May
Submit request for a training course from ICARDA-TCU	ICARDA Researcher	Submit with trip report / when requested TCU
HMPP training plan for this year	IRA Project Manager	1 April
It is recommended that HMPP technicians/researchers spend 1-2 weeks at ICARDA/Syria to work with the GRU staff.	IRA Project Manager	During 2002
Prepare study tour to Jordan and Lebanon	IRA Project Manager, ICARDA RC, Researcher	Determine whether to proceed with 2002 tour by 1 April; if not, reschedule for 2003
Summarize Tunisian projects with relevance to the HMPP	IRA Project Manager	1 May
Establish a website that describes the project	USDA-ARS-OIRP	1 June
Collection and review of Tunisian and regional HMP literature	IRA Project Teams ICARDA Researcher	Collection 1 August Review 1 December
Plan and implement annual report, financial report and possible coordination meeting	IRA Project Manager, ICARDA RC, Researcher	1 September
Provide contact information about MEDUSA project in Greece	ICARDA Researcher	1 June
Provide references on existing onion and garlic packages	USDA-ARS-NGRL	1 April
Prepare USDA-FAS-ICD-RSED-SCRIP proposal(s)	USDA-ARS-NGRL	1 September
Prepare USDA-FAS-ICD-RSED Cochran proposal	USDA-ARS-OIRP IRA Project Manager	1 September
Prepare USDA-FAS-ICD Exchange visit proposal	USDA-ARS-OIRP	Will investigate by 1 April, if possible proposal prepared by 1 August

Appendix 3: Terms of Reference (TOR) for Component Activities

1) Socio-Economic Survey

The survey will assess the supply and demand of medicinal plants used for human and livestock healthcare needs. Social and economic aspects will be emphasized. For the sociological work the following will be accomplished: (i) rural community use and dependency of residents on medicinal plants and traditional knowledge of their use, including major species used (human and livestock), frequency, sustainability of supply and cost; and (ii) urban use that will focus on major species used (human), availability and volume of raw materials, origin (local, imported), traded, consumers, cost. Economic aspects of markets for herbal and medicinal plants should study prices, imports, exports or potential for trade at the local, national and international levels. The role of women in collecting and purchasing herbal and medicinal plants in urban markets should be identified.

The team should include: a resource economist, botanist, ethno-pharmacologist, and a systems production specialist. The consultant or team should suggest ways in which the project can address problems of supply and demand, community collaboration and participation in identifying strategies for conservation and management of reserves and wild resources. The following factors need to be examined:

Market factors:

1. Size (number of vendors) and prospective growth of the herbal and medicinal plant market,
2. Marketing and distribution infrastructure (
3. Export sales potential
4. Major herbal and medicinal species used and associated crops in the market;
5. Source (free, purchased);
6. Origin of materials (local, outside region); if outside region, from where;
7. Volumes per species or parts thereof;
8. Value (cost per gram per species or parts thereof);
9. Major market locations in southern Tunisia;
10. Clientele (women, men, other traders, pharmaceutical companies, herbal processors/herbalists);

Production factors:

1. Availability (seasonal, year round) and cost of local herbal and medicinal plants, water and other non-labor inputs;
2. Availability (seasonal, year round) and cost of herbal and medicinal plants from other countries;
3. Transportation, port and warehousing facilities;
4. Vendor gender, age, knowledge, background;
5. Approximate volume of plants materials available for sale;
6. Days per week markets open;
7. Source of raw materials (local and imported);
8. Availability of supplies;
9. Preference (Tunisian, imported);
10. Industrial uses and magnitude of production (pharmaceutical, cosmetic and food uses)

The team will prepare a budget for field activities, data analysis and report writing. To include:

- days expected in the field; number of field personnel; per diems (accommodation, meals); field transportation costs; collecting, identification, specimen drying, storage costs; data analysis and report writing (days).

2) Medicinal plant inventory and database

An inventory of indigenous herbal, medicinal and aromatic plants currently used by inhabitants of the target regions will form the foundation of all activities related to medicinal plant conservation, management and sustainable use as defined under the project objectives. This inventory will provide the base information such as target species population locations and densities, species diversity, traditional methods of harvesting and utilization, and existing threats to the target species populations, which are needed to understand the current status of these plants in southern Tunisia. The team leader will identify, organize and manage a team consisting of a botanist, social anthropologist and ethno-pharmacist. Such individuals should appreciate the broad holistic aspect of the project and be willing to work within their own unit as well as with other teams. Special emphasis should be placed on the knowledge of the role of farmers and particularly women in the management and use of medicinal plants for human and livestock needs.

