Megaproject 6: Knowledge Management and Dissemination for Sustainable Development in Dry Areas

Rationale

International and national strategies, often supported by the donor and development community, are increasingly focusing on pro-poor economic growth and rural poverty reduction. This is reflected in recent declarations that call for revitalizing the support to agriculture and rural development to levels that are more consistent with the importance of agriculture to national economies, the needs of the rural communities and the global targets of poverty reduction (Millennium Development Goal - 1). In response, the CGIAR Science Council strategy explicitly relates four out of the five system priorities to the reduction of poverty. However, if the international public goods (IPG) generated by research are to have an impact on rural communities and poverty, there is a need for sound management of the knowledge generated from IPG research results and its alignment with dissemination to end-users.

ICARDA has focused on generating research results aimed at enhancing the economic growth of farmers and pastoralists in developing countries. However, majority of the poorest farmers and pastoralists have not had access to information and knowledge generated from this research. This is attributed partially to the limited and uncoordinated international and national support for knowledge dissemination, and limited capacity of national programs to take advantage of advances in information and communication technologies (ICT) to acquire, use, manage and disseminate knowledge.

Megaproject 6 has been established in response to these challenges and to integrate the Center's work on knowledge management and dissemination into the overall research and capacity building program. The goal is improved welfare of the rural poor in the dry areas through better use of knowledge for sustainable agricultural production and dissemination of new livelihood options. The strategy is to develop and implement a systematic and consultative approach for knowledge management and dissemination to the widest possible segments of the rural poor, taking into consideration chances of success, sustainability and potential for upscaling.

ICARDA has converted research results into appropriate technological, policy and institutional options that have been successfully transferred and adopted by large-scale resource management and agricultural development projects (e.g., Matrouh Resource Management Project in Egypt, Barani Village Development Project in Pakistan). The approaches developed by ICARDA have also been adopted by national programs in other development projects in Tunisia and Morocco. ICARDA, along with other Centers, has also accumulated valuable lessons in agricultural rehabilitation in post-conflict Afghanistan and other countries, as documented through the publication *Healing Wounds: How the International Agricultural Research Centers of the CGIAR Help Rebuild Agriculture in Countries Affected by Conflict and Natural Disasters.*

National seed systems face a range of problems, including deficiencies in production and processing facilities, limited technical and managerial capacities, lack of trained personnel, and absence of a vigorous private seed distribution system. Formal seed enterprises in CWANA supply only a small portion of the seed of major crops; the remainder is provided from farmers' own stocks or exchange among farmers (the informal sector). Weaknesses in seed supply systems limit access by farmers to seed of improved varieties. Formal seed systems have also been disrupted in post-conflict countries, and seed supply becomes a major constraint following extended droughts and other disasters. ICARDA is the only CGIAR Centre with a dedicated Seed Unit. Its activities are particularly relevant to countries in Central Asia and the Caucasus, and in post-conflict countries, where the re-organization of seed support is an important component in the restoration of agricultural productive capacity.

The Seed Unit aims to improve seed supply to farmers of the region by strengthening national seed programs, based on training, networking (through the CWANA Seed Network), and technical assistance and advice. The Unit also carries out research on alternative seed delivery mechanisms, the economics of seed delivery by formal or informal sectors, and the role of the private sector.

The rapid advances in ICT/KM have in many cases largely by-passed countries not equipped with the technical or human capacity to take advantage of them. Public research systems in developing countries are lagging behind in their ability to take advantage of new knowledge. NARS need assistance in utilizing ICT/KM tools effectively within their research programs so that they can take advantage of IPG research outputs.

Capacity building of NARS and other partners through training in specific aspects of research are included under the respective megaprojects MP1-MP5. MP6 focuses on the development of alternative approaches to capacity building and knowledge dissemination, such as distance learning (e-learning), expert systems, etc, and on the up-scaling and out-scaling of the knowledge developed by the other five research projects.

Target Ecoregion

The project targets non-tropical dry areas, with its main geographic focus on Central and West Asia and North Africa (CWANA) and the Nile valley countries.

Project Description

The project goal, purpose, outputs, output targets and associated expected outcomes and impacts are provided in the attached "Project Impact Pathway" matrix. Assumptions and external conditions associated with outputs, outcomes and impacts are listed in the introduction to the Project Portfolio.

The overall *modus operandi* of MP6 is to disseminate to end users research outputs, poverty and livelihoods analysis, impact assessment and knowledge packages developed by ICARDA's research program. One specific task in the medium-term plan is the development of 'best bet' approaches that enhance the capacity of a broad range of users to access packages of technological, institutional and policy options (TIPOs).

