

**Integrated Work Plan of Medicinal and Aromatic Plants
(MAP)
in Arid and semi-arid zones of Morocco**

**PROJECT TITLE: Biological Diversity, Cultural and Economic Value of
Medicinal, Herbal and Aromatic Plants in Morocco**

REFERENCES: Request 5 for Section 108 Funds (Moroccan dirhams)

I. PROJECT PRESENTATION

A. DESCRIPTION OF PROJECT

The overall objective of the project is to support the conservation, management, and sustainable utilization of medicinal and herbal plants in Morocco while ensuring effective *in situ* protection of threatened habitats and ecosystems. The project will be located near Settat, a region characterized by large rainfed grain farms. Because of the lack of income alternatives in this area, this region will be one of the most severely affected as the FTA eventually results in increased imports of US grains and pulses. Medicinal plants offer one of the few viable cropping alternatives to grains in this area. This project is an extension of an on-going project in Tunisia, and is envisioned to extend further to other arid and semi-arid countries in the region.

B. MARKET OVERVIEW

Introduction

One of the major difficulties of assessing the importance of medicinal and aromatic plants and developing a strategy for their conservation and sustainable use is the lack of hard facts about which species are used. What is their detailed distribution, how they are collected or harvested, which species are in cultivation and where, and what are the quantities involved in collection, consumption, and trade. Trade statistics are unreliable as is the identity of the material traded under such names as oregano. Covering plants belonging to more than one genus and several species.

There has been renewed interest in recent years in phytotherapy as well as an increasing awareness for the conservation and sustainable use of biodiversity for local people. The

project is seen as a means to generate income and to sustainably utilize and conserve biodiversity by numerous Moroccan stakeholders that are concerned with medicinal and herbal plants who agree there is a large commercial potential not yet exploited.

Trade Impact

Because of the extreme vulnerability of Moroccan grain producers. In the FTA negotiations wheat was identified as one of 3 so-called “explosive” commodities.

And other grains and pulses were highly sensitive. This project aims to explore alternative income generation in a rainfed region that relies on grains and has few other alternatives (e.g., tourism).

In the Settat region, more than 80percent of the area is devoted to grains (bread wheat, durum wheat, and barley) and pulses. With no large irrigation projects nearby, the region depends on rainfall, which in a normal year is about 350 mm (14 inches) a year, less than in the Texas panhandle. Production varies dramatically, depending on rainfall. In some years, the Settat region can account for up to 15 percent of Moroccan durum wheat production and almost 10 percent of Moroccan production of bread wheat and barley. About 80 percent of farmers in this region have less than 12 acres of land. This area would be one of the most vulnerable in Morocco when/if producer prices for grains are reduced. Without irrigation, there are few other crops suitable for planting, as well as few other economic opportunities.

Morocco has long been a major market for US grains. By offering vulnerable grain producers a possible alternative to cereal production, this project will help lessen the negative impact of the FTA on one of the most vulnerable sectors in the Moroccan economy, there by reducing opposition to the FTA and facilitating the market for U.S. wheat and barley, as well as pulses.

C. PERFORMANCE INDICATORS

Goal

- (a) A comprehensive diversity collected and conserved: endangered species identified; niches of biodiversity identified for in-situ conservation; a herbarium and database established; genetic variability assessed; promising genotypes with chemical and medicinal properties identified.
- (b) Degree of cultivation, marketing and processing assessed; constraints to the sustainable development of the sector identified; the cultural role of medicinal and herbal plants assessed; recommendations for research, policy and management made.

- (c) A mechanism established for coordination and information exchanged within and among countries, and creation of a safety duplication of ICARDA germplasm with germplasm gathered from morocco as well as from Tunisia, Egypt, Jordan, and from other arid and semi-arid areas.
- (d) Improved techniques for commercial production developed.

Objectives

The overall objective of the project is to support the conservation, management, and sustainable utilization of medicinal and herbal plants in morocco while ensuring effective in situ protection of threatened habitats and ecosystems. The project's specific objectives are to:

- 1- Prepare national database on indigenous medicinal and herbal plants, with a view to assess their usage, status, and eco systems.
- 2- Conserve, manage, and sustainably use, both in situ and ex situ, medicinal, herbal and aromatic plants in arid and semi-arid areas.
- 3- Institutionally strengthen collaborating agencies, i.e scientific research institutes, faculties of pharmacy, extension services, universities, NGOs, etc, to add value to medicinal herbal and aromatic plants through processing, chemical analysis and marketing.
- 4- Improve public awareness of the importance of medicinal plants and build on traditional knowledge and cultural heritage.

