



Syria-Jordan-Lebanon-Palestinian Authority  
GEF/UNDP/CARDA/IPGRI/ACSAD

# Dryland Agrobio

Conservation and Sustainable Use of Dryland Agrobiodiversity  
Funded by GEF/UNDP

حفظ التنوع الحيوي الزراعي واستخدامه المستدام في الأراضي الجافة

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## Project Implementers Build Logical Framework

A workshop was held at ICARDA headquarters in Tel Hadya, Syria, on 17-20 April 2001 to prepare a logical framework for the Agrobiodiversity Project. The workshop was attended by Dr Hani Daraghma, Regional Coordinator for the Arab States, GEF-UNDP; National Project Managers; National Project Coordinators; national UNDP Officers; and seven scientists from the International Center for Agricultural Research in the Dry Areas (ICARDA), the International Plant Genetic Resources Institute (IPGRI), and the Arab Center for Studies of the Arid Zones and Dry Lands (ACSAD). The workshop was facilitated and supported by the German Foundation for International Development (DSE) and German Agency for Technical Cooperation (GTZ).

On the first day of the workshop, a preparatory session was held with the Syrian team to review the project document, draw the hierarchy of the project and the problem tree, and analyze the upper level objectives. The Syrian Component's log-frame was held up as an example during the remainder of the workshop.



*Prof. Dr Adel El-Beltagy (center) meets with participants in the logical framework workshop.*

In his opening statement, Dr Mahmoud Solh, ICARDA's Assistant Director General for International Cooperation, welcomed the participants on behalf of ICARDA Director General Prof. Dr Adel El-Beltagy, and on behalf of the two collaborating institutions IPGRI and ACSAD. He stressed the importance of conducting the logical framework exercise to build on the experiences gained so far in the project, to develop impact and project progress indicators, and to come up with clear assignments for the project's national and regional components. He commented on the good progress made by the project. He cited various progress reports and the visit of a World Bank delegation to project target areas in Lebanon. That delegation was impressed by the activities conducted by the project team and recommended the development of strong links with development projects, especially those supported by the World Bank in the region.

Dr Daraghma thanked the German donors, DSE and GTZ, for their assistance in conducting the workshop, and thanked ICARDA and all the participants for their



*Prof. Dr Adel El-Beltagy (center, front row) welcomed the logical framework workshop participants to ICARDA and wished them success in their meeting.*

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dedication to the success of the project. He also stressed the importance of developing indicators for the evaluation of project progress and impact.

The facilitators began each session with an explanation of the methodology of the logical framework exercise. This was followed by group discussion on how best to apply the approach to the project components. The workshop produced lists of clear objectives, expected outputs, activities, indicators, means of verification, and risk assumptions. Dr Ahmed Amri, the Project's Regional Coordinator, took on the task of summarizing all the information.

At the end of the workshop, Dr Daraghma and Dr Amri thanked DSE and GTZ and the two consultants for their valuable assistance and all the participants

from the national and regional project components for their contributions and expressed their wish that the process continue at the national level, so that annual workplans can be presented in the same format at the project's meeting in September 2001.

This workshop was also a good opportunity for the Syrian and Palestinian components to meet with Prof. Dr El-Beltagy and Dr Solh to discuss ways to strengthen on-going collaboration.

The Director General met with all participants in the workshop and stressed the value of agrobiodiversity in Central and West Asia and North Africa and the importance of its preservation. He also explained ICARDA's strategy for poverty alleviation with emphasis on natural resources management.

### Farmer Study Tour Conducted

The first study tour sponsored by the GEF-UNDP Dryland Agrobiodiversity Project took place as planned on 19-24 May 2001. Two farmers and two extension specialists each from Jordan, Lebanon, Palestinian Authority, and Syria traveled with Dr Ahmed Amri and Mr Ali Shehadeh, International Center for Agricultural Research in the Dry Areas (ICARDA), to visit the project sites in Jordan, Lebanon, and Syria, and the experimental station of the Arab Center for Studies of the Arid Zones and Dry Lands (ACSAD), Izraa, and ICARDA's research farm and headquarters in Tel Hadya.

During the first day, Dr Amri welcomed the participants on behalf of the donors, ICARDA, and the



*Participants in the farmers study tour to Jordan, Lebanon, Syria, and to ICARDA and ACSAD experimental stations.*

project components. He presented the program of the visit and explained that this kind of study tour is meant to allow good interaction among the project teams. All the participants hoped that the next study tour would be organized in Palestine.

The group then visited the water harvesting structures and rangeland demonstration trials at the Muwaqqar and Ajloun project target areas in Jordan, where Dr Mahfouz Abu Zanat and Dr Mohammad Ajlouni explained the activities of the project. This was a good opportunity to explain and discuss the place of shrubs in the rehabilitation of rangelands. Dr Jan Valkoun, ICARDA, suggested that local species be used in the water harvesting trials.

During the second day, the group visited the ACSAD experiment station at Izraa. Mr. Rafik Al-Raiss from ACSAD explained the techniques used to establish fields and nurseries of fruit trees. He shared his more than 40 years of experience grafting wild species of fruit trees. Mr Ali Khnifis and the Syrian team guided the group to trials of wheat landraces at Sweida, and to the beautiful fruit-tree nursery and the rich *Triticum* area at Mshanaf.

The tour then moved west, to Lebanon. Dr Wafa Khoury, Dr Hassan Machlab, and the project assistants accompanied

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the group on a visit to all the project sites at Ham, Nabha, and Aarsal. Participants learned about the water harvesting techniques applied and the trials conducted.

On the fourth day, the group visited the project sites at Al-Haffeh and visited two fruit-tree nurseries established by farmers.



*Dr Wafa Khoury explains that the stone wall was built by farmers to harvest water for better crop production and conservation of local biodiversity.*

During the remaining two days, the group toured ICARDA's project sites in the Khanasser Valley, Syria. Dr Zuheir Masri showed agricultural packages recommended for sustainable agriculture in an area of less than 300 mm rainfall. Participants also visited pasture and rangeland nurseries and rotation trials at Tel Hadya, where Dr Moustafa Bounejmate

explained ICARDA's work on rangeland improvement and rehabilitation. They then moved on to the durum wheat breeding plots and heard from Mr Tony Asbati about the place of landraces and wild relatives in the improvement of durum wheat. Dr Valkoun, Dr Amri, and Dr Siham Asaad then explained the activities of the Genetic Resources Unit, and Mr Firas Badran showed slides of the activities conducted by the Palestinian Project Component and the results achieved.

