



**International Center for Agricultural Research in the Dry
Areas**

**Centre-Commissioned External Review of ICARDA's
Outreach Programs and Partnerships**

Final Report

Review Panel

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Abbreviations and Acronyms

ADG-ICC	Assistant Director General-International Cooperation and Communication
AFESD	Arab Fund for Economic and Social Development
DDG-R	Deputy Director General-Research
APRP	Arabian Peninsula Regional Program
ARC/Egypt	Agriculture Research Center-Egypt
ARC/Sudan	Agriculture Research Center-Sudan
ARI	Agriculture Research Institute-Cyprus
AUB	American University of Beirut
AVRDC	The World Vegetable Center
BIGM	Biodiversity and Integrated Gene Management
BoT	Board of Trustees
CAAS	Chinese Academy of Agricultural Sciences
CACRP	Central Asia and Caucasus Regional Program
CARDNE	Regional Center on Agrarian Reform and Rural Development–Jordan
CBS	Centre of Biotechnology-Sfax, Tunisia
CBO	Community based organization
CCER	Central Commissioned External Review
CGIAR	Consultative Group on International Agricultural Research
CDU	Capacity Development Unit
COF	Center of Organic Farming in Iraq
CODIS	Communication, Documentation and Information Services
CRP	CGIAR Research Program
CWANA	Central and Western Asia and North Africa
DDG-R	Deputy Director General-Research
DISIPS	Diversification and Sustainable Intensification of Production Systems
EIAR	Ethiopian Institute of Agricultural Research
EPMR	External Program and Management Review
ESA	École Supérieure d'Agriculture de Mograne-Tunisia
ESAK	École Supérieure d'Agriculture du Kef-Tunisie
FFS	Farmer Fields Schools
GCSAR	General Commission for Agricultural Research-Syria
GISU	Geographic Information System Unit
HCST	Higher Council for Science and Technology-Jordan
ICARDA	International Center for Agricultural Research in the Dry Areas
ICT	Information and Communication Technology
IFAD	International Fund for Agricultural Development
INGC	Institut National des Grande Cultures-Tunisia
INRGREF	Institut National de Recherche en Génie Rural, Eau et Forêts-Tunisia
INWRDAM	Inter-Islamic Network on Water Resources Development and Management
IPG	International Public Good
IPM	Integrated Pest Management
ITGC	Institut Technique des Grandes Cultures-Algeria
ITU	Information Technology Unit
IWLM	Integrated Water and Land Management
JUST	University of Science and Technology
KL	Kaslik University in Lebanon
LU	Lebanese University
LARI	Lebanese Research Institute
MSN	Michigan State University
NAPC	National Agriculture Policy Center-Syria
NARC	National Agriculture Research Center-Palestine
NARI	National Agriculture Research Institute–Eritrea
NARP	North Africa Regional Program

NCARE	National Center for Agriculture Research and Extension-Jordan
NCSR	National Council for Scientific Research in Lebanon
NFSM	National Food Security Mission–India
NGBT	National Gene Bank of Tunisia
NVSSARP	Nile Valley and Sub Saharan Africa Regional Program
NGO	Non-Governmental Organization
NRAA	National Rainfed Area Authority-India
NRM	Natural Resource Management
NVSSARP	Nile Valley and Sub Saharan Africa Regional Program
OFID	OPEC Fund for International Development
PARC	Palestinian Agriculture Relief Committee
PDGMU	Project Development and Grant Management Unit
R-4-D	Research for Development
RKVY	Rashtriya Krishi Vikas Yojana-India
SACRP	South Asia and China Regional Program
SBAR	State Board of Agriculture Research-Iraq
SEPR	Social, Economic and Policy Research
SRF	CGIAR Strategy and Results Framework
TIPO	Technical, Institutional and Policy Option
UJ	University of Jordan in Jordan
WARP	West Asia Regional Program
WLI	Water and Livelihood Initiative

EXECUTIVE SUMMARY AND RECOMMENDATIONS

This Center Commissioned External Review (CCER) of ICARDA's Outreach Programs and Partnerships was conducted from 10 June to 20 July 2013. The overall review methodology is based on indicators of relevance, effectiveness and efficiency in terms of the alignment of the Outreach and Partnerships Program's objectives with those of ICARDA's, and in ICARDA's capacity to achieve its expected outputs, and in its optimum use of human and financial resources. The measurement criteria included the level of satisfaction expressed by NARSs partners, collaborating CGIAR centers, Advanced Research Institutions and other strategic partners, as well as the match between the geographic distribution of regional offices, ICARDA's Strategic Plan and CRPs.

The CCER took place in an environment marked by ICARDA's relocation and decentralization; new challenges facing agriculture in the dry areas in the context of climate change; implementation of CGIAR reforms and CRPs; growing importance of public/private cooperation and the increased recognition of the need to choose more effective and value added research-for-development partners. The Panel received presentations from management and program staff, conducted individual and small group discussions with a large number of key informants, and Panel members visited- together and separately- five regional and country program sites in Jordan, Lebanon, Turkey, Morocco, Egypt, Ethiopia, India, Pakistan, Uzbekistan and Tajikistan. The Panel reviewed the Center's relevant documents to the CCER work and conducted a survey questionnaire on outreach programs. The Panel is grateful to ICARDA's management and staff, and the Trustees with whom it engaged with for the open and constructive manner in which the Review was conducted.

The CCER Panel found that the countries covered by the outreach programs are characterized by tremendous agro-ecological diversity and differentiated agriculture production environments requiring different research for development approaches from ICARDA. Thus, the research topics embraced along the R4D continuum and impact pathway, diverse across outreach programs, were found to address the more salient challenges according to regional specificities and priorities; the collaborative arrangements with NARS are strong and involve a wide range of partners with high levels of mutual trust and respect. Further, the panel finds that ICARDA engages with a wide range of diverse partners that support ICARDA to deliver its mandate throughout the research to development continuum in dry areas; the outreach activities are highly relevant to their mandate countries and ICARDA's 2007-2016 Strategic Plan; the Regional Offices are solid and highly respected entities with strong leadership and continue to produce impressive results through well-established effective local, national, regional and international partnerships.

Together, the Center's collaborative research through outreach programs have achieved many notable and commendable results including the development of improved elite lines and cultivars of cereal, legume and forage crops resistant to biotic and abiotic stresses; technology packages to address water shortages, adaptable conservation agriculture practices; capacity development through non-degree and degree training; capacity development of NARS through the establishment of research facilities such as biotechnology laboratories; the production of a large number of peer-reviewed publications co-authored with NARS partners; and a diverse number of substantial and impressive on-going effective public and private partnerships with development agencies, public and private sector entities along the impact pathway. Some of ICARDA's success stories are summarized in Appendix VIII of this report.

In many ways, the collaborative research through Outreach Programs and Partnerships today are better placed than they were at the time of the previous CCER in 2003/2004 in being able to effectively address some of the key long term global challenges of food

security, poverty alleviation and the sustainability of natural resources in drylands. Still, the Panel finds some room for improvement. Areas for improvement are presented below as recommendations. In drawing its recommendations, the CCER panel is aware that some may have fallen beyond the original scope of the terms of references, but these have arisen as a consequence of the Panel's perceived ideas of how best to improve on ICARDA's performance through Outreach Programs.

Overall recommendations:

Research-for- Development

ICARDA has mandated responsibilities for the production of International Public Goods through research. It is expected that this research be potentiated for practice change through guided adaptive research, which is the universally accepted function of ICARDA's outreach programs with R4D partners. Most donors reasonably expect that the projects they fund will include management of the complete research to impact continuum. It is therefore inevitable and desirable that ICARDA ventures cautiously through adaptive research into knowledge transfer and up-scaling of technology adoption, utilizing wherever possible, partners better placed to do so. In some circumstances, however, low capacity amongst NARS and extension agencies to effectively transform research into practice change will require ICARDA's participation in activities towards knowledge transfer.

Recommendation 1: While recognizing that ICARDA risks diluting the quality of research if significant time of scientists is spent backstopping projects that contain little publishable research, the CCER Panel recommends: (i) that outsourcing or contracting of backstopping projects be pursued; (ii) that each project will need to be packaged in its own way, but will contain components of how to apply the research, the conditions under which the research is likely to be applicable, and the required background resources needed; and (iii) that ICARDA maintain a regional vigilance and visibility for opportunities for development-ready outputs to be exploited and explicitly pursued in the Communication Plan.

Knowledge Sharing and Information Systems

Recommendation 2: The CCER Panel recommends to ICARDA putting its full weight behind its *Strategic Communication and Knowledge Sharing Plan (2012-2016)* to link the research platforms into a sophisticated communication web through a state-of-the-art knowledge management system using ILRI's experience as "best practice," with a strong focus on opening research results as International Public Goods to be accessed by everyone. This implies the following actions:

Action 1. Multiple regional and thematic learning be captured, synthesized and disseminated consistent with the 2012-2016 Strategic Communication Plan.

Action 2. Given regional specificities, complexity and dynamism of the NGO sector, a more nuanced and proactive engagement with the NGO community needs to be developed,

Action 3. Establishment of continuing network of partners - called "Friends of ICARDA" as an advocacy mechanism to be initially constructed through the current outreach offices in collaboration with CODIS, to expand impact.

Capacity Development.

Recommendation 3: The CCER Panel recommends that ICARDA increase its investment in capacity development through the creation of training capabilities at the platform/regional levels. This implies (i) that the functions of the Outreach Offices where Platforms and thematic research locations will be established be reviewed to ensure that capacity development is a major accountable responsibility (ii); the establishment of capacity development focal points at regional/platform levels with appropriate training and duty recognition; (iii) the training of outreach personnel on the preparation of training modules, resources and delivery; (iv) the Head of the Capacity Development Unit undertakes a scoping study of resources, facilities and partnerships that could be used by Regional/Country Offices to deliver training activities and serve participants; and (v) harmonize the logistics associated with the conduct of capacity development activities that needs to be described in a manual.

Socio-economic and policy research

Recommendation 4: ICARDA Outreach Programs, in general, have insufficient socio-economic studies. The Panel recommends that the ICARDA SERP Program ensure Outreach Programs have the capacity to conduct more baseline, adoption and impact studies, analyses of financial, social and economic returns of technological packages, and associated policies for technology uptake by farmers. This implies that socio-economists be posted and made more available at platform and regional levels.

Stakeholder Analysis and Political Economy

Recommendation 5: The CCER Panel recommends that ICARDA conduct stakeholder analyses, including adopting a political economy approach for more nuanced understanding of power relations in the design of every project and program to maximize uptake of research outputs. Such an approach will help define the key partners to be involved with in a change process from the very beginning of project/program cycle to help increase the chances for successful collaboration, impact and out-scaling. This is especially true in the Outreach Programs in the context of decentralization where ICARDA is expected to operate further down the research to development continuum.

Gender mainstreaming

Recommendation 6: As the SEPR is in the process of employing another gender expert, the CCER Panel recommends that ICARDA use modalities to mainstream gender in all its R4D activities. The purpose of mainstreaming gender concerns is to improve on the efficiency and effectiveness of research for development projects (especially along the value chain) as well as to support gender equality in a region where the role of women in agricultural production (especially in livestock) appears to be on the rise.

Conserving ICARDA identity at decentralized research platforms

Recommendation 7: The CCER Panel recommends that ICARDA clarify its collaborative work with the host countries where decentralized research Platforms and specific research thematic sites are located to ensure that its national and global research priorities are safeguarded, and for ICARDA to conserve its

international identity by providing its scientists with access to independent research facilities.

Devolution of decision making to regional coordinators in the context of decentralization

Recommendation 8: The Panel recommends to ICARDA that appropriate devolution of much decision-making and implementation procedures from Headquarters to Regional Offices and Platforms to improve on the efficiency of delivery and reduce stressful workload on Headquarters. This implies effective modalities for delegation of authority to the Regional Coordinators or research programs in Platforms of thematic research locations in managing contracts and committing project expenditures within the boundaries based on approved work programs and budgets to ensure smooth and timely project implementation, with the understanding that a yearly internal audit is conducted as part of risk management.

Seed systems development

To ensure impact of crop improvement research at ICARDA, the seed systems remain a bottleneck in several countries such as Egypt, Ethiopia, Sudan, Yemen, Iraq, Uzbekistan, Tajikistan and Azerbaijan where seed health is below standard and the variety release and seed certification practices are lengthy and cumbersome.

Recommendation 9: While the responsibility of variety release and seed certification lies with NARS, the CCER Panel recommends that ICARDA enhances its assistance through focused training and mentoring to the countries where the seed system has collapsed and needs to be rebuilt on a solid base for seed health and streamlined variety release processes.

Alignment with CRPs and sustainability of Outreach Programs

It is possible that restricted funding projects through the Regional Programs directly will be reduced as funding is increasingly channeled through the CRPs. This represents problems of sustainability for Regional Programs, and in particular for those Regional Programs in which there will be limited CRP interventions. As these programs in ICARDA mandate countries represent crucial links with NARS and other development partners, uncertainty about sustainability needs to be addressed.

Recommendation 10: Given that restricted funding of outreach projects may be directly reduced as funding is increasingly channeled through CRPs, the CCER Panel recommends that ICARDA develop a management plan that clarifies the role of the Regional Programs in the CRPs, the interaction between ICARDA Regional Programs, and those of partner Centers in CRPs and the resulting costing arrangements.

North Africa Regional Program (NARP)

Expanding NARP coverage to West Africa

Recommendation 11: Expand ICARDA's work in the relevant CRPs to the drylands of West Africa through NARP to support research, particularly on (i) drought management through improved on-farm water management including water harvesting, supplemental and raised bed irrigation; and (ii) improving the resilience of rangelands and small ruminants.

Strengthening NARP Platform research capacity

Recommendation 12: It is recommended that the research team at the North Africa platform based in Morocco be strengthened in the areas of agronomy and socio-economics.

Nile Valley and Sub-Saharan Africa Regional Program (NVSSARP)

SSA region research priorities

Recommendation 13: In the process of transforming the Ethiopia office from a country program to a global platform and Regional Program to serve SSA, it is recommended that ICARDA hold stakeholder consultation meetings with SSA countries to develop updated regional research priorities and collaboration modalities.

West Asia Regional Program (WARP)

ICARDA -Turkey Country Program

Recommendation 14: The CCER Panel recommends that ICARDA reinforce the capacity of the Turkey country office in Ankara with a full time research assistant in breeding to allow the Country Coordinator to devote more time to breeding, facilitation and coordination.

Central Asia and the Caucasus Regional Program (CACRP)

English language training

Recommendation 15: To enhance the effectiveness of CAC counterpart scientists, the CCER Panel recommends that the CGIAR Regional Collaborative Research Program of which ICARDA is a coordinator and a member, include a budget item in the PFU budget for partner communications and training in the English language. This could be financed by a small increase of membership contributions, NARS contributions and partial cost recovery from trainees.

PFU employment policy

Recommendation 16: The CCER Panel recommends that ICARDA accelerate the full implementation of the new harmonization policy for local support staff employment for the CGIAR PFU in Tashkent by issuing ICARDA contracts for existing employees with salary payment in USD through their local bank account, provided that these are transferred from abroad in line with the host country legislation.

Highland Regional Network

Recommendation 17: The CCER Panel recommends that ICARDA take the lead in reactivating the Highland Regional Network, locating it at the CGIAR PFU in Tashkent or another suitable country, with a small catalytic financial contribution to periodically organize regional knowledge sharing events and support to resource mobilization efforts for a long-term mountainous highland ecosystem research project/program.

Broadening CACRP geographic coverage to Mongolia

Poverty in Mongolia has been a direct consequence of the transition to a market economy in the 1990s, after the breakup of the Soviet Union and the collapse of Mongolia's centrally planned economy. Presently, one in three people in Mongolia are poor and poverty is deeply

entrenched in rural areas, where about half of the country's poor people live, and much of which is drylands. The livestock and pasture sector complemented by winter wheat growing in high altitudes is key to the livelihoods of rural Mongolians. Half of all people in rural areas are small ruminant semi-nomadic herders who move from one remote pasture to another, living with their families in traditional tents. At present, the country is benefiting from donor attention for financing food security projects with focus on small ruminant and pasture development.

Recommendation 18: ICARDA to consider expanding its CAC Regional Outreach Program to Mongolia and taking the lead in collaboration with the CGIAR PFU members in Tashkent to include Mongolia in ongoing and future regional projects on the improvement of crop and small ruminant production systems and capacity development.

South Asia and China Regional Program (SACRP)

Partnering with Indian State Programs

Recommendation 19: The CCER Panel recommends that ICARDA explore the potential to further mobilize resources through partnering with Indian State programs whilst ensuring the regional applicability of developed International Public Goods.

Enhanced research capacity and partnership with Pakistan

Recommendation 20: The CCER Panel recommends that ICARDA undertake a high level mission to Pakistan to forge strategic partnerships. Utilizing NARS strengths and commitments, the delegation is likely to mobilize funds to do regionally significant R4D, focusing on integrated water and land management for implementation, potentially in collaboration with CACRP.

Linkages with CRP legumes

Recommendation 21: In case Pakistan faces barriers to being involved in the grain legumes CRP under ICRISAT leadership (being in India), the CCER Panel recommends that ICARDA identify mechanisms for re-engaging with Pakistan around legume breeding activities from within or without the CRP Grain Legumes breeding work.

In-depth review of Afghanistan Country program

Recommendation 22: The CCER Panel recommends that ICARDA undergo a strategic review of the Afghanistan Country Program to adjust to the new political climate with particular attention to requirements of staff located in-country, their welfare and options for proxy management for effective delivery.

Partnerships with NARS and Advanced Research Institutes

NARS south-south collaboration

Recommendation 23: While maintaining its good practice in engaging closely with NARS/ARIs, the CCER Panel recommends that ICARDA recognize that some NARS are more advanced than others. Strong NARS should be involved in support of the lesser advanced ones using both formal and informal south-south collaborative mechanisms facilitated by ICARDA, as well as to document and share best practices and learning through ICARDA's sophisticated website for knowledge management referred to in **Recommendation 2** above

Joint appointment with NARS

Recommendation 24: Based on past successful joint appointments between ICARDA and NARS, joint appointment is considered a powerful collaborative modality currently underutilized at the outreach level and should be used more often to enhance partnership, bring in needed expertise and save on costs such as the case with Morocco for biotechnology work.

Partnership award for outreach teams

Recommendation 25: Whilst it is appropriate that ICARDA recognize research excellence through publication awards, the importance of outreach and partnership activities should also be recognized. The CCER Panel therefore recommends that ICARDA develop a “most successful partnership” award that celebrates excellence in outreach through effective partnerships.

Private sector partnerships

Recommendation 26: On the basis of on-going promising impact-oriented private sector partnerships, the CCER Panel recommends that (i) on-going and future outreach programs play a more active role in the promotion of private sector investment in support services for technology transfer and post-harvest activities; (ii) assess and document in the form of best practices some of the on-going promising experiences in the outreach programs starting with Turkey’s on-going experience in the seed sector to identify enabling conditions for up-scaling; and (iii) more engagement with big and small international/national private sector companies such as those engaged in food processing and agribusinesses in general, as well as individual and corporate philanthropies.

Restructuring of regional offices

Recommendation 27: The CCER Panel endorses the restructuring of ICARDA’s regional outreach offices to align with the decentralized research platforms. This consists of (i) evolving the Morocco country office into a regional office to align with the platform in Morocco. Tunisia remains a country office to service sub-regional outreach projects, reporting to the new Morocco regional office; (ii) evolving the Ethiopia country office into a regional office to align with the platform in Ethiopia. Egypt remains an enhanced country office reporting to Headquarters to service the specific thematic focus site on high input irrigated systems, as well the sub-regional outreach activities in the Nile Valley in Egypt and Sudan; (iii) the regional office in India matches the location of the platform in India for food legumes reporting to Headquarters; and (iv) the regional office in Uzbekistan matches the location of the specific thematic focus site on highlands systems, reporting to Headquarters.

Research focus at platform and outreach programs

Recommendation 28: The CCER Panel recommends that respective focus of research work at platforms and at outreach locations is guided by the complementarity and positioning along the R4D continuum and impact pathway. Platform research focuses on research to produce a range of alternative and broad outputs that need to be validated, tested and evaluated with NARS and farmers by outreach programs, facilitating the research for development collaboration with partners to address specific agro-ecologies and socio

economic conditions for the development of validated location specific outputs and technology transfer practices.

System research approach

ICARDA's breeding capacity for all mandated crops, and particularly for winter wheat by the Turkey-CIMMYT-ICARDA collaborative IWWIP, is strong and conducive to generating robust and enhanced wheat varieties. Breeding, however, is only part of the answer to productivity increases, with an average contribution of 25%. Crop agronomy and husbandry remains a missing key factor for further yield increases, for which ICARDA is well placed to play a lead role in addressing the gap of integrated system research.

Recommendation 29: The CCER Panel recommends that ICARDA takes the lead in appropriately addressing the systems research approach by ensuring that crop agronomy and husbandry work is adequately and timely addressed as an integrated part of breeding activities in all outreach programs and IWWIP. The systems research work would need also to be complemented by more ICARDA research on commodity value chains to maximize impact.

Coordination and integration of multidisciplinary research

Recommendation 30: To improve on weak coordination among research programs and ensure systems research integration, the CCER Panel recommends that ICARDA address this gap through the formation, at an early stage for each research project, a well-staffed and result-based multidisciplinary implementation team with a binding financing plan regardless of source of funding across collaborating research and outreach programs within ICARDA.

Management responsibility at regional offices

Recommendation 31: The CCER Panel endorses the Decentralization principle in that ICARDA will function as one management entity at the Regional/Country level to service both Platform research and research in outreach, plus capacity development. The full responsibility in terms of science quality, deliverables, and reporting of research activities both at platform and outreach levels is under the Directors of the four Research Programs. The Regional Programs/Coordinators are in charge of facilitating the research for development collaboration with partners to enhance impact and ensure that the complementary down-stream research conducted by the Research Programs and collaborating NARS is well coordinated within the specific region or country setting.

Strengthening the staffing level of regional offices and decentralization of decision making at platform level

Recommendation 32: Given the increasing demand on administrative support services at the regional offices as a result of the establishment of large decentralized Platforms, the CCER Panel recommends that ICARDA reviews the management and staffing requirements of support staff at regional offices where research Platforms are established.

1. Introduction

1.1 Objectives, review methodology and acknowledgment

Objectives. Guided by ICARDA's goals set forth in its Strategic Plan 2007-2016 and the Center's operational decentralization and CGIAR reforms, the objectives of the CCER are: (i) to assess the performance of ICARDA's outreach programs and partnerships during the period 2007-2013; and (ii) to derive recommendations useful for ongoing and future outreach programs and partnerships and the implementation of ICARDA's decentralization strategy.

Review methodology. The overall performance review methodology is based on three key indicators; the relevance, effectiveness and efficiency of outreach programs and partnerships. The relevance is assessed in terms of alignment of outreach programs and partnerships objectives with those of ICARDA within the CGIAR system level outcomes of reducing rural poverty, enhancing food security, improving nutrition and health, and sustainable management of natural resources. The effectiveness is reviewed in terms of achieving the expected outputs of outreach programs, and the efficiency in terms of the optimum use of the available human and financial resources.

The measurement criteria applied for the review of the strategic, operational, coordination and integration issues facing the outreach programs include: (i) the level of satisfaction expressed by NARS partners and collaborators; (ii) the level of satisfaction expressed by non-CGIAR partners; ICARDA professional staff at Headquarters, outreach offices and collaborating CGIAR partners and donors; (iii) the match between the geographic distribution of regional offices and ICARDA's Strategic Plan and CRPs; (iv) the extent to which gender is considered explicitly in outreach programs and extent of women's participation in development at different levels; (v) the amount and nature of joint and collaborative work with NARS partners and others, and results achieved over time in terms of outputs, outcomes and publications; (vi) the type and amount of germplasm exchange resulting in improved crop varieties released and associated production technologies, evidence of adoption by farmers in countries and development projects supported by donors; and (vi) nature and scope of capacity development, training themes, number of trainees and proportion of women trained.

Process. The approaches applied by the Review Panel and the generation of supporting data, opinion and evidence included: (i) direct interviews and interactions with NARS and other implementing partners, collaborating CGIAR centers and advanced research institutions, ICARDA staff at Headquarters and outreach offices; (ii) responses to survey questionnaire; (iii) review of program and project reports, minutes of coordination meetings and proceedings; (iv) review of selected publications and research reports, and; (v) in-depth field visits to review selected outreach projects/programs. The regional and country programs visited by the Panel are: WARP in Amman, with Jordan, Lebanon and Turkey as country programs, NARP in Rabat with Morocco as a country program, NVSSARP in Cairo with Egypt and Ethiopia as country program, CACRP in Tashkent with Uzbekistan and Tajikistan as country programs, and SACRP in New Delhi with India and Pakistan as country programs; and finally (vi) a roundtable meeting and international hook-up with ICARDA's Management Committee to discuss the CCER draft report.

The CCER's terms of reference are presented in Appendix I, and the review methodology in Appendix II. The CCER schedule of activities is presented in Appendix III, the list of documents made available for this review is in Appendix IV. and a sample of 10 success stories in technology generation and impact is provided in Appendix VIII.

Acknowledgement. The CCER Panel would like to extend its deep appreciation to ICARDA management, program directors and the scientists it met at Headquarters, regional and

country offices, as well as all the partners from the National Agricultural Research Centers, agricultural research institutes, NGOs, farmers, private sector representatives, donors and representatives from collaborating CGIAR and non-CGIAR centers met during the field visits for sharing their views and providing thoughtful recommendations to the Panel.

1.2 Definitions

ICARDA research programs: These refer to the four overarching research programs that encompass the entire ICARDA mandate and are implemented under the full responsibility of their respective directors. Focusing primarily on upstream research, and as needed, on downstream research, these programs are: BIGM, IWLM, DSIPS and SEPR. Prior to the CGIAR reforms, the research programs were financed mainly by the core budget and through restricted project funding. With the current implementation of the CGIAR reforms, the four research programs are increasingly funded through CRPs.

Outreach programs: These refer to regional and country outreach collaborative programs implemented in close collaboration with NARS under the technical backstopping and responsibility of ICARDA's research programs for science quality; and deliverables and facilitating the collaborative down-stream research work with NARS to enhance impact. These projects are mostly financed primarily by restricted project funding.

Decentralization of research and capacity development: This refers to physically locating elements of ICARDA's Headquarters, research programs with associated facilities, staff and support services at regional platforms and thematic focus sites.

Research platforms. These refer to Headquarters or regionally decentralized research program entities with global and regional responsibility to carry out, in collaboration with NARS and partners, elements of ICARDA mandated systems-based research and capacity development to achieve more effective agro-climatologically targeted IPGs. The four platforms called for by the on-going phased approach "Strategy for Decentralization of ICARDA's Research and Capacity Development" are defined as follows:

- Headquarters platform encompassing the principal research station at Tel Hadya in Syria, representative of high rainfall areas together with Terbol sub-station in Lebanon, representative of high rainfall and off-season production and Sanliurfa station in Turkey, representative of lower rainfall areas.
- North Africa Platform in Morocco for rainfed cereal-based systems.
- Sub-Saharan Africa Platform in Ethiopia for mixed integrated crop-livestock systems.
- South Asia platform for food legume systems.

Thematic focus sites: Decentralized research themes with global and regional responsibility to carry out-- in collaboration with NARS and partners-- elements of ICARDA's mandated research and capacity development for specific and unique production environment sites. The two thematic focus sites called for by the on-going phased approach "Strategy for Decentralization of ICARDA's Research and Capacity Development" are defined as follows:

- Thematic focus site based in Egypt for high input irrigated production systems with focus on wheat.
- Thematic focus site based in Uzbekistan for rainfed highlands agro-ecologies with focus on winter wheat and winter barley.

Benchmark and action site: These refer to representative physical locations of research and experimentation work at platforms, specific thematic sites, CRPs and outreach programs.

1.3 Context of the review

The CCER re-examined regional outreach programs and partnerships in a context driven by the following new forces: ICARDA's relocation and decentralization plan; broadening of ICARDA's coverage to non-tropical dry areas globally; new challenges facing agriculture in dry areas, particularly climate change; CGIAR reforms and the implementation of the CGIAR Research Programs (CRPs); emergence of new donors and their evolving priorities; growing importance of public/private cooperation; the increased recognition of the need to choose more effective and value added research-for-development partners; the increasing focus on impact; increased focus on gender and the key role of women in addressing food security and alleviating hunger and new information technologies that can strengthen partnerships knowledge sharing and support the dissemination and open use and adoption of IPGs.

1.4 Previous CCER Recommendations and Center Responses

The previous CCER on outreach activities conducted in 2003 concluded that ICARDA has an outstanding outreach program in terms of the extent and diversity of collaborative activities. The CCER Panel recommendations are provided, along with ICARDA management responses, in Appendix VI.

All the recommendations were adopted by ICARDA and have been addressed satisfactorily. The major concerns highlighted by the CCER Report of 2003 were related to:

- (i) The impacts of the changes in funding - from unrestricted to restricted—on changing the balance of outreach activities and regional emphases.
- (ii) The research management structure in relation to outreach. The 2003 CCER raised two concerns that led to a recommendation on the need for a change in management structure to a single, clear line of reporting for all research matters. It also pointed out the potential difficulties in the interplay between Headquarters and regional programs with the current double management structure.
- (iii) Increasing pressures on the researchers to deliver more and more outreach activities, possibly at the expense of the research activities. The current CCER panel is of the opinion that the on-going CRPs context calls for a systematic continuum between ICARDA research in the headquarters and now platforms or thematic research sites and the collaborative research with NARS programs. Therefore, the increasing pressure referred to in the 2003 CCER is no longer an issue.

The 2003 CCER gathered testimonies from over 100 respondents from almost 30 countries that uniformly expressed their positive experience cooperating with ICARDA (41% rated it excellent and 58%, good). Over half of the testimonies came from directors of agricultural research for development institutions. The CCER also presented specific evidence of technology transfer and impact of the outreach activities that strongly supported the overall conclusion that the outreach programs were performing at an outstanding level.

