

Center-Commissioned External Review  
of ICARDA's Natural Resource Management Program and  
Socio-Economics

Final Report  
August 3, 2005

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## Recommendations

1. The realignment of projects into the six Megaprojects seems appropriate in light of the on-going development of the CGIAR-wide approach to Integrated Resources Management. Some have expressed concern, however, that the realignment might actually discourage integration. Given the strong desire of the scientist to interact collaboratively, this is not likely. However, since most project funding will actually come from "special projects" which cut across megaprojects, ***the panel recommends that the management and functioning of the megaproject structure be reviewed with the aim of promoting simplicity in lines of responsibility and reporting.***
2. The recent improvement in socio-economic research performance suggests that appointment of a socio-economist at the P-level would be an efficient use of resources, and provide scope for some further attraction of grant funding to underpin core areas of socio-economic activity. ***The panel recommends that such an appointment be considered.***
3. An important area of new work for socio-economists would be to develop appropriate integrated impact assessment methods to correspond to the development of the Integrated Natural Resource Management approach. These need to be consistent across different spatial scales, and coherently assimilate different styles of evaluation, ranging from the highly quantitative to the qualitative. ***The panel recommends that such methods be developed and implemented.***
4. Given the certainty of water scarcity throughout the CWANA region and the increased competition amongst alternative users for this scarce resource ICARDA has an opportunity to take the lead in the increasingly important area of the re-use of wastewater for irrigation. Policies and technologies for the use of such waters have not been well-defined in much of the region and, in many cases; this may be the only source of water available for irrigation or supplemental irrigation. ***Thus the panel encourages ICARDA to continue and intensify its research to better utilize wastewater as a source of water for irrigation.***
5. Recognizing the increasing demands on social research to i) achieve its specific agenda as exemplified in Megaproject 5, with its inherent challenges, ii) to contribute to other Megaprojects, and iii) to participate in most of ICARDA's other undertakings, ***the panel recommends that a critical mass of social science researchers with required competence profiles (institutions, policy and gender, among others) must be secured to allow timely delivery, continuity, and high quality output.***
6. The output of a research centre such as ICARDA is primarily knowledge. In addition it may provide products such as new crop varieties. The knowledge

produced must conform to internationally accepted standards of reliability. This is achieved through publication in peer reviewed journals. Such publication is the quality control point at the crossroads between research and development. Making due allowance for the varying nature of the work, the panel noted that the output of such referred publications from ICARDA's Natural Resources Management and Socio Economics Programmes is below expectation. ***The panel recommends close monitoring of performance to ensure that a higher proportion of ICARDA's work is presented for timely publication in refereed journals.***

7. The rural families which are the primary beneficiaries of ICARDA's work depend on a range of farming systems adapted to a wide range of dry land conditions. In more marginal areas, livestock are the source of all of the income of these families, and the management of the ecosystem is essentially a function of the animal management regime. In many systems which involve cropping, more than half of the income comes from integrated livestock (usually small ruminant) production. The livestock element in all of these systems provides important economic buffering in an insecure world, and gives work and income opportunities from adding value along the production chain, particularly for women. The potential for improving livelihoods through improvement of the livestock component in these systems is under-researched in ICARDA's current programme. ***The panel recommends that the specific requirements of an enhanced livestock element in the overall programme be examined.***

## **1 Introduction**

The Board of Trustees of ICARDA has initiated this Center Commissioned External Review (CCER) of the Natural Resource Management Program and Socio-Economics. It is a response to a suggestion of the 4th External Management and Program Review (EPMR), published in 2000, that it should do so to check progress on implementing its main recommendations after two or three years. The EPMR itself gave extensive attention to the natural resource management program within ICARDA, and its suggestions for reorientation were extensive. These, in summary, suggested greater emphasis on strategic water issues and management at community level; reduced scope and greater focus in social science research to improve quality of output; articulation of a vision, strategy and an implementation plan for natural resources management as a whole; and characterization of rural livelihood strategies of the poor to identify research options, investments, policies and technologies most likely to benefit them (these recommendations of the EPMR concerning the Natural Resources Management program are reproduced in Annex I).

The terms of reference of this CCER (provided in Annex II) were to determine progress in responding to and addressing these recommendations, particularly with reference to research quality. It was also required to examine whether its dissemination within the ICARDA mandate region was appropriate and useful in addressing the problems of food security, poverty and environmental degradation. Finally, it was requested to look to the future to assess whether research in this area addressed the evolving circumstances of the mandate region. A previous CCER addressing ICARDA's outreach activities has informed our perspective, and concurrently, two other CCERs have been initiated but have not yet reported. These concern the other main area of ICARDA's research, related to integrated gene management activities, and ICARDA's capacity-building role.

The review team members (whose brief CVs are appended in Annex III) were Professor Donald Slack (University of Arizona: Chair), Professor Patrick Cunningham (Trinity College Dublin), Professor Peter Midmore (University of Wales Aberystwyth) and Dr Fatima Nassif (INRA Morocco). The review team met from 28 March to 7 April 2005 at ICARDA headquarters. During that time it received presentations from ICARDA research management and the principal scientists involved in the Natural Resource Management Program, visited the Khanasser Valley Integrated Research Site, interacted with staff in group and individual meetings, and examined material drawn from the entire written outputs of Program staff in the period 1999-2004. The efficiency and cooperative response of Program staff in assisting the review team through the period was much appreciated by the review team, and facilitated the preparation and presentation of a draft report on the final day.

The following report of our essentially forward-looking review contains an initial section describing the Natural Resource Management (NRM) Program, to set the scene for the substance of the review. This comprises two main components. The first examines activity during the period 1999-2004. Major areas of interest are water resources

management, the role and significance of socio-economics research, development of a vision for INRM as a whole, and the appropriateness of work on livelihood strategies and poverty. Using the discussion of these as a basis, an assessment is made of the quality of research outputs, their impacts and the efficiency of resource use. The second component turns attention to the future, and discusses how forward visioning and plans consolidate and extend the foundation laid during the review period. Here we comment on the re-formulation of prior themes into integrated Megaprojects, and draw attention to potential difficulties in management, performance assessment, and dissemination to and implementation by the National Agricultural Research Systems (NARSs). Drawing on both prior components, the final section develops some overall conclusions, and makes recommendations for the future management and direction of NRM research.

## **2 The NRM Program at ICARDA**

### *Background and Evolution*

The Natural Resources Management Program (NRMP) of ICARDA was formed in 1997 by the merger of the programs on Pasture, Forage and Livestock Production (PFLP) and Farm Resource Management Program (FRMP).

In 1998 the research program of ICARDA was organized on a project basis consisting of 19 major research projects. The newly formed NRMP was comprised of ten of these projects in the areas of production systems and management, natural resource management, and socio-economics and policy.

The projects as reported in ICARDA's Medium Term Plans were as follows:

#### Production Systems and management

- Project 2.2 Agronomic management
- Project 2.3 Sown pasture and forage production
- Project 2.4 Native pasture and rangeland management
- Project 2.5 Small ruminant production

#### Natural Resources management

- Project 3.1 Water resource management
- Project 3.2 Land management and soil conservation
- Project 3.4 Agroecological characterization

#### Socio-economics and policy

- Project 4.1 Socioeconomics of Natural Resources Management
- Project 4.2 Socioeconomics of production systems
- Project 4.3 Policy and public management research

Each of these projects was led by a Project Manager who was also an active research scientist. Focus areas for research were identified as 1) Rainfed lowlands, 2) Rainfed highlands, 3) Rangelands, and 4) Irrigated areas. Each was further sub-divided according to climate and soil types. The following priority research domains were developed for NRM research; 1) Mixed crop, range and small ruminant systems, 2) Rainfed cropping systems, 3) Conjunctive water use systems (rainfall and irrigation), 4) Fully irrigated cropping systems, and 5) Peri-urban agricultural systems.

An initial set of three integrated research sites were selected to represent combinations of critical NRM problems, important agroecologies and production systems with suitable and willing NARS partners. These were, 1) the Khanasser Valley in Syria, representing a combination of rain-fed and supplemental irrigation cropping with small ruminant production, 2) A set of 5 sites in Egypt, representing mainly full irrigation and high cropping intensities, and 3) Boykozon near Tashkent in Uzbekistan, representing a management system and agroecologies undergoing rapid transition in Central Asia from the former Soviet systems with a combination of full irrigation, rainfed farming systems and transhumant pastoralism.

Results of this exercise were incorporated into ICARDA's Medium Term Plan 1998-2000 with water use efficiency and quality accorded highest priority followed by soil fertility and conservation, sustainable use of natural vegetation and biodiversity.

#### *Development of the Present Research Focus*

Following a change of leadership in 2001, NRMP began to re-formulate a smaller set of thematic project areas as a response to the 1999 EPMP recommendations. After an internal discussion and analyses of issues for drylands a set of four major project themes were identified. These were:

1. Characterization of livelihood strategies and assessment of the implications of land use change;
2. Management strategies and guidelines to prevent land degradation;
3. Management strategies and guidelines for coping with water scarcity;
4. Viable options for diversified crop-livestock systems.

From these analyses, rainfed agricultural systems (including integrated crop-livestock systems) and rangelands were given highest priority amongst the agroecologies and production systems considered. The following set of goal and purpose statements were developed to accompany these themes:

*NRMP Goal:* Improved well-being of the people and strengthened resilience of agro-ecosystems in the dry areas through sustainable management of natural resources.

*NRMP Purpose:* Develop and disseminate resource-conserving technologies, management practices, policy and institutional options and decision

support tools, through research and capacity building partnerships to enhance agricultural production and livelihoods in the dry areas.

### *Present Configuration and Emphasis*

During 2003 and 2004, through discussions at the Center level, these four themes were incorporated into ICARDA's Medium Term Plan for the period 2005-2007. The above themes were transformed into the following Megaprojects in 2005.

- |                |   |
|----------------|---|
| Megaproject 1. | Management of scarce water resources and mitigation of drought.   |
| Megaproject 3. | Improved land management to combat desertification.               |
| Megaproject 4. | Diversification and sustainable improvement of rural livelihoods. |
| Megaproject 5. | Poverty and livelihood analysis.                                  |

### *NRM Staffing*

During the past six years (1999-2004) the annual senior staffing level within the NRM programs have consisted of an average of 15 "P-level" scientists, 8.5 at the research associate level and 2.2 junior professionals. In addition there have been approximately two fellows and 2 associate experts. More recently there have been a couple of post doctoral fellows involved in project research.

