ICARDA International Center for Agricultural Research in the Dry Areas

ICARDA-European Commission partnership (1990-2011)

This brief highlights cooperation between the European Commission and ICARDA for programs over the past two decades to improve food security and the livelihoods of rural populations in the world's dry areas.

With the partnership of the European Commission and other longstanding donors, ICARDA has built the capacity of national research systems and researchers across the world's dry areas. The center has developed and disseminated more than 800 new high-performing crop varieties. It has also developed technologies and interventions that have the potential to improve farming productivity and the lives of millions of smallholder farmers living in dry areas and fragile ecosystems.

A 20-year partnership for increased food security

Cooperation between ICARDA and the European Commission programs on rural development, science and technology and on agricultural research for development have been in progress since the 1990s.

The Commission has supported ICARDA's work through various policies and programs:

- Mediterranean cooperation policy.
- Environmental themes such as desertification and food security.
- Cross-border projects with Middle East and North African countries.
- Regional programs for vocational and technical training.
- European Framework Programs on Science and Technology and with Europe Aid.

ICARDA is also an active player in Mediterranean regional cooperation in a partnership with the International Centre for Advanced Mediterranean Agronomic Studies and its institutions. This includes projects on capacity development for food security with Mai Montpellier and on drought management with Mai Zaragoza.

ICARDA-EU development and research projects (1990-2011)

In the past two decades, ICARDA has participated in and managed 11 EU-funded projects. They cover research on legumes, cereals, wild oats, wheat improvement[1]; poverty, livelihood analysis and impact assessment; desertification and remediation of marginal lands; and strategies for organic and low-input integrated breeding and management.

Central and West Asia, North Africa

Algeria, Lebanon, Morocco: Capacity development on social and gender analysis approaches

This IDRC-funded project uses coaching, mentoring, peer review and workshops to build the capacity of participating national research teams. When completed in late 2012, the project expects to generate new insights into conditions and socio-economic constraints of rural women in the Mediterranean region as well as strengthen the capacity and increase the visibility of the partners involved.

[1] Partnership with the International Maize and Wheat Improvement Center - CIMMYT.

Case studies in each country provided new insights, and lessons on how to increase the impact of future development projects. In Algeria, researchers looked at the production and marketing of traditional garments (*qashabiya*) made from camel wool. The study helped identify gender-related marketing factors such as institutions, information and transparency, that limited the benefits to women. In Morocco, studies focused on medicinal plants as a livelihood option for poor communities. The results showed how limited attention to indigenous knowledge, gender roles and ethnic community decision-making processes has limited the impact of previous development projects on medicinal plants.

Central and West Asia: Poverty and livelihood analysis, impact assessment, economic and policy research

This EC-funded studied the livelihood dynamics of the rural poor and conducted a market-value chain analysis of high-value crops and livestock in the Central and West Asia and North Africa (CWANA) region. It also demonstrated the impacts of agricultural research and identified constraints to technology adoption. Activities included research on the effects of climate change on agricultural production, income, and natural resource use and capacity building of national agricultural research systems partners. EU support to this program also supported an integrated climate impact assessment project in Central Asia and China combining farm surveys, crop modeling scenarios and economic impact assessment. This produced policy options for adaptation of agriculture to climate change in Central Asia.

Economic analyses helped quantify the impacts of research programs, and the returns to donor investments. One study looked at the impacts of chickpea research in Syria, where technologies have been developed for winter planting (rather than traditional spring planting). In a survey of 160 villages across 14 districts, as many as 73% of farmers had adopted the technology. The data show that adoption of winter chickpea is expanding rapidly, particularly in drier zones – and that adoption could be further accelerated with better extension support and farmer training.

In Turkey, researchers studied adoption patterns of five new winter and spring wheat varieties developed, through international collaboration. Farmers report that under rainfed conditions, the new varieties gave more than double the yield of older varieties: 3541 kg/ha, compared to 1654 kg/ha. Average gross margin increased from $ 392 to $ 858 per hectare. Adopters of the new varieties had household incomes 80% higher than non-adopters.

ICARDA-CIMMYT Wheat improvement program

ICARDA is working with CIMMYT to develop and test new and improved wheat varieties with drought, heat and cold tolerance and resistance to diseases – such as stem rust (Ug99) – and pests such as the Hessian fly. The project is also developing integrated pest management options and putting into action conservation agriculture practices for wheat-based production systems.