1.5 Previous EPMR recommendations and Center Responses

The overall conclusion of the EPMR conducted in 2006 was that ICARDA has developed an excellent outreach effort in collaboration with NARS, through its regional programs and is an important player in the development and dissemination of agricultural knowledge in dry areas. According to the EPMR, NARS scientists and government officials everywhere expressed appreciation of ICARDA's scientific expertise and support in the development of wide networks, high performing projects and in supporting capacity building. The EPMR survey of ICARDA's donors revealed their very positive attitude and high satisfaction with ICARDA's performance. Regarding ICARDA's partnerships and collaboration with CGIAR

Centers, the EPMP commended ICARDA's approach to collaborative and collective action which helped improve its effectiveness and efficiency in serving its mandate in the drylands.

The only EPMP recommendation relates to external audits of outreach programs. The recommendation states that *"Given the dispersed nature of ICARDA's research activities, the Panel also recommends that External audits should routinely include visits and reviews of the regional and outreach centers, at least on a random (selective) or rotational basis."* In response, ICARDA management has since used External Auditors to routinely review the Center's regional and outreach offices on a selective and rotational basis, in addition to regular internal audit reviews performed by ICARDA.

2. Overview and Assessment of Outreach Programs

2.1 Overall assessment and recommendations

Overview. The regions and countries covered by ICARDA's outreach programs are characterized by tremendous agro-ecological diversity, differentiated agriculture production environments and high variability in altitude, temperature, rainfall patterns, aridity, frequency of climate change and variability events and their impact (droughts, extreme heat and cold waves), soil and land use, water scarcity, cropping patterns, cropping seasons and socioeconomic conditions. Cereal crops (particularly bread, durum wheat and barley), food legumes, forage crops and small ruminants constitute the major food security commodities across outreach programs and regions.

The research topics embraced through a large and diversified project portfolio across outreach programs include crop and small ruminants improvement; plant protection; adaptation to climate change; on-farm water use efficiency and land management including water and soil salinity; diversification and sustainable intensification of production systems; safe and productive use of waste and grey water; conservation of land races; informal seed production systems; mountainous agriculture and watershed management; conservation agriculture; commodity value chain and access to markets; and capacity development. In addition to CRP1.1 Dryland Systems led by ICARDA, the outreach programs support ICARDA Research Programs in their involvement in another 8 CRPs.

All the Outreach Programs have strong collaborative research -activities with NARS and a wide range of key partners. Without being exhaustive, the active partners include relevant ministries and extension services; national and international higher research institutes and universities; International Agriculture Research Centers (IARCs) such as AVDRC and ICBA, other CGIAR centers; international and regional organizations such as FAO and UNDP; NGOs such as Care, IUCN, Alliance for Hunger, and PARC; farmers' organizations such as seed cooperatives; small and large private sector players such as seed producers, input and output traders, agro-industries; Regional Fora (FARA, AARINENA, APAARI and CACAARI); international, bilateral and national development agencies and donors such as IFAD, the World Bank, AFESD, OFID, AfDB, EU, IsDB, Kuwait Fund, USAID, USDA, IDRC, CIRAD, JICA, ACIAR, AusAid, Netherlands and the Italian Government; and foundations such as the Bill and Melinda Gates Foundation, Agha Khan Foundation and OCP Foundation.

All ICARDA Regional Programs are highly relevant to the Center geographic mandate and the ICARDA 2007-2016 strategy. They form a solid and highly respected entity with strong leadership and have produced impressive results through well-established and effective local, national, regional and international partnerships. The strength of the partnership with NARS is reflected by the strong support of NARS to ICARDA when its expatriate staff were relocated from its principal station in Tel hadya because of developments in its host country, Syria. NARS were quickly responsive in providing office space, transportation services, land for experimentation in national research stations, and laboratories at no cost to ICARDA. ,

The Turkey-CIMMYT-ICARDA IWWIP is highly relevant for its mandate countries and ICARDA's 2007-2016 strategy. The partnership approach based on pooling resources and the involvement of Turkey as the lead implementing partner to mainstream IWWIP work in its national wheat research program with scientific support by ICARDA and CIMMYT proved to be an effective model for the generation of international public goods. IWWIP breeding, however, is only part of the solution to productivity increases, with an average contribution of 25%. Crop agronomy and husbandry remain a missing key factor for further yield increases in that program. Thus, ICARDA is well placed to play a leading role in addressing the gap of integrated farming system research in IWWIP and outreach programs.

Achievements. Together, the outreach programs achieved many notable and commendable results. It is impractical to mention them all. The results of individual outreach program are detailed in Section 2.2 to 2.7 of this report. The major achievements across these outreach program include:

- Development of elite lines and cultivars of wheat: Several bread and durum wheat high yielding varieties, combining drought and heat tolerance, and multi-disease (yellow and UG99 stem rust) resistance have been released, and large quantities of certified seeds have been produced in NARP, NVSSARP, WARP and CACRP mandate countries including Morocco, Algeria, Tunisia, Mauritania, Turkey, Syria, Jordan, Lebanon, Iraq, Ethiopia, Egypt, Eritrea, Sudan, Yemen, Iran, Uzbekistan, Tajikistan, Kazakhstan, Kyrgyzstan, Azerbaijan, Georgia, Armenia, Turkmenistan and Afghanistan;
- Improved barley and forage varieties using ICARDA's released germplasm developed in Egypt, Morocco and Ethiopia;
- Development and release of improved faba bean varieties including the production of large quantity of seeds for uptake by farmers in Egypt, Sudan, Ethiopia and Yemen;
- New varieties of lentil, chickpea, faba bean, grasspea, have been supplied to NARS and improved value chain developed through detoxification of grasspea in South Asia and Ethiopia;
- Development of small-scale private sector enterprises, such as village-based seed enterprises for lentil and grasspea;
- Promotion and adoption of improved, cold tolerant Ascochyta blight resistant chickpea varieties in Turkey, Ethiopia, Lebanon, Tajikistan and Armenia;
- Development, promotion and up-scaling of technology packages to address water shortages including raised bed row planting in Egypt, Ethiopia, Sudan and Yemen which enabled farmers to increase crop productivity;
- Conservation agriculture involving zero tillage and stubble retention practices validated, promoted and adopted in Iraq, Syria, Jordan, Lebanon, Morocco, Tunisia, Azerbaijan, Kazakhstan and Uzbekistan;
- Community-based approaches for greywater reuse in home gardens developed in Syria, Palestine, Jordan and Lebanon;
- Integrated production system for Buffel grass as an indigenous forage species with high water use efficiency in the Arab Peninsula countries;
- Short-term individual and group training reaching over 1500 participants during the 2007-2013 period;
- Degree training resulting in over 40 Master degrees and 8 PhDs during the same period.
- Institutional capacity development of NARS through the establishment of research facilities including biotechnology facilities and artificial insemination laboratories;
- The production of a large number of co-authored peer reviewed publications in international journals with NARS scientists reaching 80 in NARP, 23 in WARP, 10 in Turkey country program, 25 in CACRP, and 20 in SACRP, in addition to books and symposium papers.

In relation to strategic issues, the panel finds that: (i) the Outreach Programs are very effective in addressing ICARDA's Strategic Plan in collaboration with NARS. ICARDA approaches involving on-farm research, seed system research, multi-institutional partnerships and the inclusion of socio-economics are all areas of particular innovation; (ii) the current structure of Outreach offices covers major dryland agro-ecologies well to ensure the continuity of research activities under decentralization and the new CGIAR reforms, particularly the CRPs. NARS expect additional efforts by HQ scientists to be expanded in the decentralized platform facilities. Some emerging issues are with regard to CRPs such as the reduced financial sustainability of Outreach Programs and lack of interaction with some national programs (such as CRP Grain Legumes with Pakistan); (iii) Women scientists remain a minority in Outreach Programs but there is a trend to engage junior female scientists; at the same time, gender concerns are not fully mainstreamed in research and outreach activities; and (iv) the Outreach Programs have achieved extraordinary levels of enthusiasm amongst collaborating NARS across regions, and together, the collaboration is considered a shared strength which frequently generates synergies and complementarities between ICARDA and its NARS partners.

In relation to operational issues, the Panel finds that: (i) overall, plant germplasm exchange has been very efficient and effective with large numbers of nurseries shared with national research programs and gene banks. There are clear examples of south-south exchange of germplasm, such as that the one facilitated by LARI in Lebanon. Concerns have been raised about the deterioration in usefulness of some of ICARDA's pulse lines sent to Pakistan; (ii) in linking research with development, a high level of satisfaction has been expressed by partners and many success stories cited, of which 8 are included in Appendix VIII. There are some concerns about the degree of estimating the transferability and applicability of research outputs and outreach learning to other places, and improvement is needed in this area. In other words, the success of adaptive research in terms of impact and innovation, needs to be made ready for application elsewhere. This would ideally be building a body of coherent thematic learning across all projects in that theme; (iii) in terms of enhancing the integrated approach to address dry areas challenges, a commendable job is taking place in transforming ICARDA research outputs into action within a farming system approach. However, whilst each Regional Program, with support from ICARDA Research Programs, has its own disciplinary "flavor" in response to different imperatives, there is a challenge for the Regional Program staff, as they need to be well informed and up-to-date in areas outside of their own area of expertise in order to have a whole system of competence; and (iv) NARS personnel expressed a high level of satisfaction with the processes for setting capacity development priorities. ICARDA scientists have mutually beneficial research linkages with relevant organizations and enjoy high respect.

In relation to coordination and integration issues, the panel finds that; (i) the involvement of "downstream" stakeholders varies across regional programs, depending on the nature of the projects and the source of funding. Where projects have been embedded in development projects, there are good examples in Jordan, Lebanon, Morocco, Sudan, Egypt, Yemen, Pakistan, Afghanistan, Uzbekistan and Azerbaijan, the full suite of partner types have been included. However, improvement is needed to engage systematically with more "downstream" partners (through stakeholder analysis and political economy analysis); and (ii) regarding technical backstopping from the HQ Programs and Support Units, the research activities identified by the Outreach Programs as needing to improve their backstopping responsiveness are BIGM and DSIPS. The IWLM and SEPR are mostly seen as providing "adequate" backstopping. With the exception of a few specific research areas identified by the NVSSAR Program, none of Research Programs were deemed "unsatisfactory". The support units were identified as requiring improvement in the technical support they provide, particularly to the North and Sub-Saharan Africa Programs. WARP was generally more positive about backstopping, but that may be because it is the office closest to the current location of Headquarters scientists. At the individual project scale, satisfaction about

backstopping appears to depend on ownership attitudes towards projects as defined by budget responsibility.

Overall Recommendations

Research-for- Development

ICARDA has mandated responsibilities for the production of International Public Goods (IPGs) through research. It is expected that this research is potentiated for practice change through guided adaptive research, which is the universally accepted function of ICARDA's Outreach Programs with R4D partners. Most donors reasonably expect that the projects they fund will include management of the complete research to development impact continuum. It is therefore inevitable and desirable that ICARDA ventures cautiously through adaptive research into knowledge transfer, utilizing wherever possible partners better placed to do large scale technology transfer. In some circumstances however, low capacity amongst NARS and extension agencies to effectively transform research into practice change will require ICARDA's participation in activities towards knowledge transfer.

Recommendation 1: While recognizing that ICARDA risks diluting the quality of research if scientists spend a significant amount of time on backstopping projects that contain little publishable research, the CCER Panel recommends: (i) that outsourcing or contracting of backstopping projects be pursued; (ii) that each project will need to be packaged in its own way, but will contain components of how to apply the research, the conditions under which the research is likely to be applicable, and the required background resources needed; (iii) that ICARDA maintain a regional vigilance and visibility for opportunities for development-ready outputs to be exploited and explicitly pursued in the Communication Plan.

Knowledge Sharing and Information Systems

While ICARDA produces an impressive number of scientific publications in collaboration with NARS, there is still considerable scope for ICARDA to package and share research results as well as “lessons learnt” and “best practices” in a more proactive and systematic manner to influence wider and more diverse audiences, and to have a greater impact on the ground (some examples of best practices that could be packaged can be found in Appendix VIII). While the panel recognizes that ICARDA has already done some knowledge packaging for external partner consumption, the panel finds that ICARDA would benefit from doing significantly more around knowledge sharing. In the context of decentralization and the presence of a significant number of geographically dispersed offices, ICARDA will also have to invest more heavily in knowledge sharing and information systems *internally* to ensure that it operates as a coherent whole in the implementation of its strategic plan, and to avoid duplication and fragmentation as well as *externally* for greater and wider influence.

In this context, ILRI's experience is a relevant best practice. ILRI organizes and shares data, information and knowledge to support research, informs partners and stakeholders, and provides the evidence base for decision making. As such, besides books and research papers, ILRI designs systems and services to capture, organize, share and disseminate the data and information produced, making it as available and accessible as possible through its Partnerships and Communications Group. ILRI has an institutional repository - called Mahider – which is a complete record of its research outputs. It contains metadata on as many different outputs as can be captured. It also provides the full 'text' - or a link to the full content - of their outputs. ILRI uses a diverse number of communications and knowledge sharing tools such as: _ ILRI toolbar, ILRI news, ILRI clippings, ILRI blogs, ILRI on Facebook, ILRI on Twitter, ILRI website and staff profile, conversations and groups on Yammer, presentations and posters, film and videos, Podcasts

and radio files, photographs, journal subscriptions accessible to staff and an array of corporate publications.

Recommendation 2: The CCER Panel recommends putting its full weight behind its *Strategic Communication and Knowledge Sharing Plan (2012-2016)* to link the research platforms into a sophisticated communication web through a state-of-the-art knowledge management system using ILRI's experience as "best practice," with a strong focus on opening research results as International Public Goods to be accessed by everyone. This implies the following actions:

Action 1. Multiple regional and thematic learning be captured, synthesized and disseminated consistent with the 2012-2016 Strategic Communication Plan.

Action 2. Given regional specificities, complexity and dynamism of the NGO sector, a more nuanced and proactive engagement with the NGO community needs to be developed,

Action 3. Establishment of continuing network of partners - called "Friends of ICARDA" as an advocacy mechanism to be initially constructed through the current Outreach Offices in collaboration with CODIS, to expand impact.

In addition, ICARDA has developed impressive informal networks of people working in the field of agricultural research for development, including donors, researchers, administrators, development project managers, development practitioners, policy makers and politicians. The networks have been built up particularly through the credibility and energy of Regional and Country Office Coordinators. As per **Action 3** in Recommendation 2 above, these networks need to be consolidated and formalized to ensure an ongoing sense of "belonging" to ICARDA in order to mobilize action around generating synergies among partners and utilizing current technologies to maximize efficiency of interaction. This cadre of continuing partners would serve to expand advocacy for ICARDA's activities and outputs, and act as a conduit for ICARDA to receive insights from a wide range of people. The Panel considers that membership must have benefits and these may include regional events, e-newsletters, access to webinars and networking tools.

Capacity Development

ICARDA, in collaboration with its regional and international partners, offers a range of individual and institutional capacity development opportunities that include specialized training courses, internships, sponsorships for graduate students, on-the-job training, and farmer field schools. ICARDA and its partners have trained more than 17,600 researchers from 36 countries since its establishment in 1977. This includes 665 MSc and PhD students who were co-supervised by ICARDA scientists and conducted their thesis research at ICARDA research stations and laboratories. The added value of ICARDA's demand driven trainings enable NARS to build a critical mass of well-trained researchers and extension workers capable of leading change and innovation by supporting knowledge, learning and technology transfer, upgrading research skills, producing and scaling out research results and ensuring excellence in science.

Recommendation 3: The CCER Panel recommends that ICARDA increase its investment in capacity development through the creation of training capabilities at the platform/regional levels. This implies (i) that the functions of the Outreach Offices where Platforms and thematic research location will be established be reviewed to ensure that capacity development is a major accountable responsibility (ii); the establishment of capacity development focal points at regional/platform levels with appropriate training and duty recognition; and (iii) the training of outreach personnel on the preparation of training modules, resources and delivery; (iv) the Head of the

Capacity Development Unit undertake a scoping study of resources, facilities and partnerships that could be used by Regional/Country Offices to deliver training activities and serve participants; and (v) harmonize the logistics associated with the conduct of capacity development activities that needs to be described in a manual.

Socio-economic and policy research

Socio-economic and policy research sheds light on the opportunities and constraints at every point along the impact pathway. It demonstrates the social and financial benefits and the enabling policy changes needed to encourage uptake of improved technologies. ICARDA socio-economists are working hard to track technology uptake through adoption and impact assessment on rural populations in the drylands. They also develop options for linking small farmers more closely to markets and the value chain. In this capacity, the socioeconomic and policy group at ICARDA are key to the outreach and partnership program.

Recommendation 4: ICARDA Outreach Programs, in general, have insufficient socio-economic studies. The Panel recommends that ICARDA's SERP Program ensure Outreach Programs have the capacity to conduct more baseline, adoption and impact studies, and analyses of financial, social and economic returns of technological packages and associated policies for technology uptake by farmers. This implies that socio-economists be posted and made more available at platform and regional levels.

Stakeholder Analysis and Political Economy

While stakeholder analysis identifies the key partners with whom ICARDA needs to work with to improve on the efficiency and effectiveness of a research for development initiative, the CCER Panel believes that ICARDA could also explore the usefulness of political economy (PE) approaches. PE helps to understand power issues and key entry points for ICARDA to contribute to the ongoing policy reform process at the local and national levels by identifying social hierarchies, leadership, local cliques, cultural and social influences, power networks, inequality, patterns of participation, and the dynamics of organizations over time. Thus, PE is a more nuanced stakeholder analysis to help map out the stakeholders in relation to one another, and provides for a better understanding of the political engines of policy change and their opportunistic and unpredictable patterns.

Recommendation 5: The CCER Panel recommends that ICARDA conduct stakeholder analyses, including adopting a political economy approach for more nuanced understanding of power relations in the design of every project and program to maximize uptake of research outputs. Such an approach helps to define the key partners to be involved with in a change process from the very beginning of a project/program cycle to help increase the chances for successful collaboration, impact and out-scaling. This is especially true in the Outreach Programs in the context of decentralization where ICARDA is expected to operate further down the research to development continuum.

Gender mainstreaming

The World Development Report on Gender Equality and Development (2011) indicated that correcting the market and institutional failures that underpin gender inequality could yield substantial gains in productivity and produce broader economic benefits, including those reaped from agriculture. This is especially important in the dry regions where there are strong opportunities to empower women economically. Addressing gender inequalities in rural and agricultural contexts improves the efficiency, effectiveness and sustainability of research and development efforts and helps increase food security. According to the FAO

(2011), equalizing access to productive resources between women and men farmers could increase farm yields by 20% to 30% and agricultural output in developing countries by as much as 2.5% to 4% percent.

Women scientists at ICARDA remain a minority especially in the Outreach Programs, where all regional/country managers are men. Few women are represented at the NARS level, and fewer still hold NARS leadership positions. Obviously, ICARDA can do better to engage more women at the above levels. In India, women appear to be about 25% of junior NARS scientists. R4D projects are more gender balanced, mainly because they include junior women scientists and because outreach projects in some cases engage explicitly with women stakeholders and farmers, such as the Promotion of Medicinal and Aromatic Plants (MAP) in Morocco and Tunisia. Most gender explicit projects are donor driven such as IDRC's funded SAGA project. Otherwise, ICARDA's research and Outreach Programs have not yet mainstreamed adequately gender balance across research programs in terms of women and men having equal access to resources, markets and technologies. During the 2000-2012 period, in terms of capacity development activities, women constituted 18% of all trainees in group courses and individual training events, 40% of M.Sc and PhD ICARDA research fellows, and 50% of all ICARDA interns.

Recommendation 6: As the SEPR is in the process of employing another gender expert, the CCER Panel recommends that ICARDA use modalities to mainstream gender in all its R4D activities. The purpose of mainstreaming gender concerns is to improve on the efficiency and effectiveness of research for development projects (especially along the value chain), as well as to support gender equality in a region where women's roles in agricultural production (especially in livestock) appears to be on the rise.

Conserving ICARDA identity at decentralized research platforms

Recommendation 7: The CCER Panel recommends that ICARDA clarify its collaborative work with the host countries where decentralized research Platforms and specific research thematic sites are located to ensure that its national and global research priorities are safeguarded, and for ICARDA to conserve its international identity by providing its scientists with access to independent research facilities.

Devolution of decision making to regional coordinators in the context of decentralization

Recommendation 8: The Panel recommends to ICARDA that appropriate devolution of much decision-making and implementation procedures from Headquarters to Regional Offices and Platforms to improve on the efficiency of delivery, and reduce stressful workloads on Headquarters. This implies effective modalities for delegation of authority to the Regional Coordinators or research programs in Platforms of thematic research locations in managing contracts and committing project expenditures within the boundaries, based on approved work programs and budgets to ensure smooth and timely project implementation with the understanding that a yearly internal audit is conducted as part of risk management.

Seed systems development

Seed systems remain a bottleneck in several countries such as Egypt, Ethiopia, Sudan, Yemen, Iraq, Uzbekistan, Tajikistan, Azerbaijan and Afghanistan where seed health is below standard, and the variety release systems and seed certification practices are lengthy and cumbersome.

Recommendation 9: While the responsibility of variety release and seed certification lies with NARS, the CCER Panel recommends that ICARDA enhances its assistance

through focused training and mentoring to the national seed systems in countries where these systems have collapsed and need to be rebuilt on a solid base, and ensure effective seed health testing and streamline variety release processes.

Alignment with CRPs and sustainability of Outreach Programs

The Regional Programs have served ICARDA through building and nurturing linkages in regions of ICARDA's geographical and technical mandate, in order to execute research in collaboration with NARS and build partnerships throughout the R4D continuum to realize the impact of research outputs. In the regions where CRPs are active, it is expected that the Regional Programs would continue with these roles. Given the importance that has been placed on the management of research to ensure impact for CRP accountabilities, the Regional Programs are well placed to serve an important role in the implementation of CRPs. Whilst for CRP 1.1 Dryland Systems, the role of ICARDA Regional Programs appears straightforward, their role in the implementation of other CRPs is less clear and needs clarification.

It is possible that restricted funding projects through the Regional Programs directly will be reduced as funding is increasingly channeled through the CRPs. This represents problems of sustainability for Regional Programs, in particular for those Regional Programs in which there are limited CRP interventions in the regions they serve. As these Programs in ICARDA mandate countries represent crucial links with NARS and other development partners, uncertainty about sustainability needs to be addressed.

Recommendation 10: Given that restricted funding of outreach projects may be directly reduced as funding is increasingly channeled through CRPs, the CCER Panel recommends that ICARDA develop a management plan that clarifies the role of the Regional Programs in the CRPs, the interaction between ICARDA Regional Programs and those of partner Centers in CRPs, and the resulting costing arrangements.

2.2 North Africa Regional Program (NARP)

History and geographic coverage: Since its inception in 1977, ICARDA has had a long robust history of partnerships and networking with regional and sub-regional NARS partners and other advanced research institutes in North Africa and beyond to implement projects and meet ICARDA's and NARS strategic objectives in the drylands. In 1984, ICARDA's North Africa Regional Program (NARP) and its regional office was established in Tunis to serve Algeria, Morocco, Tunisia and Libya. Mauritania was included into NARP in 1999, though activities in this country remain limited.

Challenges and research themes: The region is characterized by tremendous agro-ecological, altitude and climate diversity. Cereal crops, wheat, barley, food legumes, forage crops and small ruminants constitute the region's major commodities. The region also has a number of common challenges: climate change and climate variability, water scarcity, land degradation and desertification, rangeland deterioration, high population growth rates and a variety of old and new biotic and abiotic stresses, threatening this region's ability to feed itself. To address these challenges, NARP focusses its activities mainly on germplasm enhancement; IPM; genetic resources conservation and use; integrated natural resource management (land and water); mountain agriculture; conservation agriculture; crop/livestock integration; value chain approach; adaptation to climate change; local community development and building the capacity of NARS

NARP has a large portfolio of on-going projects, implemented mainly in Morocco and Tunisia, along with other regional projects such as "Enhancing Food Security in Arab Countries including Morocco and Tunisia" and cross-regional projects such as "Program for

Improved Water Management for Sustainable Mountain Agriculture in Jordan, Lebanon and Morocco". ICARDA has a very large Libyan Project supported by the Libyan Government, which was interrupted because of the developments in Libya but is now operational. The Project has a large component on degree training (M.Sc. and Ph.D.), beside research in three major thematic areas: Crop Improvement, Water Management and Integrated Livestock/Rangelands/Crops Production System.

Achievements: There have been many notable and commendable achievements since 2007. It is impossible to mention them all. Below are some highlights:

- Development of elite lines and cultivars of wheat using molecular marker assisted selection and doubled haploid techniques in conventional wheat breeding.
- Genetic transformation of durum wheat in using a drought tolerant barley gene.
- Molecular characterization of genetic diversity of Moroccan olive germplasm.
- The new directorate on Mountains in Morocco is delivering improved water management technology packages developed through an IFAD research grant.
- In Algeria, five durum wheat cultivars, one bread wheat cultivar and two barley varieties derived from an ICARDA-ITGC collaboration, successfully led to their multiplication by the national seed production system, resulting in high adoption by farmers and significant increases in cereal crop production.
- An ICARDA-IFAD collaboration in Morocco organized rural women in CBOs around medicinal and aromatic plants for their sustainable use and processing along the value chain, and improved access to local, national and international markets with impact on women's income.
- A regional project with Tunisia, Morocco and Algeria, funded by AusAID, is testing technologies and working with forage seed companies and machinery developers to facilitate farmers' adoption of conservation agriculture.
- In Morocco, ICARDA and INRA are collaborating together with M.S Swaminathan Research Foundation, IAV Hassan II and ICRISAT on an Indian-Moroccan Food Legumes South-South initiative to increase food legumes production by small farmers to meet food and nutrition security, with \$5 million financing by the OCP Foundation. The OCP (Office Cherifien des Phosphates) is a global leader in the phosphates and derivatives market.
- The Morocco Collaborative Grant Program (MCGP), established in 2004, utilizes Morocco's contribution to the CGIAR to strengthen cooperation between INRA-Morocco and ICARDA by funding research projects that serve the needs of Moroccan farmers and by leveraging additional funding support from other sources. ICARDA collaboration in this program was deemed key to leveraging additional outside funding and in producing important results in all projects but especially in: (i) The Reinforcement of Plant Genetic Resources Conservation and Utilization at Settat Genebank; and (ii) Institutional Backstopping Project in Biotechnology and Genetics.
- 26 Master degrees and two PhD degree students completed their biotechnology research work under ICARDA supervision.
- Over 80 peer reviewed publications in international journals, ICARDA publications, books and symposium papers since 2007, in collaboration with NARS scientists.

Partnerships: Currently, NARP has strong partnerships and collaborative arrangements with a host of partners, including the Ministries of Agriculture and Water, the NARS in Tunisia, Morocco, Algeria and Libya, and a large number of national and international higher research institutes and universities. In Algeria, ICARDA partners with ITGC and University of Constantine. In Morocco, ICARDA partners are: CNRST, Rabat; Mohammed V University, Rabat; Hassan I University, Settat; Hassan II University, Casablanca; Ibn Tofail University, Kenitra; Sidi Mohamed Ben Abdellah University, Fes and Abdelmalek Essaâdi University, Tangier/ Tetouan and, IAV Hassan II. In Tunisia, ICARDA partners with Institution de la Recherche et de l'Enseignement Supérieur Agricoles (IRESA); Institut National de

Recherche Agronomique de Tunis (INRAT); Institut National Agronomique de Tunisie (INAT); Institut des Régions Arides de Medenine (IRA Medenine); Institut National de Recherche en Génie Rural, Eau et Forêts (*INRGREF*); École Supérieure d'Agriculture du Kef (ESAK); École Supérieure d'Agriculture de Mograne (ESA Mograne); Institut National des Grande Cultures (INGC), Tunisia; National Gene Bank of Tunisia (NGBT); and the Centre of Biotechnology-Sfax (CBS).

NARP also partners with a host of other universities and higher agricultural research institutes from outside the region such as Bologna University, Italy; Cornell University and Virginia Tech in the USA; Technical University of Munich and University of Kassal in Germany; Ghent University, Belgium; INRA-France and INIAP/IPIMAR, Portugal.

NARP partnership also extends to development agencies, NGOs, CBOs, the private sector, and international, regional, sub-regional organizations such as FAO, FARA, CORAF/WE CARD, NASRO, the International Centre for Genetic Engineering and Biotechnology (ICGEB), and other CG centers like CIMMYT and ICRISAT, international and bilateral and national donors such as IFAD, AfDB, EU, USAID, AUSAID, The CGIAR Generation Challenge Program, the Arab Science and Technology Foundation, as well as funding from the Moroccan, Algerian and Libyan governments.

ICARDA North Africa Platform: ICARDA's current decentralization plan visualizes a North Africa platform, based in Rabat, Morocco, to serve ICARDA's global program with a focus on intensification and diversification of rainfed cereal-based production systems, as well as in the implementation of the ICARDA-led CRP 1.1 and collaboration with CRP2, CRP 3.1, CRP 3.5, CRP 3.6, CRP 5 and CRP 7, where ICARDA is an active partner. To implement these programs, and to continue to deliver results from on-going and future restricted projects, ICARDA's research programs from the North Africa Platform will focus on the following:

- **BIGMP:** Intensification/diversification of rainfed cereal based production systems to serve ICARDA's mandate for spring bread wheat, durum wheat, barley, food legumes (chickpea, lentil and faba bean), complemented with a biotechnology and IPM.
- **IWLM:** Supplemental irrigation, water productivity, watershed management, soil and water conservation.
- **DSIPS:** Agronomy, conservation agriculture, dryland fruit trees/horticulture, crop/livestock integration, forage and herbal, aromatic and medicinal plants.
- **SEPR:** Economic modeling, climate impact, NR economics, policy, institutions/sociology, gender and market value chains.

To meet its regional and global mandate, ICARDA has posted its scientists, mainly from BIGMP, in Rabat, Tunis and Turkey. The Director of BIGMP remains posted in Amman, Jordan. A BIGM Principal Scientist (an entomologist) currently leads the Platform. ICARDA's Tunis office hosts six BIGMP and one DSIPS international scientists, three visiting scientists/consultants, one research assistant, and 10 support staff. Morocco has 13 BIGMP and one IWLM international scientist, two BIGMP visiting scientists, 7 BIGMP technicians and a support staff of 6, expected to grow to 10 to accommodate for the increase in the demand for support services.