A detailed breakdown of senior staff and their disciplines are shown in Annex IV. Numbers and spread of disciplines have not varied greatly over the past six years at the level of senior scientist. However the water group has expanded through consultancies and post-doctoral fellows. The post of natural resources economist was vacant for several years before being filled in 2004. Other areas have remained more or less constant.

## **3 Development of an Integrated Natural Resource Management Vision and Approach**

The challenge faced in the dry areas of the ICARDA mandate region is to maintain and even enhance food supplies for a growing population from a limited natural resource base. Critical pressures arise from limited water and frequent drought, desertification and loss of biodiversity, particularly in zones where arable and pastoral activities are marginal; some of the most acute poverty occurs among people who depend on these fragile ecosystems for their livelihoods. Traditional natural resource sciences are not well-equipped to deal with such problems, and single discipline approaches have more or less failed to cope with their complexity and extent.

The need to develop improved recognition of the need for integration among the diverse range of disciplines represented in the ICARDA group of scientists responsible for this area was clearly articulated by the 4th EPMR. It made a significant recommendation relative to ICARDA's future research strategy in natural resources management as

follows: *Recognizing ICARDA's efforts to consolidate its natural resources management research by merging its former projects into a more integrated program, the Panel recommends that ICARDA, together with appropriate partners, articulate a vision, strategy and an implementation plan for natural resources management, drawing on CGIAR and other experiences and centered on Unified Research Sites most appropriate for its emerging poverty alleviation focus.*

In elaborating on this recommendation, the EPMP further noted that the strategy of working in "integrated research sites" is commendable, and in line with the evolving CGIAR paradigm. They also noted that further studies should include incorporation of the wealth of small farm studies into a GIS format with a view to laying farming systems profiles over the biophysical characteristics of the region. ***Finally they noted that the thematic grouping of projects in the NRMP is not, in itself, an impediment to integrated research*** (emphasis added). They identified three related issues on which ICARDA should focus: careful planning of the implementation of projects in terms of the involvement of mixed disciplines; ensuring that the disciplinary loyalties of individual scientists do not collide with the need for compromises in approaches, objectives and activities that are inherent to multidisciplinary projects and finally, that appropriate criteria should be introduced into the performance evaluation process.

ICARDA has accepted these recommendations and taken actions to implement them. The appointment of a new Program Director in 2001 has been instrumental in achieving progress in this respect. The Program developed a new strategy, logical framework, goal and purpose statements. The strategy was developed taking into account the CGIAR INRM Task Force findings, the NRM strategies of donors and the outcomes of regional priority setting exercises (see the NRMP goal and purposes developed at that time in the previous section).

ICARDA natural resource scientists have had an increasingly prominent and enthusiastic role in developing the Integrated Natural Resource Management (INMR) approach within the CGIAR as a whole, most recently in the organization of the fourth in a series of INRM Taskforce workshops in Aleppo and providing an organizational role in the 6th workshop to be held in Manila in June 2005). This methodological approach aims to simultaneously address issues of environmental sustainability and poverty alleviation. It is based on 11 cornerstones which, broadly, involve grass-roots participation, stakeholder engagement, adaptive learning and cross-discipline methods of working.

Human welfare is at the center of this new approach, but it also recognizes that this must be embedded in the constraint of the ecosystems which people inhabit (poor people are described as being especially reliant on natural ecosystems). It is oriented towards problem solving; the research process starts with identifying and agreeing priorities for solutions among all stakeholders, including producers and communities. Combined efforts across research disciplines then identify best bet options, trade-offs and a final set of practical interventions, and the impacts of these are analyzed at system level before returning to the stakeholders to see what the impact has been. A

toolbox (which includes diagnostic, problem-solving and process tools) supports the overall framework. This is an iterative method which, by returning to the starting point and revisiting the consensus perception of problems, gradually evolves and refines insights into an ever-changing underlying context. The evolving perspective involves researchers as much as the communities with whom they engage, and thus requires acceptance of and interaction with the socially constructed nature of reality, a major shift from standard epistemological approaches.

Many of these themes were apparent in recent research, for instance in the engagement of farmers in marginal rainfed zones in participatory barley breeding, or in analysis of gender relationships in the feminization of agricultural labor. However, the INMR approach represents an attempt to articulate a coherent and practical framework, and the close involvement of ICARDA scientists is one of the central responses to the previous EPMP recommendations.

As such, we assess whether it has been successful according to three key criteria: *the adequacy and appropriateness of the strategic framework for achieving the ICARDA mission for natural resource management; the evidence that development of the approach has had an influence on the elements of research activity in the natural resource management area; and the extent to which practical implementation in the integrated research site is working as a means of testing and developing the integrated approach.*

In essence, ICARDA's goal for natural resource management research is to improve people's well-being and strengthened resilience of agro-ecosystems in the dry areas through sustainable management of natural resources. It seeks to achieve this by promoting resource conservation and at the same time enhanced farm output and livelihoods, which clearly correspond to issues raised earlier in this sub-section.

Development of the approach is ambitious and consequently time-consuming; therefore progress in its implementation has been limited. It is recognized by ICARDA and its collaborators that the approach is under continuing development. In collaboration with NARSs, new benchmark sites utilizing the principles of INRM approach and selected with the support of advanced GIS techniques are being established. Since 2001 the program has been adapting the CGIAR-INRM approach to its main integrated research site (IRS) in Syria, the Khanasser Valley with the participation of the Jebel al-Hoss Development with UNDP, FAO, Atomic Energy Agency of Syria, the Olive Bureau, Syrian research and extension services, the University of Bonn, Germany and local communities. Similar efforts are being made in the IRS in Boyzokon, Uzbekistan and in Morocco with the national program INRA.

Particular aspects of the INRM approach that have been incorporated into most NRMP project submissions from 2002 onwards include participatory action research, application of the sustainable livelihoods framework and a more integrative cross-disciplinary approach. Examples of successfully funded projects that include these are:

1. The Community-based optimization of the management of scarce water resources in agriculture in West Asia and North Africa.
2. The Water for Food Challenge Program projects on a) Improving on-farm water productivity in the Karkheh River basin and b) Livelihood Resilience in upper catchments.
3. The communal management and optimization of mechanized microcatchment water harvesting for combating desertification in the East Mediterranean region.
4. The development of an Integrated Natural Resources Management Framework for Sustainable Agriculture in Central Morocco

This development of the International Public Good dimension requires some comment. There have been some difficulties in achieving success even with the resources at the disposal of an International Scientific Center, and thus the learning costs involved when replicated by NARSs might be anticipated to be equally or more significant. Those costs, scaled up by the number of communities involved and the timeframe required for its general implementation through the mandate region, should be taken into account when evaluating the project, and compared with opportunity costs of conventional approaches. Therefore, appropriate *ex post* impact assessment is of considerable importance, but is still under development; the CGIAR Taskforce document on INRM<sup>1</sup> notes the difficulties involved in this are difficulties in accurately assessing baselines or counterfactuals, the length of time over which effects will be felt, and complex cause-effect relationships.

Nevertheless, the approach has been developed in outline, and with appropriate partners the leading role played by ICARDA natural resource scientists has been important and valuable. It has also initiated a long term process of cultural change, currently at leadership level in CGIAR programs but with prospects of further permeation among a wider group of scientists and into NARSs and across extension and local and regional government administrators. There is evidence that parallel research programs in ICARDA are incorporating ideas from the new approach, and although currently limited, could in subsequent iterations begin to have greater impact.

Integrated Natural Resource Management, as noted earlier, is being implemented in practical terms in the Khanasser Valley integrated research site. There is clear evidence that exposure to conditions on the ground is having a salutary effect in terms of re-orienting research practice, although not always in ways anticipated. Work in the integrated research site has been in existence for some years, and in 2001 this was reformulated to provide an integration of inputs to achieve sustainable and productive use of land and water. A clear impact of development of the INMR approach can be seen in the adjustments in project approach adopted in 2002, where a focus on livelihoods and poverty became the primary aim, and involved new emphases on participation and transferability (for example, formation of farmer interest groups, or livelihood characterization studies). This demonstrates the impact in terms of adaptive learning among ICARDA staff.

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<sup>1</sup> Interim Science Council (2003): *Research Towards Integrated Natural Resources Management*. Rome: CGIAR.

One major concern, however, is that funding for this project is only in the short term, from a variety of sources, and that lessons from this kind of engagement only materialize (equally in the research staff and the communities involved) after a significant accumulation of time. This point also emerged from the Bonn University evaluation of the overall project;<sup>2</sup> whilst broadly encouraging, it noted that extra effort is required in making knowledge acquired explicit, and to find ways to internalize management of system-wide processes to cut down on costs of outscaling the approach. This requires new resources, especially expertise in the qualitative assessment of impact to help to deepen the insights achieved in a longer term (perhaps core-funded) application of effort.

In addition to these changes and partially in response to the recommendation from the 2003 CCER on "Outreach" at ICARDA that a detailed review of the breakdown of its research agenda be undertaken with the purpose of re-formulating the 19 medium-term 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, ICARDA has consolidated the 19 projects in the portfolio to six integrated Megaprojects. This realignment of project focus was completed in September 2004 and the new model implemented at the beginning of January 2005. One of the aims of the reconfiguration was to ensure that efforts to formulate projects are integrated from the beginning. A second outcome of restructuring the project "portfolio" along the themes of the six megaprojects is that they represent ICARDA's "window" to the external environment. In other words they present to the "world" how ICARDA wants to be known for its expertise and success in these areas.

During 2003 and 2004, through discussions at the Center level, the four NRM themes were incorporated into ICARDA's Medium Term Plan for the period 2005-2007. The themes became the Mega projects described on page 7 above in January 2005.