Many wheat farmers in Central and West Asia and North Africa (CWANA) live in rain-fed areas of less than 350 mm annual rainfall, and their livelihoods often depend mostly on income from wheat production. Genetic improvement of winter wheat (WW) and facultative wheat (FW) is relevant to small-scale farmers in the CWANA region. Both WW and FW occupy more than 16 million ha. The relevance of genetic improvement is illustrated by the long-lasting collaboration between Turkey, CIMMYT, and ICARDA. The program explores possibilities and available technologies to improve the sustainable productivity of wheat in the CWANA region. The program focuses on genetic improvement of WW, FW, spring wheat, and durum wheat combined with improved plant health and adoption of agricultural practices for improving soil moisture conservation, which improve water efficiency. Combining breeding with multi-location testing of outstanding wheat germplasm, high-yielding elite materials with tolerance/resistance to prevailing biotic and abiotic stresses are developed and made available to national programs in the CWANA region. Turkey was an ideal country for screening, testing and selection of germplasm at ten different ecological zones. This has resulted in developing appropriate germplasm for adaptation in the CWANA region.

- Each year, the project trains about 100 young scientists from CWANA countries in advanced research techniques. It has thus helped create a strong research base to drive future advancements in the region.
- Between 2006 and 2010, as many as 65 improved wheat varieties (35 spring bread wheat, 19 durum wheat, 11 FWW) have been released in ten CWANA countries.
- To help accelerate the dissemination of new varieties, large quantities of seed are produced at ICARDA's Tel Hadya research station in Syria. From 2007 to 2010, more than 17.6 tons of seed were produced, for research, seed multiplication and community initiatives.

In 2010, an EU review panel examined the ICARDA-CIMMYT Wheat Improvement Program for CWANA (an IFAD-funded program co-supported by the EU). The panel found that the program: "*....remains highly relevant... has been well managed; its efficiency satisfactory; its effectiveness highly satisfactory.*»

Pakistan: Pathways out of poverty identified in selected sites

This USAID-funded project aimed to improve the livelihoods and food security of rural people in the Baluchistan province of Pakistan. It strengthened the capacity of the Baluchistan research and technology transfer system to provide sustainable market-oriented arid agriculture and livestock marketing, and focused on enhancing crop productivity and agro-processing.

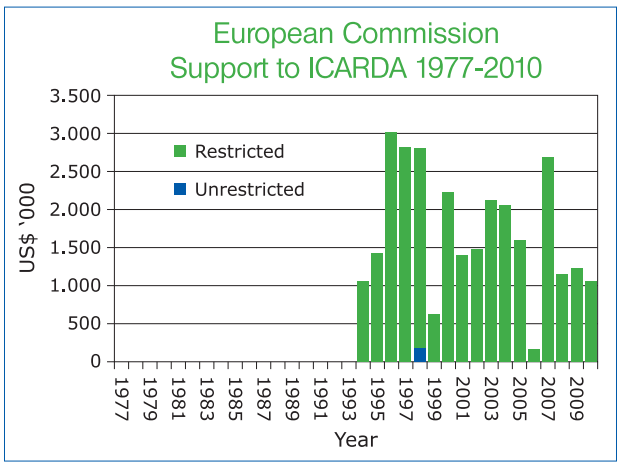
The project introduced a range of low-cost innovations to improve water productivity, reduce water losses from watercourses, and harvest rainwater for irrigating crops, shrubs and fruit trees. For example, small changes in irrigation practice saved 250 cubic meters of water per hectare, with no loss of yield. An integrated package of livestock technologies – preventive veterinary health care, alternative feeding regimes, improved range management, fodder production – is creating new income opportunities for small-scale producers. Improved varieties of wheat, barley, lentil and vetch were introduced, together with community-based seed multiplication programs, supported with training and equipment. The new varieties out-yielded local cultivars by 20% to over 60% depending on rainfall.

Africa

Conservation agriculture in Africa

In this project, ICARDA and partners are studying the reasons for the limited adoption of conservation agriculture in Africa in order to promote its large-scale adoption. The project will draw on a number of selected case studies from major agro-ecological zones and farming systems of Africa through the use of selected biophysical, socio-economic and innovation systems models.

In Morocco, current efforts are building on long-term research conducted by national research centers. Researchers have tested zero-tillage systems on a range of crops (wheat, barley, maize, lentil, vetch, oat, chickpea, sunflower) in dry rainfed areas. Over a nine-year period, conservation agriculture practices increased wheat yields by 26 to 46%, compared to conventional tillage. There were also substantial improvements in water conservation, erosion control, soil nutrient levels and carbon sequestration. One important constraint has been overcome with the development of low-cost zero-tillage seeders designed and fabricated locally. More than 5000 hectares are under conservation agriculture in Morocco; this is expected to increase to 7000 hectares in 2012.



Africa: Strategies for organic and low-input integrated breeding and management

This project will develop novel breeding approaches aimed at improving the performance, quality, sustainability and stability of crops adapted to organic and low-input systems, in their diversity in Europe and taking into account the needs of small-scale farms in Africa.