Activities

- Collect and conserve local species.
- Identify and establish in situ conservation sites.
- Characterize the biology and agronomy of selected species.
- Conduct chemical analysis for selected species.
- Survey cultural and economic values of herbal, medicinal and aromatic plants.
- Develop a CD ROM with information an available germplasm, habitat and distribution, use, published reports, etc.
- Promote involvement of NGO and private sector.
- Enhance regional and international network.
- Conduct field days and awareness workshops.

Participants

- The Center d'Agrodiculture (Arid agriculture Center) is part of the **Institut National de la Recherche Agronomique (INRA)**, the major research body of the Ministry of Agriculture. The Center was created in 1980 by USAID and the Mid-America International Agricultural Consortium (MIAC), a 5-state consortium comprising Nebraska, Missouri, Kansas, and Iowa. Because of this connection, INRA Settat has long had close links to US scientists.
- The **International Center for Agricultural Research in the Dry Areas (ICARDA)** is one of 16 international agricultural research centers that make up the CGIAR system. Based in Aleppo, Syria, ICARDA has a regional office in Tunisia that has been working with FAS/RSED for several years. ICARDA is currently managing six 108-funded projects for RSED in Tunisia, including a project similar to this one on medicinal plants.
- USDA's **Agricultural Research Service (ARS)** will provide expertise and guidance for this project.

Project Management and Evaluation

The ICARDA office in Morocco will manage the funds and the project. (see annex I.) Money will be provided in 2 tranches. The first tranche will be provided at the beginning of the project. The second will be provided after one year, following an interim progress reports submitted to the record of expenses, will be submitted by ICARDA to Carol Kramer -Le Blanc. Director, FAS/ICD/RSED, with a copy to agRabat.

Contributions from other parties

ICARDA, INRA Settat, and ARS will make in kind contributions consisting of:

- Salaries of ICARDA, INRA and ARS scientists.
- Support staff expenses at all 3 institutions.
- Laboratory and equipment usage.

**Integrated Work Plan of Medicinal and Aromatic Plants
(MAP)
in Arid and semi-arid zones of Morocco**

**PROJECT TITLE: Biological Diversity, Cultural and Economic Value of
Medicinal, Herbal and Aromatic Plants in Morocco**

Work plan workshop preparation

Purpose

To develop the plan of work for the new project on the promoting conservation, management and sustainable utilization of Medicinal and Aromatic Plants (MAP) in selected dryland ecosystems.

Background

The project was developed by ICARDA in collaboration with INRA and the funding is obtained from USDA. The project first meeting was held at INRA-Settat on 9 February 2005 and was attended by 34 participants including researchers, extension agents and farmers to discuss the potential activities and target species and sites and to form teams for each project output. Technical backstopping is requested by INRA-Morocco through the North Africa Regional Program to develop the work plan for the two coming years. Dr. El Mourid met on 11 February 2005 with the Agriculture Attaché at USA Embassy and with the Director General of INRA Dr. Hamid Narjisse.

The project document and the outcome of the meeting held on the 9 February 2005 were discussed and used to develop a logical frame work matrix for the project. After ample discussion it was decided to consider this project as a pilot and investigation project and therefore should concentrate on fewer species and sites and gather relevant and needed socio-economic information on the importance and opportunities of MAPs in Morocco. Both ex-situ and in situ/on-farm conservation methods will be adopted and a holistic approach including technological, add-value, institutional and policy options will be followed. This pilot project will develop a sound approach to allow for scaling out and scaling up of the efforts of conservation of MAP species in different ecosystems in Morocco. It will conduct field surveys on major biotic and abiotic constraints for major PAM in Morocco, document the local knowledge, and investigate the economic importance and market opportunities of MAPSs. This project will also consolidate the research on MAPs at INRA Morocco and will adopt a participatory approach for transferring the available technologies.

Target areas and species

- Cereal based systems: The promotion of cultivation of **Cumin**, **Fenugreek** and **Coriander** will be conducted in Settat region;
- Irrigated areas (small irrigation): the activities will focus on the Integrated Pest Management of **Mint** at Guisser area and on the Integrated Crop Management for **Fennel** at Sidi El-Mokhtar. If possible, verification trials on IPM of mint could be conducted starting the second year at Tiznit and Meknes regions, known as other major mint growing areas in Morocco. Other aromatic species could be associated with mint;
- The cultivation of some species will be introduced at farmers' fields: **Caper** will be promoted at Safi region, **Muscari comosum** at Guisser. Domestication trials (cultivation) will be conducted at experiment stations at Settat and Belfaa for **Thymus**, **Muscari comosum**, **Oregano** and other important species;
- Management plans will be developed and tested for in situ conservation of **Thymus** populations in three natural habitats (Boulaouane forest, Argana and Oulmes), and **Muscari comosum** at Guisser region;
- Additionally, the project will provide technical backstopping for the introduction of selected MAP species in existing or to be created home gardens and nurseries. Women farmers will be targeted by this activity.