This realignment of projects seems appropriate in light of the on-going development of the CGIAR-wide approach to Integrated Resources Management. Some have expressed concern, however, that the realignment might actually discourage integration. Given the strong desire of ICARDA scientists to interact collaboratively, this is not likely. *However, since most project funding will actually come from "special projects" which cut across megaprojects, it is important that "reporting lines" and "management lines" coincide to avoid confusion.*

Suggestions for development of the Integrated Natural Resource Management approach include economic, methodological and qualitative refinements. More explicit incorporation of economic assessment in *ex ante* and *ex post* evaluations is needed. Although ecosystems are fairly self-contained with respect to natural resource flows, social interactions take place over wider spatial scales and are considerably more fluid. A consequence of this is that, for example, other market activities which provide

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<sup>2</sup> Baur, H. (2005): Review of the project "An integrated approach to sustainable land management in dry areas". Mimeo, Bonn University.

opportunities for seasonal migration or out of eco-regional product sales and purchases might be taken explicitly into account. As poverty alleviation is a primary target, some system-level summation, taking into account spill-over impacts of direct interventions could, for example, come from Social Accounting Matrix models. In principle, these can identify the monetary impacts on different types of household, grouped by income, livelihood strategy or other relevant classifications. They can also be extended to cover environmental as well as financial stocks and flows.

The emphasis on observation at ecosystem or bioregion, reflecting diversity, is an important departure from rule-generating procedures which generalize across cases. Nevertheless, emphasis on integrated research sites still needs to be tested for robustness, and comparative case study analysis involving a search for contrast (in the jargon of qualitative evaluation, a “search for disconfirming evidence”) could improve the generalizability of insights. Equally, the stress on participation requires some caution to be exercised to avoid self-selection bias among participants; although gender is a recognized issue in past ICARDA research, there will often be a need to take other variations in resources and influence that need to be taken into account.

#### **4 Water Resources Management, Land Management and Soil Conservation**

##### *Water Resources Management:*

The following comments apply primarily to what was formerly project 3.1, which has now been largely incorporated into Megaproject 1.

The 4th EPMR recommended that ICARDA *place more emphasis on strategic issues of water use/allocation and management at rural community level, and that it join in strategic partnerships to carry out this work.*

In elaborating on this recommendation, the report further suggests that some fruitful areas for work could include, among other things, the use of marginal waters and saline land for the production of forage and a focus on water harvesting including design of long-term programs with NARSs for water harvesting. Additionally, the report suggested identifying “hot spots” in CWANA where reallocation of water resources and/or land use changes will most probably appear and where “case studies” can be developed which can be used to identify strategies or technologies to help farmers in similarly affected locations throughout the region deal effectively with similar issues and problems.

ICARDA has accepted the recommendation and has implemented a number of projects which incorporate many of the suggestions. However, it should be noted that response to this recommendation did not mean an immediate shift in all that ICARDA does in the water area as effective response is inevitably linked to initiation of new projects.

For example, the project, *“Community-based optimization of the management of scarce water resources in agriculture in west Asia and north Africa”* short title “Water

*Benchmarks of CWANA*”, has been initiated at sites in three different countries within CWANA; Morocco, Egypt and Jordan. Each of the sites represents a different “benchmark” environment. Thus the Moroccan site is representative of a rainfed farming location where supplemental irrigation can be utilized, the Egyptian site is representative of an irrigated farming system where marginal waters in the form of recycled drainage water with an increased level of salinity is utilized, and the Jordanian site is representative of agriculture in the steppe or Badia where water harvesting is the primary means available for enhancing production. Each of these benchmark types are further elaborated by satellite sites. Thus rainfed satellites are found in Algeria, Syria and Tunisia; Irrigation satellite sites are found in Iraq and Sudan and Badia satellites are located in Libya and Saudi Arabia. These satellite sites offer further opportunities to investigate and evaluate aspects of water resources not available at the primary sites. For example, the Algerian site makes use of treated sewage water for supplemental irrigation. The project was initiated in 2003 for 4 years and funded equally by the Arab Fund for Social and Economic Development and the International Fund for Agricultural Development. The project uses the participatory research approach at the community level to research ways of improving the productivity of water in agriculture in the benchmark and satellite environments. The project has been implemented using an integrated approach with consideration given to technical, economical, institutional and policy issues, and is carried out on site primarily by the NARSs in each of the countries. Additional partnerships involve the International Center for Advanced Mediterranean Agronomic Studies (CIHEAM) and several other Advanced Research Institutions (ARIs).

Additional projects undertaken since the EPMR have also incorporated the suggestions. These include the Challenge Program, Water-for-food project “Improving On-farm Agricultural Water Productivity in the Karkheh River Basin (KRB)” which was developed together with the project “Livelihoods resilience in Karkheh basin”. These projects were initiated in 2004 and are being carried out through the NARSs in Iran with additional support and collaboration from the University of California-Davis, IWMI, IRRRI and CIAT. This project is indicative of how ICARDA has formed and utilized strategic partnerships to carry out its work. The project “Communal Management and Optimization of Mechanized Microcatchment Water Harvesting for Combating Desertification in the East Mediterranean Region” or short title “The Vallerani Project” which was started in 2004 is another example of recently implemented NRMP water-related projects which incorporate the EPRM suggestions noted above. The objective of the project is improved livelihoods and reduced desertification in the marginal steppe areas of Syria and Jordan. It is carried out through partnerships with NARSs of Syria and Jordan and ARIs in Switzerland. Projects in Central Asia have also been implemented which incorporate the EPMR recommendations.

It is clear to the review panel that ICARDA has incorporated the recommendations of the EPMR into its research and development activities as they relate to Integrated Natural Resources Management. Projects which have been developed and implemented within the past three to four years have indeed placed more emphasis on strategic issues of water use/allocation and management at the rural level. They have also developed and utilized relevant strategic partnerships with NARSs, ARIs and with

other CGIAR Centers. *The panel encourages ICARDA to continue to follow this approach as they transition to the new alignment of projects under the "Megaproject" model.*

Given the certainty of water scarcity throughout the CWANA region and the increased competition amongst alternative users for this scarce resource, ICARDA has an opportunity to take the lead in the increasingly important area of the re-use of wastewater for irrigation. Policies and technologies for the use of such waters have not been well-defined in much of the region and, in many cases; this may be the only source of water available for irrigation or supplemental irrigation. ***Thus the panel recommends that ICARDA continue and intensify its research to better utilize wastewater as a source of water for irrigation.***

#### *Land Management and Soil Conservation*

The Land Management and Soil Conservation program which was formerly project 3.2 has now been largely incorporated into Megaproject 3, Improved Land Management to Combat Desertification. Neither the EPMP nor the CCER on "Outreach" mentioned specific recommendations relative to Land Management and Soil Conservation.

The scientists within this group are involved in Integrated Natural Resources Management in several projects including the Khanasser Integrated Research Site in Syria, the Karkheh 'Water for Food' Challenge Program Project in Iran and two projects in Morocco, Conservation Tillage and Mountain Agriculture.

An integrated, multi-scale research approach for land degradation assessment and problem solving has been developed. Additionally some simple land degradation assessment tools have been developed and utilized.

Research within this project area (now MP3) appears to be well defined and productive. More focus on upscaling and outscaling should move results to practice and impacts on policy. The panel encourages ICARDA to continue to focus on upscaling and outscaling of outputs from MP3, as well as from the other projects.

## **5 Diversification and Rural Livelihoods**

In the reorganized NRM Program, nearly one third of the research is classified as work on improving farming systems to improve the livelihoods of the poor.

Throughout the CWANA region, these systems vary enormously. This variation reflects mainly the response to climate and water availability and spans the spectrum from marginal rangeland to intensive irrigated systems.

In general, the more intensive the pattern of land use, the more scope there is for improvement in productivity. In the less intensive systems, attempts to alter present patterns frequently increase risk to unacceptable levels. While the poverty of people is

often greater in the more marginal areas, the numbers of poor people affected by low productivity is greater in the more intensive cropping areas.

ICARDA's Program covers this spectrum of systems – but thinly. Just 2 senior positions are directed at cropping systems, 2 on native pasture and rangeland, and 1.5 on livestock.

We were informed that the area where most progress has been made in improving productivity of farming systems in the region is in the more intensive cereal production, particularly wheat. The opportunities for further improvement in barley and food and forage legumes remain great. In particular, the development of more effective combinations of crop and animal enterprises on farm, and also involving improved complementarity between farms, seems to offer unexploited potential.

This is recognized in the present Program. The theme of better rotations, particularly involving food and fodder legumes, is well researched, but should hold further potential. The role of livestock, primarily sheep, integrated with cropping systems, is also one with considerable possibilities for further development. We were impressed by the examples presented in the Khanasser area of sheep fattening and cheese production.

The livestock element in these farming systems has received insufficient attention in the past, considering that it is the source of more than half of farm income on many nominally cropping systems. It also has unacknowledged social impacts, providing financial buffering in an insecure world, work and income opportunities for women, and often a steadier flow of income than crop production.

In more marginal areas, livestock are the source of all of the income of farmers, and the management of the ecosystem is essentially a function of the animal management regime. For both of these reasons, increased emphasis on the livestock resource is justified.

## **6 The Quality of Social Science Research on Poverty and Livelihood Issues**

Rural livelihoods in dry marginal areas are characterized by a range of diverse economic, social and cultural constraints, among others. Some of these constraints are structural and complex but nevertheless can be identified and adequately measured: these include a lack of resources, especially capital and other assets. Others, however, are likely to reflect intertwined processes of social change and are not easily studied or measured: these include changes in family structure, community power structure, local institutions, prevailing value systems and norms. Knowledge and technology should provide better ways of understanding and improving livelihood systems. More specifically, in the context of the dry areas, the role of social science research is to enhance understanding of these phenomena.

ICARDA has chosen to develop and integrate social science research in order to better serve its stakeholders. The social science research agenda at ICARDA is carried out by relatively few qualified scientists with different competence profiles. Particular expertise exists in livelihoods and poverty analysis; economics and market studies; adoption and impact studies; and gender research. Most, if not all, ICARDA social scientists have gone through a long process of interaction with other biological and natural scientists, inside and outside the Center. At the present time, there is a core of lead scientists who are well qualified to undertake the research agenda to completion, provided that there is a clear division of labor and responsibility. Their ability to fully cover the various social, cultural, and policy dimensions (whether in technology development, testing and impact assessment or understanding of the global policy and institutional implications of technological change) will depend on the time they allocate to this research, compared with calls on their expertise.