Throughout the study tour, farmers shared their experiences and discussed at length many of the project's proposed technologies. They said that the tour had allowed them to understand the approaches of the project and its overall strategy. The participants' evaluation of the study tour showed their full satisfaction, and expressed their preference for a longer tour in the future.

The participants also met with the governors of Lattakia and Sweida who expressed their full support for the project. Participants had the opportunity to visit Ajloun Castle and Salah Eddine Castle near Al-Haffeh.

During the closing ceremony, Dr Samir El-Sebae Ahmed, on behalf of Prof. Dr Adel El-Beltagy, thanked all the participants, ACSAD and ICARDA researchers, and the national project teams for their valuable contributions to the success of the first farmer study tour.

## First National Agrobiodiversity Workshop held in Lebanon

Parliamentary Representatives, national experts, scientists from public and private institutions, collaborating farmers, and national and international organizations took part in the first national workshop on the Conservation and Sustainable Use of Agrobiodiversity in Lebanon held on 12 April 2001 in Beirut.

The workshop was held to inform national experts, representatives of concerned institutions and non-governmental organizations about the Agrobiodiversity Project, its objectives, strategy, and activities. Aside from serving as a forum for sharing of experiences, the workshop set out to create a national interest group that would serve as the foundation of a national agrobiodiversity committee to support *in situ* conservation and sustainable use of

agrobiodiversity in Lebanon.

Five presentations were made on matters related to conservation of agrobiodiversity:



*Dr William Erskine, ICARDA's Assistant Director General for Research, speaks at the workshop's opening ceremonies.*

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- The Lebanese National Biodiversity Strategy and Action Plan, by Ms Lara Samaha, CBD Focal Point, Ministry of Environment
- GEF-UNDP Dryland Agrobiodiversity Project objectives and strategy, by Dr Hassan Machlab, National Coordinator, Lebanese Agriculture Research Institute
- Project activities and achievements, by Dr Wafa Khoury, Agrobiodiversity Project Manager, Lebanon
- Need for regional actions to conserve dryland agrobiodiversity, by Dr Ahmed Amri, Regional Coordinator, International Center for Agricultural Research in the Dry Areas (ICARDA)
- Mechanisms for the establishment of a national committee for the sustainability of *in situ* conservation and use of agrobiodiversity, by Dr Georges Ayad, Regional Director, International Plant Genetic Resources Institute–Central and West Asia and North Africa (IPGRI-CWANA).

In the afternoon, the participants were split into six specialized groups to:

- discuss the project activities and to suggest ways to improve the impact and efficacy of the Project within the target areas and Lebanon as a whole
- identify potential collaborators for the Project to help achieve the ultimate goal of sustainable agriculture with the conservation of local agrobiodiversity
- suggest mechanisms to support and secure the sustainability of the *in situ* conservation and sustainable use of agrobiodiversity in Lebanon after the completion of the Project.

The main recommendations of these working groups can be summarized as:

## 1. Natural resource management—soil and water:



*Group discussion at the First National Agrobiodiversity Workshop in Lebanon.*

- Building of small to medium sized earthen reservoirs (external funding to be sought)
  - Use of mulches for tree crops
  - Testing of new water-harvesting techniques, macro and micro scales
  - Reintroduction of terraces for soil conservation
  - Community contribution for soil reclamation and rehabilitation with the Green Plan
  - Modification of plowing techniques in the direction of minimum or no tillage
  - Testing of solid compost to improve soil structure and fertility
  - Interaction between farmers, extension service, and researchers.
2. Natural resource management—crops and natural vegetation:
- Train farmers in target communities in how to do mass-selection in cereal landraces, thus maintaining the adaptability of the landraces to the area and at the same time keeping an acceptable degree of variability
  - Improve reforestation efforts: coordination between Ministry of Agriculture and Ministry of the Environment needed to replant indigenous local wild fruit trees. The seed sources and seedling destination should be known and the seedlings should be locally produced. Accordingly, coordination is needed with existing projects involved with reforestation and combating desertification
  - There is a need for the establishment of a formal seed sector for the production of seeds
  - The formal sector responsible for wheat seed production should not only encourage the production of improved varieties but also encourage the production of cleaned and treated seeds of landraces and buy them from farmers at encouraging prices
  - There is an urgent need for a seed law that would serve as the basis for any seed increase
  - Landraces should be characterized (including for straw quality), identified, and tested before any seed increase activity is initiated
  - Extension services should be involved directly in highlighting the importance of landraces and research results to the farmers and rural communities
  - The natural soil rhizobia in the target sites should be researched/surveyed.
3. Natural resource management—rangelands and

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geographic information systems applications:

- Grazing options investigated for rangeland rehabilitation
  - Rehabilitation of rangelands through reseeded of indigenous forage crops
  - Planting of forage legumes as part of the current crop production system, including fruit tree production
  - Use of adapted/appropriate forage shrubs
  - Use of water-harvesting techniques for the improvement and survival of the vegetative cover
  - Introduction of indigenous knowledge in rangeland management.
4. Socioeconomic, legal, and policy issues:
- Assessing the actual economic value and cash return of genetic resources through their current use (handled by the present Project survey methodologies)
  - Assessing the economic and environmental losses resulting from the present situation
  - Project should cover a study on the possible value added to landraces, local varieties, and wild crops through the identification of the role and the intervention of the private sector in the direct use of the agrobiodiversity (food industry, marketing, development of local and international markets)
  - Encourage the establishment of cooperatives
  - Recommend the strict application of national legislation concerning quarries, water resources, and natural environments, and increasing the severity of penalties
  - Application of the urban planning regulations, especially with regard to the classification of agricultural land
  - Definite and final study of the present legislation
  - Ratification of international conventions with direct influence on agrobiodiversity
  - Identification of the most appropriate mechanisms for the application of the international conventions and their domestication
  - Encouragement of regional cooperation and coordination for agrobiodiversity conservation and harmonization of relevant legislation at the regional level for the common interest (e.g., control of the regional migration of herds between countries, especially in relation to overgrazing in the dry border areas).
5. Education and public awareness:

**At the national level**

- Work with the concerned decision-makers (Ministry of Education, National Education Center, etc.) to improve the official academic curriculum with respect to agrobiodiversity
- Work with the concerned decision-makers to accelerate the development and adoption of legislation concerning environmental clubs in all schools.