It is essential for the success of a germplasm resources conservation program for those involved to understand the differences in goals, objectives and subsequent activities between a germplasm conservation program and a research project involving the collection and evaluation of germplasm. One of the biggest differences is in the initial collection of the germplasm involved. A conservation program should base collection efforts on attempting to capture a reasonably comprehensive sample of the existing genetic diversity within the target taxon and not just those plants expressing currently desired agronomic or morphological traits. Selections made either at the time of the initial collection or in the regeneration and evaluation activities should be re-accessioned using an additional accession number. Proper cleaning, drying, packaging and storage of the seeds should be a priority activity. Maintaining complete and accurate data in a readily accessible database on all accessions is essential. Regular monitoring of the germplasm in both *in-situ* and *ex-situ* programs is required.

Specific activities include:

A. Inventory of the target areas

- usually conducted when the target plants are in an active stage of growth. Some target taxa may require the plants to be in flower for proper identification;
- knowledge of the environmental requirements of the target plants will guide the collection team as to where in the target areas to conduct the inventory;
- east-west or north-south transits within the proper ecological niches should be used to obtain the best population samples.

B. Seed Collecting

- seeds should be collected using the same transits developed in the Inventory step;
- sufficient quantities of seeds should be collected whenever possible to reduce the need to immediately increase the seeds to support the *ex-situ* conservation and research needs;
- seed collection should be conducted using the published FAO standards for seed collection of genetic resources, which minimizes the impact to the plant populations;
- to meet the requirement for seeds it is preferred to increase the number of plants sampled and not collect all the seeds available in a given area;
- for germplasm management purposes, it is important to limit the actual numbers of accessions collected. An accession should try to represent genetic uniqueness which would be found in distinct geographical or ecological populations of the target species;
- complete “passport data” should be collected on each accession;
- accessions should be documented through herbarium vouchers and photographs;
- collection locations should be identified using a GPS unit.

C. Seed Regeneration

- in cross pollinated crops, pollen contamination between accessions needs to be prevented. This is usually done by physically separating the accessions in the field and the use of border rows. The distance between accessions is dependent upon the pollination characteristics of the taxon;
- for *ex-situ* conservation purposes steps need to be taken to maintain the genetic integrity of the accession. Any selections made within an accession should be re-identified using an additional accession number.

D. Ex-Situ Conservation: Seed Storage

- because of the many activities already within the project, medium-term seed storage and not long-term seed storage should be the priority for this project. Specific seed storage recommendations for many taxa are readily available but probably don't exist for the taxa involved. Some modifications for the target taxa will likely be required and consultation or collaboration with a seed scientist should be considered;
- sufficient seeds should be stored to handle distribution, viability testing and research needs for at least 5 years;
- seed viability needs to be regularly monitored and results need to be made part of the inventory record;
- as *ex-situ* conservation is a stated activity within this project, seed storage needs to be of equal importance as the other stated activities and not just a place to store excess seeds;
- seed regeneration will eventually be required and should be planned. For management purposes it is best to schedule a set number of regenerations each year rather than wait until the entire collection drops below the set threshold level. Results from viability testing will indicate when the scheduled regenerations should begin.

E. In-Situ Conservation

- ideally this would be located in a state or nationally protected area and outside the area of development. Grazing by domestic animals would have to be managed. In this situation, initial inventory of the target area with periodic monitoring and maintenance of the collected data may be sufficient;
- to have *in-situ* conservation within the area of development, the development, monitoring and enforcement of sustainable harvesting methods is essential. Grazing by domestic animals will have to be closely managed or possibly eliminated from the target area.

G. Database development and maintenance

- this is an essential component of all germplasm conservation programs - *in-situ* as well as *ex-situ*;
- should include sections on accession data such as the passport data, a taxonomy section to insure uniform and proper plant nomenclature, an inventory section identifying the precise location and type of germplasm such as seed, field collections, *in-situ* locations, propagation areas, herbarium records and photographs. Maintenance of distribution records and information on evaluations should also be included in the database and tied to each accession. The USDA-developed pcGRIN is recommended for use as a model database. Linkage of the database with GIS layers, photographs and other graphics are also important and should be included;
- security of this database is extremely important and steps must be taken to protect it from viruses and the corruption and loss of data. This is achieved through maintaining regularly updated virus protection programs, limiting the number of people who can add and change the data within the database, and the regular back-up of the data and the storage of the data both onsite and off-site.