This section of the review considers the continuing evolution of research quality and assesses its strategic direction. The 4th EPMR examined social science research in ICARDA with particular critical attention, and made a number of far-reaching recommendations. It pointed to a lack of a clearly articulated research agenda. Despite considerable volumes of research activity, methods used were not innovative, outputs were uncompleted or delayed, and their representation in high quality journal publications was meager. A lack of focus on characterization of socio-economic structures suggested that the representativeness of (primarily) on-farm research and its implications for policy and implementation could not be clearly assessed.

It called for a refocusing of social science to concentrate on fewer issues, and increased cooperative arrangements with other institutions, in order to improve the quality of outputs. It advised greater use of participatory methods, diagnostic techniques to focus on priority problems, trialing in integrated research sites, an emphasis on policy implementation, more integration with other areas of research in ICARDA, and strengthened links with member states in the mandate region. In line with developments in the CGIAR, it also suggested that the refocusing should be in the direction of constraints to rural livelihoods improvement, formulation of livelihood options for the rural poor, and their enumeration in a form which could be taken up by stakeholders from individual and family level up to policymaking by national governments.

Furthermore, ICARDA's mission has recently been affected by a period of substantial change, globally, regionally, and at country level. It has had to respond to millennium development goals, particularly those related to poverty and environment, and consequent changes in the CGIAR agenda. It has also had to respond to priorities of its immediate clients, the NARSs in the CWANA region (with whom a very long process of priority setting has been accomplished), and the demands of donor stakeholders. These overlap with, but are not identical to, the suggestions for reorientation made in the EPMR.

### *Social science research quality*

In the period under review (1999-2004), the Natural Resource Management (NRM) Program was divided into three thematic groups, one of which was specifically socio-economic in orientation. This group provides inputs across the range of ICARDA activities, and some socio-economists work on specific areas external to the NRM area, such as in Seed Economics.

Improved focus has been achieved by concentrating effort on key areas: studies of the adoption and impact of ICARDA's research outputs on productivity improvement, income generation and natural resource management; valuation studies of natural resource use by rural communities, and analysis of impact of NRM research on rural livelihoods; rural livelihoods and poverty analysis, specifically including gender and nutritional dimensions of poverty, constraints on resource access and income opportunities and their role in poverty alleviation; and policy and institutional analysis concerning natural resources management, particularly water and rangelands, to extend livelihood options for the rural poor. Combinations of economic and biophysical information in spatial databases have contributed to progress in identifying and exploring issues of major concern.

This has been further sharpened by development of the Integrated Natural Resource Management approach, in which socio-economic researchers have played a leading role, and its implementation in the Khanasser Valley Integrated Research Site. The latter has been instrumental in developing closer engagement with researchers elsewhere in ICARDA, supporting greater use of participatory methods in overall research approaches, and through overlays of complementary, targeted interventions, synergies are increasing the nature of insights that are being achieved. Research personnel in disciplinary areas outside of socio-economics value this refocused contribution. Initial coverage of new work in the series of Annual Reports of the NRM Program provides confirmation that integration between approaches of social and life sciences is greater and that priorities have been realigned towards the main objectives of donors for dissemination of pro-poor innovations that involve diversification and value addition linked to market opportunities, and contribute to counteraction of environmental degradation.

However, in consequence there is a huge demand on social scientists, individually and collectively, to support the work of ICARDA as a whole, and also conduct workshops training courses, in addition to developing a coherent set of social science research activity. The plethora of audiences that social scientists at ICARDA must respond to makes it all the more difficult for individual scientists to respond promptly to the demand.

In general, the social science group has responded well to the challenges, although some researchers have been more productive than others in terms of standard scientific productivity. Outputs have been extensive, with a variety of documents and reports in different formats and in different languages in order to serve their diverse audiences. There are also conference contributions and papers in proceedings, and chapters in books (often in collaboration with researchers outside the socio-economics group, or in

other CGIAR Centers); among these are some publications of significant value, which will be utilized widely in the international research and extension community. However, across the evaluation period, and in comparison with norms across CGIAR Centers as a whole, refereed journal outputs are low, and few yet reflect the change in approach outlined earlier.

The response lag between EPMR recommendations and their impact is inevitable, for two main reasons. Firstly, because of the degree of re-orientation required, changes have taken time to bed down, and it is only recently that sufficient output of a quality suitable for publication has accumulated. There are a number of journal articles currently in the process of peer review, and to some extent, the higher the quality of journal targeted, the longer the lag between submission and publication will be. Nevertheless, there is a need to support and enhance overall capacity for production of higher level quality output, in addition to monitoring progress on refereed journal publication to ensure that this momentum continues.

That leads to the second and more important reason. There has been considerable delay in appointing a lead social scientist (a prominent recommendation of the EPMR) to provide the necessary momentum, because ICARDA only found a scientist of sufficient caliber on the third round of advertisement. This has exacerbated the bottleneck caused by the imbalance between the relatively few members of socio-economic staff and the high expectations of them. As noted, they support work across disciplines as well as developing a distinct research identity of their own. Their strategic response to the research workload on senior scientists includes a clear division of labor among group members, the attraction of graduate students, post doctoral fellows and joint appointments, and building partnerships. Effective interaction among socio-economists has provided another means of increasing group efficiency in the face of increasing demands for contributions to the different research areas. Even though the socio-economists themselves feel that they can respond to the challenges this poses, there could be potential for much greater impact with a modest increase in resources. Further, because of the diminishing proportion of unrestricted funding in their overall budget, senior socio-economists are on a treadmill whereby the success in attracting projects involving restricted grant funding, necessary to cover the range of their remit, requires more supervision of the junior researchers who carry them out.

One possible solution to this problem could be to explicitly build the time necessary for dissemination in the form of journal articles into the costing of grant applications. Another could be to negotiate with those commissioning the research to provide deliverables which are in the same length and style of journal articles, and avoid the extended report stage altogether. Either would need to secure the understanding and concurrence of sponsors. Strengthening the group with skilled support staff along with capacity enhancement among the senior scientists themselves could also be instrumental in improving performance and output, particularly in terms of increased publications.

### *Research on livelihoods*

Social science research examining rural livelihoods and poverty analysis in ICARDA has only relatively recently been established. Despite this, following a comprehensive review of approaches, several studies have been completed in which key constraints have been identified with technical as well as institutional and policy options identified and evaluated. There have been some successful (and also a few less successful) case studies which provide clear insights, resting on the social science contribution, that have been instrumental in addressing the complexity of pathways out of poverty. A wide range of potential interventions, including added value products, the use of micro credit, and adoption of appropriate management technologies are currently under scrutiny in different benchmark sites.

Research on livelihoods has come to represent the pivotal pillar of social science at ICARDA. Most importantly, both quantitative and qualitative research is carried out to build better understanding of rural livelihoods strategies and their improvement. As noted at several points earlier, economic, social, and policy options have been incorporated in the research agenda through the Khanasser Valley integrated research sites, and at other benchmark sites in different countries within the CWANA region. Participating in conferences and workshops on livelihoods analysis methodologies has allowed ICARDA social science research to learn from worldwide international development of new approaches and methodologies. Gender research is recognized as a necessary dimension of the work and is increasingly given appropriate attention. The focus on specific research themes provides opportunity for addressing gender-based researchable questions and hypotheses, and the selection of appropriate methods to investigate them. Gender research on particular niches, such as cheese making and food processing among others, are already being pursued by ICARDA socio-economists.

Thus, the new structure also promotes establishment of a favorable environment in which the group members can undertake quality social science research with appropriate methodologies. There are, however, further bottlenecks to be faced. This includes securing the appropriate manpower with the required expertise, and securing funds for addressing the kinds of socioeconomic, policy and gender issues that are of relevance to different end users. Often, these funds come with their own constraints. Greater collaboration in research project proposals with agricultural science and natural resource management colleagues could attract more funds to finance some of the social research agenda. With respect to the gender component, the emerging interest in Civil Society in rural areas provides an opportunity to create synergies for mutual benefit to be derived from gender sensitive research.

### *Assessment*

The current nature of social science at ICARDA indicates optimism. Individual social scientists do not display the disfunctionality common among social scientists in natural science-dominated environments. They perceive themselves as having a key role to

play in the NRM Program and in the Center as a whole. This role has been attained through a great deal of hard work, persuasion and mutual learning and is exemplified by intense involvement in development of future research strategies and commitment to the goals of individual projects.

The first round of impacts on collaborating NARSs indicates that the change in strategy has been worthwhile. Integrated, participatory methods are beginning to be taken up, supported by training and through the demonstration effect of the Khanasser Valley Integrated Research Site. Further benchmark sites outside Syria have been established with the support of NARSs (similar to the INRM approach deployed in the Khanasser Valley, although not involving the whole range of interventions). It is far too early to say whether these benchmark sites will have the same catalytic role in promoting integrated cross-disciplinary working in member countries. More fundamentally, the value of the investigative process as a whole needs to be carefully evaluated from the point of view of the ultimate beneficiaries. The multifaceted nature of interventions requires a departure from traditional one-dimensional impact assessment techniques, with greater reliance on interpretative approaches in support of quantitative evaluation.

In summary, recommendations by the EPMR have had an effect on socio-economic research. The challenge they set has provided a stimulus to research staff to improve the quality and orientation of output. They have focused on fewer, more relevant issues, and together with greater collaboration and promotion of participatory research methods, have increased the efficiency of use of expertise in this area. Two more joint appointments with other CGIAR Centers have been made (with ILRI and IFPRI) which have potential to increase cross-fertilization of ideas and add impetus. Similar arrangements have been made with CIRAD France. However, improved quality of output has not been achieved and must be the focus of greater attention in the future. It can therefore be concluded that i) ICARDA has the capacity to carry out high quality work on the economic, social and policy dimensions of rural livelihoods improvement and identifying potential pathways out of poverty in the ICARDA's mandate areas; but ii) with senior socio-economic staff in short supply, there is concern that resources devoted to the area are insufficient.