**At the level of the target area**

*Schools*

- Make use of school activities to involve the local community and enhance awareness about agrobiodiversity
- Encourage schools to establish botanical gardens of local and indigenous crops
- Encourage schools to undertake environmental activities, such as the adoption of trees
- Train teachers on the concepts and methodologies of environmental activities.

*Communities*

- Make use of local knowledge and traditions for environmental awareness
- Establish local nurseries for maintenance and multiplication of local varieties and crops
- Encourage farmer-to-farmer meetings to increase the exchange of experience.

6. Alternative livelihood options:

*Apiculture*

- Training sessions for honey producers on apicultural technologies, including husbandry, production, processing, and packaging (in cooperation with the agro-food private sector)
- Improvement in the marketing process and marketing channels for honey through:
  - Certification of origin, special labels, special packaging
  - Identification of the proper channels between producers and markets
- Encourage establishment of cooperatives and the corresponding cooperative credits.

*Eco- and agro-tourism*

- Work for the official recognition of the Project sites on the national tourism map, with the prerequisite of supplying basic information on these sites (climatic, ecological, agricultural, demographic, historic, etc.)
- Study the feasibility and cost of eco-tourism

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(making use of students in tourism faculties and institutes)

- Study the possibility of promoting "ski de fond" in the Project sites
- Identify possible hosting institutions and families within the communities for eco- and agro-tourism;
- Study the best use of local crops (wheat and legume products), wild fruit crops (pickled and dried fruits) and local traditional and organic products (local sheep/goat milk and meat products, pickled vegetables and wild crops, honey, etc.) within the eco- and agro-tourism.

### *Value added to the landraces and local varieties:*

- Study the possibility of encouraging organic farming
- Study the possibility of use of wild crops for food and medicinal purposes (using indigenous knowledge of the local community).

The success of this workshop was in its ability to create a national interest in agrobiodiversity conservation as reflected by the number of experts attending the lectures and working groups covering all institu-

tions. By sharing experiences in various specialized fields related to the Project activities, the experts were able to come up with useful recommendations for improved implementation. There is, however, need for further specific/thematic meetings of national experts to discuss the specifics of implementation of the recommended activities.

The workshop was held under the patronage of H.E the Minister of Agriculture, Dr Ali Abdallah, and in the presence of Dr Berj Hatjian, Director General, Ministry of Environment; Mr Yves De San, UNDP Resident Representative; Dr William Erskine, Assistant Director General for Research, ICARDA; and Dr Mustapha Yaghi, Chairman of the Board of the Lebanese Agricultural Research Institute.

In their opening addresses, they stressed the importance of joining in efforts at the community, national, regional, and international levels to conserve the remaining agrobiodiversity. Dr Erskine talked about the need for better management of natural resources (water, soil, and plants) for sustaining agricultural development and achieving food security.

## Agrobiodiversity Project Participates in Jordanian-German Biodiversity Group Meeting

The Agrobiodiversity Project participated in the Jordanian-German Biodiversity Group Meeting at Jordan University for Science and Technology (JUST) on 26-27 April 2001. The workshop was organized to finalize a land use practices and biodiversity project between Jordan scientists and Centre for Environmental Research (UFZ).

During the workshop, JUST scientists made presentations on plant biodiversity, biogeography and ecology of Jordan, and climate change. The UFZ team also presented their experience in genetic diversity, biodiversity vis-à-vis land use practices, limitations of biodiversity models, and spread of alien plant species.

Dr Mohammad Ajlouni, National Manager of the Agrobiodiversity Project in Jordan, presented the project strategy, objectives, and achievements to date. He stressed the global importance of Jordanian biodiversity, and the different scenarios for conserving biodiversity through its sustainable use.

Mr Nabeeh Al-Kayed, Agrobiodiversity Project Assistant, presented the experience of the Royal

Society for the Conservation of Nature in the Dana Reserve as an example of utilization of biodiversity in Jordan.

The participants visited the trials at Ajloun, where the Agrobiodiversity Project is demonstrating biodiversity conservation through land use practices that meet community needs.



*Water harvesting technique used in Ajloun for olive and other fruit trees.*

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### Project Participates in Media Workshop in Jordan

In cooperation with the Biodiversity Strategy and Action Plan Project, the Agrobiodiversity Project participated in a workshop on the role of media in promoting biodiversity, 11-12 April 2001 in Amman, Jordan.

*The workshop was organized to:*

- Introduce the concept of biodiversity to media people in Jordan
- Train people working in the media on how to prepare environmental reports

- Discuss ways to increase public awareness about biodiversity conservation.

Lectures and researchers presented their experiences on different topics, including plant, animal, and micro-organism biodiversity and the conservation experience in Jordan.

Project Manager Dr Mohammad Ajlouni made a presentation on the Project, its concept, possible conservation models, goals, and achievements. He stressed the importance of public awareness in promoting biodiversity in Jordan.

### Agrobiodiversity Project wins four awards at the 10<sup>th</sup> Al-Basil International Exhibition for Inventions

The Agrobiodiversity Project participated in the 10th Al-Basil International Exhibition for Inventions held in Damascus, Syria, on 12-13 April 2001. The Project was successful in introducing agrobiodiversity products from local communities as new and original inventions.