3) Systems of production

This component will focus on identifying medicinal species whose future economic conversion and sustainability can best be guaranteed by cultivation or management *in-situ*. This will require the identification of potential collaborating rural communities and knowledge of local environmental conditions, existing food and cash crops and compatibility. Women play an important role in all phases of agriculture, plus their knowledge of medicinal plants makes it imperative that they be consulted and seen as partners in identifying cultivation practices. It is expected that the team will include agronomists (dryland experts and those specializing in irrigation) and farmers knowledgeable of local agricultural practices.

Specific activities include:

Rainfed or rangeland species

- potential species suitable for cultivation;
- ecological and agronomic requirements in the wild (soil, pH, light, moisture, etc);
- adaptation of plants to cultivated conditions;
- characterization of germination requirements and/or potential difficulties (examples);
- tolerance to intra- and inter-specific competition;
- resistance or vulnerability to insect pests and plant pathogens;
- potential harvesting problems;
- requirements of storage to best maintain biological and therapeutic activity;
- ease of processing;
- description of community and farmers interest in participating in the project;
- amount of land communities/farmers can make available;
- possible yield to be expected; and
- recommend best placed communities, species and requirements for sustainable cultivation
- development of sustainable harvesting methods;
- enforcement of sustainable harvesting methods by local people.

Irrigated land

- locations of irrigated agriculture (government, privately owned land)
- potential species suitable for cultivation;
- potential adaptability of species to irrigation;
- possible affect on yield, content of active ingredients, therapeutic activity;
- basic questions as identified as above;
- recommend potential locations, species and requirements for irrigated cultivation.

The team will prepare a budget for field activities, equipment, data analysis and report writing including:

- days expected in the field
- number of field personnel
- salaries and per diems (accommodation, meals)
- field transportation costs
- capital equipment and expendables
- chain of production costs: planting, managing, harvesting, specimen drying, processing, extracting, packaging, storing and marketing
- data analysis and report writing (days)

5) Institutional Analysis and Assessment

The team or consultant should address the following issues to assemble functional inter-relationships and teamwork in the project.

Institutional Mandates: The institutional mandate of each of the major institutional (government, NGOs, private sector and Universities) stakeholders that have a role in plant and ecosystem conservation.

Relevant Current Experience: The current level of activity and expertise of the units involved in any aspect of medicinal and other plant biodiversity conservation and resource management.

Background Documentation: For each of the institutions involved review the information contained in the websites and libraries on medicinal and herbal plants.

Financial Infrastructure and Co-financing: The level of budget support and other sources of revenue to carry out programs (including any partnerships with the private sector and or other international organizations and donors).

Proposed Institutional Mechanisms: Based on the identification and diagnostic of the key institutional stakeholders, the consultant or team will propose the institutional mechanisms that are pre-requisites to the delivery of the activities proposed within each of the project components.

Alternative Institutional Mechanisms: If the existing agencies and ministries lack the degree of autonomy, budget, planning and execution capacity required to carry out the proposed program, the team or consultant will also investigate and propose other mechanisms for the delivery of this project and direct benefits to the identified beneficiaries.

Comparative Advantages and Coordination: The consultant or project team will be responsible for the identification and analysis of the administrative as well as technical expertise of the proposed agency for the implementation of the project (IRA). This will be assessed against the specific roles to be handled by other government agencies, the comparative advantage of each of the government agencies, and their needs for training to enhance the capacities that will be required in the Project Management Unit.

Partnership Arrangements: The consultant or project team will also suggest the best ways of engaging in partnerships to be established between the government agencies, beneficiaries, NGOs, academia, and the private sector.

Appendix 4: Terms of Reference (TOR) for a Project Appraisal Document (PAD) for the Herbal and Medicinal Plants Project in Tunisia

Project Background

The flora of Tunisia is rich in medicinal and herbal plants. In addition to enhancing health care and well-being medicinal and herbal plants contribute to soil protection as they cover a significant percentage of the soil in the range and forest areas of Tunisia. Medicinal and herbal plants are important for the well-being of the population, especially of the rural poor who depend on these resources to treat human and livestock ailments and diseases. Additionally they generate income, in particular for the resource-poor people, especially women, who are involved in most of the fieldwork, processing and marketing of medicinal plants. Preserving of these species and knowledge of their uses will require specific intervention to ensure that these knowledge and plants are not lost through environmental degradation, agricultural expansion and over-exploitation. The project will support the conservation, management, and sustainable utilization of medicinal and herbal plants in Tunisia, while contributing to development of effective *in-situ* protection of threatened habitats and ecosystems.