Recognizing the increasing demands on social research to i) achieve its specific agenda as exemplified in Megaproject 5, with its inherent challenges, ii) to contribute to other Megaprojects, and iii) to participate in most of ICARDA's other undertakings, **the panel recommends that a critical mass of social science researchers with required competence profiles (institutions, policy and gender, among others) must be secured to allow timely delivery, continuity, and high quality output.**

## **7 Overall Quality and International Standards of the NRM Program**

The primary output of ICARDA's research is new knowledge. This will generally be in the form of modest extension or confirmation of the existing body of knowledge in the

field. Less often, though equally valuably, it will challenge or contradict existing knowledge.

For new knowledge to be useful, it must first be reliable, that is it must be free of error. This requirement is crucial. Erroneous information is not just a waste of the resources involved. It is in fact a subtraction from the body of knowledge. Bad information is worse than no information.

To ensure that results are error free, ICARDA's researchers conduct their studies to the highest standards of professional competence. For the users of these results, these standards are guaranteed by independent, and usually anonymous, peer review - in effect, by acceptance and publication in a peer reviewed journal. The normal reviewing process depends critically on the evaluation of the results against the background variability inherent in all studies, and the use of this contrast to calculate the probability of error. This form of screening and publication is in fact the quality control phase of the production of new knowledge.

Publication in a peer reviewed journal is thus the primary measure of the reliability, and hence of the quality, of research. The process provides the best guarantee that the results are:

- New, and not simply a repetition of existing knowledge.
- The outcome of correct methodology, whether in laboratory methods, experimental design, appropriate analysis or other respects.
- Properly interpreted, and that the interpretations are set in the context of existing work in the field.

The system is not perfect. Editors and reviewers may make errors of judgment. Some journals have more rigorous standards than others. It is possible for some scientists to record larger numbers of journal papers by judicious subdivision of work. Some lines of research lead inherently to fewer publications than others. The numbers alone are therefore an insufficient measure of the productivity of quality research.

Furthermore, this quality control system is more clearly suitable for some kinds of research than for others. The more the work conforms to classic designed experimentation, the more appropriate the system is. Research with multiple objectives and research where the objectives or measurements are less precisely defined, or where the background variability is not known, may be difficult to evaluate using this framework. This is particularly the case with research in the social sciences, and with participatory research.

All of these caveats confirm the reality that the number of journal articles is less than the full story on evaluation of the output of quality research. Considerable informed judgment is also required.

Over the period 1999 to 2004, the NRM grouping has had approximately 15 senior scientists and a similar number of more junior colleagues in each year. The senior (P level) scientists carry the main responsibility for publication of the results of research. With all its qualifications, the standard first measure of primary research output is the number of journal articles (refereed publications) per senior scientist. On this measure, ICARDA with 1.84 journal papers per scientist per year ranks 10th among the 15 CGIAR Centers. Within ICARDA, the NRM group had an average of 0.8 for the past five years. This is an improvement on the figure of 0.5 for the preceding five years, but is still a cause for serious concern.

In any program of research for development, primary refereed publication is normally a small part of the total output. The same work can and should be exposed to challenge in professional conferences, and should be presented in non-technical terms to the full spectrum of potential users and beneficiaries. This secondary use of research results is as important as the primary publication, and this must be acknowledged in any evaluation of the program.

The recorded output of the NRM group for the five years 1999-2004 shows 409 such items. This represents an output of about 6.5 secondary uses for each primary publication, and indicates a high level of effort to bring the results of research into practice.

## **8 Relevance of the ICARDA Natural Resources Management Program**

The Center's efforts to ensure the relevance of its NRM program and socioeconomic to the CGIAR goals and to NARSs research needs are commendable. On one hand, the primary impetus behind continuous changes and realignments within ICARDA comes from shifts in the global CG research agenda and goals. ICARDA has effectively re-shaped its research agenda to be strongly relevant and in harmony with the new CGIAR research priorities. The latter include among others, 1) the sustainable and equitable management and intensification of water and land resources, 2) the provision of affordable, adequate, and nutritious food supply through genetic improvement, 3) income enhancement through agricultural diversification and value-addition linking the poor to markets, 4) policy improvements, institutional innovations and capacity strengthening to support sustainable reduction of poverty and hunger. A quick glimpse at the six Mega Projects confirms their consistent and coherent focus with the CGIAR priorities.

On the other hand, not only has ICARDA been working and collaborating with NARSs within its mandate region, but it facilitated and implemented a two year (2001-2002) bottom-up innovative and intensively monitored process directed to setting the research priorities for the CWANA region. The process was carried out in response to the CGIAR plank regarding the Regional Approach to Research.

Initially, sub regional organizations (SRO), namely the Association of Agricultural Research Institutions of the Near East and North Africa (AARINENA) and Central Asia and Caucasus NARS Forum (CACAARI) were supposed to take the lead role throughout the process while ICARDA was supposed to play a catalytic role. However, in implementing the exercise, ICARDA became the leading agent because the two SROs faced difficulties with respect to their status of “recognized regional authorities”.<sup>3</sup>

More importantly, ICARDA involved all the key stakeholders of the CWANA region including the “non- traditional” actors such as farmers, NGOs, and grassroots organizations. The driving force behind the efforts deployed was the creation of the right conditions and the enabling environment for the identification of regional priorities that are effectively reflective of the research needs of the region and are relevant to regional stakeholders’ priority areas. As stated in the report on the exercise, “Given that the increasing focus on natural resource management is a common trend in the region (CWANA), it is essential that it be clearly reflected in the regional research priorities and the associated *modus operandi*”.<sup>4</sup>

## 9 Future Directions of the NRM Program: Themes, Priorities and Adequacy

### *General Observations*

ICARDA, in common with the other CG Centers, is tasked to respond to its mission by the generation of new knowledge, and by the effective transfer of that knowledge to the benefit of end users. The first part of this agenda is relatively well defined, well within the competence of trained scientists, and the output is generally made available as a public good. The second part is an unbounded challenge – the limits are set only by the resources deployable.

In a change of strategy designed to deliver more effective targeting of research investment and more effective uptake of results, the Centers are now expected to integrate their research more closely with the economic and social objectives of their clients. In responding to these expectations there is an inevitable tradeoff between the tight professional control needed to deliver results of high quality and reliability, and the broader reach of work which must simultaneously accommodate the multiple dimensions of its ultimate client base.

This is to restate, not to resolve, a dilemma that faces all CG Centers. Staff, management, board, donors and beneficiaries all must make judgments on the appropriate balance between generating new knowledge and ensuring its impact in

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<sup>3</sup> Belaid, A.; M. Solh; and A. Mazid. Setting Agricultural Research Priorities for the Central and West Asia and North Africa Region. ICARDA, September 2003.

<sup>4</sup> Ibid.

practice. The new CG strategy reinforces the importance of research for development as opposed to Center programs towards delivery of development (<http://www.sciencecouncil.cgiar.org/activities/spps/pubs/RP0515.pdf> ).

This emphasis can be put in a wider context. The 2003 budget of the CG system was about \$400m. The total for global official development assistance was \$68bn. Thus the proportion of the external investment in the development of poorer countries and people that is devoted to exploring better ways of managing their agricultural resources is less than 1%. In a development role, the Centers are in danger of duplicating the role of the many specialized international development agencies. Use of their limited capacity in this area must therefore be targeted with care, and with a maximum degree of cooperation with national and international partners.

Within the context of the new strategy, we believe that ICARDA in its NRM program should continue to seek themes and opportunities that maximize its output of new, relevant and useful knowledge. At the same time, it should integrate the research as fully as possible with the world and lives of those for whom it is intended.

[Numerous formal studies have shown that the global return on investment in agricultural research is strongly positive. Each senior scientist in ICARDA is responsible, on average, for expenditure of more than \$0.5m per year (and in the INRM program, over \$0.8m). There is a corresponding responsibility to ensure that commensurable benefits accrue to society].

We are asked to comment on the "appropriateness of the current research themes and priorities", and on "future directions of the program particularly in relation to the CG-wide approach to INRM". We are also asked to look beyond the present program at whether "current and likely future scenarios are adequately being addressed by the NRM program for the CWANA region".

Since these three requirements are closely linked, we treat them in sequence in this section.

#### *The current program*

The current program is thoroughly documented in the materials we have received. It is most easily described in the groupings in which it has been managed.

The INRM program accounts for 14.5 senior scientists out of ICARDA's complement of 45, and its cost is over \$14m, or nearly 50% of ICARDA's total. It thus shares responsibility for delivery across the full range of ICARDA's mandate; breeding, biodiversity and seed system work, which are not part of the NRMP, make up the remainder of the Center's effort.

<b>Area</b>	<b>Senior Scientists</b>	<b>Budget 2003</b>
Agronomic management	1	2.19
Sown pasture + forage production	1	0.95
Native pasture + rangeland production	2	1.43
Small ruminant production	1.5	1.89
Water resource management	2.5	3.88
Land management + soil conservation	2	0.98
Agroecological characterization	1	0.72
Socioeconomics of NRM	1	0.47
Socioeconomics of agricultural production systems	1	1.39
Policy and public management research	0.5	0.40

The appropriateness of the current research themes and priorities in NRMP can be evaluated against the challenges which constitute ICARDA's mandate.

Broadly, the current (2004) program addresses the improvement of production systems (45% of its effort), better water and land management (39%) and socioeconomic and policy issues (16%). These themes are today, as they have been since ICARDA's establishment, relevant and appropriate to its mandate. In our review of the individual projects, there were none that are not germane to these themes.

This general endorsement of the direction and balance of the program does not mean that its management, renewal or productivity cannot be improved. We comment elsewhere that, broadly, the output of fully validated (i.e. refereed and published) results in less than half that might reasonably be expected.

Many more projects could benefit from involvement of colleagues with expertise in economics or sociology. Some projects are of necessity driven by donor interest, and may therefore not be broadly focused. There seemed to be too little strategic analysis of projects in their wider economic or ecosystem context.

It is difficult to reduce these comments to specific recommendations, other than to point out that they will vary from project to project and are essentially management issues.

It should also be pointed out that ICARDA scientists have, in addition to their mainstream work, also to respond to an exceptionally large amount of reporting to multiple donors, interaction with multiple clients, preparation of grant applications and other requirements that are part of working in an international center.

*Future directions*

The intended future directions are spelled out in the Medium-Term Plan. This regroups the work into six Megaprojects (MPs). We have commented earlier on the difficulties we have encountered in reconciling the new classifications with the old.