The joint stand of the Project and the International Plant Genetic Resources Institute (IPGRI)-Central and West Asia and North Africa (CWANA), included posters on agrobiodiversity conservation, brochures, and locally manufactured products, such as jams from fruit tree landraces and underutilized species, medicinal plants, and bread and burghul made from local wheat varieties. Videos on diversity in Palestine and Syria were also presented to visitors. This original contribution was highly appreciated by the Ministry of Supplies and UNDP-Syria, which granted Mr Rami Khalil, public awareness specialist at IPGRI-CWANA, with two gold medals, and the



*IPGRI-CWANA & Dryland Agrobiodiversity Project stand during the 10th Al-Basil International Exhibition for Inventions.*



*Awards presented to the GEE/UNDP Dryland Agrobiodiversity Project by the Al-Basil Fair Committee.*

Agrobiodiversity Project with four Certificates of Recognition, for ICARDA, IPGRI, and the National Project Components of Jordan and Palestine, respectively. The Agrobiodiversity Project was also awarded three cups for the best inventions supporting the conservation of dryland agrobiodiversity.

In his opening address, HE. the Minister of Supplies, Dr Osama Ma'ae Al Bared, thanked GEF, UNDP, ICARDA, IPGRI and international and regional organizations for their efforts in working towards food security for the world. National newspapers published five articles and national television presented a program on the objectives and strategy of the Dryland Agrobiodiversity Project in West Asia.

More than 10,000 people from 12 countries attended the fair.

### ***In situ* Conservation and Field Genebank Management Regional Course Held**

West Asia is a major center of plant diversity and endemism. Wheat, barley, lentils, many forage and rangeland species, and many major fruit trees originated in the Fertile Crescent, which extends from Palestine, through Syria and southern Turkey, into Iraq and western Iran. Genetic diversity of these species is, however, seriously eroding due to rapid degradation of habitats and the use of modern varieties. Urgent action is needed to preserve this germplasm, so important for future generations.

*In situ* conservation, preservation in the field, complements on-going *ex situ* (genebank) conservation. It allows for the preservation of a larger range of diversity and the local knowledge associated with growing the plants or crops. The Agrobiodiversity Project aims at promoting community-based *in situ* conservation in Jordan, Lebanon, the Palestinian Authority, and Syria. ICARDA, the executing institution of the Project's Regional Component is providing the National Project Components with needed technical backstopping and training in cooperation with the International Plant Genetic Resources Institute (IPGRI) and the Arab Center for Studies of the Arid Zones and Dry Lands (ACSAD).

ICARDA, IPGRI, and ACSAD organized a two-week regional course on *in situ* conservation and field genebank management at ICARDA and ACSAD headquarters on 1-12 April 2001.

Dr Samir El-Sebae Ahmed, Head, Human Resources Development at ICARDA, and Dr Ahmed Amri, Regional Coordinator of the Center's Near East Project, and Dr George Ayad, Regional Director, IPGRI-Central and West Asia and North Africa, opened the course by welcoming the participants on behalf of their respective institutions. Dr El-Sebae Ahmed stressed that the course covered the theoretical and practical aspects of *in situ* conservation of agrobiodiversity and the establishment of field genebanks.

Two participants from each the Palestine Authority, Lebanon, Syria, and Jordan attended the course, which covered:

- Definitions and strategies for the conservation of agrobiodiversity

- Population dynamics and techniques for sampling genetic diversity
- Promotion of *in situ* conservation of underutilized species within the *in situ*/on-farm initiative
- New concepts for protected area management
- Identification of pasture and forage legume target species
- Evaluation and documentation of genetic resources
- Agricultural techniques for promoting agrobiodiversity in dry areas
- Requirements for the establishment and management of fruit tree field genebanks
- Policy and legal aspects related to *in situ* conservation
- Field trips to project target areas in Al-Haffeh and Sweida, and to ACSAD's experimental research station in Izraa for a practical session.

The lectures were covered by staff from ICARDA's Genetic Resources Unit and Natural Resource Management Program, IPGRI-Central and West Asia and North Africa, and ACSAD.

### **Syrian teachers, education specialists trained in biodiversity conservation**

Twenty-two Syrian schoolteachers and education specialists participated in a training course entitled "Promoting Biodiversity in the Education System," 21-26 April 2001 in Lattakia.

The course was organized by the Syrian National Component of the Agrobiodiversity Project in close collaboration with the Regional Component (International Center for Agricultural Research in the Dry Areas [ICARDA]) and the International Plant Genetic Resources Institute—Central and West Asia and North Africa (IPGRI-CWANA), under the auspices of H.E. the Syrian Minister of Education.

Dr Suleiman Al-Khatib, the Deputy Minister of Education, opened the course and thanked the Project for organizing and sponsoring the "important

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and original event" and conveyed assurances of the Ministry's full support of project activities aimed at increasing awareness in schools about the importance of agrobiodiversity conservation.

In his opening address, Dr Hani Daraghma, the GEF Representative for the Arab Region, thanked all the contributing parties and stressed the importance of involving different national and local institutions in the implementation of project activities. He said the education system has a vital role to play in increasing public awareness about the need for conservation of local biodiversity.

Twenty lectures were given by the Project's Regional Coordinator, Dr Ahmed Amri, ICARDA; Mr Rami Khalil, public awareness officer, IPGRI-CWANA; the Project Component teams of the Department of Agricultural Scientific Research and the Center of Research at Bouqa; the education specialists; and scientists from the Arab Institute for Forests and Rangelands, all stressing the importance of conservation of biodiversity and the role to be played by schools.



Teachers and education specialists trained in aspects of biodiversity conservation in Syria.

The participants visited project sites at Al-Haffeh and the Center of Research at Bouqa and talked to farmers and scientists about Project activities.

In their evaluation of the course, the participants said they were highly satisfied with information provided and they expressed their readiness to work jointly with the Project to include aspects of agrobiodiversity conservation in the school curricula and extra-curricular programs. The main recommendations issued from the closing session were:

- Strengthening of collaboration between the Ministry of Education, the Ministry of Agriculture, and the Agrobiodiversity Project to extend this experience to other provinces
- Joining efforts to develop school curricula and appropriate teaching support and teaching aids
- Use of school gardens as *in situ* conservation sites of target species
- Greater participation of schools in the afforestation efforts.