Assessment

There is no doubt that ICARDA's NARP is a solid, highly respected entity with strong leadership that has entrenched itself in dryland research and agricultural development initiatives in North Africa with impressive results through well-established and effective local, national, regional and international partnerships that have led to significant results along the impact pathway. All ICARDA work in the region is done in partnership with the NARS. The strength of the partnership is exemplified not only in the large portfolio of work that ICARDA has performed in the region with partners, but also by INRA's quick response in providing office space, transportation services, land (about 150 ha in 7 stations for experimentations) and lab and greenhouse facilities at no cost to ICARDA, following limited access to Tel Hadya. The North African partners are strategic partners for ICARDA and vice-versa. The relationship between ICARDA and North African partners is considered by the NARS as effective and flexible, and has evolved since 1977 to encompass not only traditional NARS partners but also a growing number of new strategic partners from a wide and differing range of research and development players, including the private sector, NGOs, farmers, and a growing number of donors. ICARDA partners value ICARDA because ICARDA provides opportunity to work at regional and global levels and because ICARDA has a solid reputation in providing high level scientific expertise to projects by well trained, committed and engaged scientists. They also value ICARDA because ICARDA is successful in mobilizing additional resources, provides needed training to individuals and institutions, and produces state-of-the-art research and technology that are of relevance to the region.

Recently, there has been a significant growth in the number and type of partners along the impact pathway that include women and men farmers, cooperatives, farmer unions, CBOs, NGOs, small and large private sector players, traders, processors, seed producers, and others who have become important partners for ICARDA in NARP. As the national research programs developed in institutional and human capacities, the nature of the partnership has also evolved from mostly a top-down relationship in the late seventies up to the early nineties to an equal partnership based on mutual trust and respect with shared benefits reaped by both sides, and a strengthening of NARS leadership capacity. The NARS are confident that they now have the capacity to engage in South-South collaboration, independent of ICARDA. There is strong evidence that projects are proposed, developed, implemented and evaluated in jointly in collaboration with NARS partners, including a large number of research users. This has helped to develop mutual trust between ICARDA and its NARS partners in the region, which in turn, has helped maximize ICARDA's potential for influence along the impact pathway. While the NARP is doing an excellent job in outreach collaborative research and technology transfer through wide range of partnerships, ICARDA could exercise more influence along the impact pathway as follows:

Recommendations

Expanding NARP coverage to West Africa

Recommendation 11: Expand ICARDA's work in the relevant CRPs to the drylands of West Africa through NARP to support research, particularly on (i) drought management through improved on-farm water management, including water harvesting, supplemental and raised bed irrigation; and (ii) improving the resilience of rangelands and small ruminants.

Strengthening NARP Platform research capacity

Recommendation 12: It is recommended that the research team at the North Africa platform based in Morocco be strengthened in the areas of agronomy and socio-economics.

ICARDA identity in the research platform in Morocco

In line with the overall **Recommendation 7** on conserving ICARDA international identity presented in Section 2.1 of the report, there is a need in the case of Morocco to clarify ICARDA's collaborative work at the Platform level to manage the high expectations of INRA by clearly articulating ICARDA commitments to Morocco and the North Africa region, in addition to meeting its global commitment, which will be partly accomplished from the Morocco Platform. This implies (i) an updated MOU with the Moroccan government to delineate ICARDA's responsibilities in Morocco versus its responsibilities to the rest of the world, define ICARDA's status in the country, facilitate the exchange and transfer of germplasm and other research equipment and facilitate the travel of scientists; and (ii) to preserve ICARDA's identity in Morocco and maintain science quality and excellence, a good level of independence from the NARS with regard to offices, land and labs will be needed.

2.3 Nile Valley and Sub-Saharan Africa Regional Program (NVSSARP)

History and geographic coverage: The outreach and partnership program in the Nile Valley and Sub-Saharan Africa (NVSSA) region was evaluated through field visits and extensive meetings with a range of stakeholders in Cairo, Egypt, where the NVSSA Regional Program is currently based. Visits were also conducted in Ethiopia, where the ICARDA country office also manages a significant portfolio of ICARDA projects in this region and beyond, and where the CRP1.1 Director is currently based. ICARDA started its outreach program through the Nile Valley Program (NVP) in 1979 that focused on a Faba Bean Improvement Project supported by IFAD. The Program started with Egypt and the Sudan and then Ethiopia was added in 1985 when the Program became ICARDA Nile Valley Regional Program (NVRP). The remarkably close NARS partnership established in the NVRP was the model that ICARDA followed in all its Outreach Programs. The major achievement of this Program is to get national scientists to work outside the research station on farmers' fields in close collaboration between researchers, extension agents and farmers. This has established the system of research for development continuum (R4D), followed in the Outreach Programs. The Program was expanded beyond faba bean to cover other food legumes, barley, bread and durum wheat, as well as natural resource management. In 1995, Yemen was added to the Program and it was named ICARDA's Nile Valley and Red Seas Regional Program (NVRSRP). Eritrea was added to the Program in 2003. In 2007 ICARDA renamed the Program as the Nile Valley and Sub-Saharan Africa Program (NVSSARP) in line with its 2007-2016 strategy to expand its activities in Sub-Saharan Africa. . A review of project documents and other grey literature along with the CCER survey questionnaire results, filled by both offices, were also used to inform the CCER Panel.

Staffing of ICARDA-Cairo Regional Office: Presently headed by an acting Regional Coordinator, the office is home to two principal water and irrigation management scientists one of whom is an ICARDA-IWMI joint appointment; one water and irrigation management specialist; a WLI project manager; one IWMI-ICARDA post-doc; two NARS water management specialists-- one for on-farm and the other for on-basin level; one principal wheat breeder; a socio-economist working on livestock systems out-posted by CIRAD, and 10 administrative and services support staff.

Staffing of ICARDA-Ethiopia County Office: The office is based at the ILRI Ethiopia-Campus, which also hosts IFAD, CIP, IWMI, CIMMYT, CIAT, CIFOR, IFPRI, ICIPE, ICRISAT and the World Agroforestry Center. The interactions between CGIAR centers on this campus with each other, and with the adjacent EIAR campus provide strong opportunities for coordination, knowledge exchange and developing collaborative work, all necessary ingredients for successful CGIAR collaboration, especially within the context of CRPs.

Currently headed by an acting Country Coordinator, the ICARDA-Ethiopia office staffing include (i) the Director of CRP1.1 and associated support staff; (ii) ICARDA's small ruminant team previously based in Aleppo and composed of a principal livestock production scientist, an animal nutritionist, a small ruminant geneticist and a small ruminant breeder; (iii) the head of ICARDA's Seed Unit and International Nursery IV and one pulse pathologist; (iv) one National Professional Officer managing watershed project funded by Austria Development Agency in IWLMP; (v) a vacant socio-economist position and (vi) a small administrative and services support team.

Project portfolio and financing partners: Currently, there are about 30 active projects under implementation in the NVSSARP program funded by AfDB, USAID, USDA, Australia-ACIAR, KFAED, IFAD, IsDB, ADA-Austria, FAO, IDRC, Grain Research Development Foundation, Biodiversity International, EC 7th Framework Program, Bill and Melinda Gates Foundation, CIRAD, JICA, IFPRI, EMBRAPA-Brazil, with funding totaling about USD 0.9 million from the Government of Egypt through Egypt's Agricultural Research Center (ARC) for 6 projects implemented in Egypt. A large number of these projects are being implemented in Egypt and Ethiopia, with less coverage in Sudan, Yemen and Eritrea. Only one project, "Support to Agricultural Research for Development of Strategic Crops in Africa (SARD-SC)" for USD 15.5 million, funded by AfDB, extends coverage to other Sub-Saharan African countries, namely Kenya, Lesotho, Mali, Mauritania, Niger, Nigeria, Tanzania, Zambia and Zimbabwe.

Implementing partners: ICARDA's traditional partners in the NVSSAR Program include:

- **In Egypt:** Ministry of Agriculture and Land Reclamation, several research institutions within the ARC, and the Ministry of Water Resources and Irrigation, the Water Research Center.
- **In Eritrea:** Ministry of Agriculture, National Agriculture Research Institute (NARI) and Hamelmalo Agriculture College
- **In Ethiopia:** Ministry of Agriculture, various regional state governments, agricultural bureaus, Ethiopian Institute of Agriculture Research (EIAR) and associated regional agriculture research centers, national and regional seed enterprises, farmers' unions, NGOs, seed growers and processors associations, extension services, cooperatives, private sector traders, exporters and agro-industries (food factories and breweries)
- **In Sudan:** Ministry of Agriculture and Agriculture Research Corporation (ARC)
- **In Yemen:** Ministry of Agriculture, and the Agricultural Research and Extension Authority (AREA)
- Ten universities in Egypt, Ethiopia and Sudan
- Sasakawa Africa Association and Cornell University

Linkages with CRPs: The NVSSARP has direct linkages to CRP1.1 on Dryland Systems which is housed at the ICARDA office in Addis Ababa; CRP2 on Policies, Institutions and Markets; CRP3.1 on Wheat; CRP3.5 on Grain Legumes; CRP3.6 on Dryland Cereals; CRP3.7 on Livestock and Fish; CRP5 on Water, Land and Ecosystems; and CRP7 on Climate Change, Agriculture and Food Security.

Research themes: The NVSSA region is characterized by high variability in temperature, rainfall, soil and land-use, elevation, cropping patterns and cropping seasons. The main research themes covered by NVSSARP are crop improvement and plant protection for bread and durum wheat, barley and food legumes; integrated water and land management to increase water and land productivity; diversification and sustainable intensification of production systems, with a focus on small ruminants and feed improvement; and socio-economic and impact studies to assess social, gender, economic and policy constraints, and poverty mapping studies and adoption studies as well as a focus on developing individual and institutional capacity through degree and non-degree training. The objectives of the

program are to: (i) improve agricultural productivity and food security through genetic enhancement, reducing biotic and abiotic stresses, improve crop-livestock production systems, and seed production and distribution; (ii) reduce vulnerability to climate change through efficient water resource and drought management; (iii) provide production and market information and enabling policy environments; (iv) improve livelihoods and pathways out of poverty, and reduce rural unemployment for better livelihoods; (v) linking small growers with domestic and international markets; and (vi) building human and institutional capacities.

Output achievements and impact: The major outputs and impact achieved are:

- Ethiopia released three bread wheat and one durum wheat high yielding varieties resistant to yellow and stem rusts from ICARDA breeding lines.
- Ethiopia released more than 25 varieties of faba bean, field pea, kabuli chickpea, lentil and grasspea.
- Sudan recently released one ICARDA germplasm bread wheat variety tolerant to heat (Goumria 3).
- Ethiopia produced and distributed 200 tons of improved and multi-disease tolerant wheat and legumes seeds.
- Rapid deployment of high yielding and rust resistant wheat varieties reached 4000 farmers in Ethiopia, 2000 farmers in Egypt and 500 farmers in Sudan during the 2012 crop season.
- A shuttle-breeding program with EIAR-ICARDA in Ethiopia and the Agricultural Research Institute in Kenya (KARI) for disease resistance helped to release Ug99 resistant wheat varieties that have been shared with other countries.
- In 2012, NVSSARP developed and promoted technologies addressing water shortages and poor soils. In Ethiopia, this enabled farmers to increase crop productivity by 100% and reduce soil erosion by 50%.
- Raised bed planting technology developed by ICARDA and ARC/Egypt was scaled up from 15,000 acres in 2011/12 to 55,000 acres in 2012/13 in El- Sharkieh Governorate due to the economic benefits to farmers and media exposure of the technology.
- Promotion and adoption of Kabuli chickpea with support from the Ethiopian Government is picking up from the current 20% of the total chickpea area to reach more than 40% in the coming five years.
- Egypt currently provides ICARDA with a high input breeding site for bread and durum wheat for Southern latitudes at ARC/Sids Research Station in Beni Sweif in Central Egypt that provides earliness through a wheat shuttle breeding program that saved ICARDA doing that in CIMMYT's Obregon site in Mexico.
- ICARDA-ARC/Egypt Wheat Improvement Program at Sids Research Station is becoming a key destination for training wheat and legumes scientists from Central Asia, North Africa and sub-Saharan Africa regions.
- Through the Water Benchmark Project and WLI- an affordable Raised-Bed Combination Machine (RCM) was developed, tested and is being manufactured on a pilot basis. The technology reduced seeding rates by 50%; increased wheat yields by 17-25%; and reduced irrigation water by 30%.
- Currently, many of the new food and malting barley varieties grown in Ethiopia are those that have been developed through EIAR-ICARDA collaboration.
- Several degree and non-degree training conducted for NARS scientists.
- Assistance in the establishment of a biotechnology lab in Egypt
- Capacity development for building a tissue culture facility in Eritrea.
- Design and specifications for soil, water, plant, and biotechnology facilities in Sudan (Marawai Authority) developed and delivered.

Assessment

ICARDA partnerships in Egypt, Sudan and Ethiopia are longstanding and lucrative, the research portfolio is large, and the number of partners is high and expanding considerably to include a host of other partners not only in Egypt, Sudan and Ethiopia but also in other SSA countries. The fact that AGERI/Egypt immediately provided space and lab equipment for ICARDA's biotechnology group attests to the good relationship between ICARDA and NARS in Egypt. Furthermore, the shuttle wheat breeding site at ARC Sids Research Station for high input agriculture and earliness provides ICARDA with a strategic location for wheat improvement for southern latitudes. Similarly, the fact that the ILRI campus in Addis Ababa accommodated ICARDA scientists from Tel Hadya and immediately presented ICARDA with office space and labs is a clear indication that ICARDA has a solid collaborative relationship with ILRI and the Ethiopian Government.

The relationship between ICARDA and partners in NVSSARP is built on mutual trust and respect and collaborative work is encouraged throughout different project stages such as during proposal writing, implementation, and evaluation. Because of this good practice, ICARDA has the reputation of responding to NARS priorities in a demand-driven mode. In Ethiopia and Egypt, ICARDA is considered to be working more on the ground with farmers compared to other CG centers because ICARDA conducts farmer field experiments, organizes field days, creates farmer field schools and supports travelling workshops to speed up technology adoption and up-scaling. All the work that ICARDA conducts in the NVSSA region is conducted in close collaboration with NARS.

While ICARDA collaborates closely with NARS, there are opportunities to collaborate with other local and international partners. In Egypt, this could include the Ministries of Planning, International Cooperation and Science and Technology as well as with more international, regional and local NGOs such as Farm Africa and Africa Harvest, CNV (Dutch), Mercicorps and SG2000. In Ethiopia, ICARDA could partner with more (i) universities, notably the Haramaya University on pastoral systems and capacity building, (ii) Mekele University on PPB of barley and (iii) Arba Minch University on water technology. Internationally, ICARDA could explore relationships with NEPAD, ASARECA, BUFFET Foundation, DFID, African Union, EGAD, Seed Trade Association, breweries, meat exporters, abattoirs, food processors, drug vendors, the Biodiversity and Conservation Ethiopian Institute, and the Ethiopian Agricultural Transformation Agency (EATA), which works under the Prime Minister's office. (iii) ICARDA could be an active partner in a platform with the World Bank and IGAD, as part of a technical consortium to support and develop strategies with the WB and USAID to implement CRP 1.1.

According to one Ethiopian NARS partner, ICARDA-NARS collaboration created a revolution in agriculture in Ethiopia. ARC partners in Egypt and EIAR partners in Ethiopia expressed deep satisfaction with ICARDA's work. They consider having good relationships with ICARDA because "ICARDA meets their demand in the research areas they value most such as in crop improvement, livestock and water." Regional and country coordination meetings are good practices and are highly appreciated by NARS as they are seen to enhance results and knowledge-sharing and allow for joint planning amongst ICARDA scientists and NARS. The collaborative arrangements between ICARDA and NARS extend to planning and project inception workshops, as well as technical steering committees and other forms of joint project management.

Sub Saharan Africa Research Platform: The following comparative advantages are in favor of Ethiopia as an ideal location for a research platform: (i) the country is presently a major hub for international development players and donors, including CGIAR Centers where all the CPRs are active; (ii) it has a favorable research and development environment with varied agro-ecological systems (highlands, lowlands, mid-altitude, etc.); (iii) it has a significant genetic biodiversity and a network of several regional research centers with good

facilities in wheat, barley, food legumes, small-scale irrigation and land management as well as in small ruminants; (iv) the Ethiopian Institute of Agriculture Research (EIAR) and other research and development partners are keen to achieve results not only in Ethiopia but also in the rest of SSA where they see themselves playing an important regional leadership role; (v) Ethiopia has available facilities, labs (including state of the art biotechnology lab) and services; (vi) Ethiopian scientists are well trained, young and enthusiastic, but there is questionable capacity to retain Ethiopian scientists, as there is a serious brain drain with scientists seeking more lucrative positions outside the country; and (vii) Ethiopia is in a strong position to influence other countries because of their regional networks and the spillover effect is high. Provided that political landscape remains the same, the only two issues of concern for ICARDA are (a) the Ethiopia-Eritrea relationship: while scientists from both countries have little problem working together, one could expect disruptions to occur at the higher political level; and (b) the limited availability of affordable good schools for internationally recruited staff.

ICARDA's work in East Africa could be expanded more in Eritrea, Ethiopia, Sudan, Kenya, Djibouti, Somalia and Tanzania for drought-tolerant legumes (mainly chickpea, or dry field pea) and malting barley in Kenya, Tanzania and the Congo. ICARDA has a comparative advantage to work in Sub-Saharan Africa on sustainable intensification under climate change, develop higher yielding forage crops, improve productivity of small ruminants through improved nutrition, breeding, reproductive biotechnology and enhance rangeland management resilience. Furthermore, ICARDA has a comparative advantage to work on land and water integrated management, small-scale irrigation, water harvesting on farms, and salinity problems.

Recommendations

SSA region research priorities

Recommendation 13: In the process of transforming the Ethiopia office from a country program to a global platform and Regional Program to serve SSA, it is recommended that ICARDA hold stakeholder consultation meetings with SSA countries to develop regional research priorities and collaboration modalities.

Seed systems. In line with the overall **Recommendation 9** on seed systems, presented in Section 2.1, in the case of Egypt and Ethiopia where the seed systems has been identified as a major priority area, there is need for ICARDA's assistance in the development of a seed database system to help match seed demand with seed supply, and more short-term in-country capacity development on quality seed production at the farm level.

2.4 West Asia Regional Program (WARP)

History and geographic coverage: Since its inception in 1989, ICARDA's WARP has had a strong track record of partnerships and networking with regional and sub-regional NARS partners and other advanced research institutes. While its current geographic coverage embraces seven countries, WARP's on-going activities serve mainly five: Jordan, Palestine, Lebanon, Syria and Iraq. Syria is also benefiting from an ICARDA country program managed from its Headquarters at Aleppo. ICARDA's Turkey office manages the collaborative activities with Turkey. For Cyprus, ICARDA activities are centered on knowledge sharing and participation in research priority setting events.

Staffing: The ICARDA office in Amman is now the largest in terms of staffing and has absorbed more ICARDA staff following the limited access to Tel Hadya than any other office. The current staffing of the WARP Regional Office in Amman is composed of a Regional Coordinator; one water resource engineer, three Country Managers posted in Iraq, Lebanon

and Palestine; one regular 6-month retainer senior scientist consultant, an executive secretary, a financial officer, two accountants, and two services support staff.

Challenges: WARP countries face serious food insecurity challenges resulting from water scarcity, severe and frequent drought events expected to worsen as a result of climate change, land degradation and desertification and threats of increased severity of existing and new biotic and abiotic stresses. To address these challenges while reducing poverty and improving food security, WARP networks with a large number of partners on natural resources conservation, crop and livestock productivity improvement, diversification of production systems and sources of income, and human resources and capacity development.

Research portfolio: During the period under review, WARP has implemented a large and diverse portfolio of projects as follows: (i) 5 WARP initiated and managed projects with a cumulative cost of USD 14.775 million covering primarily Iraq, Palestine and Jordan; (ii) 13 regional projects across ICARDA-wide Regional Outreach Programs managed by the Center's Headquarters (5 by IWLM, 3 by BIGM, 2 by DISPS and 3 by CDU). The cumulative cost of the 13 projects amounts to USD 31.4 million, of which over 70% is for activities in WARP countries, particularly Iraq. As of June 2013, WARP has a pipeline of 7 new projects in various stages of donor approval processes. WARP's regional and country specific projects have direct linkages with CRP 1.1 under SRT2 (most vulnerable systems) and SRT 3 (high potential systems), and to lesser extent with 7 other CRPs, namely CRP 5, CRP 7, CRP 3.2, CRP 3.1, CRP 3.5, CRP3.7, CRP 3.6.

Financing partners and research themes: WARP's financing partners include AFESD, IFAD, USAID, UNDP, ACIAR, OFID, IDRC, IsDB, Kuwait Fund, EU, JICA, AusAID and the governments of the Netherlands and Italy. The research topics are food security related and include: crop improvement and livestock, adaptation to climate change, safe and productive use of wastewater and grey water, conservation of land races, informal seed production systems, on-farm water use efficiency, soil and water salinity, mountainous agriculture, watershed management, conservation agriculture, IPM technologies for date palm pests, wheat pest and rust, Aschocyta blight in chickpeas, commodity value chains and access to markets, dairy processing, training and capacity development.

Implementation partners: WARP implementation partners include (i) Ministries of agriculture, water resources, environment, science and technology (ii) national research and extension institutions, namely SBAR and COF in Iraq; NCARE and HCST in Jordan; LARI and NCSR in Lebanon; GCSAR and NAPC in Syria; NARC in Palestine and ARI in Cyprus; (iii) Universities include the universities of Mosul, Baghdad, Al-Anbar and Al-Sulyamania in Iraq; University of Jordan and JUST in Jordan; American University of Beirut, Lebanese University and Kasslik University in Lebanon; Aleppo University and Damascus University in Syria; (iv) NGOs, namely IUCN, Alliance for Hunger, Hashemite Fund for Badia Development and Farmers Associations in Jordan; Agha Khan Foundation in Syria; and Care, PARC and UNDP Assistance Program to the Palestinian people in Palestine; and (v) other relevant partners, namely CARDNE and INWRDAM in Jordan and ESCWA in Lebanon.

Achievements: Since 2007, WARP has made considerable progress towards the achievement of its expected outputs and impact. Some highlights include:

- ***Conservation agriculture:*** zero tillage and stubble retention practices validated and widely adopted in Iraq and Syria in over 6000 ha and 15 000 ha respectively and large scale dissemination is underway in Jordan and Lebanon.
- ***Biological control methods*** using Neem to replace chemical pesticides for the date palm Dubas bug developed in Iraq. The uptake is expected to cover over 12 000 ha in Iraq.

- Biological control methods for lesser Date Moth using *Bacillus Thurengiensis* (BT) developed: The practice reduced the infestation rate by 38-80%.
- **Sustainable integrated approaches for Badia system** restoration based on mechanized water harvesting structures combined with rangeland and grazing management have been developed with high potential for scaling up in Syria and Jordan.
- **Community based approaches for greywater reuse** at home/farm levels have been used with high potential for scaling up in Syria, Palestine, Jordan and Lebanon.
- **High yielding and drought resistant wheat and forage varieties** using ICARDA released germplasm.
- **Ex-situ conservation of Palestinian crop species:** over 750 accessions of wild wheat, barley, chickpea and lentil collected, documented and conserved.
- **Integrated protection and production management (IPPM)** of horticultural crops using soil solarization to replace methyl bromide in Gaza to protect the environment. The use of tensiometers to monitor crop irrigation demand resulted in 35% water saving for cucumber and increased crop yield by 5-10 %.
- **Farmer's field schools** have been introduced in many projects in Iraq, Palestine and Jordan.
- **Capacity development through short term individual and group training** impacted 563 participants from 5 countries: 52% of the trainees are from Iraq and 25% from Syria. The training areas included improved seed production, supplemental irrigation, experimental design, GIS, artificial insemination, socioeconomics and extension practices.
- **Capacity development through degree training** resulted in two MS and one PhD graduates.
- Capacity development included the establishment of an artificial insemination lab and the purchase of locally manufactured zero tillage seed drills for Jordan and Iraq.
- During the period under review, 23 co-authored publications with NARS have been produced and published.

Assessment

The CCER panel considers ICARDA's WARP a robust entity, efficiently and strategically managed by a competent Regional Coordinator supported by a well performing administrative support team. The strength of WARP and its regional office is exemplified by (i) the impressive results on the ground in terms of research outputs and outcomes, particularly in the two challenging countries of Iraq and Palestine through effective partnerships and networking with NARS and influential decision makers in government ministries and donor agencies, as exemplified by (i) the three research success stories generated by WARP in Iraq and Palestine during the period under review which are presented in Appendix VIII, and (ii) the timely and effective management of the relocation process in Amman of ICARDA's research programs and support units, particularly the CDU.

2.4.1 ICARDA's Partnership with Lebanon

History and objectives: ICARDA's collaboration with Lebanon began when ICARDA Headquarters were established in Lebanon following the signing of a host country agreement in 1977 to host ICARDA's Headquarters, the Director General Office in Beirut, and research work in specific areas: (i) the first relates to ICARDA's research and experimental stations at Terbol and Kfardan, with unique environments: mild summers suitable to grow two generations of crops per year (regular winter-spring season and the summer off season) and speed up considerably the cycle of plant breeding for cold tolerance and disease screening in cereals and legumes and (ii) ICARDA outreach activities in Lebanon through donor driven and funded regional for development programs under

WARP. After the first Director General of ICARDA completed his term in Lebanon, the second Director General moved the Headquarters to the Center's main research station in Tel Hadya near Aleppo in Northern Syria.

Research portfolio and partners: The experimental research at Terbol and Kfardan station in the Bekaa Valley is an integral part of ICARDA HQ and has contributed significantly during the 2012-2013 agriculture season for plant breeding in cereals and legumes for yield trials, selection and testing for cold tolerance and disease resistance on over 25 ha of rainfed and irrigated field trials. ICARDA's small ruminant elite sheep heads have been successfully transferred from Aleppo to Terbol station, as well as the seed section and associated work on seed health. The CCER Panel considers that the Terbol station program is well managed where there were no major issues to address.

The Outreach activities conducted in partnership with LARI and AUB's Faculty of Agriculture and Food Science covered three adaptive and technology transfer projects, respectively financed by a bilateral partner (USAID for the Water and Livelihood Initiative), a multilateral partner (IFAD for the improved water management for sustainable mountain agriculture project), and a private donor (Coca Cola Foundation for the community-based intervention in the safe use of grey water in home farming). Other partners included the Ministry of Agriculture, the Green Plan, the Faculty of Agriculture Sciences of St. Joseph University and the Lebanese University, the Faculty of Agriculture of Kaslik University, and le Conseil National de la Recherche Scientifique (CNRS).

Achievements: These included: conservation of genetic resources at AUB's Gene Bank at AREC (9000 accessions), seed multiplication for production of international nurseries over 23 ha, significant increase in wheat production and farmers income in Lebanon, 16 tons of foundation seeds produced from 13 released varieties, viral testing and inoculums establishment for faba bean, implementation of the EU-IFAD funded project "enhanced small-holder wheat-legume cropping systems to improve food security under changing climate", implementation of IFAD funded project "Scaling up best practices for managing Awassi sheep to small scale farmers in WANA," training of AUB/AREC students in crop improvement, and regional group training workshops on integrated crop-livestock production, cereal crop improvement, and food legume breeding.

As a result of the ongoing events in Syria and the subsequent relocation of ICARDA in Lebanon, ICARDA's Country office has successfully liaised with the Lebanese Government and ensured smooth facilitation and management of the transfer process to Beirut of a large number of essential ICARDA staff (15 internationally recruited staff) and 21 support staff from the Director General's Office, Corporate Services, including Human Resources, Finance Department, Information Technology Unit; and Grant Management and Project Development Unit under International Cooperation.

2.4.2 ICARDA -Turkey Country Program

History, portfolio and staffing: The ICARDA Turkey office was established in 1990, following the signature of an agreement in 1986. The ongoing collaboration in Turkey includes three major operations, the Turkey-CIMMYT-ICARDA International Wheat Improvement Program (IWWIP), the joint work at Sanliurfa Regional Research Institute initiated in 2011-2012, and the Turkey-ICARDA Regional Cereal Rust Research Center in Izmir. In addition, the Country Office implements two regional projects, the first relates to the long term training activities financed by AFESD and managed by CDU, and the second relates to the training component co-financed by the European Union and IFAD on Enhanced Food Security in Arab Countries through technology transfer, managed by BIGM. In addition, training events have been held for both IWWIP and HQ planned training sessions. The current staffing of the Country Office is composed of a Country

Coordinator/scientist devoting 60% of his time to wheat breeding work and 40% to coordination, facilitation and government liaison for IWWIP. The office also has one administrative officer.

International Winter Wheat Improvement Program (IWWIP)

Geographic coverage and challenges: operating since 1990, the primary mandate countries for IWWIP are the facultative and winter wheat growing areas covering over 16 million ha of CWANA: Kazakhstan, Kyrgyzstan, Syria, Tajikistan, Turkey, Turkmenistan, Uzbekistan, Algeria and Morocco, Iran, Afghanistan, the Caucasus (Azerbaijan, Armenia and Georgia) and the mountainous regions of Pakistan's borders. The wheat production environments both within and among the 15 targeted countries for whom wheat is a major dietary component are highly variable in terms of total rainfall, elevation, soil type, maximum and minimum monthly temperatures and availability of irrigation. It is anticipated that the IWWIP region will be the most severely impacted by climate change (higher temperatures and diminishing rainfall), translating into more severe heat and water stress and new and more virulent diseases. The consequences for IWWIP are that the current appropriate varieties today will no longer be appropriate in 10 to 15 years' time and IWWIP would need to adjust its breeding strategy to address the challenges resulting from climate change.

In addition to its considerable in-kind contribution in the form of research facilities and equipment, the Turkish government's financial contribution towards IWWIP operating costs amounted to USD 0.73 million in total since Turkey's contribution to the CGIAR system began in 2005. In the area of capacity building, the Government of Turkey allocated to IWWIP USD 0.54 million for Turkish staff capacity development, including English language training, USD 0.220 million for IWWIP for international staff training, and USD 0.245 for other activities such as an Agro-ecological Zoning project and Legumes project totaling USD 1.5 million.