Project logical frame work matrix

The process of development of project activities was launched during the meeting held at INRA-Settat on 9 February 2005 and attended by 34 persons including researchers, extension agents, university professors and farmers. The meetings held at INRA-Rabat on 11-12 February 2005 have allowed to develop the logical frame work matrix including activities which can be conducted during the project duration and with the support provided. The process of identification of key stakeholders, members of the project team and collaborating farmers, NGOs and private sector will be initiated soon to discuss the proposed outputs and activities and agree on responsibilities and implementation arrangements. The time table and budgets are presented in the annex 2.

Project teams and partners

The following table is regrouping proposed persons to lead the teams of different project outputs. Mr. El-Hachmi Aouragh will oversee the overall implementation of the project activities.

Outputs	Morocco	ICARDA
Socio-economic studies including market studies	Herzenni, Nassif	Shideed
Conservation in situ and ex situ of MAP	Ouabbou (ex situ), Al Faiz (in situ)	Amri
Demonstration of technological and management options	Aouragh, El Mzouri, Dahan, Lhaloui	El Mourid and El Bouhssini

Investigation of add-value options and increasing awareness	Nassif, ElGharras	Amri
Enabling policies and institutional environments	Herzenni, Nassif	Amri
Strengthening national and regional/international networking	Aouragh and Al Faiz	El Mourid and Amri

Monitoring and evaluation

There will be an annual technical meeting (September or October) to present and discuss the results and to establish work plan and exit strategies for the project in the presence of main collaborators and key stakeholders.

Annex 1: MAP project Logical Framework Matrix

Objectives/Outputs	Indicators	Means of verification	Assumptions
Development objective Contribution of MAP to improvement of livelihoods enhanced			
Immediate Goal Conservation, Management and Sustainable utilization of MAP in selected dryland ecosystems promoted	Cultivation of selected MAP enhanced and add-value options promoted	Number of field cultivated with target MAPs; Number of accessions and species conserved ex situ and in situ	Market opportunities available Willingness of local communities to participate
Outputs 1. Current status of MAP in Morocco documented; 2. MAP in situ and ex situ conservation initiated;	Reviews and surveys conducted Three collection missions conducted in project region, Oulmes and Argana regions; Two in situ conservation pilot sites identified at Boulaouane et Guisser Arboretum and herbarium developed Two home gardens, one nursery and one seed cleaning, unit supported	Report and databases available Number of accessions collected and conserved Management plans developed and discussed with local communities Number of species conserved in arboretum and herbarium Number of trained men and women on nursery management, seed production and home gardening	Studies available Willingness of local communities to apply the management plans Willingness of local communities to work

<p>3. Technological and management options tested and demonstrated;</p>	<p>Surveys conducted on constraints</p> <p>Domestication trials conducted of Thymus, Oregano and Muscari at two experiment stations and farmers fields;</p> <p>Accessions and varieties of selected MAP species evaluated for agronomic and genetic traits;</p> <p>Demonstration trials conducted on integrated crop management on mint, coriander, fenugreek, cumin and fennel;</p>	<p>Reports</p> <p>Reports on Preliminary results of domestication</p> <p>Number of accessions and populations selected</p> <p>Number of trials and number of farmers participating in farmers' schools</p>	<p>together</p>
<p>4. Add-value options investigated and awareness increased;</p>	<p>Two training courses on processing of selected MAPs;</p> <p>Technical backstopping and support provided to community-based pilot processing initiatives (cumin, capers and mint);</p> <p>Stakeholders workshop organized;</p> <p>Various public awareness supports developed;</p>	<p>Number of men and women trained</p> <p>Three community-based initiatives established</p> <p>Number and qualifications of participants</p> <p>Number of leaflets, mass media interviews and participation to fairs</p>	<p>Existence of national efforts or committee on PGR</p>