The NRMP is dispersed across these six MPs, making it very difficult to identify the resources which will be specific to NRM as now defined. We therefore cannot comment on where any shift of resources is intended. What is clear is that the outputs are to be targeted and described differently. In assessing the future directions, we have looked at the balance of effort as proposed over the six MPs over the coming years.

The MTP 2005-07 shows the following allocation:

<b>Megaproject</b>	<b>Description</b>	<b>Percent of budget</b>
MP1	Water/drought	13.0
MP2	Gene management/biodiversity	30.4
MP3	Land management/desertification	7.6
MP4	Diversification/rural livelihoods	28.3
MP5	Poverty+ livelihood analysis	6.2
MP6	Knowledge management/dissemination	13.7
CAC	Central Asia/Caucasus	0.6

*Source: Medium Term Plan 2005-2007, p. 16*

The principal change is the allocation of specific resources to economic and social studies (MP5) targeted on the poor. The explicit intention is that these will be closely linked to the other INRM areas and will steer the whole program more purposefully to the benefit of the disadvantaged. We fully endorse this initiative. As a proportion of total resources the commitment is modest, but if suitable staff provision is made it should be sufficient to achieve the reorientation sought.

The provision for knowledge management and outreach has also been increased significantly. This is also appropriate. Both of these changes are a reasonable response to the CGIAR-wide approach to INRM.

*Current and Future Scenarios*

Beyond the immediate program and plan for ICARDA's INRM, we are asked to look at whether additional areas of relevance and concern are adequately addressed. The following is a provisional list:

Water:

- Use of waste water
- Use of salty water
- Mapping + monitoring of water resources + use at regional level

- Policy issues in water management, including pricing strategies

Urbanization:

- Peri-urban dairy production and integration with forage producing areas (collaboration with ILRI).

Ownership/capital:

- Study of the changing pattern of capital in agriculture – particularly the effect of external capital and ownership of animals, feed, intermediate goods.

Transport:

- Analysis of the effect of increasing use of transport on interaction between range areas, feed supplies, increment of feed and annuals.

Environment:

- Search for ways to mitigate the deterioration of the peri-urban and rural environment (use of phosphogypsum is a current example).

Benchmark study:

- ICARDA was set up in 1977 following a study of the state of agriculture and society in the WANA countries. A repeat of that study is proposed (a) to estimate change, including indirectly the impact of ICARDA technologies, in agricultural productivity (b) to identify the significant new challenges that have emerged, and (c) to provide a baseline for ICARDA's future programs.

## **10. Major Conclusions and Recommendations**

*Observations:*

1. Measures need to be considered for reducing the burden of reporting on socio-economists, and providing greater opportunities to concentrate on publication in refereed journals.
2. Work in Land Management and Soil Conservation appears to be well defined and productive. More focus on upscaling and outscaling should move results to practice and impacts on policy. The panel encourages ICARDA continue to focus on upscaling and outscaling of outputs from MP3, as well as from the other projects

*Recommendations:*

1. The realignment of projects into the six Megaprojects seems appropriate in light of the on-going development of the CGIAR-wide approach to Integrated Resources Management. Some have expressed concern, however, that the realignment might actually discourage integration. Given the strong desire of the

scientist to interact collaboratively, this is not likely. However, since most project funding will actually come from "special projects" which cut across megaprojects, ***the panel recommends that the management and functioning of the megaproject structure be reviewed with the aim of promoting simplicity in lines of responsibility and reporting.***

2. The recent improvement in socio-economic research performance suggests that appointment of a socio-economist at the P-level would be an efficient use of resources, and provide scope for some further attraction of grant funding to underpin core areas of socio-economic activity. ***The panel recommends that such an appointment be considered.***
3. An important area of new work for socio-economists would be to develop appropriate integrated impact assessment methods to correspond to the development of the Integrated Natural Resource Management approach. These need to be consistent across different spatial scales, and coherently assimilate different styles of evaluation, ranging from the highly quantitative to the qualitative. ***The panel recommends that such methods be developed and implemented.***
4. Given the certainty of water scarcity throughout the CWANA region and the increased competition amongst alternative users for this scarce resource ICARDA has an opportunity to take the lead in the increasingly important area of the re-use of wastewater for irrigation. Policies and technologies for the use of such waters have not been well-defined in much of the region and, in many cases; this may be the only source of water available for irrigation or supplemental irrigation. ***Thus the panel encourages ICARDA to continue and intensify its research to better utilize wastewater as a source of water for irrigation.***
5. Recognizing the increasing demands on social research to i) achieve its specific agenda as exemplified in Megaproject 5, with its inherent challenges, ii) to contribute to other Megaprojects, and iii) to participate in most of ICARDA's other undertakings, ***the panel recommends that a critical mass of social science researchers with required competence profiles (institutions, policy and gender, among others) must be secured to allow timely delivery, continuity, and high quality output.***
6. ICARDA is undoubtedly a Research Centre. Production and sharing of knowledge are necessary for the Centre's growth and evolution. In fact publication in refereed journals can be used as the check point at the crossroads between research and development. In this respect, the social science research achievements seem rather limited. Improved quality output has not yet been achieved and must be the focus of greater attention in the future. The panel recognizes that there is output in the pipeline to be delivered but it has certainly not reached a satisfactory level which could be at least two refereed journal

publications per person per year. **Consequently, the panel recommends monitoring progress on refereed journal publication to ensure that this momentum continues.**

7. The rural families which are the primary beneficiaries of ICARDA's work depend on a range of farming systems adapted to a wide range of dry land conditions. In more marginal areas, livestock are the source of all of the income of these families, and the management of the ecosystem is essentially a function of the animal management regime. In many systems which involve cropping, more than half of the income comes from integrated livestock (usually small ruminant) production. The livestock element in all of these systems provides important economic buffering in an insecure world, and gives work and income opportunities from adding value along the production chain, particularly for women. The potential for improving livelihoods through improvement of the livestock component in these systems is under-researched in ICARDA's current programme. **The panel recommends that the specific requirements of an enhanced livestock element in the overall programme be examined.**

## **Annex I: 4th EPMR Recommendations concerning the NRM Program**

1. In view of the critical nature of water scarcity in the CWANA region, the Panel recommends that ICARDA place more emphasis on strategic issues of water use/allocation and management at rural community level, and that it join in strategic partnerships to carry out this work.
2. Regarding social science research, the Panel recommends that ICARDA should (i) reduce its scope and concentrate on fewer issues, selected in close collaboration with the Center's physical and biological scientists – that are central to the operational mandate of the Center; and (ii) seek to improve the quality of output by among others, (a) judicious recruitment or designation of a lead social scientist, (b) recruitment of high quality support staff, and (c) entering into more cooperative arrangements like those existing with IFPRI.
3. Recognizing ICARDA's efforts to consolidate its natural resources management research by merging its former projects into a more integrated program, the Panel recommends that ICARDA, together with appropriate partners, articulate a vision, strategy and an implementation plan for natural resources management, drawing on CGIAR and other experiences and centered on Unified Research Sites most appropriate for its emerging poverty alleviation focus.
10. Recognizing that ICARDA has conducted a wide-range of studies offering partial insight into poverty, the Panel recommends that ICARDA determine, with its partners, the rural livelihood strategies of the poor in its region to clarify what research options, investments, policies and technologies are most likely to benefit them. Special emphasis should be given to highly vulnerable segments of the population.

## Annex II: Brief CVs of Panel Members

### Name: SLACK, Donald C. (USA) Team leader

**Position:** Professor and Head, Department of Agricultural and Biosystems Engineering, The university of Arizona, Tucson Arizona.

**Education:** B.S. University of Wyoming, Agricultural Engineering, 1965; M.S. University of Kentucky, Agricultural Engineering, 1969; Ph.D. University of Kentucky, Agricultural Engineering and Math Statistics, 1975.

**Experience:** 1991–present: Professor and Head, Department of Agricultural and Biosystems Engineering, The University of Arizona, Tucson, AZ; 1984–1991: Professor, Department of Agricultural Engineering, University of Arizona, Tucson, AZ; 1975–1984: Assistant to Associate Professor (1980), Department of Agricultural Engineering, University of Minnesota, St. Paul, MN; 1973–1975: Research Assistant, Department of Agricultural Engineering, University of Kentucky, Lexington, KY; 1970–1973: Agricultural Engineering Advisor, Department of Agricultural Engineering, University of Kentucky, Lexington, KY (Duty post was in Khon Kaen, Thailand); 1966–1969: Research Specialist, Department of Agricultural Engineering, University of Kentucky, Lexington, KY; 1965 Assistant Civil Engineer, Bureau of Engineering, City of Los Angeles, CA

*Professional societies:* American Society of Civil Engineers–Fellow; American Society of Agricultural Engineers–Fellow; American Society of Agronomy; Soil Science Society of America; American Geophysical Union; International Committee for Irrigation and Drainage; American Society for Engineering Education;

**Expertise:** Maximizing Water and Nutrient use Efficiency in the Agromanagement of *Arid Zone Sandy Soils*. P.I. with Muluneh Yitayew and William Rasmussen. Collaborative Research Project with Ain Shams University (*Egypt*), Faculty of Agriculture and the USDA Salinity Laboratory. Oct. 1, 1992–Sept. 30, 1995. USDA–OICD (NARP Collaborative Research). \$382,202. *Moroccan* Pilot Project for Watershed Management. Co-P.I. with Kenneth G. Renard. July 1, 1995–Dec. 31, 2000. Food and Agricultural Organization of the United Nations. \$150,000. Irrigation Technologies for Maximizing Water Use Efficiency of Field Crops under Drought and Salinity Conditions in *Arid Zone Soils*. Co-P.I., with M. Yitayew, A.M. El-Gindy and A.M. El-Araby. May 15, 1997–May 14, 2001. (A collaborative project with Ain Shams University, Cairo, *Egypt*) USDA–ICD–FAS–ATUT. \$178,591. Middle East and Mediterranean Desert Development Program. *Improving the Efficiency of Water Use in Arid Land Agriculture*. Principal U.S. Water Adviser. USAID through San Diego State University and the International Arid Lands Consortium. Phase I. March 1, 1998–Dec. 31, 1999. ~\$600,000. Southwestern Indian Water–Allocation and Use. P.I. June 1999–June 2001. Cooperative States Research Education and Extension Service (USDA). \$85,000. Electrokinetic Management of Nitrate Movement in *Drip Irrigated Soils*. Co-P.I. with Dennis Larson and James Walworth (Soils). Nov. 15, 2000 to Nov. 14, 2002. USDA–NRIGP. \$112,000

Evaluating the Irrigation Efficiencies and Turf/Landscape Practices on the Campus of Northern Arizona University. March 1, 2002 to February 28, 2003. Water Resources

Res. Ctr. U of AZ. \$12,000. Development of Human Resource Training Capabilities in Emerging Areas of Agricultural Production and Processing in Mexico. Oct. 1, 2002–Sept. 30, 2005. Co-PI with Mauricio Carrillo of Chapingo University, USAID/Mexico through Association Liaison Office (TIES Program), \$299,935. Urban Erosion Control and Storm Water Harvesting in Northern Mexico. May 1, 2004–April 30, 2006. P.I. International Arid Lands Consortium. \$75,000.