The project is centered on farmer-participatory varietal selection (PVS), where farmers and researchers work together to test a range of varieties, to identify those that best suit local resources and farming priorities. PVS helps farmers develop capacity and build on traditional skills and knowledge. Project farmers in Ethiopia are currently evaluating more than 100 new barley genotypes developed from parent lines identified during the PVS.

Agricultural Research for Development to ensure long-term food availability

ICARDA takes a 'research for development' approach. The goal is to better understand how farming systems in dry and marginal areas can become more productive and to propose options and solutions developed with partner countries.

Such a 'systems approach' includes, for example: research on integrated crop/livestock systems; the more efficient use of limited soil and water resources; or the introduction of new crops into traditional farming systems, to increase nutrition and ensure the stability of harvests.

Effective policies and institutions are also a key part of the farming system. Improving this national infrastructure can have a direct impact on the lives and incomes of small farmers.

While others work on parts of this picture, ICARDA is one of the few research centers to link research on global issues such as water scarcity and climate change, with hands-on work with farmers and communities – led by an understanding of the practical problems they face.

The center's core activities result in:

- Strengthened capacity of people and national institutions in dry areas.
- Testing of approaches and technologies that improve rural development and food security.
- Working with countries to apply new ideas developed through research with country partners.

[2] Thematic Strategy and Multiannual Indicative Programme (MIP) of the Food Security Thematic Programme (FSTP) for 2011-2013.

ICARDA-EU Strategic Cooperation - key projects

Title	Duration (mo.)	Total Budget (US$)
CYCLER-Support on: Supporting the implementation of FP6 research activities related to waste water use and recycling by using new generation greenhouse systems, adapted to the requirements of the MED partner countries	24	0
Enhancing Productivity and Sustainability of Crop Production in the Mediterranean Highlands	36	302450
Legumes, Cereals, Wild Oats, Prep studies	0	4794977
Nile Valley Regional Programme. Strengthening Research for Sustained Production of Wheat, Barley and Cool Season Food Legumes in Egypt	48	0
Nile Valley Regional Programme. Egypt Phase II. Developing Sustainable Farming Systems Under Special Consideration of Cereals and Cool Season Food Legumes	60	6728000
Project 2: ICARDA-CIMMYT Wheat Improvement Program (ICWIP)	24	543000
Project 8: Poverty and Livelihood Analysis and Impact Assessment	24	1714400
Desertification Mitigation and Remediation of Land (DESIRE)	60	311436
Administration of funds within the Project on Coordination of Agricultural Research in the Mediterranean (ARIMNet)	60	114618
Conservation Agriculture in Africa: Analysing and Foreseeing its impact - Comprehending its Adoption (CA2AFRICA)	30	1366226
Strategies for Organic and Low-input Integrated Breeding and Management (SOLIBAM)	53	349355

ICARDA research partners in the European Union

EU Collaborations/Partners/Coordination

Centre De Coopération Internationale En Recherche Agronomique Pour Le Développement (CIRAD)

Centro Internacional De Agricultura Tropical (CIAT)

Leibniz-Zentrum Fuer Agrarlandschaftsforschung (Zalf)

Institut De l'Environnement Et Recherches Agricoles (INERA)

Centro Internacional De Mejoramiento De Maiz Y Trigo (CIMMYT)

Institut National De La Recherche Agronomique (INRA)

Consejo Superior De Investigaciones Científicas (Csic)

Associazione Italiana Per L Agricoltura Biologica (Aiab)

Progressive Farming Trust Ltd T/A The Organic Research Centre (Orc)

Danmarks Tekniske Universitet (Riso-Dtu)

Institut Technique De L›agriculture Biologique (Itab)

Technische Universitaet Muenchen (Tum)

Instituto De Tecnologia Quimica E Biologica - Universidade Nova De Lisboa (Itqb)

Agencia Estatal Consejo Superior De Investigaciones Cientificas (Csic)

Escola Superior Agraria De Coimbra (Esac)

Agricultural Research Institute Of The Hungarian Academy Of Sciences (Has)

Scuola Superiore Di Studi Universitari E Di Perfezionamento Sant›anna (Sssup)

Universita Degli Studi Di Perugia (Unipg)

Eidgenoessisches Volkswirtschaftsdepartement (Fdea-Art)

Københavns Universitet (UCPH)

Inra Transfert S.A. (It)

Saatzucht Donau Gesmbh & Cokg (Donau)

Gautier Semences Sas (Gautier)

Agrovegetal S.A. (Agrovegetal)

Arcoiris Srl (Arcoiris)

Universita Di Pisa (Unipi)

University Of Copenhagen, Denmark

National Research Council Of Italy-Institute For Agricultural And Forest Mediterranean Systems (ISAFOM)

Narural Environments Research Council (Nerc)

University Of Western Australia (UWA)

Universitat De Barcelona

International Fund For Agricultural Development (IFAD)