Teachers and education specialists visit the local landraces nursery at Al-Haffeh project site.

## Main activities of the Project Components (April-June 2001)

### Regional Component

- Dr Ahmed Amri has moved to ICARDA's Amman office. Correspondence should be sent to his new address: P.O. Box 950764, Amman 11195, Jordan Telephone: 00962-6-5525750/5517561/5538602; Fax 00962-6-5525930; E-mail: [Icarda-jordan@cgiar.org](mailto:Icarda-jordan@cgiar.org).
- The Regional Coordinator and Dr Jan Valkoun attended the ICARDA Program Committee meeting on 22-23 April 2001 and explained the project strategy to members of the Center's Board of Trustees. Trustees are very interested in ICARDA pursuing this new dimension of *in situ* conservation of dryland agrobiodiversity. On 25 April 2001, more than 45 people representing the

funding agencies, the directors of national agricultural research system (NARS) collaborating institutions, ambassadors, and ministers of agriculture visited ICARDA's Genetic Resource Unit and were briefed on *ex situ* and *in situ* conservation activities.

- Dr Amri and Dr Mohammad Ajlouni attended a workshop on "Rangeland Management and Property Rights" organized as part of the activities of the Mashreq/Maghreb Project by the National Center for Agricultural Research and Technology Transfer (NCARTT), ICARDA, and the International Food Policy Research Institute in Amman on 29-30 April 2001. It was a good opportunity to stress the importance of enhancing collaboration between projects, and especially

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with the Agrobiodiversity Project.

- The Regional Coordinator attended the national workshop on rangeland management and development organized by NCARTT within the Mashreq/Maghreb crop/livestock integration project. He urged the National Agrobiodiversity Project Component to take advantage of the achievements of this project and to develop strong collaboration since the two projects have similar concerns and priorities. The Agrobiodiversity project should benefit mainly from the legislation studies on community based rangeland management.
- Dr Amri and Dr Ajlouni participated in a workshop on plant variety protection in Amman on 10-12 June 2001. The workshop, led by international expert Dr John Dodds, discussed the national draft policy and legislation and ways to protect landraces maintained by farmers.
- The Regional Coordinator lectured on "breeding methodologies for the promotion of diversity conservation" in a course on participatory breeding organized by the Jordanian Project Component. He also made a field visit to Semta to conduct selection sessions with farmers and extension agents.

## Jordanian Component

- Eng. Nabeeh Al-Kayed joined the project team as an assistant to the National Project Manager on 10 April 2001. Mr Nabeeh has previous experience with the Royal Society for Conservation of Nature.
- In cooperation with the Medicinal Plant Project at NCARTT, the project staff started a plantation of medicinal plants in the Ajloun project sites within water harvesting structures. Species such as *Laurus nobilis*, *Origanum syriaca*, and *Salvia triloba* were introduced to help diversify the sources of income for local communities.
- With regard to finding alternative sources of sustainable and self-generating incomes for commu-



*Water harvesting for medicinal plants introduced by the project for income diversification.*



*Water Harvesting for biodiversity conservation in Semta, Jordan.*

nities, the project team visited villages in the Ajloun target area to discuss training in beekeeping. Three groups of men and two groups of women were formed to receive training in beekeeping and honey production. The project will provide two beehives for each group of 15-20 people for training that will be conducted over a period of one year.



*Training the local community in beekeeping.*

- A farmer workshop on benefits of field genebanks and on-farm practices to conserve agrobiodiversity was held at Ajloun on 10 May. Twenty-two farmers attended the workshop. Project staff, contracted experts, and NCARTT staff presented activities planned to promote *in situ* conservation of local agrobiodiversity, and they stressed the need for strong collaboration with local communities in ensuring the success of the project. More agricultural days were organized by the project in collaboration with the Ajloun Agricultural Directorate at Rajeb and Sakhra villages at Ajloun.



*Participants in the farmer workshop on benefits of field genebanks and on-farm practices to conserve agrobiodiversity.*

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## Lebanon Project Component

- The second annual National Steering Committee meeting was held at the Lebanon Agricultural Research Institute (LARI), Fanar station, on 25 June 2001. Representatives from the Italian Embassy and the GTZ (German)-supported project on Combating Desertification in Lebanon (CoDeL) were invited to attend. A progress report was distributed to the committee members, and the Project Manager highlighted the major achievements, successes, constraints faced, and the future prospects of the project activities. The workplan was then presented, which was followed by discussion on LARI's contribution, the regionality of the project, and the importance of coordination with and fund leveraging from other projects for the successful achievement of the project's objectives.
- Dr Theib Oweis, Water Management Specialist, and Mr Pierre Hayek, Research Assistant, ICARDA, visited project sites in Lebanon on 4-7 June 2001, to provide technical assistance and to evaluate water-harvesting activities conducted in Lebanon last year. The techniques used and the resulting plant growth around them were evaluated and recommendations for improvements were given. Possible sites for snow water collection in Ham were studied and it was suggested that a soil dam be constructed there as a demonstration.
- Based on an indigenous knowledge survey conducted in May 2001 in the target communities, several plants with possible medicinal and aromatic properties were reported. A team made up of a national consultant (pharmacist and photographer), Dr Mustapha Bounejmate (Forage and Feed Legume Production Specialist, ICARDA), and Mr Adel Nassar (ICARDA-Terbol), and supported by the project staff, was responsible for collecting and documenting more than 20 species (excluding the target species). These are being catalogued based on estimated active chemical ingredient used for medicinal purposes. These plants were also pressed and sent to ICARDA for taxonomic identification. The UNDP Resident Representative and the administrative and man-



*Khamsha (Plumbago europaea) a beautiful ornamental plant.*

agement team in the Beirut office were invited to a photography exhibition featuring images of project target sites and the medicinal plants identified.

- Farmers from project target sites were invited with other growers from the Bekaa Plain to a field day to observe and evaluate various foreign and local almond varieties in LARI's demonstration orchard. Several farmers attended the field day organized by LARI Horticultural Department.