**Name: Midmore, Peter**

**Position:** Professor of Applied Economics, School of Management and Business, University of Wales Aberystwyth.

**Expertise:** Rural development policy analysis, economics of agriculture, sustainable development, economics of devolution, socio-economic methodology development.

**Education:** 1979-1982 University of Wales Aberystwyth. BScEcon Economics and Agricultural Economics; 1984-1988 University of Wales Aberystwyth. PhD Agricultural Economics.

**Experience:** 1983-1984: Research Assistant, Agricultural Marketing and Rural Development at University of Wales Aberystwyth; 1988-1997 Lecturer in Agricultural Economics at University of Wales Aberystwyth; 1991-1992 Visiting Fellow at University of Reading; 1997-2001 Professor of Rural Studies at University of Wales Aberystwyth; 2001-present Professor of Applied Economics at University of Wales Aberystwyth

Participant in and leader of various research projects sponsored by Welsh Office and National Assembly for Wales (local rural development, upland farming policy, impact assessment, sustainable economic welfare measurement); Economic and Social Research Council (farm pluriactivity); British Ministry of Agriculture, Fisheries and Food (farmer perceptions of organic farming), Department of Environment, Food and Rural Affairs (rural evidence-based policy development); Rockefeller Foundation (information technology, Malawi); European Commission (organic farming economics and policy, organic marketing and rural development). Member, Farming for the Future Commission (National Assembly for Wales); Rural Funding Streams Review Working Group. Fellow, Royal Society of Arts.

**Name: CUNNINGHAM, Patrick (Ireland)**

**Position:** Professor of Animal Genetics, Trinity College Dublin.

**Experience:** He was formerly Deputy Director (Research) in the Irish National Agriculture and Food Research Institute (1980–1988), visiting Professor at the Economic Development Institute, World Bank (1988) and Director of the Animal Production and Health Division, Food & Agriculture Organisation of the UN, Rome (1990–93). He is the author of over 200 scientific publications on the genetics of domesticated animals. He is Co-founder and Chairman of the biotechnology company IdentiGEN. He has been President of the European and World Associations of Animal Production, and served on the European Life Sciences Group which advised Commissioner Busquin.

In recent years he has served on review groups for University of California, Davis,

Swedish Agricultural University, Danish Institute of Animal Science, ETH, Zurich, and on advisory committees for Wageningen University and Research programs for the Dept for International Development, London.

**Name: NASSIF, Fatima (Morocco)**

**Position:** Institut National de la Recherche Agronomique, Settat, Morocco

**Education:** 1989, Ph.D. in Sociology Kansas State University. Manhattan, Kansas, U.S.A. Thesis: "The Sociology of Mixed Farming in Morocco: Incorporating the Fella's View". 1983 M.A. in Sociology Kansas State University. Manhattan, Kansas, U.S.A. Thesis "The Elites in the Maghreb: A Comparative Study of Political Development". 1974 Certificate of profound studies/Sociological theories. Faculté des Lettres, Université Mohammed V, Rabat. Morocco. 1971 Bachelor of Arts in Philosophy (with distinction). Faculté des Lettres, Université Mohammed V, Rabat, Morocco.

**Experience:** Research 2004–2005: Gender dimensions of agro-biodiversity conservation 2002–2004: Integrating women in local community development. 1998–2003: Socio-economic studies pertaining to in situ conservation of agro-biodiversity. 1997–2002: Participatory plant breeding: the case of barley in Morocco. 1995–96: Socio-economic study of the impact of market liberalization on small cereal producers. 1995–96 Research on property rights. 1993–95: Study on constraints to the adoption of new barley varieties. 1994: Effects of price on adoption of new barley varieties. 1993–95: The division of labor division in Chaouia farm-households. 1992: Farmers' behavior in drought situations. 1990–93: The baseline study: farming systems typology in semi-arid regions of Morocco. 1990–92: On-farm evaluation trials.

### Annex III: Terms of Reference

#### *Introduction*

In 1997 the Pasture, Forage and Livestock Program and the Farm Resource Management Program of ICARDA were merged to create the Natural Resource Management Program (NRMP). This merger occurred in response to the changing focus of the CGIAR to include productivity enhancement and the sustainable use of natural resources for crop and livestock production. The 4<sup>th</sup> External Program and Management Review (EPMR) of ICARDA was completed in 2000 and a number of recommendations were made on natural resource management (EPMR, 2000). In order to assess and evaluate the progress made since the last EPMR and to ensure that the research is consistent with the evolving NRM mission of the CGIAR and the current and emerging challenges facing this Center's mandate areas, ICARDA wishes to conduct a Center Commissioned External Review of its research on natural resource management.

A CCER on Natural Resource Management (NRM) would address the current and future priorities for activity in this area. It must be aware of the recommendations of the Fourth External Program and Management Review (EPMR) of ICARDA:

- *In view of the critical water scarcity in the CWANA region, the Panel **recommends** that ICARDA place more emphasis on strategic issues of water use/ allocation and management at rural community level, and that it join in strategic partnerships to carry out this work.*
- *Regarding social science research, the Panel **recommends** that ICARDA should: (i) reduce its scope and concentrate on fewer issues, selected in close collaboration with the Center's physical and biological scientists and the national programs - that are central to the operational mandate of the Center; and (ii) seek to improve the quality of output by among others, (a) judicious recruitment or designation of a lead social scientist, (b) recruitment of high quality support staff, and (c) entering into more cooperative arrangements like those existing with IFPRI.*
- *Recognizing ICARDA's efforts to consolidate its natural resources management research by merging its former projects into a more integrated program, the Panel **recommends** that ICARDA, together with appropriate partners, articulate a vision, strategy, and an implementation plan for natural research management research, drawing on CGIAR and other experiences and centered on Unified Research Sites most appropriate for its emerging poverty alleviation focus.*
- *Recognizing that ICARDA has conducted a wide-range of studies offering partial insight into poverty, the Panel **recommends** that ICARDA determine, with its partners, the rural livelihood strategies of the poor in its region to clarify what research options, investments, policies, and technologies are most likely to benefit them. Special emphasis should be given to highly vulnerable segments of the population.*

*Terms of Reference*

This review should examine:

- Progress in developing a shared mission and vision for NRM and the validity and variability of approaches being developed to implement a sound, viable integrated research program that produces international public goods.
- Future directions of the program particularly in relation to the on-going development of the CGIAR-wide approach to Integrated Natural Resource Management
- How the mission, vision and future plans can foster closer integration of the research on natural resource management and research on germplasm improvement.
- The capacity of ICARDA to undertake work on the social, cultural and economic constraints to rural livelihoods improvement and to identifying escape routes from rural poverty.
- The capacity of ICARDA to formulate livelihood options for the rural poor and to enumerate any of such options in ways relevant to all stakeholders from the family & individual level through to National government.
- Progress in addressing EPMR recommendations on:
  1. Placing more emphasis on strategic issues of water use/allocation and management at rural level
  2. Developing strategic partnerships for water management-related research
  3. Re-focusing ICARDA's work on social science to concentrate on fewer issues, improve the quality of outputs and increase cooperative arrangements with other institutions
  4. Progress on determining the rural livelihood strategies of the poor in the CWANA region and what research options, investment policies and technologies are most likely to benefit them.

Specific questions to be addressed include:

- Are current and proposed ICARDA research themes and priorities in the NRM field appropriate and relevant to the demands of NARS, the CGIAR and donors?
- Is the science quality of NRM research at ICARDA at an international standard?
- Has the impact of NRM research been adequately quantified and published?
- Are appropriate uptake pathways to the adoption of NRM products being explored/followed?
- Are current partnerships with advanced research institutions, civil society, national programs, and the private sector appropriate to advance ICARDA's natural resource management research?
- Is the program addressing both current and likely future scenarios for NRM in the CWANA region?