Project Development Objective

The development objective of the proposed project is to improve the livelihood and health of communities through the conservation, management, and sustainable use of medicinal and herbal plants for human and livestock needs in Tunisia while ensuring effective conservation of these plants using *in-situ* and *ex-situ* methods of plant genetic resources management. Progress will be determined by:

- a) threats to medicinal and herbal plant species are diminished and key biodiversity areas identified and protected;
- b) a functioning database and monitoring system is established and operational;
- c) communities participate actively in conservation, management and income generating programs.

Project Global Objectives

The global environmental objective of the proposed project is the improved conservation and sustainable use of medicinal and herbal plants (several of which are rare and endemic, and thus of global importance at the national and local level in the selected areas) through achieving the following objectives over and above the Baseline Scenario:

1. Establishing a policy framework for medicinal and herbal plants biodiversity
2. Conservation and management
3. Institutional strengthening and implementation of a coordination program
4. Implementing of a community-based support program
5. Designing and implementing of a communication strategy

Project and Institutional Context

Tunisia was one of the first countries to sign and ratify the Convention on Biological Diversity, signing in June 1992 in Rio de Janeiro and ratifying in May 1993. Tunisia's long-term objective is to ensure the protection and conservation of the broadest possible range of global biodiversity and its rational use. The Ministry of Environment and Land Use Planning (MOE) has been mandated to be the focal point for GEF projects. MOE is also mandated to establish and manage wildlife reserves and currently manages 8 reserves and 2 national parks. The Ministry of Agriculture (MOA) recognizes the importance of conservation and sustainable use of medicinal plants to meet agricultural diversification objectives and enhance the efficiency of land and water use. IRA, MOA and MOE are conserving herbal and medicinal plant genetic resources through traditional protocols while they are working to establish new legislation, as called for in Specific Project Objective 16 of the National Strategy on Biological Diversity (p.32

English version, April, 1988). Medicinal plant field crops with industrial value, particularly aromatic plant extracts are a tradition in Tunisia but the processes may be technically upgraded.

The *Direction General des Fôrets* (DGF), MOA is seriously trying to compensate the loss the forests and rangelands through re-forestation programs, range management, law enforcement and other activities. This is very difficult as it is at times in conflict with efforts to increase agricultural production. The Ministry of Health (MOH) recognizes the important role medicinal plants and their traditional use play in providing for the healthcare needs of Jordanians especially the rural poor. Universities are doing also work on medicinal and herbal plants, e.g. University of Monastir.

The project is consistent with the recommendations of the National Strategy on Biological Diversity (1998) that recommends more work to protect Tunisia's rich diversity of medicinal and herbal plants. The commercialization of medicinal and herbal plants is also recognized as a key component of Tunisia's poverty alleviation and rural development objectives.

Scope of Work

The consultant will carry out the preparation report synthesizing the prepared various project components reports (socio-economic studies, biodiversity inventory and database, the approach to match herbal and medicinal plants to current or proposed farming systems and the Institutional assessments). The preparation report will form the basis for the GEF proposal for review and the World Bank Project Appraisal Document (PAD). The preparation report will include the following:

1. Description of the project area will be drawn from documents supplied to the consultant and supplemented with information collected during the preparation phase. The description will include, summary of project scope and objectives, detailed project description.
2. Project objectives and descriptions: to contain the development, global environment objectives, main project component, including inputs, outputs, and monitor indicators.
3. Implementation responsibilities identify the institutions and organizations responsible for all project activities: implementation agreements between the client and the implementing agencies, participation arrangements, administrative arrangement for project implementation and clarify responsibilities of all involved agencies.
4. Project budget and cost: a break down for all project component costs to be presented in cost tables according to World Bank standards. Including disbursement category. Foreign and local costs will be presented separately.
5. Sustainability: the preparation report will evaluate the financial and institutional sustainability of all project activities and benefits, and propose means to improve the opportunities for sustainability after project implementation.
6. Procurement plan: the report will contain a procurement plan for all goods and services needed for project implementation.
7. The economic analysis: the report will provide a comparison of least cost options for proposed activities to justify the use of all GEF and other funding, and incorporate the incremental cost analysis provided by the World Bank. Detailed economic and financial analysis of the project.
8. Technical assistance: description of all local and international technical assistance needed to support project objectives.
9. Benefits: all benefits of the project to be quantified.
10. Justification and risk: justification for GEF financing and risks (technical, institutional, political) which could jeopardize project implementation, including how the risks will be handled.
11. Major agreement: conditions to be fulfilled by the Government of Tunisia before and during project implementation will be identified. The timing of conditionality will be specified and presented in a form that could allow if necessary for their use as a condition for obtaining initial or subsequent tranches of the GEF grant.