## Palestinian Project Component

- Ms Buthaina Mized has joined the project team as seed technology specialist.
- A training workshop for teachers and agricultural extension agents was held in Hebron on 20 May 2001. The workshop, organized by the Palestinian Agricultural Relief Committee (PARC) and An-Najah University (the National Executing Agency) resulted in eight schools in Hebron taking part in a campaign, in cooperation with the Ministry of Education, intended to raise public awareness about the importance of biodiversity.



*Teachers and extension agents training in Hebron.*

- The scenario for the documentary film on agrobiodiversity was approved by the Ministry of Agriculture, UNDP, and Al-Najah University. Video taping has already started. Two agricultural extension agents from each target area, nominated by the Ministry of Agriculture, were selected to participate in the public awareness program.
- Meetings were held in the north (Jenin/Tayaseer village), participated in by the Project National Coordinator, project staff, and staff of An-Najah University. Students and supervisors from two schools in Tayaseer village were briefed on the student clubs to promote agrobiodiversity. The meeting covered expectations and activities that

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should be implemented, especially during summer vacation. In another meeting, farmers in Tayaseer were sought to serve as 'pioneer farmers' to help in demonstrating technologies.

- The Project Manager conducted a one-day course for 22 agricultural engineers in Al-Zababdeh. He briefed the new graduates on the status of agro-



*Hands-on training in nursery production in Palestine.*

biodiversity in Palestine, the actions and strategy needed, project objectives, and project activities designed to conserve agrobiodiversity through sustainable utilization.

- Three joint field visits to Sair target site were conducted in close cooperation with PARC. Ten pioneer farmers and 10 women farmers were selected for the agrobiodiversity extension program. In addition, a meeting was held at Sair school on 30 June 2001 to raise awareness about the Agrobiodiversity Project among women farmers.



*The opening of the teachers and education specialists training course in Lattakia, Syria.*

### *Syrian Project Component*

- More than 180 farmers, private sector representatives, and local officials took part in the first national workshop on the importance of beekeeping in biodiversity conservation held in Sweida and organized by the Syrian Project Component. Mr Ali Khnifis and Dr Ahmed Amri gave interviews on project strategy and achievements to national television reporters.
- In collaboration with the Directorate of Education in Lattakia, the Syrian Project Component planted 11 target fruit tree species at Mahmoud Ali Dib school at Al Haffeh. Students, local authorities, and the project team participated in the planting, meant to lead to greater concern for biodiversity. The project was asked to extend this activity to all the schools in the region.

## Pistachio in the Southern Provinces of Syria

**Eng. Bayan Mohamed Muzher**

### Summary

The study was carried out in the south of Syria in Dara'a and Sweida provinces where pistachio is widely distributed and used as rootstock. The genus *Pistachia* is the most important rootstock for pistachio varieties grown in Syria. The species *Pistacia*

*atlantica* grows at altitudes between 500 and 1600 m. The study showed that there are two subspecies of *P. atlantica* in Dara'a and Sweida provinces. The second species of pistachio is *P. khinjuk*, which grows at 900–1200 m above sea level in Sweida province. Its spread is limited compared with other *Pistacia* species. The third species is *P. terebinthus*, which reaches 2–6 m in height. Leaves are 10–20 cm long

# Dryland Agrobio

and contain 9–13 leaflets. *P. terebinthus* is found at altitudes of 50–300 m in Dara'a province.

Tests of seed viability of *P. atlantica* using Tetrazolium showed germination of 86% for subspecies A and 63% for subspecies B.

## Introduction

The genus *Pistacia* is distributed in several areas in Syria (Mouterde 1966). Little work has been done, however, on the survey and taxonomic identification of the wild pistachio species in Syria. The trees of cultivated *Pistachia vera* grafted on *P. atlantica* gave a higher yield compared with those grafted on *P. palaestina* and *P. terebinthus* (Crane et al. 1971, Crane 1975, Crane et al. 1976). Zhang et al. (1995) pointed out that there is a higher material concentration in the leaves of *P. atlantica* (especially boron, copper, zink, and phosphorous) compared with other *Pistachia* species. The genus *Pistacia* is the most important rootstock and pollinator for cultivated pistachio varieties in Syria (Haj Ebraheem 1998). These species are mainly distributed in the southern parts of Syria at Dara'a and Sweida provinces. The other species might have a role in future improvement work or could be used for medicinal purposes.

Pistachio production in Dara'a and Sweida provinces is decreasing in spite of the extension of arable land. Many factors are affecting the yields of grown varieties, such as the nature of soils, rootstock and pollinators, pests, and climatic conditions. *P. atlantica*, *P. khunjuk*, and *P. terebinthus* can be used as rootstocks for resistance to winter frost, drought, calcium deficiency, nematodes, *verticillium*, and *capnodes*, and for better pollination compared to the widely used *P. vera*. Pistachio grows well on sloping, stony, and



*Pistacia atlantica*.



*Pistachio nuts*.

well-drained soils, and thus can help make productive use of marginal lands.

### The present study was undertaken to:

- Survey and classify pistachio species in the southern provinces of Syria;
- Study the main factors contributing to the degradation and genetic erosion of these species and advise on conservation measures;
- Study seedling propagation for *Pistacia* rootstocks; and
- Study the compatibility of the wild species as rootstocks for grafting cultivated pistachio.



*Pistachio orchard in Syria*.

## Materials and Methods

The study was carried out in Dara'a and Sweida provinces, southern Syria. The genus *Pistacia* in the family *Anacardiaceae* has 4 sections, 11 species, and 13 botanical varieties. The species found in Syria and used in this study are:

***Pistacia atlantica*:** an Irano-toranean xerophitic species, and one of the most widely distributed wild species. It is highly tolerant to winter frost, and is adapted to dry conditions and poor soils.

***Pistacia khinjuk***: an Irano-toranic xerophytic species with environmental requirements similar to those of *P. atlantica*.

***Pistacia terebinthus***: a Mediterranean species native to the western and central parts of the Mediterranean basin.

For the eco-geographic and botanical survey the plant morphological characteristics and descriptors and environmental characteristics were recorded (branches, stem, bark, leaves, flowers, fruits, and seeds; climatic, soil physical and chemical characteristics).

The Tetrazolium test was used to assess seed viability.