IWWIP research activities: IWWIP is a full fledged breeding program starting from crossing to international seed distribution of advanced lines with high yielding, good quality and biotic and abiotic stress tolerance, which could be divided into groups of activities as follows (i) crossing and multi-location tests and selection trials in 7 different production environments in Turkey to tackle several breeding priorities (high yields and wide adaptation; drought, heat, cold and salinity tolerance; yellow, leaf and stem rust resistance; and end product quality) under three major production systems (irrigated, supplementary irrigation and rainfed) in a wide range of geographical and temporal environments across the mandate countries; (ii) seed multiplication and international nursery distribution; (iii) collection, characterization and utilization of land races in breeding; (iv) training of scientists; (v) enhanced quality and healthy seed testing systems with financing from CRP 3.1 for 2 years.

IWWIP Achievements. The germplasm generated by IWWIP is directly released varieties or used indirectly as parents and genetic material. The achievements include:

- Seed multiplication and annual distribution of 2.5 tons of IWWIP germplasm material to over 40 countries in CWANA, Europe and North America. IWWIP distributes to 4 regular international nurseries; FAWWONSA, FAWWONlrr, IWWYTSA and IWWYTlrr and special trait nurseries such as WWSRRN, WWYRRN, SunPestRN, accounting for around 600 advanced lines of high-yielding, disease resistant, and good quality germplasm.
- Release of 52 wheat cultivars in 11 countries (seven cultivars in Afghanistan, one in Armenia, one in Azerbaijan, three in Georgia, four in Iran, two in Kazakhstan, five in Kyrgyzstan, three in Tajikistan, twenty-six in Turkey, two in Turkmenistan and one in Uzbekistan).

- IWWIP released cultivars have been planted on over 1.94 million ha in the releasing countries during 2012, and it is steadily increasing, starting from 2007 when it was less than 1 million ha.
- As of 2012, over 1620 landrace accessions have been collected and characterized all over Turkey. Evaluation for morpho-pheno-physiological characters is on-going since 2010, with an increasing numbers of head rows and yield trials since 2011.
- During 2012, over 70 young Turkish scientists benefited from English language courses; 30 Turkish technicians, quality lab staff and breeders from BMQ courses; 7 scientists from IWWIP member countries benefited from theoretical and practical training in breeding for a period ranging from 2 to 5 months, and 2 Turkish scientists benefited from advanced training in breeding at CIMMYT HQ in Mexico for a period of 4 months.
- Over 10 peer-reviewed publications co-authored with NARS have been published.

Turkey-ICARDA Collaboration in Sanliurfa and Ankara Genebank

Triggered by the need for ICARDA to relocate its research staff in light of the current situation in Syria, the collaboration with Turkey in Sanliurfa Regional Research Institute proved to be the best option for effective and efficient back-up plantings for ICARDA nurseries to be able to continue seed production and international distribution. The Sanliurfa initiative and the associated infrastructure, along with the strong interest expressed by Turkey for partnership, offered the necessary ingredients for Sanliurfa to evolve into a valuable node for ICARDA in the context of decentralization. In parallel with the above collaboration, 14, 000 ICARDA plant genetic material are saved in a “black-box” in Ankara’s genebank, along with the repatriation of 1000 plant genetic material from ICARDA’s genebank in Aleppo to Ankara.

Turkey-ICARDA Regional Cereal Rust Research Center in Izmir

Initiated in 2012 through an agreement between ICARDA and the Government of Turkey, the research center is under establishment in Izmir with financing from the government of Turkey. The importance of this Center for wheat and rust in the region, and throughout the world, is that foreign rust isolates can be brought to the center and studied to allow scientists to learn more about rust and to monitor and take measurements before rust outbreaks, which is of paramount importance for food security in the region. This is the first establishment of its kind in the developing world. BIGM’s senior cereals-rust pathologist assigned to head the Center is recently out-posted in Turkey, and temporarily housed in the ICARDA- Ankara Office.

Other Activities: ICARDA’s Turkey Office also carries out a long-term training program for the Young Agricultural Scientists from Arab Countries. In 2012, 4 young scientists (1 Tunis, 1 Jordan and 2 Egypt) have been trained on bread making quality and drought tolerance in wheat. Another activity, supported by EU-IFAD, is to conduct technology transfer studies using on-farm trials, demonstrations and farmers field days in 3 different provinces of Turkey, conducted by 3 different ARI’s in the provinces.

Assessment

This CCER considers IWWIP highly relevant for its mandate countries and ICARDA’s 2007-2016 Strategy Plan. The partnership, based on pooling resources with Turkey as the lead implementing partner to mainstream IWWIP work in its own wheat research program with scientific support from ICARDA and CIMMYT, has proved to be an effective model for the generation of international public goods, including capacity building in cereal breeding.

This CCER Panel embraces the conclusion of the September 2012 External Review Mission of IWWIP stating: “ Without IWWIP, there would be very significant deficiency in the capacity to produce winter wheat varieties that are appropriate for the IWWIP mandate region. The consequences of not having IWWIP varieties would be a significant short fall in meeting the demands for food security for a region that is more reliant than any other part of the world on wheat for its calorific requirements”.

IWWIP has the capacity to generate through breeding robust, yield enhancing wheat varieties. Breeding, however, is only part of the answer to productivity increases with an average contribution of 25%. Crop agronomy and husbandry remains a missing key factor for further yield increases. ICARDA is well placed to play a leading role in addressing the gap of integrated farming system research in IWWIP and outreach programs (see **Recommendation 29** in Section 4.2 of the Report)

The current staffing level of Turkey country office is insufficient to cater for the emerging increased demand for administrative, coordination and facilitation support required by (i) ICARDA training courses normally held in Aleppo with an increasing share being organized in Turkey with facilitation by the country office in Ankara; (ii) the establishment of the new Regional Cereal Rust Research Center in Izmir; and (iii) the Turkey-ICARDA collaboration in Sanliurfa.

The Turkish Government established and equipped in 2009 the International Agriculture Research and Training Center in Izmir with a hotel facility for trainees. Several successful International training events and workshops have been held during the last three years by FAO and other organizations at a competitive cost. The government of Turkey, through its General Directorate of Agriculture Research and Policies, invites ICARDA to actively use this Training Center, with the potential to expose the trainees to Turkey’s rich experience in public/private sector partnerships in the agriculture commodities value added chain. Turkey has also developed an effective public/private sector partnership, including breeder rights in the production and distribution of certified cereals seeds using improved varieties released by IWWIP, which other countries can benefit from.

Recommendations

ICARDA Turkey Country office

Recommendation 14: The CCER Panel recommends that ICARDA reinforce the capacity of the Turkey country office in Ankara with a full time research assistant in breeding to allow the Country Coordinator to devote more time to breeding, facilitation and coordination.

2.5 Central Asia and the Caucasus Regional Program (CACRP)

History and geographic coverage: ICARDA activities started in 1995 in Central Asia and the Caucasus (CAC) when ICARDA held the first CAC/ICARDA stakeholders meeting in Tashkent. ICARDA activities in CAC were streamlined for fifteen years after the establishment in 1998 of an ICARDA-CAC Regional Office in Tashkent through a signed legal agreement with the Government of Uzbekistan. The CACRP covers five Central Asian countries: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan and three Caucasian countries, namely: Armenia, Azerbaijan and Georgia.

Housing of the CGIAR Program Facilitation Unit (PFU): ICARDA-CAC Regional Office houses and coordinates the PFU of the CGIAR Regional Collaborative Research Program for Sustainable Agriculture Development in the CAC region, of which ICARDA is a member. An ICARDA Regional Coordinator heads the PFU. This Collaborative Program is based on

a Partnership Agreement signed by eight CGIAR Centers, ICARDA, Biodiversity International, CIP, CIMMYT, IFPRI, ILRI, IWMI and ICRISAT, two Non-CGIAR international research centers (AVDRC and ICBA), and an advanced research institute, Michigan State University (MSU), working together in a regional consortium in close collaboration with the counterpart NARS. In turn, the CGIAR-PFU hosts the Executive Secretary of the Central Asia and Caucasus Association of Agricultural Research Institutions (CACAARI), which also offers valuable opportunities for collaboration on the research priorities of the region.

Governed by a Steering Committee with memberships from all signatories of the Partnership Agreement and participating NARS, the CGIAR Collaborative Program contributes towards food security through increased productivity of agricultural systems. The overall research portfolio covers a wide range of complementary R4D themes in line with respective Center mandates and comparative advantages. In addition to ICARDA's research themes, the on-going CGIAR Collaborative Program covers: crop improvement in sorghum, pearl millet, potato and vegetables, ecologically based IPM practices, in situ/on-farm conservation of agriculture biodiversity for horticulture crops and wild fruit species, water productivity, integrated management of surface and ground water resources, concerted use of trans-boundary water initiatives, biosaline technologies for the utilization of marginal water, land degradation, use of underutilized plants, reforestation, watershed management and environmental governance.

Staffing of ICARDA-CAC regional office and the PFU: The core full time professional staff is composed of an ICARDA Regional Coordinator/Head of PFU; a Deputy Regional Coordinator; a senior crop breeder and an international senior wheat breeder. This team is complemented by the following long and short-term research specialists and assistants, funded by donors' restricted projects: environmental governance researcher (SEPR); crop modeling researcher (IWLM); conservation agriculture regional coordinator (DSIPS); project field research coordinator (DSIPS); a land management specialist (IWLM); and a research assistant. Composed of one administrative officer, one administrative assistant, an accounting supervisor, a communication officer, a web manager, an immigration officer, a driver and a part time translator, the staffing level for administrative, financial and services management is presently adequate to meet the needs of both ICARDA-CAC and the CGIAR-PFU.

ICARDA research themes in CAC: Implemented by NARS in a capacity building mode, CACRP research themes focus on breeding for wheat which is considered a strategic commodity for food security in the region, as well as for barley, food and forage legumes through assistance for the evaluation, variety release, seed multiplication and uptake of germplasm provided by international nurseries. The breeding objective for wheat consists of developing high yielding, wide adaptation, drought and heat tolerance, yellow, leaf and stem rust (Ug99) resistance, salinity tolerance, and end product quality. The other equally important research areas include sustainable land management, climate change adaptation through crop modeling, socio-economic studies, agro-ecological and governance studies, conservation agriculture, crop intensification and diversification, rangelands and livestock development, including value-addition activities, on-farm water use efficiency, pollinators and knowledge management.

ICARDA research portfolio and partners in CAC: From 2007 until the present, CACRP has been implemented through 31 regional, sub-regional and country financed projects for a total cost of USD 21.7 million with an average of USD 3.1 million per year exclusive of in kind contribution by NARS. In addition to all members of the CGIAR Regional Collaborative Program and participating NARS, IFAD, UNESCO, BEAF/GIZ and the Russian Federation are active partners. Within NARS, all national and regional institutes that play a role in R4D, technology transfer and the seed sector have been mobilized.

Achievements of ICARDA research activities in CAC: Since 2007, considerable progress has been made in achieving the intended outputs of ICARDA's outreach program. These include:

- Development of many winter wheat varieties resistant to yellow rust, the most important disease in the region, with 5 varieties submitted for accelerated release to the State Variety Testing Commission in Uzbekistan in 2010 and 2011 and one variety in Tajikistan in 2011.
- Seed multiplication on over 60 ha of 4 wheat resistant varieties in Uzbekistan and 3 varieties in Tajikistan in 2013, which will be planted on 2000 ha for further seed multiplication in 2014 and distributed to farmers in 2015.
- Several improved winter wheat lines tolerant to medium level salinity (5-10 dS/m) developed in Uzbekistan and Turkmenistan and one new line is at an advanced stage of development for submission to the State Variety Testing Commission in Turkmenistan.
- Outscaling to more than 270 farmers across 18 districts in Tajikistan in 2010-12 of two cold tolerant and Ascochyta blight resistant chickpea varieties.
- Conservation agriculture practices for irrigated areas tested and developed in Azerbaijan, Kazakhstan and Uzbekistan.
- Soil salinity management technologies developed.
- Phosphogypsum application technology to remediate soil sodicity in high magnesium soils of south Kazakhstan tested and outscaled.
- Crop-Syst crop modeling calibrated for a number of wheat varieties and multi-lingual versions developed.
- Scenarios based approach for participatory development of climate adaptation strategies developed.
- Two environmental governance approaches developed: the first is based on "Integrated rangeland restoration" and the second on "collective landscape restoration."
- Farming practices with alternative pollinators developed.
- Angora and cashmere bucks with fine fibers introduced to nucleus goat flocks in Tajikistan. Women trained in yarn processing into knitwear and carpets in Tajikistan and Kyrgyzstan and quality products successfully test-marketed in Europe and USA.
- Research strategy for Dryland Systems (CRP) developed.
- Capacity building through group training courses from 3 to 10 days has been conducted for young NARS scientists. The topics included plant genetic resources, winter wheat breeding and adoption, production of high quality wheat seed, crop modeling application, irrigation practices for enhanced water productivity, soil and ground water salinity monitoring and conservation agriculture. Visits to HQ by scientists and traveling workshops were organized across NARS countries. Support has been provided to four Ph.D. research studies in Uzbekistan and 3 in Azerbaijan to enhance the scientific capacity of young researchers.
- Over 25 peer-reviewed publications co-authored with NARS finalized and accepted. The publications covered climate change, conservation agriculture, wheat pathology and wheat breeding for rainfed and irrigated environments.

Assessment

ICARDA's support to wheat breeding and associated seed production in CAC resulted in the release of 13 improved varieties. In Uzbekistan, for example, through an accelerated release process, one of the varieties is currently planted over 70 000 ha and 6 other varieties are planted over 100 000 ha with the potential to expand to 200 000 ha.

The capacity development of young scientists through in-service training and seminars is seriously handicapped by the lack of oral and written communication skills in English

language. The priority training areas expressed by CAC NARS include: molecular breeding and access to molecular markers, seed quality, screening for pest resistance and salt tolerance, experimental design, breeding for food and forage legumes, research on crop diversification and livestock integration in rainfed production systems.

The past practice of local support staff recruitment by individual PFU hosted centers on the basis of different job description and grading led to unproductive competition. A harmonized recruitment policy is now in place on the basis of salary and benefit structures recently developed and endorsed by all PFU hosted Centers. The policy calls for the need to issue ICARDA contracts only for all existing employees with salary payments in USD through a local bank account in line with the host country agreement. The full implementation of this policy is behind schedule due to ICARDA's relocation to Beirut.

The Highland Regional Network, promoted by ICARDA, presently covers three CAC countries, Tajikistan, Kyrgyzstan, and Georgia, in addition to Iran, Turkey and Morocco. The Network is inactive and lacks a formal decision on where it should be housed to ensure its reactivation.

The full alignment of the CAC Outreach Program with CRPs is likely to reduce the funding sustainability of ICARDA outreach activities in countries not covered or with limited coverage by CRPs such as Georgia and Armenia. (See **Recommendation 10** in Section 2.1)

Among the potential new partners in the CAC region are: World Fish, FAO, University of Bonn (ZEF), Agha Khan Foundation, ICRAF, Russian Federation (ECFS) and international NGOs such as Oxfam. In terms of expanding ICARDA-CAC coverage to other countries, Mongolia would be a natural candidate given the similarities of its agriculture production environments with the Central Asian Countries for wheat and livestock.

Recommendations

English language training

Recommendation 15: To enhance the effectiveness of CAC counterpart scientists, the CCER Panel recommends that the CGIAR Regional Collaborative Research Program of which ICARDA is a coordinator and a member, include a budget item in the PFU budget for partner communications and training in the English language. This could be financed by a small increase of membership contributions, NARS contributions and partial cost recovery from trainees.

PFU employment policy

Recommendation 16: The CCER Panel recommends that ICARDA accelerate the full implementation of the new harmonization policy for local support staff employment for the CGIAR PFU in Tashkent by issuing ICARDA contracts for existing employees with salary payment in USD through their local bank accounts, provided that these are transferred from abroad in line with the host country legislation.

Highland Regional Network

Recommendation 17: The CCER Panel recommends that ICARDA take the lead in reactivating the Highland Regional Network, locating it at the CGIAR PFU in Tashkent or another suitable country with a small catalytic financial contribution to periodically organize regional knowledge sharing events and support to resource mobilization efforts for a long-term mountainous highland ecosystem research project/program.

Broadening CACRP geographic coverage to Mongolia

Mongolia is not presently part of by CACRP or SACRP mandate countries. Poverty in this country is a direct consequence of the transition to a market economy in the 1990s, after the breakup of the Soviet Union and the collapse of Mongolia's centrally planned economy. Privatization of state farms brought high levels of unemployment and lower income. Presently, one in three people in Mongolia are poor and poverty is deeply entrenched in rural areas, much of which are drylands, where about half of the country's poor people live. The livestock and pasture sector, complemented by winter wheat growing in high altitudes, is key to the livelihoods of rural Mongolians. Half of all people in rural areas are small ruminant semi-nomadic herders who move from one remote pastureland to another, living with their families in traditional tents. At present, the country is benefiting from donor attention for financing food security projects with a focus on small ruminant and pasture development. These projects lack the technological base for productivity enhancement.

Recommendation 18: ICARDA to consider expanding its CAC Regional Outreach Program to Mongolia and taking the lead in collaboration with the CGIAR PFU members in Tashkent to include Mongolia in ongoing and future regional projects on the improvement of crop and small ruminant production systems and capacity development.

2.6 South Asia and China Regional Program (SACRP)

Geographic coverage and staffing: Located in New Delhi in the National Agricultural Science Center Complex, where 9 other CGIAR centers hosted by the Indian Council of Agricultural Research (ICAR), Ministry of Agriculture, Government of India, are housed, ICARDA–SACRP regional office covers directly 9 countries: Bangladesh, Bhutan, China, India and Nepal. The Afghanistan Country Office is linked to SACRP, but for this review will be considered separately. The total current research project portfolio value of the SACRP is USD 7.0 million with USD 6.0 million being spent in India. The office was inaugurated in November 2008. There was some project presence prior to 2008, but not as a Regional Program. A Regional Coordinator heads the office with the support of 5 administrative and services staff and 3 NARS Research Associates. There are also 5 NARS Research Fellows out-posted in provincial offices in India.

Research themes: the major theme for the SACRP is crop improvement for food and feed (barley, lentil, Kabuli chickpea, grasspea, faba beans, forages, wheat), and inclusion of legumes in systems, such as during rice fallow periods. Other themes are: Small-ruminant production systems (in rangelands); On-farm water-use efficiency; Diversification of production systems; Socio-economic analysis and policy option development; Farmer-participatory adaptive research and dissemination, and capacity building. The Regional Coordinator (IRS) is a food legume breeder. He is supported by NARS scientists in the areas of socio-economics (one scientist) and a water productivity consultant as part of the Indian Council of Agricultural Research (ICAR)-ICARDA work plan. Project-based and outstation staff work on lentils (4 scientists), and grasspea (3 scientists). The main Consortia Research Programs interacting with the SACRP are CRP Dryland Systems, CRP Grain Legumes and CRP Dryland Cereals.

Output achievements: New varieties of lentil, chickpea, faba bean, grasspea, barley and a few durum wheat and bread wheat genetic materials have been supplied to NARS. Over 1300 international nurseries were supplied, and 99 varieties have been developed in the SACRP. Improved production technologies on lentil and grasspea have been developed, as well as value chain improvements through detoxification of grasspea. Seed hub and village-based seed enterprises have been created and women farmers were given improved livestock management skills. In the period 2008-2013, the staff at the SACRP have co-authored 20 peer reviewed journal articles, 1 book, and 17 book chapters/conference

proceeding papers; all on legumes (almost all on lentil). Since 2010, lentil uptake has been rapid, with about 4300 farmers growing it on over about 1650 ha, producing about 1350 metric tons of seed. Similarly, since 2010, about 1960 farmers have adopted new varieties of grass pea on over 635 ha, producing about 420 metric tons of seed. In northwestern Bangladesh, techniques to include new varieties of lentil into the rice fallow periods have been widely accepted. Farmers in the Pabna district harvested lentil worth more than 150,000 USD in one year.

Implementation arrangements: the four ICARDA Headquarters' Research Programs have interactions with SACRP to varying degrees. The strongest connection is with the BIGM Research Program. In the last 4 years, 13 BIGM scientists, 7 DSIPS scientists, 3 IWLMP scientists and 2 SEPP scientists have participated in activities with the SACRP. The staff have identified that the support from the SEPR is adequate, whilst the support from the other Research Programs and Support Units need improvement.

All the activities of the SACRP are implemented through the NARS. In India, the SACRP is deeply connected with the activities of the Indian Council of Agricultural Research (ICAR), and its various institutes and state research stations (9), as well as the Department of Agriculture and Cooperation, National Rainfed Area Authority and several State Agricultural Universities (13). In Bangladesh, partnership is with the Bangladesh Agricultural Research Council (2 Institutes) and the Bangladesh Agricultural University. In Bhutan, the partnership is with the Council of Renewable Resource Research, and in Nepal, with the Nepal Agricultural Research Council. Partners in China are the Chinese Academy of Agricultural Sciences (CAAS), Yunnan Academy of Agricultural Sciences, and the Institute of Environmental Sustainable Development. The CAAS and some of the ICAR institutes are of Advanced Research Institute standard. This large number of collaborating scientists and organizations places considerable strain on the SACRP office, particularly on the Regional Coordinator.

Partnerships with Advanced Research Institutes and other CGIAR Centers: In addition to the institutions above, advanced research institutes collaborating with the SACRP are the University of Saskatchewan (lentils), North Dakota State University (lentils), Washington State University (lentils), and University of Western Australia (short duration pulses). Strong collaboration with other CGIAR centers are noted, which will continue through the CRPs, particularly CRP Dryland Systems, CRP Grain Legumes and CRP Dryland Cereals. The strongest relationship is with ICRISAT and Biodiversity International. The SACRP has an excellent relationship with the other CG Centers. However, there are some problems in communication within the CRPs more generally. There is also some concern about mandates with regard to chickpea research and germplasm release between ICRISAT and ICARDA.

Partnership with the private sector and NGOs include: the OCP Foundation, Morocco, which is a significant donor (USD 0.99million) to the India-Morocco Food Legume Initiative, as well as for providing knowledge transfer opportunities. SACRP also works with 5 NGOs, particularly on food legumes. This has led to the development of small-scale private sector enterprises, such as village-based seed enterprises. Seed hubs developed include 32 for lentil (16 registered) and 7 (unregistered) for grasspea.

Partners in impact generation: Partnerships with NARS scientists and NGOs have included plans beyond output generation. This has led to the development of small-scale private sector enterprises, such as village-based seed enterprises, seed hubs and farmers' participatory varietal selection. There is a good level of involvement of State Agricultural Universities, but there are deep problems with other state extension resources. Nevertheless, this area of engaging knowledge exchange among partners in projects could be improved. There is concern amongst senior ICAR personnel that ICARDA sometimes strays into the area of extension, stating that ICARDA must stay on mission with research.

Assessment

In transforming the SACRP into a Platform, considerable additional staffing will be required in line with the increased range and level of responsibilities and accountabilities. This needs to be consistent with other such platforms. Changes in personnel could include the appointment of an Office Manager reporting to HQ administration, supported in-office by accredited finance and HR staff, with a highly manualized administration. ICARDA will need to ensure sufficient science staffing and science leadership within the expanded office.

The presence of ICRISAT Headquarters at Hyderabad, India, represents an opportunity to utilize existing resources of a like-minded center. Indian field and laboratory resources are of a very high standard, particularly in New Delhi, and the ICAR expressed willingness to make these resources available for regionally relevant research and capacity development.

The SACRP could be more actively collaborating with the Country Office in Pakistan. This will need explicit commitment as the Regional Office transforms into a Platform. At the moment, there are genuine barriers to service of the Pakistan Country Program from India, which requires proactive commitment.

There are likely to be good opportunities to work with Indian state government agencies to mobilize resources and create international public goods. Great care needs to be taken to ensure mobility of those public goods.

Partnering with Indian State Programs

Recommendation 19: The CCER Panel recommends that ICARDA explore the potential to further mobilize resources through partnering with Indian State programs whilst ensuring the regional applicability of developed International Public Goods.

2.6.1 ICARDA-Pakistan Country Program

Research themes: ICARDA-Pakistan Country Office is housed in the National Agricultural Research Center in Islamabad. The first project was the Barani (dryland) Village Development Project (1999-2007). Currently, there are 3 USDA financed projects (USD 9.8 million) and 4 Financial Facilitation Projects for ACIAR (USD 1.3 million). The portfolio value of projects completed during the period 2007-2013 was USD 5.62 million. The current research themes include wheat improvement; cotton germplasm and practice improvement; watershed management; water harvesting and efficient irrigation; breeding; agronomy; and water and land management. Monsoonal rains dominate Pakistan's rainfall over a two-month period. Enormous opportunities exist for enhanced incomes and nutritional security through increased productivity and production options utilizing monsoonal rain. The ICARDA-Pakistan Country Office is very active in this theme.

Output Achievements: Achievements include agronomic system improvement for wheat and cotton, including relay cropping; fast-track release of improved wheat and cotton varieties, and seed multiplication and distribution; approaches to water harvesting and efficient irrigation (particularly of crop trees) including solar pumps; approaches to reduce erosion from loess soils. There is a strong use of ICARDA legume germplasm by NARS directly, with all chickpeas grown in Pakistan having an ICARDA pedigree to some degree. There is evidence of post-project life of research outputs, including village-based seed systems, livestock feed supplement businesses, micro-catchment projects and efficient irrigation systems on farms. A major development project is being developed (around 32 billion Pak Rup) by the Punjab Provincial government, building on the successes of the Barani Village Project, to utilize small dams for irrigation. Many journal articles, particularly with university staff (>10 journal articles), but also with NARS, have been published.

Implementation arrangements: the four ICARDA Headquarters' research programs and support units have interactions with the Pakistan Country Office to varying degrees. The strongest connection is currently with the BIGM Research Program. There has not been very much attention to the Pakistan Office by ICARDA Headquarters for the last 2 years. Although there has been good direct interaction between lentil breeders at Headquarters and NARS, this has decreased in the last 3 years.

All the activities of the Pakistan Country Office are implemented through the NARS, Pakistan Agricultural Research Council and their centers and institutes, and to some extent Punjab Provincial Institutes (2). Approximately 30 FTE Pakistan researchers are involved in ICARDA projects. This large number of collaborating scientists and organizations places considerable strain on the office, particularly on the Country Coordinator.

Partnerships: Partnerships with Advanced Research Institutes and other CGIAR centers included good interaction with USDA scientists, particularly around cotton germplasm and agronomy. Interaction with CYMMT in relation to wheat improvement has been developed. However, there is a very poor working relationship with ICRISAT. There has also been development of small-scale private sector enterprises, such as village-based seed enterprises, and animal feed-supplement manufacturing. Significant interaction with the private sector, particularly for facilitating adoption, and for making available resources, includes enterprises such as village service providers and retailers. Several NGOs have interacted with the office. The most productive NGO partnership is probably with the National Rural Support Program, through which rapid and close interaction with rural community groups has been made possible.

Partners in impact generation: Partnerships with NARS scientists and personnel, Provincial Government Agencies and NGOs, have included plans beyond output generation. This has led to the development of small scale private sector enterprises, such as village-based seed enterprises, seed hubs, farmers' participatory varietal selection, animal feed supplement businesses, and key adoption agents such as agricultural service providers (doing contract tillage etc.). ICARDA has good involvement with Agricultural Universities in Pakistan, with an eagerness by many professorial staff to work more closely with ICARDA. Nevertheless, this area of knowledge exchange among partners in projects could be improved. Sponsors, such as USDA and ACIAR are also active participants in impact generation. Previous project work with the Agency for Barani Area Development (ABAD) has led to ongoing implementation of ICARDA project interventions in other development projects.

ICARDA has a very good working relationship with senior science administrators and scientists in Pakistan. Many senior Pakistan agricultural staff have engaged with ICARDA and are most eager to consolidate the "ICARDA way" in Pakistan with greater regional engagement. The Pakistan Agricultural Research Council and institutes expressed eagerness to play a stronger role regionally, particularly for capacity building. ICARDA could utilize this goodwill more and facilitate training aligned to regional priorities.

There is considerable activity in the Pakistan Country Office on the theme of water and land management. There is a growing amount of development activity in this theme particularly associated with monsoon water harvesting and efficient irrigation. There is a need for at least 1 more science staff member, and this could be an IRS scientist with water and land credentials.

There are likely to be opportunities to work more with the Pakistan government agencies to mobilize resources and create international public goods. An example is the Pakistan Poverty Eradication Fund. Many responsibilities are also being devolved to Provincial authorities, so it will be advantageous to work with them. Great care needs to be taken to ensure regional significance and mobility of those public goods.

Pakistan is a major producer of grain legumes and a main user of ICARDA legume germplasm. All chickpeas in Pakistan have some ICARDA blood. Urgent re-engagement between ICARDA and Pakistan pulse breeding programs needs to be undertaken. This could be mutually beneficial as there is a strong selection program in Pakistan. Given the size of the Pakistan pulse industry and its importance to food security, some involvement of Pakistan in CRP Grain Legumes should be negotiated.

Recommendations

Enhanced research capacity and partnership with Pakistan

Recommendation 20: The CCER Panel recommends that ICARDA undertake a high level mission to Pakistan to forge strategic partnerships. Utilizing NARS strengths and commitments, the delegation is likely to mobilize funds to do regionally significant R4D, focusing on integrated water and land management for implementation, potentially in collaboration with CACRP.

Linkages with CRP legumes

Recommendation 21: In case Pakistan faces barriers to being involved in the grain legumes CRP under ICRISAT leadership (being in India), the CCER Panel recommends that ICARDA identify mechanisms for re-engaging with Pakistan around legume breeding activities from within or without the CRP Grain Legumes breeding work.

2.6.2 ICARDA-Afghanistan Country Program

Project portfolio: ICARDA's Country Program and Office in Afghanistan was established in 2002, with a Host Country Agreement through the Office of the President. The office came to lead the Future Harvest Consortium to Rebuild Agriculture in Afghanistan Program, with 35 agencies. The Country program is currently managed through the main office (Kabul), and four regional offices (Baghlan, Mazar, Nangarhar, Uruzgon). Previous offices in Badakhshan, Ghazni, Helmand, Kunduz, Kunar, Laghman, and Parwan are now closed. Total current funding amounts to USD 20.6 million. Enormous USAID proposals are under development for USD 110-120 million. The Country Office has 4 IRS, and another is expected to join soon, 39 NRS and six armed guards. Whilst the Afghanistan Country Program reports directly to ICARDA HQ, it has a close supportive relationship with the SACRP.

Research themes: crop variety improvement and seed multiplication; protected (plastic house) agriculture; crop-livestock integration; goat management; on-farm water management, and integrated catchment management.