As part of the preparation report the consultant will prepare:

- Plan for Institutional and Capacity – Building needs, this plan will contain:
- All institutional arrangements and management framework required for project implementation.
- All required training to raise capacity of all relevant partner institutions, including physical, professional needs, and goods needs.
- The consultant will prepare fully budgeted work programs.
- Plan for project monitoring and evaluation, to evaluate project implementation.
- The plan will be prepared in cooperation and coordination with all concerned local institutions. The contents of the plan are described in the draft guidelines for project based Monitoring and Evaluation of Biodiversity published by the World Bank.

Reports and Time Schedule

The consultant will submit three reports in English,

- After one month of work in Tunisia, a conceptual report that details all findings and present a preliminary concept for the final report.
- The draft preparation report will be submitted eight weeks after the conceptual one, the preparation of this report is completely dependent on the preparatory surveys.
- The final report will be submitted four weeks after the submittal of the draft report.

Profile of the Consultant

The consultant will have an advanced degree in social sciences and/or biodiversity conservation. It is recommended that the consultant identified have the following skills and areas of expertise: knowledge of the country and its ecosystems, land use and land planning, and the place of plants in the contemporary Tunisian culture and economy; knowledge of relevant Tunisian institutions and their operations; and experience in institutional analysis.

Appendix 5: GEF/PDF-A next steps matrix.

<i>Action</i>	<i>By whom</i>	<i>Action Schedule</i>
Sign contracts for review of the socio-economic work	DG IRA, ICARDA NARP	March 2004
Sign contract for review of the inventory and database of biodiversity	DG IRA, ICARDA NARP	March 2004
Sign contract for review of farming systems adaptation	DG IRA, ICARDA NARP	March 2004
Sign contract for review of institutional assessment	DG IRA, ICARDA NARP	March 2004
Carry out study tour by Project Coordinator and project subject matter experts	Project manager, Team Leaders, Donor Reps and PAD Consultant	April 2004
Submit report of study tour	PAD Consultant	May 2004
Contract subject matter experts to present their components at an external review	Project Manager, Team Leaders	June 2004
Conduct 5-day workshop for adjustments based on constructive criticisms by reviewers	Project Manager, Team Leaders	June 2004
Present draft final reports	Project Manager, Team Leaders	July 2004
Present final reports to Steering Committee, GEF and World Bank	Project Manager, Team Leaders	July 2004
Appoint external PAD Consultant to write the PAD	External Consultant	July 2004
Finalize draft PAD document	External Consultant	September 2004

Appendix 6: Contact names, addresses and contact points

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Appendix 7: List of Acronyms

ARS Agricultural Research Service (USDA)
BADEA: *Banque Arabe pour le Développement Economique en Afrique*
CFRA: *Centre de Formation et de Recyclage Agricole*
CRDA *Commisariat Rurale de Développement Agricole*
CITET *Centre International des Technologies de l'Environnement de Tunis*
DGF *Direction Générale des Forêts* (MOA)
FAO Food and Agriculture Organization (UN)
GEF Global Environment Facility
GIS Geographic Information System
GRIN Genetic Resource Information Network (USDA-ARS)
HMPP Herbal and Medicinal Plants Project
ICARDA International Center for Agricultural Research in the Dry Areas
ICD International Cooperation and Development (ICD)
IFAD International Fund for Agricultural Development
INRAT *Institut National de la Recherche Agronomique de Tunisie*
IPGRI International Plant Genetic Resources Institute
IRA *Institut des Régions Arides*
IRESA *Institution de Recherche et d'Enseignement Supérieur Agricole*
MEDUSA Conservation and Sustainable Use of Wild Plants of the Mediterranean Region (Network)
MOA *Ministere de l'Agriculture*
MOE *Ministere de l'Environnement et de l'Aménagement du Territoire*
MOH Ministry of Health
MOP Ministry of Planning
NAL National Agricultural Library
NARP North Africa Regional Program (ICARDA)
NPLG National Plant Germplasm Laboratory (USDA-ARS)
OIRP Office of International Research Programs (USDA-ARS)
PAD Project Appraisal Document
pcGRIN personal computer-based Genetic Resource Information System (USDA-ARS software)
PDF-A Project Development Facility Block A Grant (GEF)
PMU Project Management Unit
RSED Research and Scientific Exchange Division (USDA-FAS-ICD)
TD Tunisian Dinars
TOR Terms of Reference
USD U.S. Dollars
USDA United States Department of Agriculture
UNDP United Nations Development Program
UNEP United Nations Environment Program
UTAP *L'Union Tunisienne de l'Agriculture et de la Pêche*
WHO World Health Organization