**Annex IV: NRMP Senior Staff profile 1999-2004**

	<b>P-level staff 1999-2005 – Scientist Years (SY)</b>					
<i>Positions</i>	1999	2000	2001	2002	2003	2004
<b>Cropping systems agronomist</b>	1	1	1	1	1	1
<b>Pasture and forage scientist</b>	1	1	1	0.3	0.5	1
<b>Rangeland scientist</b>			1.5	1.8	2	2
<b>Small ruminant scientist</b>	1	1	1	1	1	1.5
<b>Irrigation &amp; water management scientist</b>	1	1	1	1	1	1
<b>Agricultural hydrologist</b>	1	1	1	1	1	1
<b>Marginal water scientist</b>	1	2	1.8	0.5	0.8	1
<b>Soil conservation &amp; land management scientist</b>	2	1.5	0.3	2	2	2
<b>Agroclimatologist</b>	1	1	1	1	1	1
<b>Natural resource management economist</b>						0.75
<b>Agricultural economist</b>	4	3.75	2.5	2.5	2.5	2.5
<b>Soil fertility scientist</b>	1	1	1	1	1	0.75
<b>Protected agriculture</b>		0.5	0.5	0.5		
<b>Total</b>	14	14.75	13.6	13.6	13.8	15.5
<b>Other socio-economists in ICARDA</b>	3	3	3	3	2.5	1.25
<b>Research Associates</b>	7	8	8	8	8	8
<b>Junior Professional Officers</b>	2	2	4	4	4.75	3
<b>Research Fellows:</b>	1	2	2	3.25	4	1.5
<b>Associate Experts:</b>	3	3	3	2	2	0
<b>Post Doctoral Fellows:</b>	0	0	0	0	0.25	2.8
<i>Source: CCER Briefing Paper, "Evolution and Strategy of NRMP Staffing Profile", ICARDA April 2005</i>						

## **ANNEX TO THE AUGUST 2005 REPORT ON CCER OF ICARDA'S NATURAL RESOURCE MANAGEMENT PROGRAM AND SOCIO-ECONOMICS, FOCUSING ON THE 4th EPMR RECOMMENDATIONS AND THEIR IMPACT ON THE PROGRAMME**

*Introduction: The ICARDA Board of Trustees while receiving the CCER at their meeting in late September 2005 requested the CCER panel for an annex to their review summarizing the progress in natural resources management and socio-economics made at ICARDA in the light of the last (Fourth) External Program and Management Review (EPMR) in 2000. The EPMR-2000 made four recommendations (shown in bold-face text) on these aspects. Using excerpts of the CCER review report (shown in normal font) the following shows the assessment of the CCER panel in relation to these four EPMR recommendations (seriatim).*

### **4th EPMR Recommendation 1.**

*In view of the critical nature of water scarcity in the CWANA region, the Panel recommends that ICARDA place more emphasis on strategic issues of water use/allocation and management at rural community level, and that it join in strategic partnerships to carry out this work.*

Projects which have been developed and implemented within the past three to four years have indeed placed more emphasis on strategic issues of water use/allocation and management at the rural level. They have also developed and utilized relevant strategic partnerships with NARSs, ARIs and with other CGIAR Centers.

Additional projects undertaken since the EPMR have also incorporated the suggestions. These include the Challenge Program, Water-for-food project “Improving On-farm Agricultural Water Productivity in the Karkheh River Basin (KRB)” which was developed together with the project “Livelihoods resilience in Karkheh basin”. These projects were initiated in 2004 and are being carried out through the NARSs in Iran with additional support and collaboration from the University of California-Davis, IWMI, IRRI and CIAT. This project is indicative of how ICARDA has formed and utilized strategic partnerships to carry out its work.

The project “Communal Management and Optimization of Mechanized Microcatchment Water Harvesting for Combating Desertification in the East Mediterranean Region” or short title “The Vallerani Project” which was started in 2004 is another example of recently implemented NRMP water-related projects which incorporate the EPMR suggestions noted above. The objective of the project is improved livelihoods and reduced desertification in the marginal steppe areas of Syria and Jordan. It is carried out through partnerships with NARSs of Syria and Jordan and ARIs in Switzerland. Projects in Central Asia have also been implemented which incorporate the EPMR recommendations.

The CCER panel encourages ICARDA to continue and intensify its research to better utilize wastewater as a source of water for irrigation (CCER recommendation 4).

### **4th EPMR Recommendation 2.**

*Regarding social science research, the Panel recommends that ICARDA should (i) reduce its scope and concentrate on fewer issues, selected in close collaboration with the Center's physical and biological scientists – that are central to the operational mandate of the Center; and (ii) seek to improve the quality of output by among others, (a) judicious recruitment or*

***designation of a lead social scientist, (b) recruitment of high quality support staff, and (c) entering into more cooperative arrangements like those existing with IFPRI.***

The current nature of social science at ICARDA indicates optimism. Social scientists perceive themselves as having a key role to play in the NRM Program and in the Center as a whole. This role has been attained through a great deal of hard work, persuasion and mutual learning and is exemplified by intense involvement in development of future research strategies and commitment to the goals of individual projects.

In summary, recommendations by the EPMP have had an effect on socio-economic research. The challenge they set has provided a stimulus to research staff to improve the quality and orientation of output. They have focused on fewer, more relevant issues, and together with greater collaboration and promotion of participatory research methods, have increased the efficiency of use of expertise in this area.

### ***(i)Focus***

Improved focus has been achieved by concentrating effort on *key areas*:

- Studies of the adoption and impact of ICARDA's research outputs on productivity improvement, income generation and natural resource management;
- Valuation studies of natural resource use by rural communities, and analysis of impact of NRM research on rural livelihoods;
- Rural livelihoods and poverty analysis, specifically including gender and nutritional dimensions of poverty, constraints on resource access and income opportunities and their role in poverty alleviation;
- Policy and institutional analysis concerning natural resources management, particularly water and rangelands, to extend livelihood options for the rural poor
- Combinations of economic and biophysical information in spatial databases have contributed to progress in identifying and exploring issues of major concern.

Socio-economic staff support work across disciplines as well as developing a distinct research identity of their own. Their strategic response to the research workload on senior scientists includes a clear division of labor among group members, the attraction of graduate students, post doctoral fellows and joint appointments, and building partnerships. Effective interaction among socio-economists has provided another means of increasing group efficiency in the face of increasing demands for contributions to the different research areas.

### ***(ii)Quality of output***

In general, the social science group has responded well to the challenges. Outputs have been extensive, with a variety of documents and reports in different formats and in different languages in order to serve their diverse audiences. There are also conference contributions and papers in proceedings and chapters in books (often in collaboration with researchers outside the socio-economics group, or in other CGIAR Centers); among these are some publications of significant value, which will be utilized widely in the international research and extension community.

There has been considerable delay in appointing a lead social scientist (a prominent recommendation of the EPMP) to provide the necessary momentum, because ICARDA only found a scientist of sufficient caliber on the third round of advertisement.

It is only recently that sufficient output of a quality suitable for publication has accumulated. A number of journal articles are currently in the process of peer review (the higher the quality of journal targeted, the longer the lag between submission and publication will be).

Two more joint appointments with other CGIAR Centers have been made (with ILRI and IFPRI) which have potential to increase cross-fertilization of ideas and add impetus. Similar arrangements have been made with CIRAD France.

At the present time, there is a core of lead scientists who are well qualified to undertake the research agenda to completion.

The CCER panel recommends (CCER recommendation 2) that such an appointment (a socio-economist at the P-level) be considered. The CCER Panel recommends (recommendation 3) the development of appropriate integrated impact assessment methods.

#### **4th EPMR Recommendation 3.**

*Recognizing ICARDA's efforts to consolidate its natural resources management research by merging its former projects into a more integrated program, the Panel recommends that ICARDA, together with appropriate partners, articulate a vision, strategy and an implementation plan for natural resources management, drawing on CGIAR and other experiences and centred on Unified Research Sites most appropriate for its emerging poverty alleviation focus.*

The appointment of a new Program Director in 2001 has been instrumental in achieving progress in this respect. Combinations of economic and biophysical information in spatial databases have contributed to progress in identifying and exploring issues of major concern.

The Program has developed a new strategy, logical framework and goal and purpose statements. The strategy was developed taking into account the CGIAR INRM Task Force findings, the NRM strategies of donors and the outcomes of regional priority setting exercises.

The development of the Integrated Natural Resource Management approach, in which socio-economic researchers have played a leading role, and its implementation in the Khanasser Valley Integrated Research Site has been instrumental in developing closer engagement with researchers elsewhere in ICARDA, supporting greater use of participatory methods in overall research approaches, and through overlays of complementary, targeted interventions, synergies are increasing the nature of insights that are being achieved.

ICARDA natural resource scientists have had an increasingly prominent and enthusiastic role in developing the Integrated Natural Resource Management (INMR) approach within the CGIAR as a whole, most recently in the organization of the fourth in a series of INRM Taskforce workshops in Aleppo and providing an organizational role in the 6th workshop to be held in Manila in June 2005). This methodological approach aims to simultaneously address issues of environmental sustainability and poverty alleviation. It involves grass-roots participation, stakeholder engagement, adaptive learning and cross-discipline methods of working.

#### **4th EPMR Recommendation 4.**

*Recognizing that ICARDA has conducted a wide-range of studies offering partial insight into poverty, the Panel recommends that ICARDA determine, with its partners, the rural livelihood strategies of the poor in its region to clarify what research options, investments, policies and technologies are most likely to benefit them. Special emphasis should be given to highly vulnerable segments of the population.*

ICARDA has chosen to develop and integrate social science research in order to better serve its stakeholders. Particular expertise exists in livelihoods and poverty analysis; economics and market studies; adoption and impact studies; and gender research. Most, if not all, ICARDA social scientists have gone through a long process of interaction with other biological and natural scientists, inside and outside the Center.

Initial coverage of new work in the series of Annual Reports of the NRM Program provides confirmation that integration between approaches of social and life sciences is greater and that priorities have been realigned towards the main objectives of donors for dissemination of pro-poor innovations that involve diversification and value addition linked to market opportunities, and contribute to counteraction of environmental degradation.

Social science research examining rural livelihoods and poverty analysis in ICARDA has only relatively recently been established (under the new Megaproject on livelihood and poverty analysis and impact assessment, MP5). Despite this, following a comprehensive review of approaches, several studies have been completed in which key constraints have been identified with technical as well as institutional and policy options identified and evaluated. There have been some successful (and also a few less successful) case studies which provide clear insights, resting on the social science contribution, that have been instrumental in addressing the complexity of pathways out of poverty.

Research on livelihoods has come to represent the pivotal pillar of social science at ICARDA. Most importantly, both quantitative and qualitative research is carried out to build better understanding of rural livelihoods strategies and their improvement. Participating in conferences and workshops on livelihoods analysis methodologies has allowed ICARDA social science research to learn from worldwide international development of new approaches and methodologies. Gender research is recognized as a necessary dimension of the work and is increasingly given appropriate attention. The focus on specific research themes provides opportunity for addressing gender-based researchable questions and hypotheses, and the selection of appropriate methods to investigate them. Gender research on particular niches, such as cheese making and food processing among others, are already being pursued by ICARDA socio-economists. Thus, the new structure also promotes establishment of a favorable environment in which the group members can undertake quality social science research with appropriate methodologies.

The Panel recommends (CCER recommendation 5) that a critical mass of social science researchers with required competence profiles (institutions, policy and gender, among others) must be secured to allow timely delivery, continuity, and high quality output.

*It can therefore be concluded that ICARDA has the capacity to carry out high quality work on the economic, social and policy dimensions of rural livelihoods improvement and identifying potential pathways out of poverty in ICARDA's mandate areas.*