Output achievements: distribution of improved seed and local multiplication; efficient irrigation systems and water harvesting techniques; supplementary irrigation; integrated management of fodder, crops, water, landscapes. More than 50% crop varieties are based on ICARDA/CGIAR material, and a wheat variety covering more than 25% of area (Lalmi- 2) is an ICARDA variety. Village-based seed enterprises have been developed - 35 have been established in 8 provinces - and IFAD will be funding an additional 12 more in three provinces. Currently, more than 30% of the certified seed produced in the country is from these enterprises. 6 peer-reviewed articles have been published in the last 3 years.

Implementation arrangement and assessment

The linkages with ICARDA Headquarters research programs and support units are mostly through the SACRP office, or taking people to HQ. Many scientists are reluctant to travel to Afghanistan. There are good linkages with germplasm, livestock and water management

approaches in many regions of the country. The local NARS are quite weak in science training and experience, requiring ICARDA staff to do most of the work and joint implementation of projects with gradual transformation of roles. The on-going large portfolio, weak NARS, and the difficult security circumstances place considerable strain on the office, particularly on the Country Coordinator.

Partners: Many NGOs, including the Ministry of Agriculture, Irrigation and Livestock have substantial USAID support. The Indian Government is also assisting, particularly through capacity building. Major funding agencies are ACIAR, the Netherlands and IFAD. There has been an enormous increase in the rate of adoption when partners work together, for example when the NARS, development donors and village based seed enterprises collaborate together. In one example, the adoption of a new variety of mung bean went from 80 ha in 2009 to 3000 ha in 2010 after the main stakeholders; knowledge stewards and financial backers began working together.

Recommendation

In-depth review of Afghani Country program

Recommendation 22: The CCER Panel recommends that ICARDA undergo a strategic review of the Afghanistan Country Program to adjust to the new political climate with particular attention to requirements of staff located in-country, their welfare and options for proxy management for effective delivery.

2.7 Arabian Peninsula Regional Program (APRP)

Geographical coverage and staffing of the Regional Office: Operating from ICARDA Regional Office in Dubai and established in 1998, ICARDA's APRP covers the seven Arabian Peninsula Countries namely Saudi Arabia, Kuwait, United Arab Emirates, Oman, Qatar, Bahrain and Yemen. The current staffing of the Regional Office is composed of a Regional Coordinator, a rangeland and forage specialist, an on-farm water management specialist, 2 retainer consultants, one administrative officer, an accountant, a secretary, and a driver. An ICARDA Country Office has also been established in Oman to directly manage a large regional project on date palm.

Research areas and project portfolio and financing partners: APRP research focuses on water resources management, forage crops improvement, rangeland management, and protected agriculture. During the period under review, APRP research portfolio is composed of 2 large on-going projects and two completed projects (one small and one medium sized) for a cumulative cost of USD 8.665 million. These are:

- The Project for Technology Transfer to Enhance Livelihoods and Natural Resource Management in the Arabian Peninsula, co-financed by IFAD and AFESD for an amount of USD 3.760 million. Covering 7 countries, the project is managed by ICARDA's Dubai office (on-going).
- The Date Palm Project covers 7 countries and is financed by the Gulf Cooperation Council (GCC) for a total amount of USD 4.5 million managed by ICARDA Dubai office (on-going).
- The joint ICARDA/AVRDC project for the CWANA with AVRDC financing of USD 48,662 (completed).

APRP has two projects in the pipeline. The first "Integrated Agricultural Production System in the Arabian Peninsula" for a total cost of USD 6.857 million presented to AFESD, IFAD, and OFID for partnership co-financing. The second, "Improving Food Security through Enhancing Sustainable Integrated Small Ruminants Production Systems in UAE" for a total cost of USD

2.930 million, presented to Abu Dhabi Food Control Authority (ADFCA) for partnership financing.

Implementation partners: APRP implementation partners are:

- **In Saudi Arabia:** the Agriculture Extension and Research Department and the National Agriculture Animal Resource Center of the Ministry of Agriculture and King Abdul-Aziz University for Science and Technology.
- **In UAE:** Agriculture Directorate of Agriculture Development of the Ministry of Environment.
- **In Kuwait:** Public Authority for Agricultural Affairs and Fish Resources.
- **In Bahrain:** Ministry of Municipalities Affairs and Urban Planning.
- **In Oman:** Ministry of Agriculture and Fisheries and Sultan Qabus University.
- **In Qatar:** Agricultural Affairs Department and Agriculture Extension and Research of the Ministry of Environment.
- **In Yemen:** Agriculture Research and Extension Authority and National Livestock Resources Research Center of the Ministry of Agriculture.

Achievements: From 2007 onwards, APRP made considerable progress in the development of technological packages in rangeland rehabilitation, irrigated forages, on-farm water management and protected agriculture. The technology packages tested on a number of pilot farms have had positive impacts on the welfare of poor farmers in the region, on the management of natural resources, and on the environment. The packages include:

- Integrated Production and Protection Management (IPPM) under protected agriculture for high quality cash crops, reducing pesticide residue and hazardous chemical use. By December 2012, about 110 growers adopted these technology packages. Oman and Yemen, with 24 and 22 growers respectively, had the highest number of growers who adopted this technology.
- Integrated production systems for Buffel grass as an indigenous forage species with high water use efficiency. By December 2012, about 100 farmers adopted this technology in all seven Arabian Peninsula (AP) countries, while the project's original target was 90 farmers. The highest numbers belong to Oman and UAE, with about 30 farmers each. However, in the UAE, another 52 farmers have adopted this technology package under the direct supervision of the Ministry of Water and Environment.
- Integrated production system for spineless forage cactus. A total of 30 farmers adopted the technology by December 2012.
- Enhancing the adoption of new forage and rangeland production systems by providing large quantities of seeds of suitable species. The project established five seed technology units as well as two seed health units in the Arab Peninsula. In addition, ICARDA-APRP provided technical backstopping for the establishment of a seed health unit in Oman.
- Participatory technology for rangeland rehabilitation through water harvesting and re-seeding techniques. Based on NARS reports, the project covered 65 ha of rangeland areas.
- Development of enhanced and simplified soilless production techniques for more water use efficient production of high quality cash crops under protected agriculture. During the period between 2008 and Dec 2012, about 110 growers adopted the soilless production techniques for vegetable crops under greenhouse conditions.
- During the period 2008 until 2012, over 350 growers adopted different ICARDA-APRP targeted technologies and about 65 ha of rangeland areas were rehabilitated.
- Capacity development training courses and field days impacted 310 researchers, extension agents, and farmers. Training topics included the production and

management of indigenous forages and spineless cactus, improved practices for the establishment and management of rangelands, IPPM technologies, management of irrigation systems, and soil-less production technologies, integrated management for the production of high quality forage/rangeland seeds, seed quality control and quarantine measures, project proposal development, scientific writing and data analysis.

- Four publications co-authored with NARS finalized and presented in international conferences.

Assessment

The CCER Panel considers that APRP is relevant to its mandate countries and succeeded in developing improved technology packages in the areas of forage and the use of marginal land for protected agriculture to address the severe constraints of the harsh production environments in the Arab Peninsula.

The sustainability of the outputs achieved in terms of their adoption by farmers beyond APRP's work with a limited number of pilot farmers' hinges on the successful establishment of private sector-led agriculture support services to assist farmer groups through result-based contracting arrangements in technology transfer, including input supply and marketing of produce.

3. Assessment of Partnerships

3.1 Partnerships with NARS and Advanced Research Institutes

On-going partnerships: Ever since its establishment in 1977, ICARDA, mainly through its regional programs, has been working extremely closely with NARS and ARIs to conduct collaborative research, build research capacity and contribute to sustainable development in the dry areas. As the above regional review indicates, almost all the research work that ICARDA does is in collaboration with NARS. According to the NARS/ARIs this panel interacted with, ICARDA's value was seen to be mostly in the support ICARDA provides in developing and implementing high quality research, in the support ICARDA gives to regional projects where learning venues within and among regions are enhanced, ICARDA capacity to attract additional donor funding to key research activities, ICARDA's research has profound and lasting results along the impact pathway, and finally, ICARDA plays a critical role in NARS capacity development.

The previous CCER in 2004 on outreach activities concluded that "ICARDA enjoys high standing among its national partners and is well-respected by national scientists and research managers." This conclusion is reaffirmed once again in this CCER. The panel finds that ICARDA's long-standing partnerships with NARS/ARIs have not only broadened geographically, most notably in Sub-Saharan Africa, South Asia and China, but also the nature of the partnerships have evolved, whereby there is more collaborative engagement, closer integration and a deeper sense of a common mission and joint accomplishment.

Evidence of this closer collaboration is provided as follows:

- A strong contribution of NARS and ARIs in the development of ICARDA's Strategic Plan (2007-2016).
- A geographical expansion of ICARDA's work on drylands to SSA, South Asia, China and to a lesser extent in Latin America, all of which is performed in close collaboration with these regions' NARS and an expanding number of ARIs.

- An increase in the financial investment of NARS in ICARDA, as evidenced by Egypt's ARC providing ICARDA with about USD 1 million USD for collaborative research in Egypt, as well as Morocco's contribution to the CG is earmarked almost exclusively to ICARDA-NARS collaboration. In addition to India which invests about USD 3.3 million in collaborative research with ICARDA. Similarly for Turkey.
- Following the evacuation of Tel Hadya, an immediate response by NARS (for example in Egypt, Ethiopia-ILRI, Jordan, Lebanon, Morocco, Tunisia and Turkey) to host ICARDA scientists and provide them with the facilities needed, including offices, laboratory space, land and equipment at no cost to ensure that work is uninterrupted.
- The increase in the number of co-published externally reviewed publications in refereed journals, conferences and workshop proceedings.
- An increase in the number of ICARDA-NARS jointly collected, documented, conserved, characterized, regenerated, exchanged, tested and released germplasm.
- A widening of the ICARDA-NARS-ARI partnerships along thematic lines such as conservation agriculture, biotechnology breeding (ACIAR), soil and water salinity (ICBA), and protected agriculture (AVRDC).
- An increase in the number of capacity development and human resources development activities since 2007 to the present.
- An increase in the number of projects developed, implemented and evaluated collaboratively between ICARDA and NARS as well as a growing number of technical backstopping activities performed by ICARDA with NARS.

Lessons learnt. The key lessons learnt include:

- Working in close collaboration with NARS and ARIs has built trust and solid relationships --formally and informally-- resulting in more effective collaborative results, which benefitted from synergies and have paid off at every level along the impact pathway.
- Regional presence in the form of platform, regional or country offices are key to the development of strong ICARDA-NARS/ARI partnerships.
- Formal collaborative venues such as regional and country coordination meetings, joint proposal writing workshops, project steering and technical coordination committees, joint publications and joint appointments to support participatory and demand-driven collaborative work and strengthen the relationship and trust between ICARDA and its partners which results in more significant impacts in addressing food security and poverty in the drylands.

Issues related to collaborating with other centers. Communities require research outputs that are applicable to complex agricultural systems, and this requires collaboration with other Centers. In addition, there are several resource requirements that different Centers have in common, and there are opportunities to collaborate to optimize utility of resources and the efficiency of their use. On the whole, ICARDA's relations with other Centers are excellent, and considerable collaboration and resource sharing has occurred for many years with few problems. Further and closer collaboration will be undertaken through the auspices of the CRPs, and this has not lead to any detected loss of identity. The CCER Panel found few issues related to working with other Centers:

- Communication: particularly related to CRP for Dryland Systems that ICARDA leads, but also CRP for Grain Legumes. Whilst members of collaborating Centers are sympathetic to disruptions of ICARDA's operations resulting from the relocation, and the imposed challenging schedule for CRP development, more efficient, timely and effective communication has been requested.
- Mandate creep: some personnel of other Centers expressed concern about ICARDA undertaking activities that other Centers do better, in particular, in relation to legumes. The Panel has not tested the veracity of these concerns, and suggests frank discussion with ICRISAT colleagues about their concerns.
- Forgotten partners: Pakistan has not been a country in which ICRISAT has been very active, and consequently it has been largely overlooked in deliberations about CRP Grain Legumes. This should serve as a reminder to ICARDA not to lose engagement with their partners when collaborating in CRPs led by other Centers. The CCER Panel recognizes that not all of ICARDA's partners will have CRP nodes and that there are other ways for partners to be involved.
- Information resource sharing: The CCER Panel was surprised to learn of nefarious approaches by some scientists to procure scientific literature. Whilst The CCER Panel acknowledges that subscription services are unreasonably expensive, The CCER Panel suggests that ICARDA investigate the cost effectiveness of joint subscriptions with other Centers.
- Willingness to host: Other Centers are generous in their willingness to act as hosts of ICARDA, such as ICRISAT in India. It is important that hosting arrangements are fully accounted for in the costing to avoid ICARDA becoming a heavy guest.

Recommendations

NARS south-south collaboration

Recommendation 23: While maintaining its good practice in engaging closely with NARS/ARIs, the CCER Panel recommends that ICARDA recognize that some NARS are more advanced than others. Strong NARSs should be involved in support of the lesser advanced ones using both formal and informal south-south collaborative mechanisms facilitated by ICARDA, as well as to document and share best practices and learning through ICARDA's sophisticated website for knowledge management referred to in *Recommendation 2* above.

Joint appointment with NARS

Recommendation 24: Based on past successful joint appointments should be developed between ICARDA and NARS. Joint appointments are considered a powerful collaborative modality currently underutilized at the outreach level, and should be used more often to enhance partnerships, bring in needed expertise, and save on costs such as the case with Morocco for biotechnology work.

3.2 Research to Development Partnerships

Central to the transformation of ICARDA's international public goods to practice change for improved livelihoods is the sponsorship, co-development, adoption and adaptation of these outputs by development partners. Relevant examples of previous and on-going effective partnerships with development agencies were reported in the responses to the CCER survey questionnaire addressed to the six regional outreach programs. In some cases, the partners are the private sector (these are covered in Section 3.3 below, and some are an extension of the work done in partnership with the NARS in Section 3.1 above. There are, however, some key organizations whose mission is to undertake development activities, and for whom research is entirely optional and dependent on how compelling the value proposition for inclusion is. These organizations range from targeted NGOs, proponents and managers of

large development projects and donors. Their role in research for development may be funding or participatory from the inception phase, providing opinions about the nature of the problematic, by enabling the research project with ground expertise (particularly about community structures) to implementation of an output that has been proven useful for the conditions they are interested in.

On going partnerships. The Outreach Offices have engaged with a variety of R4D partners, some of which are mentioned in Sections 3.1 above and 3.3 below. Here, the types of development organizations are arbitrarily classified as international donors, NGOs, government institutions, and project agencies.

There is a diverse range of development driven international donor agencies (see Chapter 2 under each Regional Program), which have sponsored outreach programs in all ICARDA offices. Since there is substantial competition for donor funds, it is vital for ICARDA to keep these donors well informed, not only about ICARDA's capability in addressing food security in the drylands, but also about emerging issues facing resource-poor communities. The activities of the Director General and Assistant Director General for International Cooperation and Communication are recognized by this panel as being effective in mobilizing funds for outreach activities, but other ICARDA units could also be more active in engaging with donors, particularly CODIS. Donor organizations require evidence in the form of rigorous science and up-to-date synthesized publications to be convinced of ICARDA's accomplishments. Similarly, development donors need to be well informed about the usefulness and transferrable learning and international public goods produced that can assist them in meeting their mandates.

ICARDA's NGO partners are listed for each Outreach Office. The capacity of NGOs in the regions where ICARDA operates differ substantially. In some countries, NGOs working in agriculture are strong, such as those located in Palestine and Pakistan. Others, such as those in Lebanon, for example, are weaker. One would have to question the added value of engaging with them in R4D where the transaction costs may be too high. Some NGOs operate only at small local scales where it might not be of much use to ICARDA in its efforts to scale-out technological packages. NGOs are useful to help ICARDA projects embed in communities, and could provide ICARDA scientists with the socio-economic and technical knowledge needed for project implementation. In SACRP and the Country Offices of Pakistan and Afghanistan, there is a clear symbiotic partnership between ICARDA and NGOs. For example, the external review of a large development project in Pakistan highlighted that the success of the project was largely owed to the activities of ICARDA and an NGO (National Rural Support Program), working together for a small fraction of the total budget. There is good potential for NGOs to assist in the accrual of impacts from ICARDA's work, but much will depend on their capacity and geographic area of coverage. Because many NGOs operate locally, interaction with NGOs is largely expected to occur through formal and informal networks developed in the regional and country offices. It would be desirable to be actively in touch with relevant NGOs in each region to keep them informed about the challenges and opportunities for resource-poor communities. But at the same time, ICARDA should be selective about the NGOs it chooses to work with by clearly defining the anticipated benefits from the very beginning.

Government institutions are key drivers of development. In some countries, such as India and Pakistan, there is a trend for increasing devolution of development responsibilities from national to provincial authorities. ICARDA has engaged with some of these provincial authorities with great success, though it is harder for there to be an awareness about ICARDA at that level. It is therefore essential that CODIS work with outreach programs to provide tailored and targeted communication strategies. It is also essential that project learning be shared so that provincial authorities can become aware of the potential benefits or risks.

Agricultural development projects, substantial in budget and scope, are often negotiated and designed with no consideration of the benefits from embedded research. Where ICARDA has been embedded in development projects, such as through the WARP, Pakistan or Afghanistan, the management of those linking development projects has expressed satisfaction about the advantages of including adaptive research. They also expressed the intention to embed research into future projects (not necessarily ICARDA's). Whilst it is impossible to enthuse all managers of agricultural development projects about adaptive research, they do respond well to the wishes of sponsors. For the international public goods produced by ICARDA to be successfully utilized, they need to be adapted to specific conditions. It is therefore useful to have funding agencies indicate the desirability of budget allocation to adaptive research. This requires ICARDA, supported by other international centers, to convince donors and sponsors through clearly synthesized arguments, supported by CODIS.

Recommendation

Partnership award for outreach teams

Recommendation 25: Whilst it is appropriate that ICARDA recognize research excellence through publication awards, the importance of outreach and partnership activities should also be recognized. The CCER Panel therefore recommends that ICARDA develop a “most successful partnership” award that celebrates excellence in outreach through effective partnerships.

3.3 Partnerships with Private Sector

Ongoing partnerships: Relevant examples of on-going effective public and private partnerships have been reported in the responses to the CCER survey questionnaire addressed to the six regional outreach programs. Most of the partnerships engaged in investment opportunities fall in the last segment between technology release and adoption of the impact pathway of research-for- development continuum. The partnership arrangements had been built along the commodity value chain, covering a wide range of private sector investment opportunities in agriculture support services including: (i) the production and distribution to farmers of critical agriculture inputs required by the productivity enhancing technology packages; and (ii) the generation of high value post harvest end products linking farmers to niche markets. The following are examples of successful public/private sector partnerships promoted through outreach programs:

- Emergence of public/private sector partnerships in the seed sector covering the production and distribution of high yielding, drought tolerant certified wheat varieties released by outreach programs using ICARDA germplasm in Turkey, Morocco, Algeria, Tunisia, Pakistan and Tajikistan. In Turkey, the share of the private sector in the certified seed market increased rapidly as a result of enabling policy measures adopted by the Turkish Government to promote the seed sector, including streamlined variety release and certification processes, breeder rights, capacity building in the seed processing industry, and price subsidy of certified seed.
- Emergence of private sector entrepreneurs in the manufacturing of low cost conservation agriculture machinery (seeders and implements for seedbed preparation) in Syria, Jordan, Iraq, Morocco, Tunisia, Turkey and Ethiopia
- Emergence of private sector involvement in the medicinal and herbal plants sector for the production of quality seedlings, production of oil and derivatives in Tunisia, Morocco, and Jordan.

- Emergence of a private sector investment in agro industries such as breweries and food processing in Ethiopia, and fruit drying in Uzbekistan, Turkey and Tajikistan.
- Emergence of private service providers, including extension and technical support for the adoption and dissemination of technologies in Pakistan, Jordan, Tunisia, Morocco, Oman, Saudi Arabia and United Arab Emirates.
- Emergence of private sector led support services for farmer's access to markets in the area of cold storage, grading and packaging, export of animal products, and pulses in Ethiopia and other countries.
- Emergence of village base seed enterprises in low potential rainfed areas where public and private seed companies are now interested to operate in India, Pakistan, Afghanistan, Eritrea, Ethiopia, and Sudan.
- Emergence of transnational market access initiatives, involving large fertilizer production and exporting companies, such as the OCP Foundation "India-Morocco Food Legumes" for the production of pulses in Morocco for the Indian market.

Lessons learnt. The major lessons learnt from ICARDA's outreach programs experience in relation to partnerships with the private sector are:

- There is a huge potential for the promotion of public/private partnerships to accelerate the uptake by farmers of improved production technology packages along the impact pathways of research-for-development for which ICARDA outreach offices are well placed to play a leading role. The major hurdles for enhancing effective partnerships with private sector operators are the transaction costs associated with:
 - ✓ The absence of enabling policy, financial and institutional environments to attract private sector investors in value chain commodities. When the enabling environments are in place and operational, such as is the case in some initiatives in Turkey, India, Morocco and Ethiopia, the private sector engages rapidly and successfully in the provision of effective pre- and- postharvest support services to facilitate technology uptake and farmers' linkages to local and export markets.
 - ✓ The lack of adequate training in commodity value chains, business development services, and the provision of appropriate equipment for small and medium size private sector enterprises.
 - ✓ The need to amend existing laws and regulations to allow informal private sector enterprises to operate legally.
- The big international private sector enterprises, such as food chain processors and traders, as well as input suppliers rarely partner with ICARDA outreach programs. On the other hand, some ongoing partnerships with corporate philanthropies are promising such as the Morocco OCP Foundation for dry legumes in India and Morocco and Coca Cola Foundation for grey water in Jordan.

Recommendation

Private sector partnerships

Recommendation 26: On the basis of on-going promising impact-oriented private sector partnerships, the CCER Panel recommends that (i) on-going and future outreach programs play a more active role in the promotion of private sector investment in support services for technology transfer and post-harvest activities; (ii) assess and document in the form of best practices some of the on-going promising experiences in the outreach programs, starting with Turkey's on-going experience in

the seed sector to identify enabling conditions for up-scaling and (iii) more engagement with big and small international/national private sector companies, such as those engaged in food processing and agribusinesses in general, as well as individual and corporate philanthropies.

4. Assessment of research decentralization, platforms and thematic sites

4.1 Restructuring of outreach regional offices

Building on its ongoing effective partnerships with NARS through the regional and country outreach programs, ICARDA is in the process of implementing a strategy for a major long term decentralization of part of its research activities carried out at Headquarters. The decentralization strategy implies that the activities of the four HQ research programs will increasingly take place in outreach locations through the establishment of: (i) four integrated research platforms of global relevance and focus. The first, based at Headquarters in Syria and located at the Tel Hadya principal station, is representative of high rainfall areas. Together with the Terbol sub-station in Lebanon, it is also representative of high favorable conditions (rainfall, soil fertility and supplementary irrigation) for cereal and legume crops, and the Sanliurfa station in Turkey is representative of lower rainfall areas. The second platform will be in Morocco for rainfed cereal based systems. The third platform will be based in Ethiopia for mixed integrated crop-livestock systems. The fourth platform in India represents food legume production systems. There are also two specific thematic focus sites of global relevance, the first on high input irrigated production systems with a focus on wheat to be located in Egypt, and the second on highlands agro-ecologies with a focus on rainfed wheat and barley, to be located in Uzbekistan. A global cereal rust research site located in Izmir, Turkey, will support the four platforms and the two thematic focus sites.

Recommendation

Restructuring of regional offices

Recommendation 27: The CCER Panel endorses the restructuring of ICARDA's regional outreach offices to align with the decentralized research platforms. This consists of (i) evolving the Morocco country office into a regional office to align with the platform in Morocco. Tunisia remains a country office to serve sub-regional outreach projects, which will report to the new Morocco regional office; (ii) evolving the Ethiopia country office into a regional office to align with the platform in Ethiopia. Egypt remains an enhanced country office reporting to Headquarters to serve the specific thematic focus site on high input irrigated systems, as well the sub-regional outreach activities in the Nile Valley in Egypt and Sudan; (iii) the regional office in India matches the location of the platform in India for food legumes reporting to Headquarters; (iv) the regional office in Uzbekistan matches the location of the specific thematic focus site on highlands systems, reporting to headquarters.

4.2 Research focus and complementarity

Guiding principle: The focus between research programs at Platform and outreach levels is guided by the complementarity and positioning along the R4D continuum and impact pathway. Referring to the definitions presented in Section 1.2 of the report, the Platforms focus primarily on upstream research to produce a range of alternative and broad outputs that need to be validated, tested, and evaluated with NARS and farmers in outreach levels where the focus is on adaptive and downstream research to address specific agro-ecologies and socio economic conditions for the development of validated location specific outputs and technology transfer practices as a basis for scaling up by investment projects. The full

responsibility in terms of science quality, deliverables and reporting of research activities, both at Platform and outreach levels, is under the Directors of the four Research Programs. The Regional Programs/Coordinators are in charge of facilitating the research for development collaboration with partners to enhance impact and ensure that the complementary down-stream research conducted by collaborating NARS is well coordinated. In practice, ICARDA's four Research Programs and Outreach Programs are mutually supportive and often intersect. Whilst designed within a "systems research approach" in mind, they are not systematically conducted through comprehensive and rigorously well-coordinated multidisciplinary teams.

The focus of the envisaged long term, as well the adjusted medium term research decentralization, at the four platforms and alignment with CRPs is well covered in the document entitled "Strategy for Decentralization of ICARDA's Research and Capacity Development."

The Headquarters platform will operate mainly as a think-tank, where strategic thinking and research is based to support and mentor the regional platforms and specific thematic sites. In this context, the four global programs will conduct research in line with their thematic areas and comparative advantage to ensure that the systems research approach is applied. BIGM, for example, will focus on strategic research to feed the international nurseries through cutting edge biotechnology and breeding work for major stresses, as well as on integrated gene management and seed health. In the medium term, Terbol sub-station will be the location for seed health research work. In addition, the HQ platform will coordinate ICARDA involvement in the CRPs.

The Morocco based platform will focus on rainfed cereal-based intensification and diversification systems. The four programs (BIGM, IWLM, DSIPS and SEPR) are heavily involved in this platform. In the short and medium term, with limited access to Tel Hadya facilities, the scope of BIGM involvement is much higher in terms of number of commodities (spring bread wheat, durum winter wheat, barley and food legumes) and associated research activities (breeding, biotechnology and IPM). This platform interfaces with 7 CRPs, particularly CRP1.1 for which Morocco is a SRT3 action site.

The Ethiopia based platform focus will be on mixed integrated crop-livestock systems. The scope includes small ruminants, NRM, water harvesting, soil fertility, cereal, and legumes. All four programs are involved, particularly DSIPS and IWLM. The involvement of BIGM in IPM food legumes and spring bread wheat will be reduced when access to Tel Hadya Headquarters becomes possible. This platform interfaces with 6 CRPs, particularly CRP1.1, for which Ethiopia and Kenya are SRT2 action sites.

The India based platform will focus on food legumes systems for southern altitudes. In the medium term, the four research programs will be involved with variable scope. In the long term, BIGM and IWLM will be regularly involved and SERP only in impact assessment. This platform interfaces with 4 CRPs, particularly CRP1.1 for which India is an SRT2 action site.

Recommendations

Research focus at platform and outreach programs

Recommendation 28: The CCER Panel recommends that respective focus of research work at platforms and at outreach locations is guided by the complementarity and positioning along the R4D continuum and impact pathway. Platform research focuses on research to produce a range of alternative and broad outputs that need to be validated, tested and evaluated with NARS and farmers by outreach programs, facilitating the research for development collaboration with

partners to address specific agro-ecologies and socio economic conditions for the development of validated location specific outputs and technology transfer practices.

System research approach

ICARDA's breeding capacity for all mandated crops and particularly for wheat by the Turkey-CIMMYT-ICARDA collaborative IWWIP is strong and conducive to generating robust, yield enhancing wheat varieties. Breeding, however, is only part of the answer to productivity increases with an average contribution of 25%. Crop agronomy and husbandry remains a missing key factor for further yield increase for which ICARDA is well placed to play a lead role in addressing the gap of integrated system research. Crop agronomy and husbandry remains a missing key factor for further yield increase.

Recommendation 29: The CCER Panel recommends that ICARDA takes the lead in appropriately addressing the systems research approach by ensuring that crop agronomy and husbandry work is adequately and timely addressed as an integrated part of breeding activities in all outreach programs and IWWIP. The systems research work would need also to be complemented by more ICARDA research on commodity value chain to maximize impact.

Coordination and integration of multidisciplinary research

Recommendation 30: To improve on the weak coordination among research programs and ensure system research integration, the CCER Panel recommends that ICARDA address this gap through the formation, at an early stage for each research project, a well-staffed and result-based multidisciplinary implementation team with a binding financing plan, regardless of source of funding across collaborating research and outreach programs within ICARDA.

4.3 Management of outreach programs and research platforms

The guiding principle is that ICARDA will function as one management entity at the regional office/platform level. The full responsibility in terms of science quality, deliverables and reporting of research activities, both at platform and outreach levels, will be with the Directors of ICARDA four Research Programs. The Regional Programs/Coordinators are in charge of facilitating the research for development collaboration and capacity development with partners to enhance impact and ensure that the associated down-stream research conducted by collaborating NARS is smoothly conducted. ICARDA Regional and Country Coordinators are responsible for the coordination of the efficient use of shared facilities and the administrative and financial services expected to expand with the establishment of the platforms. Specifically, the major facilitation and coordination functions to be performed by ICARDA Regional and Country offices are:

- Financial management and procurement of goods and services.
- Administrative management, including the organization of meetings and workshops, travel arrangements, and communication.
- Compliance with the agreement signed with the host country.
- Partnership development with NARS and other partners, including effective regular liaison with host country officials, networking with stakeholders, and representation at key regional events.
- Providing feedback to HQ on NARS priorities and partners.
- Development of bilateral and multilateral projects and support to resource mobilization, including proposal writing and follow up.

- Facilitation for the development, update and implementation of a collaborative regional research-for-development projects agenda between NARS and ICARDA and other partners.
- Communication, including website, newsletters, annual reports, and publications, internet connection and telecommunication, repository of documents and information.
- Management, coordination and implementation of collaborative region and bi-lateral R4D projects.