While giving priority to dissemination of available knowledge and TIPOs the plan is to identify and develop researchable activities in knowledge management and dissemination. This is a new area of research that aims to capitalize on the experience gained and add value by sharing and upscaling. This area of knowledge was previously addressed in an *ad hoc* manner, and will now be institutionalized in an explicit and systematic manner.

Major elements of MP6 comprise:

- Researching, developing and implementing a systematic approach to strengthen and use ICARDA's empirical information platform (scientific data bases, tools and methodologies).
- Management and dissemination of information on technological, institutional and policy options.
- Developing frameworks for up-scaling pro-poor innovations.
- Institutionalizing the participatory and community-based research approaches and contributing to strengthening the public/private partnership.
- Enhancing the management and delivery of research products and knowledge to end users through new tools such as expert systems, scientific information systems and databases, and the development of integrated knowledge management systems.
- Strengthening national seed systems through technical assistance to formal seed delivery systems (development of business plans, seed quality assurance, variety maintenance, and plant breeding rights), action research on alternative seed supply systems (e.g., community-based seed enterprises), and research and technical assistance in harmonization of policies and regulations in the seed sector.
- Strengthening the capacity to support rehabilitation of agriculture in conflict/post-conflict countries and dissemination of best-bet practices and lessons learned.
- Developing capacity building materials and innovative learning approaches.
- Targeted dissemination, use and uptake of agro-biodiversity knowledge.

The project adopts the following approach:

- To engage – as far as possible – the beneficiaries and those involved in the implementation and monitoring of ICARDA's research projects in documenting knowledge generated and technologies developed and tested in the target environments and used by the communities.
- To identify the technological, institutional and policy options (TIPOs) emanating from research outputs.
- To develop dissemination packages of TIPOs suitable and responsive to the physical, social , cultural and economic needs of the targeted communities.
- To develop flexible dissemination support mechanisms and tools (e.g., decision support tools, information and communication materials) that are suitable for adoption and upscaling.
- To build on the successes identified from *ad hoc* but effective dissemination exercises.
- To develop effective partnerships with public and the private sector to assist in equitable and profitable dissemination to targeted poor rural communities.

Users and Beneficiaries

The ultimate beneficiaries of the knowledge and technologies are farmers, farming and pastoral communities, and other resource users in dry areas.

The users are a very broad range of stakeholders and partners, including national agricultural research and extension systems, national seed systems, policy-makers, development agencies and the public and private sectors; other CGIAR and international research centers; the donor community; international research and development organizations; NGOs and civil society organizations; the general public; etc.

Effective knowledge management and dissemination (KM&D) requires a change in the culture and behavior of all partners (those who influence the process or use its products) at all levels:

- Equity must be observed when targeting the poor and the poorest farmers and livestock keepers. This is only possible if the farmers and pastoral communities are empowered and the members – especially the silent majority – are encouraged to engage and involve in the dissemination and technology transfer processes.
- The complexity and variability at the policy-making level must be understood when engaging policy-makers (at local, regional and national decision making levels).
- The roles, responsibilities and complementary niches of civil society organizations, NGOs and local entrepreneurs must be understood and incorporated in the dissemination tools.
- Peers in CGIAR centers, other international and national research centers, development and donor organizations, have gained a wealth of experience in conceptualizing and developing KM&D approaches. Therefore, the exchange of information, expertise and lessons learned will be supported and strengthened through consultations, workshops, communities of practice, etc, with a view to defining new and effective paths and tools for KM&D.
- The donor community is important in up-scaling and out-scaling research products, as well as in convincing governments and other actors through policy dialogue and funding. Donors could provide for the knowledge generated by ICARDA gateways to the poor communities at the micro-level. There are examples where downstream research, testing and upscaling innovations have been facilitated and made to reach a large number of beneficiaries when linked to investment projects aiming at rural poverty reduction.
- The general public, including the media, who influence policy-makers and donors.

Collaboration

- *National Programs:* National research and extension programs, national seed programs, national agricultural universities, national libraries.
- Non-governmental organizations (NGOs) and civil societies; other institutes in the public and private sector.
- *International and Regional Organizations:* FAO, IFAD, UNDP-GEF and other UN agencies; International seed organizations (e.g. International Seed testing Association - ISTA; International Union for the Protection of New Varieties of Plants - UPOV, International Seed Federation - ISF); ESCWA (UN Economic and Social Commission for West Asia); ACSAD (Arab Center for Studies of Arid Zones and Dry Lands), AOAD (Arab Organization for Agricultural Development).
- *Advanced Research Institutes:* Central Laboratory for Agricultural Expert Systems, Egypt.
- IFAD Rural Poverty Portal and IFAD Regional Information Networks (RINs) in Asia (ENRAP); in Latin America (FIDAMERICA); in Africa (FIDAFRICA) and in the WANA Region (KARIANET).
- FAO: Livestock, Environment and Development (LEAD) (http://lead.virtualcenter.org).
- Interagency pro-poor livestock and animal health research donors http://lri.virtualcentre.org

System Linkages: The project participates in:

- **Systemwide Programmes and other CG Consortia:**
  - FHCRAA (Future Harvest Consortium for Rebuilding Agriculture in Afghanistan) and Planned Consortia for Iraq and Sudan.
  - Inter-Centre Training Group (INTG) and ICT-KM projects.
- **Challenge Program on Water and Food** through projects implemented by ICARDA.