## Results

### *Distribution of Pistachia species*

The study showed that three species of the genus *Pistacia* are distributed in Dara'a and Sweida provinces. But a wider distribution of these species is found in Sweida province.

***Pistacia atlantica*** grows at altitudes between 500 and 1600 m. Trees are vigorous, with alternate and deciduous leaves with 7–11 leaflets, the flowers are minute and un-sexual without petals. The fruits are small and globose. The ripe fruits are green, and fruits with empty shells are pink or yellow. The study showed two subspecies of *P. atlantica*, designated subspecies A and subspecies B. The table highlights the differences between these two subspecies. Male trees are evenly distributed with female trees in Sweida province.

***Pistacia khinjuk*** grows at 900–1200 m above sea level in Sweida province. It is spread in a limited environmental range as individual male trees within *Quercus* and *P. atlantica* trees mainly at Kanawat and Sliem villages. Trees are vigorous, leaves are alternate, consisting of 3–7 (usually 5) leaflets 7 cm long and 3.5 cm wide. Limbs are 15 cm long bearing 3–4 flower clusters.

***Pistacia terebinthus*** is a dwarf deciduous tree 2–6 m high. Leaves are alternate, consisting of 9–13 (usually 13) leaflets averaging 3 cm long and 1.5 cm wide. They grow best at 50–300 m above sea level. The species is found in Wady Al-Yarmouk, Dara'a province.

### Major deterioration factors:

- Over-cutting of trees, especially in Alladja and Wady Al-Yarmouk
- Overgrazing, especially by goats
- Natural habitat destruction
- Extension of buildings through the forest
- Overuse of natural resources
- Fires
- Natural conditions, such as successive droughts

### Seedling propagation:

The seeds of the two subspecies of *P. atlantica* were tested for germination.

1. The tetrazolium test is a biochemical test for assessing the viability of seeds. It gave us the following results: 88.5% germination for subspecies A and 94% for subspecies B.
2. Field seedling propagation:
  - i Percent germination—Seeds were planted after soaking in water for 60 hours. Subspecies A had 63% germination, while subspecies B had 86% germination.
  - ii Soaking efficiency—Soaking seeds (subspecies B) in water for 60 hours resulted in 86% germination; soaking 48 hours, 46% germination; and no soaking, 13% germination. These differences were highly significant, showing the value of soaking seeds to increase germination. Soaking seeds in sulfuric acid for 30 minutes and water for 6 hours resulted in 84% germination; compared to 72% germination for acid treatment alone.

## Conclusions

The study showed the following:

- Sweida province is rich in wild *Pistachia* species biodiversity and the three species of *P. atlantica*. Its two subspecies, *P. khinjuk* and *P. terebinthus*, were found. Actions need to be taken to preserve this biodiversity from the rapid degradation of the natural habitats. The GEF-UNDP project on conservation and sustainable use of dryland agrobiodiversity is working towards the promotion of *in situ* conservation of these species. A pilot nursery for the multiplication of wild fruit tree species, including *P. atlantica*, is installed at a collaborating farm in Sahwat Al-Khodr. The site is visited by farmers during workshops organized by the project.
- The loss of these species is higher in Dara'a

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**Table 1: Major differences between the two subspecies of *Pistachia atlantica***

Character	Subspecies A	Subspecies B
Trees	10 m high with brownish stem	15 m high with brown stem
Fruit branches	10-150 cm length, bearing 3-4 flower clusters	4-10 cm length, bearing 3 flower clusters on average
Leaves	Alternate, deciduous consisting of 7-11 leaflets, usually 9 leaflets of 3 cm length and 1.5 cm width.	Alternate, deciduous consisting of 5-9 leaflets, usually 7 leaflets of 5 cm length and 8 cm width.
Inflorescence	10 cm length	10 cm length
Flowering time	April and May	April and May
Fruits	Global, 100-fruit weight 18.5 g	Oval shape, 100-fruit weight 17 g
Fruit crust	Ripe fruits are green and the blanks are brownish	Ripe fruits are green and the blanks are red
Chemical analyses	Moisture: 13.9% Protein: 6.78% Dry oil: 40.26% Carbohydrate: 2.19%	Moisture: 31.9% Protein: 7.57% Dry oil: 37.5% Carbohydrate: 1.78
Fruit cluster	Fallen fruits: 54.4% Blank nut rate: 26.2% Ripened fruit rate: 19.4%	Fallen fruits: 55.2% Blank nut rate: 20% Ripened fruit rate: 24.8%

province and the natural habitats should be rehabilitated.

- *P. atlantica* has great value as rootstock for cultivated pistachio varieties in this area because it has high resistance to pests, especially *Capnodes*, which destroys extensive areas of pistachio varieties grafted on *P. vera*.

## References

- Crane, J.E., Muriel, B.V. and Nelson, M.M. 1971. Growth of seeded and seedless pistachio nuts. Horticultural Science 96(1): 78-80.
- Crane, J.C. 1975. The role of seed abortion and parthenocarpy in the production of blank pistachio nuts as affected by rootstock. Journal of the American Society of Horticultural Science 100(3): 267-270.
- Crane, J.C. and Ford, H. 1976. Effects of four rootstocks on yield and quality of pistachio nuts. Journal of the American Society of Horticultural Science 101(5): 604-606.
- Haj Hassan, A. 1988. Characters of the female varieties of pistachio in Aleppo. ACSAD. 97 pp.
- Haj Ebraheem, E. et al. 1998. The pistachio trees and their various techniques. ACSAD. Pages 3-45.
- Mouterde, P. 1942. La flore du Djabal Druze. Dar El Mashriq Editors. Beirut. Lebanon. 224 pp.
- Mouterde, P. 1966. Nouvelle flore du Liban et de la Syrie. Dar El Mashriq. Beirut. Lebanon. 562 pp.
- Sankary, M.N. 1971. Comparative plant ecology of two Mediterranean type arid areas, in Syria and California, with emphasis on the auto-ecology of species. University of California, Davis, PhD Ecology. Pages 95-98.
- Zhang, Q.L. and Ferguson, L. 1995. Influence of rootstock on nutrient acquisition by pistachio. Journal of Plant Nutrition. Horticultural Abstracts Vol 655 No 5.