Management responsibility at regional offices

Recommendation 31: The CCER Panel endorses the Decentralization principle in that ICARDA will function as one management entity at the Regional/Country level to service both Platform research and research in outreach, plus capacity development. The full responsibility, in terms of science quality, deliverables, and reporting of research activities both at platform and outreach levels is under the Directors of the four Research Programs. The Regional Programs/Coordinators are in charge of facilitating the research for development collaboration with partners to enhance impact and ensure that the complementary down-stream research conducted by the Research Programs and collaborating NARS is well coordinated within the specific region or country setting.

Strengthening the staffing level of regional offices and decentralization of decision making at platform level

Recommendation 32: Given the increasing demand on administrative support services at the regional offices as a result of the establishment of large decentralized Platforms, the CCER Panel recommends that ICARDA reviews the management and staffing requirements of support staff at regional offices where research Platforms are established.

Terms of Reference of the CCER on ICARDA Outreach Programs and Partnerships

Introduction

The success of ICARDA is dependent upon effective partnerships. It is only through partnerships that ICARDA and its sister centers will be able to carry out an articulated global research agenda, leverage a variety of resources toward the achievement of strategic goals, and accomplish sustainable development. The assessment and enhancement of current partnerships and the formation of new ones, on many levels, is imperative if ICARDA is to achieve the goals set forth in its Strategic Plan. The central objective of this CCER is, therefore: to address the effectiveness of ICARDA's current partnerships and the necessity for new partnerships in order to achieve the goals set forth in ICARDA's Strategic Plan, within the context of its operational decentralization and CGIAR reforms.

ICARDA's research portfolio and its geographic coverage have evolved over time. Changing country contexts, needs, opportunities, and evolving areas of emphasis of the CGIAR system have driven priorities. ICARDA has always placed high priority on effective partnerships with National Agricultural Research Systems (NARS). These partnerships will continue to be central to ensuring ICARDA's relevance and impact and even more important, in light of ICARDA's decentralization. Other key partners have included national agricultural research and extension programs; agricultural and other country government ministries; universities and other research institutes; private sector NGOs and community-based organizations; farmer associations, and donors.

But new forces call for a broad re-examination of outreach and partnership building. These forces include:

- 1) The current context of ICARDA's relocation and decentralization;
- 2) Broadening of ICARDA's coverage to non-tropical dry areas globally;
- 3) New challenges facing agriculture in dry areas, particularly climate change;
- 4) Implications of the CGIAR reforms and the implementation of the CGIAR Research Programs (CRPs);
- 5) The emergence of significant new donors and their evolving priorities;
- 6) The growing importance of public/private cooperation;
- 7) The need to choose effective research-for-development partners;
- 8) The focus on impact and evaluation;
- 9) The increased focus on gender and the key role of women in food security and hunger alleviation; and
- 10) New information technologies that can enhance partnership building and sharing.

Given these forces, there is a need to develop strategies that will enhance existing partnerships and form new ones along key impact pathways. The last Center Commissioned External Review of outreach and partnership activities was conducted in 2004. ICARDA is, therefore, keen to re-assess its partnership and outreach strategy in line with the ICARDA Strategic Plan, 2007-2016, and the requirements of the CGIAR reforms for expanding partnership arrangements, enhancing program effectiveness, and maximizing impact and relevance.

Types of Partnerships

ICARDA's success in the future will be dependent on continuing to work effectively with its traditional partners, but also working with new partners in such a way that sustainable development impact is achieved, and the goals of multiple partners are met. Partnerships

and decentralization bring both benefits and transaction costs, but if carefully selected by program and geographic area, can add to the impact of ICARDA's research, improve benefits along the research to development continuum, and bring the possibility of new funding sources. Partners should demonstrate a commitment to the goals and objectives of ICARDA's research for development program, as well as an ability to integrate program outcomes into their own strategies and policies.

It will also be important to link ICARDA's capacity building and knowledge management strategies, as well as its information technology development strategy, to partnership strategies and to an overall learning and knowledge management agenda in priority areas that can enrich all partners. Building the human and institutional capacity of NARS is crucial in strengthening partnerships and decentralization and their effectiveness.

This CCER will focus on the issues affecting three primary types of partnerships: 1) research partnerships with the NARS and other advanced research institutes; 2) research-to-development partnerships; and 3) public and private sector funding partnerships. Within those three primary areas of partnership, a variety of strategic, operational, and coordination questions will be addressed.

Research Partnerships with the NARS and Advanced Research Institutes. ICARDA has four Research Programs: 1) Biodiversity and Integrated Gene Management (BIGM); 2) Integrated Water and Land Management (IWLM); 3) Diversification and Sustainable Intensification of Production Systems (DISPS); and 4) Social, Economic and Policy Research (SEPR).

ICARDA's network of outreach programs will continue to provide a platform to address both regional and global challenges of agriculture in dry areas. The national agricultural research systems (NARS) in dry areas are highly diverse, differing in their capacity, both in human and physical resources, and in their operational resources. The positioning of ICARDA in the research-for-development continuum depends greatly on the strengths of its NARS partners. Several national institutions have grown into important centers of excellence. While a good part of the research in thematic areas will be conducted by ICARDA itself, based on comparative advantages, the work will be carried forward in collaboration with NARS, including the relevant institutions in the ministries of agriculture, environment, water resources, and universities.

ICARDA has well-established outreach programs in North Africa, Nile Valley and Sub-Saharan Africa, West Asia, Arabian Peninsula, Central Asia and the Caucasus, Highlands (Afghanistan, Iran, Pakistan and Turkey), and South Asia and China. As resources become available and suitable partnerships are developed, ICARDA will strengthen and expand its programs in Sub-Saharan Africa, China and Latin America, in line with its global mandate. The Center has exploited synergy with strong NARS such as Brazil, China and India, which are also emerging as new donors.

Decentralized and collaborative research through outreach programs will continue to play an important role in implementing the Center's Strategic Plan, 2007-2016. Outreach or Regional Programs have several important roles to play: first, the programs provide a major support to ICARDA's research programs at headquarters through important channels for research partnerships with national programs and they facilitate research collaboration between these programs and ICARDA. Second, they enhance research coordination and leadership at the regional levels and regionalization of research through promoting south-south cooperation to address challenges of common interest to the countries in the different regions. Third, through the partnership with national programs, they act as platforms for up scaling and out-scaling research findings to enhance research impact. Fourth, they foster an integrated approach to address global challenges of dry areas; and, finally, they provide feedback to

ICARDA's headquarters programs on national programs' needs in research, improved technologies and capacity development to strengthen national agricultural research programs.

The current situation in ICARDA's host country, Syria, as well as the implementation requirements of CRPs has provided an opportunity for ICARDA to re-assess its structure of operations. To enhance impact and effectiveness, for better targeting of diverse environments, and for better alignment with targeted areas in the CRPs in which ICARDA is involved, regional "hubs" are being established that address identified research priorities in each region, but serve dry areas globally through IPGs. This CCER will address the potential of this decentralized approach as well as obstacles to its success and the most important issues to be addressed e.g. are there needs for upgrading information technology systems to facilitate more rapid communication among decentralized groups? What are the needs for training and human capacity building throughout the NARS to meet key objectives along impact pathways? Are there gender needs that need to be addressed throughout the decentralized system to assure adequate capacity for addressing the important roles of both men and women in food security? Are there other training needs that will assist scientists in operating within distributed research networks?

Research-to-Development Partnerships. In partnership with Regional Programs and Country Offices, ICARDA builds on both the Center's research activities at headquarters, and its collaborative research with national programs to assure links between research and development, a critical area of emphasis in the CGIAR system.

The Regional Programs and Country Offices ensure that all phases of the research-for-development continuum are sufficiently operational to ensure the desired impact of its international public goods (IPGs) to achieve its mission, and fulfill the aspirations of its ultimate beneficiaries. ICARDA continues to act as an interface between NARS, advanced research institutes, and other institutions, including civil society organizations (CSOs). This CCER will examine how CSOs and NGOs can play an even more important role in ICARDA's program in the future (building on their local strengths in community mobilization) in the introduction and participatory testing of new technologies to enhance up scaling of these technologies and ensure a multiplier effect. Also, what are the key funding issues that may be impeding these types of partnerships? Is the role of gender being adequately considered in light of the development objectives of projects?

Partnerships with the private sector also play a major role in linking farmers to markets, ensuring the sustainability of agricultural enterprises, and underpinning diversification efforts. How and with which private sector can ICARDA strengthen its partnerships for greater impact and leveraging of funding? Potential exists for partnering with global corporations, as well as locally-based private sector entities.

Examples of development partners that are currently assisting and will assist ICARDA in the future in disseminating technical innovations and new practices include IFAD, FAO, USAID, AusAID, AfDB, AFESD, IsDB, OFID, ADB, a variety of NGOs, private sector water- user associations, farmers associations and local institutions, manufacturing plants, and seed multiplication enterprises. This CCER will identify: 1) additional development partners – new partners that can make important contributions along integrated impact pathways and across projects; and 2) innovative modalities for decentralized research work.

ICARDA has developed impressive informal networks of people working in the field of agricultural research for development, including donor organization staff, researchers, administrators, development project managers, development practitioners, policy makers and politicians. The networks have been built up particularly through the credibility and energy of Regional and Country Office Coordinators. The Panel recommends that these

networks be consolidated and formalized to ensure an ongoing sense of belonging to ICARDA, to mobilize action around generating synergies among partners, and utilizing current technologies to maximize efficiency of interaction. This cadre of continuing partners would serve to expand advocacy for ICARDA's activities and outputs, and act as a conduit for ICARDA to receive insights from a wide range of people. The Panel counsels that membership must have benefits, and these may include regional events, e-newsletter, access to webinars, and networking tools.

Public and Private Sector Funding Partnerships. Global, regional, country and topical partnerships in strategic areas both: 1) require additional funds to be allocated from ICARDA to its partners for a variety of activities; and 2) represent the possibility of securing new funds. An increase in resources from the CGIAR system (based on excellence in programs) would enable ICARDA to be able to allocate more resources to its partners. Simultaneously, an expanded research for development agenda will mean that there will be an opportunity to seek other sources of funding to support creative programs with new partners at the country or regional level, or for thematic projects. Partnerships with the private sector will be an area of emphasis in this CCER. Current private sector partners include manufacturing plants for different technologies, Coca Cola, seed multiplication enterprises, and others. Additional private sector companies will also see investment opportunities for new partnerships if they understand how they might fit into an expanded agenda. Outlining ideas for a variety of new funding partnerships will be an important part of this CCER.

Strategic Issues

1. Do Regional and Country Programs address appropriately and effectively the new directions and focus adopted in ICARDA's Strategic Plan 2007-2016? What can be done differently in the structure of these outreach programs to enhance their effectiveness in achieving the goals set forth in the plan?
2. To what extent does ICARDA's current structure of Outreach Offices (both Regional Programs and Country Offices) ensure the continuity of research activities at ICARDA headquarters and the outreach collaborative research activities, and their effectiveness under the new CGIAR and associated CRPs?
3. To what extent does ICARDA's current structure of Outreach Programs ensure the effectiveness and efficiency of the Center's more decentralization of operations for the medium and long terms?
4. What are other regions/countries where ICARDA needs to expand its operation and partnership? What are the regions and countries where ICARDA needs to increase its presence by posting scientists in outreach offices? And what are the critical thematic areas?
5. What are the opportunities for new private sector partners in ICARDA's portfolio of partners and NARS networking that will enhance its research impact and what are the issues and obstacles surrounding these opportunities?
6. What are the most important development partners for ICARDA – partners that have common program and geographical interests and can commit to long-term collaboration on issues of mutual benefit? What issues and obstacles need to be addressed to enhance these opportunities? Is the important role of gender in food security considered in selection of development partners?
7. Along key impact pathways designated by ICARDA, where are the most promising opportunities for new funding partners and who are the prospective donors with mutual interests who can provide those investments? 8. To what extent have the Outreach Programs enhanced and strengthened the collaboration between

ICARDA's Research Programs and national programs and the effectiveness of ICARDA in different regions/countries?

9. ICARDA is in the process of establishing a Regional Program for Sub-Saharan Africa (SSA) as recommended by the last External Management and Program Review (EPMR). What country grouping would be most strategic for the current North Africa (NARP) and the Nile Valley and Sub-Saharan Africa (NVSSARP) Regional Programs, and the proposed SSA-Regional Program?
10. What changes in staffing and modalities of operation are needed in the Outreach programs if ICARDA decides on a more decentralized mode of operation?

Operational issues

1. What role can be played by more innovative uses of information technologies overall to improve information flow and exchange of experiences in this decentralized system?
2. How effective and efficient are Regional Programs and Country Offices in enhancing the collaboration of the Center's Research Programs with NARS in their regions/countries to exchange improved technologies and germplasm?
3. How effective and efficient are the Regional Programs and Country Offices in linking research with sustainable development through the management and coordination of R-4-D projects implemented in their programs/countries?
4. How can a more decentralized portfolio and Regional Programs and Country Offices better link research with development, and thus enhance the uptake of improved technologies and other research outputs generated from ICARDA's collaborative research in various regions/countries?
5. How can ICARDA work with Regional Programs and Country Offices to help them be more effective at resource mobilization to raise needed resources for priority research and capacity building in the different regions/countries/topical areas?
6. To what extent have the regional programs effectively and continuously implemented a regional R-4-D agenda and enhanced the integrated approach in addressing the challenges facing dry areas? Can ICARDA play a stronger role in helping to identify appropriate public and or private sector development partners?
7. How is ICARDA's capacity building strategy related to its partnership strategy? How effective are Regional Programs and Country Offices in identifying critical capacity development gaps and needs of national programs that should be addressed? Is this effectively coordinated with the scheduling of training courses in their regions/countries? How can this process be improved to better target and increase the effectiveness of ICARDA's capacity development activities?
8. How effectively does ICARDA link with other relevant organizations that are important to carrying out its research objectives e.g. national agricultural research and extension programs; agricultural and other country government ministries; universities and other research institutes.

Coordination and Integration issues

1. Are the Regional Programs and Country Offices successful in involving the wide range of stakeholders' needed as partners along the impact pathways of different collaborative research programs implemented in their regions/countries?
2. Where do the Research Programs and the Regional Programs/Country Offices need to improve their collaboration, communication and coordination to better enhance the continuum between headquarters research and the collaborative outreach research activities?
3. To what extent do the Regional Programs and Country Offices receive timely contributions and technical backstopping from the Center's Research Programs to enhance the research projects implemented in regions/countries?
4. To what extent more ICARDA scientists should be based in Outreach offices?
5. What new management and operational system is needed to support ICARDA's Strategy for Decentralization?
6. What can be done differently to enhance the effectiveness of ICARDA's regional and national coordination meetings to better focus research and capacity development activities in regions/countries?
7. What should be the role of ICARDA HQ in helping to identify new private sector, development and funding partners?
8. The Central Asia and Caucasus (CAC) Program has the dual function of Program Facilitation Unit (PFU) for the CGIAR System wide Program (which involves 11 CGIAR and non-CGIAR Centers) and coordinating ICARDA's research and capacity development activities in the region. To what extent has such an arrangement increased ICARDA and CGIAR effectiveness in the region and improved integration, partnership and complementarities?
9. How satisfied are NARS partners with ICARDA's collaborative research and capacity development activities? What are potential areas for improvement?
10. How effective and efficient are Memoranda of Understanding (MOUs) and other types of agreements with partners in terms of ensuring joint priority setting, activation and implementation? Would other arrangements with a focus on decentralization be more effective in ensuring partners' commitments in the future? What are the transaction costs of the various partnering instruments?

Panel Members and Bibliographical Information

The Panel will conduct its work within a forward-looking approach. The proposed panel composition is:

1. Mr. Abdelmajid Slama, Chair
2. Dr. Lamia El-Fattal
3. Dr. Robert Edis

Mr. Slama has over 40 years of operational experience in regional and country agriculture strategy, policy, impact assessment, building and managing multidisciplinary teams in national and international settings, resource mobilization, projects' design, appraisal, evaluation and supervision, as well as building partnerships among public, multilateral, regional and private donors for financing agricultural development and international agricultural research programs. He was the Director – Near East, North Africa and Eastern

Europe Division at IFAD, and served at ICARDA's Board of Trustees (2004-2010) and served as Vice-Chair of the Board and Chair of the Audit Committee.

Dr. El-Fattal has proven experience in strategic planning, program and project development and management in the fields of agriculture, natural resources management, health and environment, and rural development. She served at IDRC as Regional Senior Program Officer (Jan. 2002- June 2008) and Senior Program Specialist (July 2008- May 2010) in the Middle East and North Africa regional Office, Cairo. She supported, developed, monitored, managed and evaluated multi-disciplinary and applied policy-relevant research and capacity development projects.

Dr Edis is an independent agricultural soil scientist (Certified Professional Soil Scientist, level 3), and Associate Professor (Hon) with the University of Melbourne, specializing in soil processes related to agricultural production and environmental management. His particular interests are in the dynamics of nutrients, contaminants and water in soil and the subsequent influence on plants, air and water in agricultural systems, particularly water-constrained environments. He served on the Faculty Executive of The Melbourne School of Land and Environment, The University of Melbourne in various positions (2007-2010), whilst conducting research for development projects, mostly in China (1999-2010).

Review Methodology and Overall Evaluation by Outreach Program

Evaluation of performance of Outreach Programs and Partnerships

The specific Terms of Reference of the CCER Outreach Programs and Partnerships include several that are of an evaluation nature. Below is the address (only) of these specifically evaluation Terms of Reference with the measures of success, the approaches and sources used for estimating these measures, and a summary of that evaluation. The numbering is as in the Terms of Reference (Appendix I), with some further division where a specific Term of Reference contains more than one concept. As this is largely a qualitative assessment, only three (3) categories of evaluation were used: unsatisfactory, satisfactory but needs improvement and, satisfactory. Recommendations are not provided to address shortcomings singularly, but are forged in a more integrative fashion in the body of the report.

Evaluatory Terms of Reference

STRATEGIC

S1. Do Regional and Country Programs address appropriately and effectively the new directions and focus adopted in ICARDA's Strategic Plan 2007-2016?

Measures: Level of satisfaction expressed by partners and collaborators; comparison of outputs and outcomes of program against "New Dimensions" on page ix of Strategic Plan (risk management water and land and diverse systems, water productivity, socio economics, livelihood options, geographic coverage).

Approach: Interview with partners. Questionnaire completed by Outreach office staff; project and outreach office reports; direct interview of ICARDA personnel; and Panel views

Evaluation: Overall, the Outreach Programs are very effectively addressing the Strategic Plan directly, and indirectly through NARS institutional cultural change. The ICARDA approaches involving on-farm research, multi-institutional partnerships and the inclusion of socio-economics are areas of particular innovation in these areas. ***Overall evaluation is Satisfactory.***

S2. To what extent does ICARDA's current structure of Outreach Offices (both Regional Programs and Country Offices) ensure the continuity of research activities at ICARDA headquarters and the outreach collaborative research activities, and their effectiveness under the new CGIAR and associated CRPs?

Measures: Level of satisfaction expressed by non-CGIAR partners; level of satisfaction expressed by HQ staff.; level of satisfaction expressed by Outreach Office staff; level of satisfaction expressed by CGIAR partners; level of match between current size and distribution of Outreach Offices and projects and Mandate; and structure in this context was taken to mean geographic structure and not aspects of office management.

Approach: Direct interview (HQ staff, partners, Outreach Office staff); comparison of Outreach Office distribution and size against potential current and potential future activity (in line with the Strategic Plan); and examination of CRP documentation.

Evaluation: With decentralization more of the research activities will be located in what are currently Outreach Offices, and this will make for close linkages. NARS in countries where ICARDA has a presence, naturally, would like to see more effort by HQ scientists expended in their facilities. HQ staff expressed frustration with getting activities undertaken in the Outreach Offices sometimes, and Outreach Office staff expressed frustration with the level

of engagement of HQ scientists not located in the Outreach office. In regard to CRPs, there are emerging issues with engagement of Pakistan pulse programs interacting with CRP Grain Legumes. **Overall evaluation is Satisfactory.**

S3. To what extent does ICARDA's current structure of Outreach Programs ensure the effectiveness and efficiency of the Center's more decentralization of operations for the medium and long terms?

Measures: Level of satisfaction expressed by non-CGIAR partners. Level of satisfaction expressed by HQ staff. Level of satisfaction expressed by Outreach Office staff. Level of satisfaction expressed by CGIAR partners. Level of match between geographic distribution of offices and Strategic Plan

Approach: Interview with partners, and ICARDA staff in HQ and Outreach Offices; comparison of Outreach Office locations and size against the Strategic Plan; and examination of decentralization documentation.

Evaluation: Major agro-ecological systems captured well by the current geographic distribution, and are quite adaptable to decentralizing reformation. **Overall evaluation is Satisfactory.**

S6 iii) Is the important role of gender in food security considered in selection of development partners?

Measures: Extent to which gender is considered explicitly in programs; extent of women/men participation in development at different levels; and gender in capacity development.

Approach: Qualitative observation of proportion of women/men ICARDA scientists in the Outreach programs, at the NARS and development partners. Number of women/men trained; number of projects that mainstream gender.

Evaluation: During the 2000-2012 period, in terms of capacity development activities, women constituted 18% of all trainees in group courses and individual training events, 40% of M.Sc and PhD ICARDA research fellows and 50% of all ICARDA interns.

Women scientists at ICARDA remain a minority and fewer still represent ICARDA at high management levels, especially in the outreach programs, where all regional/country managers are men. In terms of partnerships, few women are represented at the NARS level, and fewer still hold NARS leadership positions. Of the entire senior NARS personnel interviewed, none were women. In India and Jordan women appeared to be about 25% of junior NARS scientists. R4D projects are more gender balanced, mainly because they include junior women scientists, especially women students and because outreach programs in some cases engage explicitly with women stakeholders and farmers, such is the case with the project in Morocco to "Rehabilitate Conservation and Promotion of Aromatic and Medicinal Plants (MAP) in the Matmata South East Region of Tunisia," or when gender explicit projects are donor driven such as the IDRC funded SAGA project. Otherwise, ICARDA's research and outreach programs have not yet fully mainstreamed gender issues in the design, implementation or evaluation of research projects, including within ICARDA and the NARS. The purpose of mainstreaming gender concerns in ICARDA's work would be to improve on the efficiency and effectiveness of research for development projects (especially along the value chain) as well as to support gender equality in a region where women's roles in agricultural production (especially in livestock) appears to be on the rise.

As the SEP group is in the process of employing another "gender" person, the CCER panel recommends modalities to mainstream gender in all its research to development activities.

Overall evaluation: Somewhat satisfactory but needs improvement (mainstreaming gender).

S8. To what extent have the Outreach Programs enhanced and strengthened the collaboration between ICARDA's Research Programs and national programs and the effectiveness of ICARDA in different regions/countries?

Measures: Amount of joint project work with time (resource mobilization, outputs (products, publications), outcomes, impacts). Opinion of NARS and ICARDA staff

Approach: Questionnaire; project and office reports; meeting minutes/proceedings (including Coordination Meetings); and interviews with NARS and ICARDA staff

Evaluation: The Outreach Programs have achieved extraordinary levels of enthusiasm amongst NARS to collaborate with ICARDA's Research and Outreach Programs, leading to clearly heightened effectiveness of ICARDA in those regions. Within ICARDA Research Program directors remark that this is the real strength of the Outreach offices. Overall evaluation: **Overall evaluation is Satisfactory.**

OPERATIONAL

O2. How effective and efficient are Regional Programs and Country Offices in enhancing the collaboration of the Center's Research Programs with NARS in their regions/countries to exchange improved technologies and germplasm?

Measures: History of germplasm exchange. History of issues with germplasm exchange. Qualitative amount of germplasm exchange.

Approach: Interview with NARS, Outreach Office, and HQ science staff. Examination of germplasm statistics in ICARDA and NARS documentation.

Evaluation: Plant germplasm exchange has, overall, been very efficient and effective. In some cases this has not required very much interference by the Outreach Office due to strong direct links amongst plant breeders (ICARDA and NARS). The pulse breeder in Pakistan feels that there has been deterioration in usefulness of lines sent from ICARDA, which the Country Office manager was not aware of. Large numbers of lines have been exchanged, and gene banks enhanced throughout the world's dry areas. Very clear examples of south-south exchange, such as that facilitated by LARI (Lebanon). **Overall evaluation is Satisfactory.**

O3. How effective and efficient are the Regional Programs and Country Offices in linking research with sustainable development through the management and coordination of R-4-D projects implemented in their programs/countries?

Measures: Amount of research effort embedded in development projects; level of satisfaction of Partners; and incidents of research outputs being taken up by development and extension partners

Approaches: Interview with partners; project and Outreach Office reports/meeting proceedings; and stories by staff and partners.

Evaluation: High level of satisfaction expressed by Partners, and many success stories. Whilst there is always more that can be done, Partners expressed that ICARDA was the most effective and efficient in this regard of the International Centers. Clear demonstrations of efficiency through village based seed enterprises using ICARDA germplasm, and supplementary irrigation in particular. Some concerns about the degree to which estimating

transferability and applicability of research outputs and outreach learning to other places is undertaken. **Overall evaluation is Satisfactory.**

O6. i) To what extent have the regional programs effectively and continuously implemented a regional R-4-D agenda and enhanced the integrated approach in addressing the challenges facing dry areas?

Measures: Involvement of people from more than one place in projects and capacity building. Evidence of consideration of regional applicability of outputs developed.

Approaches: Coordination meeting minutes; project and Office reports; and questionnaire to Outreach offices.

Evaluation: The Regional Programs do an excellent job in transforming ICARDA research outputs into action in specific places in their region. However, there are many projects in one country, often in one state, without adequate consideration given to Regional applicability of learning, or how knowledge exchange might work. The Regional Coordination meeting is the currently the main forum, and is an excellent component of the program (with very high commendations from Partners). Whilst each Regional Program office has its own disciplinary “flavor”, in response to different imperatives of the regions, the staff there integrate outputs across ICARDAs Research Programs to address the most pressing challenges. This is a significant challenge for the Regional Program staff, particularly for those in smaller offices, as they need to be well informed outside of their own area of expertise. **Overall evaluation is Satisfactory but needs improving** (regional applicability of learning, keeping abreast of what may be relevant).

O7 ii) How effective are Regional Programs and Country Offices in identifying critical capacity development gaps and needs of national programs that should be addressed?

Measures: Comparison of Partners’ strengths and weaknesses against capacity building activities; and level of satisfaction of NARS with capacity building activities.

Approaches: Capacity building reports for Outreach Offices (including those reported in Office and Project Reports and meeting proceedings. Qualitative assessment of NARS needs. Interview with NARS. Interview with Outreach Office staff. Interview with HQ Capacity Development Unit staff.

Evaluation: Capacity development needs are identified effectively through the Regional Programs through several paths, in particular the Regional Coordination meetings, project meetings, and the capability insights gained through implementing work. The central needs assessment processes, such as the surveys from the Capacity Development Unit, also help identify training needs and preferences. NARS personnel expressed a high level of satisfaction with the processes for setting capacity development priorities. **Overall assessment: Satisfactory.**

O8. How effectively does ICARDA link with other relevant organizations that are important to carrying out its research objectives e.g. national agricultural research and extension programs; agricultural and other country government ministries; universities and other research institutes?

Measures: Evidence of involvement with other relevant organizations: Joint publications; joint projects; attendance at each other’s’ coordination meetings; take up of ICARDA products, level of satisfaction amongst staff from other research organizations; Staff exchange.

Approaches: Project and Outreach Office reports. Questionnaire. Interview with staff in Outreach Offices and HQ. Interview with Partners.

Evaluation: ICARDA has many friends, and her scientists are highly respected by researchers throughout the world. The Panel found clear and compelling evidence of effective relationships with other research organizations leading to mutual benefit. **Overall evaluation: Satisfactory.**

COORDINATION AND INTEGRATION

C&I 1. Are the Regional Programs and Country Offices successful in involving the wide range of stakeholders' needed as partners along the impact pathways of different collaborative research programs implemented in their regions/countries?

Measures: Assessment of degree to which partners are involved, their nature, and the parts of the impact pathway they become involved; and impacts of ICARDA outputs.

Approaches: Project and Outreach Office reports and meeting proceedings/minutes. Interview with Partners. Interview with ICARDA staff.

Evaluation: The involvement of "downstream" stakeholders varies somewhat from office to office, depending on the nature of the projects and the source of funding. Where projects have been embedded in development projects, there are good examples in Jordan, Pakistan, Afghanistan, the full suite of partner types have been included. However, there needs to be more active engagement of "downstream" partners more generally. **Overall evaluation: Satisfactory but needs improvement (stakeholder analysis).**

C&I 3. To what extent do the Regional Programs and Country Offices receive timely contributions and technical backstopping from the Center's Research Programs to enhance the research projects implemented in regions/countries?

Measures: Level of satisfaction and opinion of Research Program Staff; level of satisfaction and opinion of Outreach Program Staff; and history of difficulties

Approaches: Interviews with ICARDA staff (HQ Research and Outreach). Questionnaire.

Evaluation: The responses to Q6 of the Questionnaire asks for an evaluation by the Outreach Offices about technical backstopping from the Research Programs and the HQ Support Units. This evaluation is summarized in the table below.