MTP 2006–2008: Project Impact Pathway

Project	**MP6: Knowledge Management and Dissemination for Sustainable Development in Dry Areas**
Goal	Improved welfare of people in dry areas through better use of knowledge and technologies for sustainable agricultural production
Purpose	Increased use by stakeholders of global public goods generated by ICARDA for agricultural development and rehabilitation

	Outputs	**Intended Users**	**Outcomes**	**Impact**
OUTPUT 1	Enhanced access by end users to technology, institutional and policy options (TIPOs) for sustainable agricultural production through the use of participatory approaches, public/private partnerships, etc	NARS, technology transfer agencies, policy-makers, NGOs, and farming communities in the dry areas	TIPOs adopted in a participatory demand-driven approach by farming communities, local technology transfer agents, NARS and policy-makers in the dry areas	Sustainable improvement in agricultural production and farm household income
Output Targets 2006	Available TIPOs, developed by ICARDA and partners, for specific enterprises, agroecologies or end users, are documented, compiled, packaged and delivered to NARS and other users	NARS, technology transfer agencies, policy-makers, NGOs, and farming communities in the dry areas	ICARDA's research outputs, in the form of TIPOs are widely disseminated and used in national R&D programs	Enhanced adoption of appropriate innovations by end users Improved incomes and livelihoods of farming communities
Output Targets 2007	Video and other media messages on improved milk processing practices delivered to NARS and other users	NARS, technology transfer agencies, policy-makers, NGOs, and farming communities in the dry areas	Suitable technological packages and information on improved practices accessible and adopted by R&D programs	Enhanced adoption of appropriate innovations by end users Improved incomes and livelihoods of farming communities
	Participatory plant breeding approach institutionalized in national breeding programs in selected countries Community-based adaptive research and technology evaluation approaches adopted by national programs in selected countries	National research and extension systems, policy-makers, NGOs, and community-based organizations in selected countries	End users' (farmers and communities) knowledge, perceptions and preferences are explicitly integrated into national R&D programs Research outputs are adapted to end users' specific requirements Additional research problems identified by farmers/communities	Enhanced adoption of appropriate innovations by end users Improved production and farm incomes Increased involvement of farming communities in determining future R&D priorities

	Outputs	Intended Users	Outcomes	Impact
Output Targets 2008	ICARDA research activities linked with development projects as a means of delivering research outputs to end users	National research and extension systems, technology transfer agencies, policy-makers, development projects	Higher adoption rates of research technology and improved practices	Improved productivity, income and livelihoods of farming communities Improved use-efficiency of information
	Available e-learning resources accessible to NARS through collaboration among IARCs, and linkages between the WANA Regional Agricultural Information System (RAIS), developed by ICARDA, and the Global RAIS, coordinated by GFAR	NARS, international information professionals and scientific community	Improved accessibility to information and better resource sharing among intended users in the dry areas	Improved use-efficiency of information and R&D performance
OUTPUT 2	Strengthened seed systems through increased private sector participation and alternative delivery systems	Seed industry participants, i.e., formal (private and public seed company) and informal (farmers' groups, NGOs), seed producers, distributors, and other organizations in CWANA and other dry areas	Quality seeds of diversified and improved crops and varieties made available to farming communities, local technology transfer agents and NARS	Sustainable improvement in the income and living conditions of farmers through increased and stable crop yields
Output Targets 2006	Ten village-based seed enterprises (VBSEs) providing at least 1000 MT of quality seed to farmers in Afghanistan	Farming groups in 5 provinces of Afghanistan	Farmers in Afghanistan using quality seed of a diversified and improved crop/variety portfolio	Better yield, yield stability and farm incomes
Output Targets 2007	Three village-based seed enterprise (VBSEs) each in Morocco, Tunisia and Algeria, providing at least a total of 100 MT of quality seed to farmers	Farmers/ farming groups in Morocco, Tunisia and Algeria	Farmers in specific areas in Morocco, Tunisia and Algeria are using quality seed of a diversified and improved crop/variety portfolio	Better yield, yield stability and farm incomes
Output Targets 2008	Document on regional harmonization of seed policies and regulations finalized, agreed upon and submitted to legislative bodies for implementation in one sub-region (candidate region: CAC)	Policy-makers, legislative bodies in different countries of Central Asia	Private seed sector able to produce and market improved seed in the sub-region	Farmers have access to quality seed, resulting in better yield, yield stability and incomes.
	WANA Seed Network re-organized as a regional seed association or regional seed forum	Public and private seed sector stakeholders in CWANA	Better cooperation and integration of the seed industries of CWANA	Farmers have access to quality seed, resulting in better yield, yield stability and incomes