<p>5. Enabling policy and institutional environment proposed;</p> <p>6. National and regional/international networking strengthened.</p>	<p>Review;</p> <p>Training workshop on ITPGRFA CBD and other conventions;</p> <p>Participation to national efforts on development of PGR access and benefit sharing legislation.</p> <p>Stakeholders analysis conducted;</p> <p>Meetings with major national stakeholders to discuss the creation of MAP network;</p> <p>Participation to regional networks;</p> <p>Coordination unit and project teams formed</p>	<p>Review report</p> <p>Number of trained stakeholders</p> <p>Specific Map legislation recommendation proposed</p> <p>List of stakeholders available</p> <p>Number of meetings</p> <p>Number of collaborating networks and institutions</p> <p>Technical and steering committees formed</p>	<p>Willingness of key stakeholders to create a network</p>
<p>Activities</p> <p>1.1 Review of existing literature information on MAP in Morocco;</p> <p>1.2 Document local knowledge on the use of MAP in project sites;</p> <p>1.3 Conduct market channels and opportunities of selected MAP's;</p> <p>1.4 Conduct household survey on the importance of MAP species.</p>			

<p>2.1 Conduct agro-ecological characterization of selected sites (including the use of GIS);</p> <p>2.2 Collect MAP germplasm in selected regions;</p> <p>2.3 Initiate/establish pilot areas for in situ conservation;</p> <p>2.4 Establish an arboretum and a herbarium at INRA;</p> <p>2.5 Promote the use of MAP in home garden and nurseries.</p> <p>3.1 Assess biotic and abiotic constraints of selected MAP;</p> <p>3.2 Explore the possibilities of domestication (of selected) spontaneous species;</p> <p>3.3 Evaluate and characterize (genetic, agronomic) the germplasm of selected species;</p> <p>3.4 Identify crop management options for researchable aspects/ issues;</p> <p>3.5 Demonstrate integrated crop management packages using farmers' field schools.</p> <p>4.1 Train local communities on add-value technologies (harvesting, processing, packaging, storage, and libeling, etc.);</p> <p>4.2 Initiate a pilot action on community add-value action;</p> <p>4.3 Organize a stakeholders workshops to promote marketability of MAP;</p>			
--	--	--	--

<p>4.4 Develop public awareness supports (leaflets, mass media, participation to fairs,...);</p> <p>4.5 Initiate research on active compounds of selected MAP species.</p> <p>5.1 Review of existing policies and institution dealing with MAP;</p> <p>5.2 Enhance capacities building of key stakeholders on policies and legislation related to Plant Genetic Resources conservation;</p> <p>5.3 Contribute to development of national PGR access and benefit sharing legislation.</p> <p>6.1 Identify key stakeholders at the local and national level;</p> <p>6.2 Contribute to the establishment of national MAP network;</p> <p>6.3 Activate the participation of Morocco to AARINENA MAP network and other regional networks;</p> <p>Establish coordination setup for implementation and monitoring of project activities.</p>			
---	--	--	--

ANNEX 4 :

Title: **Biological diversity, Cultural and Economic value of Medicinal, Herbal and Aromatic Plants in morocco.**

Country: **Morocco and the USA**

Institutions: **INRA**, represented by the Centre Régional de La Recherche Agronomique de Settat (Center for Arid Agriculture).

Principal Investigators:

	In INRA(Morocco)	In ICARDA(Tunisia)	In the USA
Name:	Dr. Mohamed El Gharous	Dr. Mohamed El Mourid	Dr. Ibrahim Shaqir
Title :	Director	Regional Coordinator	
Institution:	INRA Settat	ICARDA	USDA-ARS-OIRP
Address :	CRRA B.P .589 Settat, Morocco	B.P.435,El Menzah I 1004 Tunis, Tunisia	5601 Sunnyside Ave. Beltsville, MD 20705, USA
Phone:	+212 3 40-4087	+216 71 710-240	+1 301 504-4522
Fax:	+212 3 40-3209	+216 71 707-574	+1 301 504-4528
E-Mail:	arido@menara.ma secretariat@crrasetta-inra.ma	m.elmourid@egiar.org	ims@ars.usda.gov

Start date: **1st April 2005**

End date: **30th September 2007**

Funds Requested: Total:2,663,400 Dirhams (eq. us\$292,600 at \$ 1 = 9 dh)

Check Payable to: ICARDA

Check Sent to: Dr. Mohamed El Mourid, Regional Coordinator

INRA Authorized Representative Signature:

.....
Prof. Dr. Hamid Narjisse

ICARDA Authorized Representative Signature:

.....
Prof. Dr. Adel El-Beltagy

USDA-ARS-OIRP Authorized Representative :

.....
Ms. Arlyne Meyers