The Research Programs identified by the Outreach Offices that need to improve their backstopping responsiveness are BIGM and DSIPS. The IWLM and SEPR are mostly seen as providing adequate backstopping. With the exception of a few specific research areas identified by the NVSSAP program, none of the Research Programs were seen as being unsatisfactory. The support units were identified as requiring improvement in the technical support they provide, particularly in the African programs. The WARP Office was more positive about backstopping over all, and is the office closest to the current location of Headquarters scientists. **Overall evaluation: Satisfactory, but needs improvement (BIGM and DSIPS), and Satisfactory (SEPR and IWLM). At the individual project scale, satisfaction about backstopping appears to depend on ownership attitudes towards projects as defined by budget responsibility.**

Responses to Question 6 of the Questionnaire sent to Outreach Offices: *How do you evaluate the technical backstopping received from ICARDA major thematic Research Programs and Support units at headquarters?*

	Exemplary	Adequate	Adequate but needs improvement	Unsatisfactory
Research Programs				
BIGM More of “adequate but needs improvement”		Ethiopia ^e APRP WARP	CACPR NARP SACRP Pakistan	
IWLM More of “adequate”	WARP This is a single case and this cannot be taken as an indicator of success?!	APRP CACPR NARP Pakistan	Ethiopia SACRP	
DSIPS More of “adequate but needs improvement”		APRP CACPR WARP	Ethiopia ^e NARP SACRP Pakistan	
SEPR More of “adequate”	WARP This is a single case and this cannot be taken as an indicator of success?!	APRP CACPR SACRP Pakistan	Ethiopia NARP	
Support Units				
GISU More of “adequate but needs improvement” to “unsatisfactory”	WARP This is a single case and this cannot be taken as an indicator of success?!		APRP CACPR SACRP Pakistan	Ethiopia NARP
CDU More of “adequate but needs improvement” to “unsatisfactory”		APRP WARP	Ethiopia CACPR SACRP Pakistan	NARP
CODIS (1) More of “adequate but needs improvement” to “unsatisfactory”		APRP CACPR WARP	SACRP Pakistan	Ethiopia NARP

(1) In the area of communication and information management

^e The Ethiopia Country program distinguished different components of the Research Programs. Themes rated as Unsatisfactory were Biotechnology (BIGM); Range and forage (DISPS), and; Conservation agriculture (DSIPS). Exemplary themes were Bread wheat (BIGM), Food legumes (BIGM); Seed system (BIGM); Small ruminant (DISPS).

9. How satisfied are NARS partners with ICARDA’s collaborative research and capacity development activities?

Measures: Level of satisfaction expressed by NARS; and opinions of NARS partners.

Approaches: Interview with NARS staff. Capacity development Unit’s NARS needs assessment survey (Capacity Development Strategy 2012-2016), feedback summaries supplied by CDU.

Evaluation: NARS personnel expressed a high level of satisfaction with collaborative research, and with Capacity Development particularly regarding degree programs. Overall evaluation: **Satisfactory**.

10. How effective and efficient are Memoranda of Understanding (MOUs) and other types of agreements with partners in terms of ensuring joint priority setting, activation and implementation?

Measures: Level of satisfaction of arrangements, and opinions, amongst: Partners, ICARDA Outreach staff, ICARDA HQ staff; and history of problems. Issues other Centers have experienced.

Approaches: Interviews with Partners, ICARDA Outreach staff, ICARDA HQ staff, other CGIAR Center staff

Evaluation: The MoUs used are both highly effective and efficient provided the relationship is sound and understood throughout the bureaucracy of the participating country. The arrangement is not all-together binding, but is a weak arrangement with risks. In terms of promoting or facilitating partnerships, either for initiating or maintaining those relationships, the MOUs were seen by staff in NARS, CG Centers and ICARDA as being entirely adequate for committing to investment and effort Overall, to date: **Satisfactory**.

CCER on ICARDA Outreach Programs – Panel's Schedule of Activities

All Panel members

Monday 10 June Arrival of Panel members to Amman

Wednesday 12 June

08:00-08:30	Transportation from Hotel to Office III	
08:30-10:30	Welcome and Orientation: Assistant Director General (International Cooperation and Communication) Discussion and finalization of the proposed program and Country field visits	Dr.
10:30-11:30	Meeting with Deputy Director General (Research)	Dr.
11:30-12:30	Meeting with Acting Director, Diversification and Sustainable Intensification of Production Systems Program (DSIPS)	Dr. David
12:30-13.30	Lunch	
13.30-14.30	Meeting with Director, Biodiversity & Integrated Gene Management (BIGM) Program	Dr.
15:00-17:00	Meeting with departing and new Regional Coordinator West Asia Regional Program (WARP)	Dr. Nasri Dr. Halim
17.00	Departure to Hotel	

Thursday 13 June

	Field Visit and meeting with NARS	Dr. Halim
Ben Haj Salah		

Friday 14 June

	Panel Internal work	
15-17 June	Panel visit to Lebanon	
15 June	Review meeting with Dr. M. Solh, DG/ICARDA, ADG Corporate Services and Director of Finance	
16 June	Visit to ICARDA Terbol Station and LARI: meetings with Dr. Hassan Machlab, ICARDA Country Manager and with Dr. Michel Afram, Director of LARI	

17 June	Review meetings with the American University of Beirut and the Ministry of Agriculture
18-29 June	Panel visits and review of selected Outreach Regional and Country Programs
29 June	Panel members return to Amman from visits to Outreach Programs
<u>Wednesday 3 July</u>	
08:00-09:00	Meeting with ADG-ICC for briefing on visit to outreach programs
09.00-10.00	Director, Integrated Water & Land Management Program (IWLM)
10.00-11.00	Director, Social, Economics and Policy Research Program (SEP
11.30-12.30	Head, Capacity Development Unit (CDU)
14.00-15.00	Head, Communications, Documentation & Information Services
30 June-9July	Panel review work and report writing in Amman
9 July	Panel presents Preliminary Report and findings to ICARDA Management
10 July 2013	Panel members departure to home countries
21 July 2013	Panel submits Draft Report to ICARDA for factual errors
20 August 2013	ICARDA submits to the Panel “factual” corrections and remarks on draft report
30 August	Panel submits its final report

Summary of Visits to Outreach Offices and Field Sites

A . Slama Visit to CAC Regional Outreach Program

Wednesday 19 June 2013:Tashkent, Uzbekistan

14:00 -14:30	Briefing at ICARDA/PFU-CGIAR Tashkent office
14:00 -15:30	Meeting with Dr. Amir Amanov, Director General Uzbek Scientific Production Center for Agriculture (UzSPCA)
15:30 -16:00	Meeting with Mr. Nariman Nishanov, Socio-economist Outreach project: Improving Livelihoods of Smallholders and Rural Women through Value-Added processing and Export of Cashmere Wool and Mohair in Tajikistan, Kyrgyzstan and Iran
16:00 -18:00	Visit to Research Institute of Plant Industry: wheat breeding- selection trials

Thursday 20 June 2013: Uzbekistan

8:30 -13:00 Travel and visit to Gallaaral Research Institute: wheat breeding- agro-ecology trials

14:00- 18:00 Travel to Karchi

Friday 21 June 2013: Karshi, Uzbekistan

9:00- 16:00 Visit to Kashkadarya Research Institute for Breeding and Seed multiplication of cereal crops: breeding, conservation agriculture, crop modeling, wheat quality laboratory, and biotechnology laboratory.

Saturday 22 June: Khudjand, Tajikistan

9:00 - 2:30 Travel from Tashkent to Khudjand by car

12:30 -14:00 Review meeting with National Coordinator and a scientist Outreach project: Improving Livelihoods of Smallholders and Rural Women through Value-Added processing and Export of Cashmere Wool and Mohair

14:00 -19:30 Travel by car from Khudjand to Dushanbe

Sunday 23 June 2013: Dushanbe, Tajikistan

9:00-12:00 Review meeting with:
- Dr. A. Mahmudovich, President, Academy of Agriculture science.
- Dr. Saidov Saidjamol, Director, Crop husbandry Research Institute I
- Dr. Ikramov fazliddin, Director, Livestock Research Institute

14:00 – 19:30 Travel by road from Dushanbe to Khudjand

Monday 24 June 2013: Tashkent, Uzbekistan

9:00 – 12:30 Travel by road from Khudjand to Tashkent
14: 00- 16:00 Meeting with members of the CGIAR- CAC Program Facilitation Unit:
- Dr. Ravza F. Mavlyanova, AVRDC Regional Coordinator
- Ms. Muhabbat Turdieva, Bioversity International Coordinator
- Mr. Jusipbek Kazberov, Coordinator, IWMI
- Mr. Alisher Tashmatov, Executive Secretary, CACAARI

16:00 -18:30 Meeting with Dr. Josef Turok, Head of CGIAR- CAC Program Facilitation Unit

Tuesday 25 June 2013: Tashkent, Uzbekistan

10: 00 - 14:00 Meetings with
-Dr. Zakir Khalikulov, Deputy Regional Coordinator
- Prof. Ram C. Sharma, senior wheat breeder
- Ms Mariya Glazirina, Crop Modeling Specialist
-Dr. Kristina Toderich, Plant Scientist, ICBA Coordinator

Wednesday 26 June 2013: Travel from Tashkent to Ankara via Istanbul

Thursday 26 June 2013: Ankara. Turkey

- | | |
|---------------|--|
| 9:00 -10:00 | Review meeting with Dr. Mesut Keser and Dr. Nazari, ICARDA wheat breeders |
| 10:00-11:00 | Review meeting with Dr. Masum Barak, Director General, General Directorate of Agriculture Research and Policies and Member of ICARDA Board of Trustees |
| 11:00 -12:00 | Review meeting with Dr. H.Braun , Director of Wheat Pogram at CYMMIT and Dr. Alexy Morgounov, Head, International Winter Wheat Improvement Program (IWWIP) |
| 14:00 – 15:00 | Review meeting with Dr. Meulut Sahin, Director, Crop Research Institute and Field Crops (CRIFC) |
| 15:00 – 17:00 | Visit to Haymana research station of CRIFC: national and IWWIP rust breeding activities |

Friday 28 June 2013: Konya, Turkey

- | | |
|----------------|--|
| 9:30 – 12:00 | Visit to Bahri Dagdas International Agriculture Research Institute (IARI): national and IWWIP breeding activities on drought |
| 13: 00 - 14:30 | Review meeting with Dr. Fatih Ozdemir, Director, IARI and IWWIP Coordinator for Turkey |
| 14:30 – 15:00 | Visit to an Agriculture Credit Cooperative: seed production, processing and marketing activities. Discussion with Mr. Hayati Boga, Deputy Director for Konia Regional Agriculture Credit Cooperative |
| 18:00 19:00 | Visit to a private sector company for seed production, processing and marketing. Discussion with Dr. Hasan Ekiz, Director General |

Saturday 29 June: Travel from Konia to Amman via Ankara and Istanbul

L. El- Fattal Visit to NVSSARP and NARP Outreach Programs

EGYPT, 18-20 June 2013

Tuesday, 18 June 2013

- | | |
|-------------|---|
| 9:00-10:00 | Meeting with Dr Habib Halila, Acting RC NVSSARP, (Cairo Office, 11 th floor) |
| 10:00-11:00 | Meeting with Dr Francois Molle, IRD, France and International Water Management Institute (IWMI) - (Cairo Office, first floor) |
| 11:00-12:00 | Meeting with Dr Veronique Alary - CIRAD - (Cairo Office, 11 th floor)= |
| 14:00-15:00 | Meeting with Dr Talaat El-Gamal, Water Management Research Institute, National Water Research Centre (NWRC) |

Wednesday, 19 June 2013

Field visit to Mit Yazid command area- Study area: Pilot site of the AusAID/ACIAR funded Project on “Management of Water and Salinity in the Nile Delta with Dr. Fawzi Karajeh, Dr. Atef Swelam and AUSAID’s Mathew Lapworth and Paul Harrington

Thursday, 20 June 2013

10:00-11:00 Meeting with Dr Abdelmomen El Banna, President of Agricultural Research Center (ARC) –ARC premises. Meeting included ARS scientists Drs. Hani Ramadan and Mohammad Sulaiman.

13:00-15:00 Visit to AGERI and meeting with ICARDA Biotechnology team and Dr Osama Momtaz , Director of AGERI – AGERI/ARC premises and Alaa Hammawiyah, ICARDA Biotechnology Lab

16:00-16:30 Debriefing with Dr Habib Halila, Acting RC NVSSARP, (Cairo Office, 11th floor)

ETHIOPIA (21 June – June 25 2013)

Friday June 21, 2013

03:30-11:30 Arrival and Stay at Jupiter Hotel

11:30-01:30 Travel to Debre Zeit Research Center from Jupiter Hotel with Dr. Seid Ahmad Kemal, Pulse pathologist and acting country manager, met also with Asnake Fikre, Tebkew Oragbe, Ridwan Muhammad and Lijalem Korbo Setotaw Ferede from the Debre Zeit research Center

01:30-5:00 Visit to the Center and farmer cooperatives

Saturday June 22, 2013

11:30-12:30 Visit to Ethiopian Seed Enterprise, Dr. Tafeesse Gebru

12:30 Back to Jupiter Hotel

Sunday June 23, 2013

10:00-11:00 Visit to Dr. Tadele Dessie; Animal Genetic Resources

Monday June 24, 2013

09:00-10:00 Visit to Dr. Iain Wright, DG Representative, Addis –ILRI

10:00-11:00 Visit to Dr. Jorge Alexandra, Project Manager, Forage Diversity

02:00-04:00 Visit to Ethiopian Institute of Agricultural Research with Getnet Assefa (director of livestock research); Derese Terhume, director, public relations and communications, Tilakua Hordofa, national coordinator for irrigation, drainage and water harvesting research, Getachew Alemu, Coordinator for NARs facilitation and Endale Gebre, Deputy director, crop research.

Tuesday June 25, 2013

9:00-9:30 Overview of ICARDA-Ethiopia Partnership Seid A. Kemal

9:30-10:00 Seed System Zewdie Bishaw

10:00-10:30	CRP3.7: Small Ruminant Value Chain	Aynalem Haile
And Jane Wamatu (livestock specialist)		
11:30-12:00	Watershed project: South Gondar	Wondimu Bayu
12:00-5.00	General Discussion	All

MOROCCO, 25-29 June 2013

08:30-09:30	1. Meeting with NARP/RC	Dr. Mohammed El Mourid
10:00-13:00	2. Half day working workshops and discussion: Presentation of examples of projects by NARS with presence of key partners (Development farmers, NGOs, private sector...) <ul style="list-style-type: none"> • Program for Improved Water Management for Sustainable Mountain Agriculture: Jordan, Lebanon and Morocco • Empowering rural women in the Eastern Middle Atlas Mountain zones of Morocco through sustainable management of aromatic and medicinal plants - IFAD • Adapting Conservation Agriculture for Rapid Adoption by Smallholder Farmers in North Africa: Conservation Agriculture for North Africa (CANA) - CSE-2011-025 • Enhanced small-holder wheat-legume cropping systems to improve food security under changing climate in the drylands of West Asia and North Africa • MCGP Morocco • Socioeconomics 	Dr. El Asri Mohamed Dr. Saadia Zrira Dr. Oussama El Gharras Dr. Abbad Andalousi Fouad Dr. El Gharous Mohamed Dr. El Khattabi Abdellatif
13:00-14:00	Lunch	
14:00-15:00	3. Meeting with ICARDA scientists relocated in Rabat	Drs. Sripada M. Udupa; Michel Sanchez Garcia; Muhammad Karrou; Miloudi Nachit; Maatougui, Muhammad el-Hadi; Verma Ramesh Pal Singh; Kajji, Abdellah; Khattabi, Abdullatif; Bentiabi, Abderrahim; El-Gharras, Oussama; Karthika Rajendran; el-Bouhssini, Mustapha; Ghenem, Michael Raymond; Quahir Souhail; Fernanda Gamba.

15:00-16:00	4. Meeting with OCP-Foundation: Morocco-India initiative for the development of food legumes	Dr. Abderrahmane Lymani
16:00-17:00	5. Meeting with DG INRA,	Dr. Muhammad Badrawi
27 June Departure at 07:00	Field visit to Tadla (250 Km from Rabat) two projects: Water Benchmark and Food Security and visits/meetings with partners (farmers, NGOs, Development Agencies ...)	Dr. Bahri Abdeljebbar Dr. Boutfirass Mohammed
28 June Departure at 08:00 14:00-15:00	Visit to INRA Marchouch station (50km from Rabat) with INRA/ICARDA scientists Visit to Biotechnology laboratories in Rabat	Dr. El Bohssini Mustapha Dr. Nachit Miloudi Dr. Udupa Sripada Mahabala
15:00-17:00	Wrap up with NARP Regional Coordinator, any issues	

R. EDIS Visit to SACRP Outreach Programs

INDIA

Day/Time	Program	Resource Person
Tuesday 18 June		
0925	Arrival at the Airport (by EK 510) and stay in Siddharth Hotel	Dr. Ashutosh Sarker
1200-1300	Lunch	
1300-1730	Meeting staff and start review process at ICARDA - SACRP office	Dr. Ashutosh Sarker and staff
1300-1430	Presentation and discussion ICARDA – SACRP	Dr. Ashutosh Sarker
1430-1530	Presentation and discussion on Afghanistan Country Program	Dr. Javed Rizvi
1530-1730	General discussion	SACRP Team and Dr. J. Rizvi
1800-1925	Meeting with Director of NBPGR and his Team	Dr. K.C. Bansal Dr.M. Dutta
Wednesday 19 June		
900-1200	Discussion continues on review process	Dr. Ashutosh Sarker and the Team
1200-1300	Lunch	
1300-1700	Meeting with DDG-CS, DDG-NRM, Director-IARI, (ICAR) Visit IARI research station in morning hours	Dr. Ashutosh Sarker
1700-1800	Wrap-up meeting	Dr. Ashutosh Sarker
Thursday 20 June		
0800	Check-out from the hotel to depart for	Mr. Sudesh Thapa

	airport	
0950	Departure by AI 542 to Hyderabad	
1200	Arrival at Hyderabad and proceed to ICRISAT	Dr C L L Gowda (Program attached)
Saturday 22 June		
1820	Arrival at the airport (by AI 541) and stay in Siddharth Hotel	Mr. Sudesh Thapa
Sunday 23 June		
1000-1600	Meetings if possible.	Mr. Sudesh Thapa
1800	Check-out from the hotel to depart for airport	Mr. Sudesh Thapa
2150	Departure by EK 515 to Dubai	

ICRISAT- Hyderabad

Day/Time	Program	Resource Person
Thursday 20 June	Arrival at the Airport (at 1200 hrs by AI 542) and stay in Guestel	Transport & H&FS
1430-1500	Visit to SAT Venture, ICRISAT Video, and Feeding the Forgotten Poor	MM Sharma
1500-1600	Farm visit	MM Sharma
1600-1630	CRP3.5: Grain Legumes	CL Laxmipathi Gowda
Friday 21 June		
0830-0930	CRP1.1: Dryland Systems	Peter Q Craufurd
0930-1030	Boochetana+	Suhas P Wani
1030-1130	CRP3.6: Dryland Cereals	Stefania Grando
1130-1200	Deputy Director General-Research	Dave Hoisington
1330-1430	Director, Human Resources & Operations	Hector V Hernandez
1430-1500	Head, Human Resources & Services	Suryakanth Sharma
1500-1530	Human Resources Services	K Mohan Sharma/AJ Rama Rao
1530-1600	Assistant Director General-Finance	Rajesh Agrawal
1600-1630	Financial Services	Supriya Bansal
Saturday 22 June	FN – Free	
1330	Departure to Airport (AI 541; dep: 1615 hrs)	Transport & H&FS

PAKISTAN 24-27 June 2013

24th June:

Arrival from Dubai by EK-612 at 07:30

Stay at Hotel Crown Plaza, Blue Area, Islamabad

12:00 Briefing on ICARDA Pakistan Program at ICARDA Country Office

15:00 Meeting with Chairman PARC, Director General NARC & colleagues

25th June:

08:00 Visit at rainfed areas, and provincial agricultural research institutes.

15:00 Back to Islamabad

Stay at Hotel Crown Plaza, Blue Area, Islamabad

26th June:

09:00-10:00 Meeting with Agency for Barani Area Development (ABAD), Rawalpindi officials.

10:15-11:30 Meeting with Vice Chancellor, & Professors at Arid University, Rawalpindi.

14:00-15:00 Meeting with National Agriculture Research Center (NARC) Scientists (Wheat, Fodder, Range, SSRI, ASI, IPM & WRII).

15:30-16:30 Meeting with National Rural Support Programme (NRSP) officials.

17:00-17:30 Discussion with ICARDA Country Manager, Pakistan.

27th June:

Departure from Islamabad

Key Documents made Available to the Review Panel

- ICARDA. (2007). *Improving Livelihoods in Dry Areas - Strategic Plan 2007-2016*
- ICARDA. (2012). *Annual Report 2011*
- CGIAR. (2011). *A Strategy and Results Framework for the CGIAR*
- ICARDA. (2012). *ICARDA's Strategy for Decentralization*, Working Draft
- CGIAR. Science Council. (2006). *Report of the Fifth External Program and Management Review (EPMR) of the International Center for Agricultural Research in the Dry Areas (ICARDA) and Management Response to the Recommendations*
- ICARDA. (2003). *Report of the Center-Commissioned External Review of ICARDA's Outreach Activities and Management responses to the Recommendations*
- ICARDA. (2009). *Report of the Center Commissioned External Review of Information Technology and Systems, Information Services and Knowledge Management in ICARDA and Management Response to the Recommendations*
- ICARDA. (2011). *Strategic Communication and Knowledge Sharing at ICARDA 2012-2016*
- ICARDA. (2011). *Report of the Center Commissioned External Review of ICARDA Capacity Development Function and Management Response to the Recommendations*
- ICARDA. (2011). *Capacity Development Strategy 2012-2016- Strengthening the Capacity of NARS for Sustainable Development*
- ICARDA. (2012). *ICARDA Staff Rationalization*
- ICARDA. (2013). *Sustainable Agricultural Development of Highlands in Central, West Asia and North Africa- Elements of a Research Strategy and Priorities*
- ICARDA. (2011). *CRP 1.1 – Dryland Systems Integrated Agriculture Production Systems for the Poor and Vulnerable in Dry Areas – Draft Report*
- ICARDA. (2011). *Scoping Study on enhancing ICARDA's operation in SSA*, Dr. Abera Deressa, November 2011
- ICARDA. (2012). *Morocco Collaborative Grant Program (MGCP) Review Report*, by Dr. Mangala Rai, Dr. Ahmed Amri and Dr. Mohamed El Gharous, September, 2012.

Survey Questionnaire on Regional and Country Outreach Programs

Review Period: 2007-2012

ICARDA - CCER on Outreach Programs and Partnerships

Name of Outreach Program:

Introduction

The objective of the CCER is to review the effectiveness of ICARDA Regional and outreach programs in achieving the goals of the Centre current 10-year Strategic Plan 2007-2016, within the context of the on-going implementation of the CGIAR reforms and CRPs. The expected outcomes consist of operational recommendations for enhanced effectiveness, partnerships and decentralization.

The proposed survey aims at providing input to the CCER Panel work. The survey focuses on R-4-D continuum, capacity building and partnership activities during the period January 2007- to date 2012 in the context of the current 10-year ICARDA Strategic Plan 2007-2016. The survey is addressed to: (i) Regional Coordinators of the six regional outreach programs in North Africa (NARP), Nile Valley and Sub-Saharan Africa (NVSSAP), West Asia (WARP), Arabian Peninsula (APRP), Central Asia and the Caucasus (CACRP), and South Asia and China (SEACRP); (ii) National Coordinators of the outreach programs in Pakistan, Iran and Turkey as members of the Highlands network; and Ethiopia as a specific country program.

Survey questions:

1. List of completed and on-going projects during the period 2007- to date at your outreach program

Project Title	Benefiting countries	Total Cost	Completion date
-			

2. Composition of the current research and support staff of your outreach program

Profile	Name	Continuing Position	Short term Position	Location
ICARDA scientists				
-				
NARS scientists				
-				
Support Staff				

3. What are the major R-4-D themes addressed and the covering project ?

4. What are the results achieved in term of?
 - Research outputs: list of validated technologies, strategies and policies
 - Technology adoption/adaptation plans beyond NARS scientist
 - Capacity development of NARS: training, institutional strengthening including research facilities.
5. List of peer-reviewed publications in international journals co-authored by ICARDA and NARS scientists in the outreach program
 - Partnerships development: partners mobilized, partnership modalities, research areas for collaboration and results achieved.
 - Resource mobilization by source of financing.

Project name	Financier	Amount of financing

6. How do you assess the adequacy of implementation support to your outreach program by ICARDA headquarter Research Programs and Support units?

	Exemplary	Adequate	Adequate but need improvement	Unsatisfactory
Research Programs				
BIGM				
IWLM				
DISIPS				
SEPR				
Support Units				
GSIU				
CDU				
CODIS (1)				

(1) In the area of communication and information management

7. Are there examples of success stories on impact in your Outreach program available? If so, then the Panel would like to receive some examples in the form of a maximum of a one page write up for each for inclusion in the CCER report.
8. What changes are needed in your outreach program in the context of the implementation of ICARDA decentralization strategy approved by the Board of Trustees at its 1-3 May 2013 meeting? (A copy of this strategy document can be obtained from Dr. Shideed).
9. What are the opportunities for private sector partners in your outreach program that will enhance the research impact and what are the issues and obstacles surrounding these opportunities?

ICARDA'S Response to the Recommendations of the Previous CCER on Outreach Activities

1. Introduction

In its 2002 meeting the Board of Trustees of ICARDA decided to undertake a Centre Commissioned External Review (CCER) of ICARDA's Outreach Activities in partial response to one of the recommendations of the 2000 EPMP, and in reaction to the interest expressed on a number of occasions by the Program Committee for an in depth analysis of the Centre's outreach activities. Terms of reference were developed and a panel was appointed consisting of Dr. Lukas Brader, former Director General of the International Institute of Tropical Agriculture (chair); Dr. Abderrazak Daaloul, Director General for Agricultural Production, Ministry of Agriculture, Tunisia; and Dr. Mohammad H. Roozitalab, Deputy Head International Scientific and Research Cooperation, Agricultural Research and Education Organization, Iran. Dr. Mohamed S. Zehni served, in his capacity as Member of the ICARDA Board of Trustees, as observer to the team.

The review activities were undertaken in the period from January to May 2003. The Panel met with ICARDA Regional Coordinators, received reports from each of them with specific comments and detailed information on each of the terms of reference; served a questionnaire to ICARDA scientists to solicit their feedback; interviewed scientists at headquarters to obtain further information on the development of their research activities in recent years; sent a questionnaire to a wide range of national ICARDA partners in the CWANA region to collect their views on the effectiveness of the collaboration with the Center; visited Algeria, Azerbaijan, Egypt, Iran, Libya, Morocco, Syria, Tajikistan, Tunisia and Uzbekistan, to seek the reaction of different partners to the ICARDA outreach activities; interacted with ICARDA management on matters related to outreach activities; and held their own meeting from 29 April to 3 May 2003 at ICARDA headquarters at Tel Hadya to review the information collected, discuss major findings and prepare the report.

The Panel Chair presented the preliminary report of the Panel during the Program Committee Meeting of ICARDA Board in May 2003 in Tashkent, Uzbekistan. The members welcomed the report and it was decided that it would add value to the report if it also incorporated a section on the impact of the Regional Programs and include the brief CV of the panel Members. The Panel Chair completed this task and sent the final report to the Board of Trustees by the Director General on 15 January 2004. The report has now been published as recommended by the Program Committee.

During the Executive Committee meeting of ICARDA Board in Cairo in November 2003, Dr Mohamed Zehni presented briefly his views on the review process and on the recommendations contained in the report. It was agreed that the management would prepare a response to the recommendations including the proposed action and present it to the Program Committee in April 2004.

2. Major Findings of the CCER Panel

The CCER Panel agreed with the assessment of the EPMP Panel that ICARDA enjoys high standing among its national partners and is well respected by national scientists and research managers. The Panel in the course of its field visits found also high regard by top policy makers, and noted that they were well aware of various details of activities carried out jointly by their country and ICARDA. Through its collaborative networks, training programs and various coordinating and planning mechanisms, extensive intra- and inter-country interaction and cooperation among NARS of CWANA has been promoted. The regional

programs are giving greater impetus to the work of ICARDA and have improved the Centre's ability to generate donor income.

3. CCER Panel Recommendations and Management Response

Recommendation No. 1: The Panel recommends that the annual planning meeting be organized in such a manner that it becomes the main joint research planning exercise during the year. All scientists need to be fully involved; projects should be discussed in project working groups and the outcome of the discussions presented to plenary. It should become a planning week where all professional staff members interact with each other and contribute to the updating of the projects and the development of the research agenda.

The Center has already started implementing this recommendation. The planning weeks in 2003 and 2004 were attended by most of the staff members including those from the outreach. The week in 2004 devoted considerable time to discussion on developing new program strategy and part of this was done in working groups, which reported back to plenary.

Recommendation No. 2: Given the poor state of development in most highland regions and the high degree of poverty, considering the special interest of certain donors in supporting research activities for mountain areas, and noting also the research activities carried out by ICARDA over time in highland areas, the Panel recommends that ICARDA establishes a highlands research network for the CWANA region to develop and implement a pragmatic agricultural research programme for the highland agro-ecologies.

Recognizing that the rest of the regional programs of the Center are organized based on geographic sub-regions, and that the highland agroecological conditions are present across the CWANA region, the management agrees with this recommendation. Efforts have been initiated to establish a Highland Research Network. Dr Habib Ketata, Project Coordinator for Iran/ICARDA Project has been designated as the Network Coordinator. He is also linking this network with the Global Mountain Initiative coordinated by CIAT.

Recommendation No. 3: Outsourcing is a popular principle within the CGIAR System, but so far little effort has been made to carefully analyze the costs and benefits of it. The Panel recommends that Management reviews the available information related to outsourcing to decide if ICARDA should spend more efforts on outsourcing. It is important to first analyze the current experiences in order to determine under which conditions outsourcing will be beneficial to the Centre. Such an analysis should also address the positive effects on the relationships with NARS.

The recommendation is accepted. A status paper has already been commissioned through input by the Regional Coordinators.

Recommendation No. 4: The Panel recommends that ICARDA prepare a status report on the flow of information from field to headquarters, and vice versa, of results obtained under special projects, as well as on the current practices of updating the MTP projects, and to use the information collected for the preparation of a set of best practices.

The management welcomes the recommendation. A status paper would be prepared. While updating the MTP, the management, with the help of the Project Officer and the Research Project Managers under the overall coordination and supervision by the Assistant Director General (Research), ensures that all the information from the special projects is captured and incorporated. Meanwhile, access to "Intranet" (ICARDA's database) is now being provided to the outreach staff through "Extranet".

Recommendation No. 5: The Panel considers that there should be no double messages to ICARDA partners and staff, and that all research activities and related matters in the field

should fall under research and be reported as such. *The Panel recommends that the Board of Trustees examine the current management structure with the purpose to develop new arrangements where there is one clear line of reporting for all research matters.*

The current management structure is such that the Regional Coordinators are responsible to the Assistant Director General of Research for all research matters and to the Director of International Cooperation (currently under recruitment) for administrative matters. All the scientific staff in the outreach are a member of one of the Research Programs and are thus under technical supervision of the Directors of the respective Research Programs.