	Outputs	Intended Users	Outcomes	Impact
OUTPUT 3	Effective mechanisms for mitigating natural disasters and for agricultural rehabilitation in post-conflict situations	National research and extension systems, technology transfer agencies, policy-makers, development authorities, NGOs, and other relief and rehabilitation agencies	Rehabilitation of effective agricultural research and extension systems following conflicts or natural disasters	Restoration of the productive capacity of farmers following conflicts or natural disasters
Output Targets 2006	Collaborative programs for rehabilitating Iraq's agricultural sector developed	National research and extension system; Ministry of Agriculture; agricultural universities; development agencies	Capacity of Iraq's R&D institutions strengthened	Productive capacity of Iraqi farmers restored
Output Targets 2007	Collaborative agricultural rehabilitation programs developed in Sudan and Palestine	National research and extension system, development authorities, NGOs in Sudan and Palestine	Capacity of R&D institutions strengthened in Sudan and Palestine	Productive capacity of farming communities in Sudan and Palestine restored
	GIS database and maps of suitable crop varieties by agroecologies developed and disseminated	NARS, development agencies, IARCS	Appropriate adapted germplasm provided in post-conflict and disaster situations	Productive capacity of farming communities restored
Output Targets 2008	Potential alternative livelihoods for poppy producers in Afghanistan identified in projects supported by RALF (Research in Alternative Livelihoods Fund) managed by ICARDA	Afghan agricultural research and extension system; Afghan rural development agencies; international development agencies; NGOs	Enabling policies and institutional support required to support the uptake of alternatives to poppy production identified by national and international agencies Programs for out-scaling alternative livelihood options developed by NARS, NGOs, development agencies, etc	Alternative livelihood options adopted by farmers, reducing dependence on illicit crop production and contributing to national objectives of eliminating poppy production
OUTPUT 4	Enhanced management and delivery to stakeholders of research products and knowledge	National research and extension systems, international research partners, policy-makers, development agencies	Knowledge used in R&D programs by national and international partners	Effective use of ICARDA's global public goods in improving agricultural productivity, alleviating poverty, and protecting the environment
Output Targets 2006	Expert system for faba bean accessible to users	National research and extension systems, universities and other crop specialists	Best practices for faba bean production used by national programs in further research and in farm extension programs	Improved production of faba bean, improved farm incomes

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	International Crop Information System (ICIS) for lentil operational and accessible to users	Lentil breeders internationally	Lentil improvement programs have access to comprehensive data on lentil germplasm	Greater efficiency of lentil improvement programs Reduced genetic erosion from breeding programs using wider genetic base
	Web-based Laboratory Information Management Systems (LIMS) and Genome Management System (GEMS) for molecular data integration available to all users within CP Generation (*CP Generation*)	ICARDA scientists and partners within CP Generation	Integrated capture, storage, analysis and dissemination of genomic, genetic resource and crop evaluation information	Greater efficiency and effectiveness of international genetic improvement programs
	Integrated Library Management Systems (ILMS) used as means of networking with NARS libraries in CWANA	National libraries in CWANA	NARS, universities, and other users have access to international sources of information	Better informed national research programs
	Online bio-computing modules accessible to users	NARS and other agricultural scientists	Accurate and timely analysis of research results	Enhanced efficiency and capacity of the national agricultural research systems
Output Targets 2007	Expert system for plant protection in barley accessible to users	National research and extension systems, universities, other crop specialists, date palm producers	Best practices for barley plant protection used by national programs in further research and in farm extension programs	Improved barley production
Output Targets 2008	Expert system for management of date palm developed and tested	National research and extension systems, universities, other crop specialists, date palm producers	Best practices on date palm documented and made available	Improved date production
OUTPUT 5	Enhanced capacity of national research and technology transfer programs to better manage and disseminate knowledge	National research and extension systems; national ICT/KM systems; national seed industry staff; universities	More effective knowledge-based national research and extension programs	Enhanced performance of R&D endeavors
Output Targets 2006	National information professionals trained in management of electronic documents and databases			

	Outputs	Intended Users	Outcomes	Impact
Output Targets 2006, 2007 and 2008	E-learning and web-based training resources developed in collaboration with other IARCs and advanced research and training institutions, each year Training course in use for agricultural expert systems each year	National research and extension systems; national ICT/KM systems; national seed industry staff; universities	More effective knowledge-based national research and extension programs	Enhanced performance of R&D endeavors