## محضر فعاليات الدورة التدريبية للموجهين والمدرسين الريفيين التي عقدت في مركز التدريب التربوي في اللاذقية خلال الفترة مابين 21-26 نيسان/أبريل 2001

الحفاظ على التنوع الحيوي وامتدتهم بالمعلومات المهمة للحفاظ على المصادر الوراثية النباتية ونشر هذه المعلومات بين التلاميذ والطلاب في مختلف المراحل التعليمية للوصول الى زراعة مستدامة وتأمين الغذاء للأجيال الحاضرة والمستقبلية آخذين بعين الاعتبار نباتاتنا الطبيعية المحلية. كما وتأتي أهمية الدورة من خلال نشر الوعي البيئي بين الجميع وكل بحسب عمله حيث أنها معنية بالحفاظ على الموارد الطبيعية التي يقاس من خلالها تقدم البلد. وركزت الدورة على مواضيع مهمة جداً مثل التعريف بمشروع التنوع الحيوي الزراعي لما يتضمن من نشاطات تساعد على حفظ النباتات المحلية المهددة بالانقراض والاستفادة من السادة المحاضرين لما قدموه من معلومات قيمة حول موضوع جديد يهم الجميع وقد أعطت هذه الدورة الدفع والقدرة على العمل والخوض مع المجتمع لتوصيل الارث المهدد بالزوال والذي يؤثر في الغذاء المستقبلي حيث ان الانسان هو المسؤول المباشر عن إزالة هذا التنوع. كما ركزت آراء المشاركين في الدورة على الانتقال إلى الجانب التطبيقي العملي المثمر خلال التوسع بهذه التجارب ونشرها على كافة محافظات القطر، حيث تتم الاستفادة من الأصول الوراثية المهددة بالانقراض لتطوير العمل في التعليم الريفي وزراعة النباتات المحلية الطبية والأشجار المثمرة من الأصول الوراثية المهددة بالانقراض.

### اقتراحات المشاركين

ضرورة تعاون هيئة البحوث العلمية الزراعية مع الجهات الأخرى ووزارة التربية على إقامة:

- مشروع إنشاء مشتل زراعي للأصول الوراثية .
- تعميم تربية النحل في المدارس الريفية.
- إقامة دورات تدريبية للمدرسين الريفيين والمهندسين الزراعيين في هذه المجالات.
- ربط المدارس الريفية في منطقة عمل المشروع بالمعهد واعتبارها كمصدر للتنوع الحيوي النباتي.
- تزويد الدورات القادمة بمحاضرات حول طرق إكثار السلالات المحلية للنباتات.
- التوسع بتجربة المشروع لتغطي باقي المحافظات.
- إعداد الكتب اللازمة التي تعنى بالتنوع الحيوي والحفاظ عليه.
- توفر امكانية زراعة النباتات والانواع المستهدفة في المدارس الريفية.
- الاستفادة من حملات التشجير في نشر الأنواع النباتية المحلية.

تحت رعاية السيد وزير التربية في الجمهورية العربية السورية، عقد مشروع التنوع الحيوي الزراعي الدورة التدريبية الأولى في مجال التوعية البيئية والحفظ المستدام للأصول الوراثية النباتية، في مدينة اللاذقية خلال الفترة مابين 21-26 نيسان/أبريل 2001.

وقد افتتح فعاليات هذه الدورة الدكتور سليمان الخطيب معاون وزير التربية ورحب بالضيوف وبالمشاركين، شدد على أهمية هذه الدورة في الحفاظ على البيئة والتنوع الحيوي الزراعي وعلى ضرورة ادخال المصطلحات والأفكار المتعلقة بهذا المجال في المناهج التربوية لما لها من أهمية كبيرة في تعريف التلاميذ والطلاب في جميع المراحل التعليمية بهذه المواضيع. وركز على أهمية توطيد وتوثيق العلاقة والتعاون بين وزارة التربية ووزارة الزراعة/ممثلة بمديرية البحوث العلمية الزراعية، ومشروع التنوع الحيوي الزراعي، ومع كل من المعهد الدولي للمصادر الوراثية النباتية (IPGRI) والمركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا).

كما شارك في الافتتاح كل من الدكتور هاني دراغما منسق المرفق العالمي للبيئة للمنطقة العربية، والدكتور أحمد عمري المنسق الإقليمي لمشروع التنوع الحيوي الزراعي (إيكاردا) والسيد رامي خليل مسؤول التوعية العامة في IPGRI، والمهندس علي خنيفس المنسق الوطني لمشروع التنوع الحيوي الزراعي في سوريا، وقدموا عروضاً حول أهمية التنوع الحيوي الزراعي في منطقة غرب آسيا، وأهمية الحفاظ عليه من خلال توعية كافة شرائح المجتمع لاسيما طلاب المدارس.

وشارك في هذه الدورة 22 موجهاً ومدرساً ريفياً من جميع المحافظات في القطر وحاضر فيها 17 محاضراً من الجامعات والمراكز الدولية والعربية ومراكز البحوث العلمية الزراعية. وقد تطرقت الدورة لمجموعة من المحاور التي تضمنت التوعية والتربية البيئية والأصول الوراثية النباتية وكيفية الحفاظ عليها وأهميتها في الحصول على تأمين الغذاء المستدام للأجيال المقبلة وكذلك ضرورة إصدار التشريعات وسن القوانين الملائمة للحفاظ على الأصول الوراثية النباتية والتنوع البيئي. وتخلل الدورة زيارة ميدانية الى مواقع عمل المشروع في منطقة الحفة ومركز البحوث العلمية الزراعية في بوقا ومركز الغابات التابع للمنظمة العربية للتنمية الزراعية في بوقا حيث تم الاطلاع على التنوع الحيوي الزراعي السائد في هذه المواقع.

وفي ختام الدورة تم تقييمها من قبل المشاركين وأفاد المشاركون فيها بأن الدورة ضرورية ومهمة على اعتبار أنها خلقت لديهم الوعي بضرورة