Recommendation No. 6: Given the overall developments in agricultural research planning and implementation, and considering the increasing importance of inter-disciplinary special projects in ICARDA's research agenda, *the Panel recommends that ICARDA undertakes a detailed review of the current breakdown of its research agenda, with the purpose to reformulate the 19 MTP projects into a smaller number of inter-disciplinary projects that can effectively address the research needs of the major production systems in the dry areas.*

The Center has already embarked upon this exercise as a part of the strategic planning, and there is a document tabled for consideration of the Program Committee of the Board.

Recommendation No. 7: During the country visits the Panel was made aware that funds for research are available in a number of countries under rural development projects. However, in many cases these funds do not seem to be used for the strengthening of research activities in the countries concerned. *The Panel recommends that ICARDA explore with the national partners the opportunities for strengthening linkages with rural development and related projects as a means to increase the financial contributions to agricultural research.*

The management is fully aware of this opportunity and has made all out efforts to work with the national partners in developing research and technology transfer components linked to rural development and investment projects. IFAD and World Bank supported investment projects provided such linkages in Pakistan, Egypt, Ethiopia, Syria, and Yemen. We are currently exploring this further in Afghanistan, Central Asia (Tajikistan and Uzbekistan), Egypt, Pakistan, Syria, and Yemen. The newly appointed Senior Consultant for Research for Development – Dr Adel Aboul Naga - is providing help in this regard. The new job description for the recently advertised position of the Director of International Cooperation includes this responsibility.

Recommendation No. 8: Countries desire the involvement of ICARDA in activities outside its traditional mandate, because of its extensive experience and reputation as an International Centre, and its capacity to appraise and ensure the quality of the research undertaken. Such efforts can be undertaken at limited costs and are essential to address problems of major concern. *The Panel recommends that ICARDA reviews the possibilities of expanding its role as an honest broker in triangular arrangements involving the Centre, specialized research institutes and countries in CWANA, for the promotion of research activities on problems outside its traditional mandate.*

The Center has already embarked on development of this kind of tripartite linkages for crop diversification and enhancing income generation of the communities in the CWANA region. Efforts in this regard have already been underway in Afghanistan, Arabian Peninsula, CAC region, and Iran.

Recommendation No. 9: Given the interest expressed by the scientists to make better use of students to strengthen their research activities, *the Panel recommends that in the light of the new funding realities leading to more limited permanent staff resources, the Centre revises its current training policy to facilitate the employment of students.*

A comprehensive review has already been planned of the policy and procedures manual of the training activities at the Center. In the meanwhile efforts are being made to include positions of pre- and post-doctoral fellows in the special projects being developed. A number of new postdoctoral appointments have recently occurred. Also, an internship program has been attracting good applications. Contacts with donors and the Third World Academy of Sciences are underway to get additional support.

Recommendation No. 10: In Latin America there is considerable potential for the effective use of ICARDA inputs and technologies. Faba bean and barley are important crops in certain areas; natural resource management is a major concern in virtually the whole continent. *The Panel recommends that the Board of Trustees review the costs and benefits of maintaining an active ICARDA Regional Program in Latin America, as a basis for a decision to be taken on the development of further plans for the involvement of the Centre in this region.*

As per our current Strategic Plan, the dry areas in Latin America are within our Eco regional mandate, where the farming system is based on the crops on which ICARDA has major improvement mandate (barley, lentils, Kabuli chickpea, vetches; and under irrigated or higher rainfall conditions faba bean). The Center has strategically used this Regional Program to continue having this international dimension of its activities with only limited resources invested. While efforts in the past to augment resources for special projects had not been very successful, lately there has been new development, whereby an IFAD-supported project is being implemented in dry areas of Brazil and Mexico. Continuing the Latin America Regional Program would ensure that there is adequate visibility for the Center to mobilize additional resources for serving the dry areas there and also meet its global crop mandate. Hence, the management would suggest that it would be a good strategy to retain this Regional Program and to put some more seed money from core to increase the momentum.

ICARDA'S Response to the Recommendations of the Previous EPMR in Relation to the Outreach Programs

The Board and Management of ICARDA wish to thank and express their sincere appreciation to the EPMR Panel Chair and Members for their insightful analysis and constructive comments in the review report. We agree, in general, with the recommendations made in the Panel's report. These recommendations and the many suggestions made by the Panel will provide valuable inputs as ICARDA finalizes its strategic plan, and charts its course for the future.

We are pleased to note that the Panel's overall assessment over the last five years, ICARDA, through its research for development activities, has made many substantial contributions towards alleviating poverty and enhancing food security in the CWANA region which accounts for more than 80% of non-tropical dry areas globally. It is also reassuring that the Panel felt that the Center in several ways was better placed now than when the previous EPMR was held in 1999/2000, and that its financial management was sound. This confirms the recent rating of ICARDA as 'outstanding' for its performance measurement indicators, and serves as a tribute to the management and staff of the Center.

We are also pleased that the Panel reports that in collaboration with the NARS, ICARDA has developed an excellent outreach effort through its regional programs and is an important player in the development and dissemination of agricultural knowledge in dry areas. According to the Report, everywhere NARS scientists and government officials expressed appreciation of ICARDA's scientific expertise, and support in the development of region wide networks, projects and in capacity building including training, using existing NARS facilities.

It is also reassuring that the Panel's survey of ICARDA's donors revealed their very positive attitude and high satisfaction with ICARDA's performance.

Regarding ICARDA's inter-Center and collaborative arrangements, the Panel in general commends ICARDA's approaches to collaborative and collective action as a way to improve effectiveness and efficiency in serving its mandate for the Dry Areas eco-region.

We thank the Panel for the balance in the report between assessing past performance and charting the future course and note the practicality of the suggestions made for the future. Overall we welcome the Panel's analysis of the future challenges to the dry areas, which we supplement with the issues of climate change, gender and the prevailing geo-political environment. We would also like to express our appreciation for the excellent relations that ICARDA has with its host Governments in Syria and Lebanon.

We are pleased that the Panel views the future of ICARDA with optimism and that it perceives that there is a unique opportunity for the Center to grow and develop into a world-class research institute for the Dry Areas.

Overall we welcome the Panel's proposals on future research directions to address the problems of dry areas, which will assist the Center in charting a perspective course of action for the next five years to more effectively serve the poor in the dry areas of the developing world. We appreciate the findings of the review not only in terms of the Panel's specific recommendations, but also their other suggestions. These need to be considered in their totality within the overall context of the new strategy, which has been expressly timed to allow consideration of the EPMR's report and the views of the Center's new management. The overall financial and staffing implications of the Panel's recommendations will also need

to be carefully considered. Additional capacity will be sought through partnering with national programs, advanced research institutes and, where appropriate, through outsourcing specific areas of research.

Our responses to the specific recommendations made by the Panel are given below

In relation to Outreach Activities:

Recommendation 22: Given the dispersed nature of ICARDA's research activities, the Panel also recommends that External audits should routinely include visits and reviews of the regional and outreach centers, at least on a random (selective) or rotational basis.

Response:

Accepted: We share the Panel's view that the External Auditors will routinely review the Center's regional and outreach offices on a selective or rotational basis, in addition to the regular reviews by our internal audit.

Samples of Success stories in technology generation and impact

North Africa Regional Program (NARP)

1. *Impact of New Technologies and Innovations on Durum Wheat Production in Dry Areas of North Africa*

Durum wheat is the major cereal crop in North Africa. However, production suffers the negative effects of yield depressing factors including changing climate with erratic rainfall and frequent drought, and a spectrum of virulent diseases and destructive pests. Farmers in North Africa dry areas typically are smallholders, with little or no resources to secure production inputs necessary for achieving profitable crops. In 2003, ICARDA and NARS from 3 North African countries (Algeria, Morocco and Tunisia) and 2 West Asian countries (Syria and Turkey) jointly implemented a 4-year IFAD-funded Project, coined the IRDEN (Integrated Research and Durum Economics Network) Project with the objective to improve and stabilize durum wheat productivity and profitability by fostering adoption of low-cost technologies for increased income and improved household food security in less-favored areas of the region.

Project teams in each country comprised researchers, extension officers, farmers, seed producers and sellers, local technicians and administrators, and other staff from public and private institutions. At the technical level, researchers formed multidisciplinary teams that worked harmoniously in a well organized participation that enhanced a team spirit for work in difficult environments, and established an atmosphere of understanding and mutual respect among farmers, researchers, extension officers and other stakeholders of the durum wheat value chain, both within and across countries. This relationship was consolidated through joint on-farm work that brought all parties together, exchanging knowledge and views on better technologies and innovations for durum wheat production in moisture-limited environments. In addition, project teams produced 6 research articles, 8 brochures and 10 posters based on the IRDEN project work, while 14 students worked on mini-projects for their graduate or undergraduate research studies.

Improved production technologies including drought tolerant, disease and insect pest resistant varieties, and improved cultural practices resulted in yield increases and related economic gains varying between 5 and 100% (often between 20-40%), depending on sites and years. As a consequence, farmers embraced the new technology, including the new varieties, such as Boussalem in Algeria, Tomouh and Icamore in Morocco and Om-Rabiaa in Tunisia. Lead farmers working with the project teams, increased the seed of the improved varieties and sold it to requesting neighbors who were convinced of the superior performance of the new varieties. This was perhaps the most striking impact of the project. In fact, by project final year, 400 t of seed was increased, processed, and sold by a project-participating farmer in Algeria, who in fact continued this activity during 2007 and beyond; a similar trend was observed in Tunisia and Morocco. Such impact has a dual benefit: (a) new varieties can be available in a short time period, through on farm production of quality seed, thus contributing to raise durum wheat productivity in the target regions, and (b) on-farm seed production of “quality seed” is an economically profitable activity in remote dry areas, usually not well served by the traditional seed marketing system.

The project showed the varietal effect on the quality of durum end-products, explaining and confirming the consumer preference for certain types of durum cultivars, such as the variety Biskri in Tunisia, and the varieties Gta Dur, and Ouarsenis in Algeria. It was also found that on-farm processing of durum end-products (such as couscous) is preferred over standard

commercial processing by consumers who pay higher prices for such homemade products. Marketing of such products is already visible and is on the rise in large cities (e.g. Tunis, etc.), offering rural women the opportunity to raise the income of their households and reduce their dependence on risky dryland durum wheat production.

The impact of the IRDEN project in North Africa that has already started during the last 2 years of the project (2005 & 2006), has spread over larger areas of the 3 countries, as confirmed in a survey conducted in 2007 among national IRDEN project coordinators. On-farm demonstration of new varieties and cropping has become a major component of regional or national R4D projects (e.g. ICARDA-ARC Libya Collaborative Project, Food Security Project, etc.). Diversification of varieties and crops has gained momentum and is being more and more embraced by farmers as a means of reducing risk and assuring a less fluctuating income. The recommended reduced tillage has evolved into zero tillage that is being adopted through North Africa, especially in hilly and plateau areas.

2. Impact of Variety Improvement and Seed Production on Wheat Production in Algeria

The national strategy for agricultural production in Algeria emphasizes food security based on priority commodities, including cereal grain crops, namely durum wheat, bread wheat and barley. The new Algerian government policy of Agricultural Revival, launched in 2008, emphasizes and supports cereal production through securing necessary production inputs, such as fertilizers and agrochemicals, mechanization of crop production and promotion and use of improved technologies, including both high yielding varieties and improved production practices.

Production records over the past 12 years show that average cereal grain yield increased from 13.1 q/ha during the period 2001-2008 up to 16.4 q/ha during the period 2009-2012, representing an increase of 23%. Similarly, cereal production for the same periods, increased from 32 million quintals to 48 million quintals, an increase of 50%.

Durum wheat remains the major cereal crop, accounting for 24 million q or 50% of total cereal production in 2012, as compared to 31% for barley and only 19% for bread wheat. Average national yields are 17.9 q/ha for durum wheat, 17 q/ha for bread wheat, and 15.4 q/ha for barley. Both the variety and production techniques are important component of productivity increase. In particular, varieties are adopted from germplasm from ICARDA and other sources that are adapted to various growing conditions and stresses (especially drought, and diseases) that prevail in the different agroecologies of Algeria. The varieties originating from ICARDA germplasm represent 27% of cereal varieties in Algeria. Most of these varieties are durum wheat types (e.g. Waha, Boussalam, Chen's', Gta dur and Ammar 6) as compared to 2 barley varieties (Rihane 3 and El Fouara) and only one bread wheat variety (El Wifak). These 8 varieties during the past 3 seasons covered 45,000 ha of the 160,000 ha of cereal seed production area in the country. Durum wheat varieties originating from ICARDA account for 32% of the total durum seed production in Algeria, versus 22% only if all the three cereal species are considered.

West Asia Regional Program (WARP)

3. Integrated Control Measures for Lesser Date Moth:

The use of biological agent *Bacillus thurengiensis* (BT) as a spray, directly after completion of pollination, was demonstrated in farmer fields in comparison to farmer practices in eight governorates. Light traps were installed in each demonstration site of eight Governorates (Basrah, Diwanyia, Babil, Wasit, Najef, Baghdad, Al-Anbar, and Deyala) in order to determine the starting dates of adult emergence and monitoring purposes. Infestation level on fruits was also monitored. Each demonstration covers nearly 2 hectare.

Samples were taken from five trees representing each location including the control. One bunch was assigned randomly at each side of the tree and two random strands were taken. All fruits in the sample were counted and the number of infested fruits was recorded. The percentage of infestation by the date palm lesser moth and number of larvae per sample were also calculated. Dropped fruits were collected to determine the total infestation percentages.

Field surveys indicated that the Lesser Moth infestation varied with regions depending on location and the surrounding conditions. Data obtained from the eight sites indicated that the lesser moth infestation was higher in general during the 2012 season compared to the previous seasons. The prevailing conditions in 2012 season enhanced the development and growth of the insect.

Field surveys indicated that biological insecticides (Bt. Spray), which is commercially available, was able to reduce the infestation level of lesser date moth to an acceptable level ranging between 33-80% after two weeks of treatment and 36-78% after one months of treatment depending on location and other factors including date of application, height of trees, stage of fruit maturity, and the prevailing climatic conditions.

Trees treated with Bt. resulted in various yield increases depending on location, cultivar and time of application. The highest yield increase percentage over the control treatment was 115% recorded for Sayer cultivar in Basra and the lowest percent was 16% recorded in orchards planted with mixed cultivars in the Najef Governorate.

The unstable weather conditions and the continuous occurrence of dust and thunderstorms induced a real obstacle on the efficacy of the biological insecticides. Timing of application was also influenced by these conditions and by the limitation in team members skill needed to cover large areas during a specified period of time. Therefore, an obvious variation was observed in the initial infestation before the starting date of the treatments.

4. Integrated Control Measures for Dubas Bug (*Ommittissus lybicus*):

The work plan aimed to consolidate project previous results through dissemination and implementation of the proposed technique at farmer fields and to reduce the cost of spraying by partially replacing Neem (natural plant extract) with summer oil (summer oil is a mineral paraffinic oil, commercially available and kills by suffocations). The following interventions were introduced and evaluated:

- (1) An early season field demonstrations were conducted in an orchard (area of one hectare) located at Ain-Altammer, Karbalaa Governorate to determine the efficiencies of selected combinations of Neem and Neem-Summer Oil mixtures against Dubas Bug nymphs using both ground and aerial spraying.
- (2) A large scale demonstration to evaluate the efficacy of Neem (1% Azadarchtine) was conducted on date palm orchard on an area of 25 ha (14 farmers) in Kerbalah, Governorate. Spraying was performed using 100 L capacity wheel barrel sprayers. To validate and disseminate Neem-Summer Oil mixtures achieved results in larger areas and to reduce the cost of control program, an additional activity was conducted on an area of 150 ha owned by 188 farmers and distributed over four Governorates (Najef, Karbalaa, Babil, and Diyala) as part of a national IPM campaign.

- (3) A new specialized ground sprayer was introduced as a means to reducing overreliance on aerial spraying as well as to improve the efficacy of ground spraying system.

Results from the collected data indicated that all treatments were significantly different from the control. Yet, there were noticeable differences in terms of the efficacy. For instance, both Neem-Summer oil (1:1) and Neem alone gave the highest efficacies of 96.7 and 96.6%, respectively. Furthermore, decreasing the rate of Neem by 66% had no significant effects on its efficacy. Replacing Neem with cheaper materials such as Summer Oil reduced the cost of spraying by nearly 50%.

It is obvious that Neem was effective in reducing nymph's population to lower levels where the efficacy reached 72%. There was no indication of population damage during subsequent generations in contrast to the chemically treated orchards.

Data of a second activity conducted as a small scale campaign in four Governorates (Najef, Karbalaa, Babel and Diyala) with a total number of 188 farmers covering more than 150 ha, clearly confirmed the results under field conditions. Mixing of summer oil with Neem obviously neither reduced the efficacy nor affected by the mode of application. Efficacies after 28 days ranged from 78 to 83% for aerial spray in Babil and Diyala, respectively. Also, they ranged from 74 to 78% for ground spray in Najef and Karbalaa Governorates, respectively. The Ministry of Agriculture used Neem 1% to control Dubas by aerial spray over more than 12,000 ha during the 2012 season. This area has around one million 680,000 trees. The project monitored 2400 trees in the campaign area belong to 124 farmers.

Finally, a new specialized ground-spraying machine was introduced in the large scale implementation program of Neem. This machine was superior over the traditionally used wheel barrel sprayers in the quality of spraying particles and the quantity of spray solution/tree. The size of the new machine is one tenth of that of old machine. Further, its delivering capacity reaches 30m in height.

In summary, Neem alone or in combination with Summer Oils has proven to be an ideal alternative to the traditional chemical insecticides in controlling the Dubas Bug. The Efficacy of Neem is not the only advantage, but it is safe and friendly to the environment. Neem's efficacy, however, is directly related to the quality of its formulation, time of application, and spraying techniques. It is also recommended to use ground spraying, as it is the optimum technique to apply Neem to control Dubas because aerial spraying required further research.

5. *Improvement of Wheat Landraces in Palestine*

Informal farmer-based seed production enterprises activities were established in Palestine with four Seed producers groups in four targeted areas (Jenin, Tubas, Hebron and Ramallah). The groups were linked to farmers association, extension, National Agricultural Research Center (NARC) and ICARDA who are providing technical and financial support to engage farmers in seed production and marketing. The seed producers produced ten tons of high quality seeds of wheat and barley landraces. Because of the high seed quality that being produced, they sold the seed they produced for the local market, NGOs and other farmers at 0.8 to 1.3 \$ per kg of seed which is about double the market price.

Community participation in crop improvement: Fourteen landraces' populations of wheat and barley were improved by selecting superior heads and evaluated them under farmers' field conditions with participation of farmers' communities using head-row approach. The improved landraces populations produced between 6.6% to 35% more grain and straw yield as compared to the original landrace population.

6. Impact of Wheat Variety Improvement and Seed Production in Lebanon

Wheat production in Lebanon has always been suffering from the absence of an effective seed multiplication system. Since the early eighties, ICARDA has been testing and releasing in close collaboration with LARI, promising cereal and legume varieties suitable for the different climates prevailing in Lebanon. However, few of these varieties made their way to Lebanese farmers mainly because of the limited seed production system adopted by the government in terms of restricted budget and lack of adequate seed processing equipment. Up till the year 2009, the production of a maximum of 1000 Tons of Wheat certified seeds was permitted. The 1000 Tons were not sufficient to meet the demands of wheat growing farmers and hence many had to import more expensive wheat seeds from external markets from varieties that were not previously and properly tested in Lebanon.

In 2010, the Ministry of Agriculture and the Lebanese Agriculture Research Institute (the implementing Institution) decided to make the difference. The Ministry from the Lebanese government to increase the production of certified seeds and to develop the capacities of LARI in terms of human resources as well as equipment and infrastructure secured additional funds. To support this project, ICARDA provided the Ministry with 16 Tons of Foundation Seeds of 13 improved varieties of durum wheat, barley, lentil and chickpea. In addition, ICARDA delivered several training courses to national staff from LARI and the Ministry of Agriculture in seed production systems, variety maintenance and quarantine measures.

In 2012, the impact was to be seen. More than 4000 Tons of durum wheat certified seeds were distributed to farmers at very encouraging prices. The government is now able to cover all of its certified seed needs and is thus minimizing all risks associated with entry of untested varieties and contaminated seeds. The harvest of July 2013 is expected to demonstrate an increase in durum wheat production in Lebanon due to the use of new high yielding varieties (with yields up to 9 Tons/ha) that are suitable for several Lebanese climates and have good resistance to biotic and abiotic stresses. In addition, 1000 Tons of certified barley seeds from ICARDA's variety "Rihane 03" have also been disseminated to Lebanese farmers for the first time and will also have a great impact on barley production in the country.



H.E. Minister of Agriculture Dr. Hussein Hajj Hassan and Dr. Michel Afram, President and DG of LARI inspecting the seed storage facilities at LARI, Tel Amara in Bekaa.

Central Asia and the Caucasus Regional Program

7. Seed Multiplication of Newly Developed Varieties in Tajikistan

The ICARDA-CAC Program actively collaborates with national partners to strengthen their programs, especially in the areas of seed multiplication of newly developed varieties, expanding superior crop varieties, which ultimately lead to improved livelihoods of the people in the Region. With the release of two new cold-tolerant chickpea varieties, selected from ICARDA germplasm and tested in Tajikistan, farmers have now obtained an opportunity to plant chickpea in autumn and harvest in late spring before temperatures go up creating heat stress. The chickpea crops planted in winter also use moisture from melt snow and produce 25 to 50% higher yield than chickpea crops planted in spring. The collaborative research activities between the Crop Husbandry Institute (CHI) of Tajik Academy of Agricultural Sciences and ICARDA-CAC resulted in the release of 'Hisor-32' and 'Sino' improved chickpea varieties in 2009 and 2011 respectively. In order to reach remote areas of Tajikistan with these improved varieties, CHI and ICARDA-CAC launched a varietal out-scaling program in 2010. One ton of seeds of 'Hisor-32' and 'Sino' chickpea varieties was supplied to the farmers. Both are high-yielding varieties, with resistance to prevalent diseases in Tajikistan, and are suitable for autumn and spring planting. In 2010, a collaborative pilot project between CHI and ICARDA-CAC was started with 50 chickpea farmers by making available 20 kg of seeds of either variety on condition that the recipient farmers return the amount of seeds received. This project continued with additional 2 tons of seeds in 2011, and 2012. Through the seed return scheme and on-farm trials demonstrating the performance of new varieties, the out-scaling expanded in additional districts in Tajikistan in 2011 and 2012. Within the short span of two years, these two varieties of chickpea have been provided to 268 smallholder farmers across 18 districts that include several remote mountainous districts in Tajikistan. On average, the farmers harvested under rainfed conditions 0.8 and 0.9 t/ha yield of 'Hisor-32' and 'Sino', respectively in 2012. At the end of the 2012 crop season, around 22 tons of seeds of these two varieties were available to the farmers for further planting in 2013. Since smallholders traditionally save part of the chickpea produced as seed for planting in the following years, and farmer to farmer barter trade of chickpea seed is common in the remote districts of Tajikistan, the out-scaling project is expected to become sustainable in the district.

The project in Tajikistan, where improved varieties of chickpea, wheat and barley were made easily available through partnership among farmers, the national agricultural research and extension system in Tajikistan and ICARDA, has helped to improve rural livelihoods in Tajikistan. This model of partnership can have direct implications in other countries of Central Asia. In fact, ICARDA-CAC is already supporting another larger initiative on accelerating adoption of eight yellow rust-resistant winter wheat varieties in Uzbekistan and Tajikistan through a Partners Grant scheme under CRP WHEAT. Under this new initiative, eight yellow rust-resistant varieties of winter wheat were planted on an area of 126 ha for seed multiplication in Uzbekistan and Tajikistan. This new project aims at planting these wheat varieties over 50,000 ha in farmers' fields in 2015.

8. Technology of Phosphogypsum Application Has Been Successfully Tested and Introduced in Southern Kazakhstan

In southern region of Kazakhstan the significant part of irrigated soils (about 30-35 %) has got the so-called "takyr" properties i.e. the soils are a little suitable for an agricultural production. At irrigation events the soils are swollen, and the deep soil cracks are formed under dry conditions. It has negatively impacts to agricultural crops productivity and lead to reducing of water use efficiency. It impedes the growth of the agriculture industry on such soils; the crops yields are sharply decreasing.

In conditions of Southern Kazakhstan where the chemical industry is developed, in order to improve the soil fertility it is reasonable to use the cheap Phosphogypsum (PG) which renders positive influence on crops yields not only due to improvement of soil physical and chemical properties, but also it provide plants by mobile forms of

phosphorus. Presence acids in PG raises its solubility and provides significant improvement of agronomical properties of sealed (high-compacted) soils; therefore crop productivity can double increase in the first year of its application.

During realization of ADB funded ICARDA projects on “Management of water and soil resources” and “Bright spots” the PG application technology has been developed, successfully tested in 2000-2006 by group of scientists of the Scientific Research Institute of the Water Management (KSRIWM) of Southern-West Scientific Production Center of Agriculture headed by Dr. F.Vyshpolskyi, and it has shown the efficiency for amelioration of sodic soils and enhancement of soil fertility at Arys-Turkestan experimental site.

The technology of PG application was successfully implemented in 19 farms of Staryi Ikan village in Southern Kazakhstan on the area more than 100 hectares in November-December 2006. 408 tons of PG has been provided to farmers, application rates ranged from 2 to 8 t/ha. Thus 70 % of charges on purchase and delivery of PG have been covered by ICARDA, and farmers paid the remained 30 %.

Training on farming practices of PG application was provided by experts of KSRIWM and ICARDA scientists at all stages of its implementation.

The technology of PG application at Arys-Turkestan Canal Zone of Southern Kazakhstan resulted in increase of cotton yields by 30-50% in high water-availability years and by 70-100% in dry years, while increases of winter wheat yields were 25-30% and 30-40%, respectively.

The given technology improves agronomical soils structure, improves plants nutrition with phosphorus and potassium, reduces the evaporation from the soil surface, accelerates rates of growth of plants and provides their best development, enhances water use efficiency, raises agricultural crops productivity and pays back expenses the first two years of its application. Duration of positive influence of Phosphogypsum exceeds 5 years, and expenses for its purchase, transportation and application pay off in the first 1-2 years of planting the agricultural crops.

Researches KSRIWM have demonstrated that use of Phosphogypsum for increase of fertility of low productive soils creates a basis for successful managing already in the first year of its application. The farmers who have applied PG, and the neighboring farmers are much interested in implementation of the given technology and favorable conditions for further up scaling are now have been created.

It is planned to organize “Farmer day” for demonstration of results of implementation of technology of PG application in Staryi Ikan on 27 September 2007 and Roundtable meeting titled: “Phosphogypsum Usage for Remediation of Magnesium Dominated Sodic Soils in Irrigated Areas” will be held in Shymkent, capital of Southern Kazakhstan on 28 September 2007.

Representatives from the local/regional administrations/policymakers/ Ministries of Agriculture/KSRIWM jointly with representatives of international organizations (ICARDA, IWMI and ICBA), and farmers who have applied PG in their fields in 2006-2007 will discuss problems related to further dissemination of the PG application technology.

Arabian Peninsula Regional Program

9. *Water Saving Indigenous Buffel Grass*

Salinity and water scarcity are undoubtedly affecting pastoral livelihoods in the Arabian Peninsula. The Arabian Peninsula Regional Program (APRP) in close collaboration with the National Agricultural Extension Services has launched the indigenous Buffel grass as irrigated forage to replace the exotic high water requirements Rhodes grass. The annual yield of Buffel grass under drip irrigation is equal to Rhodes grass (20 tons dry matter/ha) with 50% less water use. Its' forage quality as well as palatability is even better. Under drip irrigation system, Buffel has almost replaced exotic forages on 82 farms in the Emirates during the period between 2005 and Dec 2012. In other six countries of the Peninsula during the same time, it has been cultivated at about 100 pilot farms to demonstrate National Agricultural Extension Services for up scaling. While mitigating the up scaling needs for quality seed, seed multiplication fields as well as three Seed Technology Units have been established in Emirates, Oman, Qatar, Saudi Arabia and Yemen whereas for rest of the countries are in pipeline. This Buffel technology package is an output of a decade long collaborative research for development program of APRP with a parallel focus on capacity building and institutional strengthening of National Agricultural Research Services.

10. Participatory Technology Development Approach to Produce More Crop Per Drop

Although protected agriculture improves water productivity, access to require quality-water in such a harsh environment, as Arabian Peninsula (AP) still is a big concern. In addition to water scarcity, greenhouses are losing their productivity due to accumulation of salt and pathogens in soil. To tackle this, ICARDA-APRP collaborated with the national agricultural research and extension systems (NARES) in seven AP countries to simplify and develop a protected hydroponics system that would be manageable by the growers and allows them to produce high quality cash crops without soil and significantly less water. Various hydroponics systems for different crops including cucumber, tomato, pepper, muskmelon and strawberries were tested in research stations and after approved successful are being transferred to growers. Numbers of Participatory Technology Development (PTD) approaches such as introductory workshops and farmers' field schools were implemented to select and introduce the innovative technology to pilot growers in all the seven peninsula countries. The results of the system at the growers sites was quite promising where water productivity increased up to 8 folds with significant improvement in yield. ICARDA-APRP is supporting farmers-to-farmers' extension system where field days and visits are arranged for neighboring growers to visit the pilot sites and to discuss the advantage and disadvantage of the system directly with their colleagues and, as a result, the adoption rate for hydroponics system is very high. For example, in UAE the number of GHs equipped with soilless production techniques at the growers' field from 5 expands to 75 houses in 2008 and 2009 respectively. Similarly in Oman, number of hydroponics GHs reached to more than 70 by the end of 2009. The success of pilot growers encourages the NARES for further support. For example in UAE the Ministry of Water and Environment is supporting growers through covering 50% of the greenhouse and soilless production systems cost. As a result number of hydroponics greenhouses in UAE reached to about 600 greenhouses in Dec 2012.

ICARDA-APRP research for development activity for enhancing the simplified hydroponics systems is continued. In this regard, ICARDA-APRP upgraded the hydroponics system by adding an automatic controller for nutrient solution. Number of controllers are installed at pilot growers in UAE, Oman and Qatar where the primary data collected from the growers indicates that the controller has positive effect on yield with same amount of fertilizer. In some cases the production increased up to 50% compared to previous records before adoption of automatic controllers.

Figure 1- cucumber Water and Land productivity in soilless & conventional soil based system



