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Consolidated Report on Center-Commissioned External Review

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IWMI
International
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Institute

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Center-Commissioned External Review of International Water Management Institute: Consolidated Report

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Executive Summary

A Centre Commissioned External Review (CCER) of the International Water Management Institute, Headquarters (IWMI-HQ) was carried out in Colombo in the period 20–28 May 2003. This came immediately after the reviews of the Regional Offices (Africa–by Prof. Alaphia Wright, Asia–by Prof. A. Vaidyanathan, and South East Asia–by Dr. Beatriz P. Del Rosario). The review was undertaken within the context of the (then) ongoing IWMI review and strategic planning process for future priority setting.

Methodology

The approach employed in the review was largely participatory in nature, consisting of:

- Review of relevant background information and documents,
- Discussions and in-depth interviews with selected IWMI staff, and stakeholders outside IWMI,
- Attendance at Regional Stakeholders Workshops,
- Attendance at a staff seminar in which research findings were presented, and
- A pre-debriefing presentation to the Board of Trustees.

Findings:

Finding 1: *Mission, Policies, Strategies, and Research Priorities:* Methodological research to develop concepts, tools and techniques for improving the data base and for facilitating integrated management of water and land is being given high priority in the Institute's programmes. Under the current division of themes on land and water development–namely, IWMA, Sustainable Smallholder Water and Land Management Systems and Sustainable Groundwater Management–research design does not appear to take adequate and explicit account of the interactions between land and water, irrigated and rain fed agriculture and, surface and groundwater. Further, current research under the theme IWMA is largely centred on, and adequately covers, various aspects of surface irrigation.

Finding 2: *Planning, Monitoring, and Evaluation:* Planning within IWMI spans the global level down to the individual researcher level in the form of the 2000–2005 Strategic Plan, the annual work plans, and the Individual Operating Plans (IOPs) respectively. IWMI still has to strengthen its practice of 'joint planning'. Monitoring and Evaluation of the implementation of the various plans does take place, although the practice can benefit from a certain amount of formalization.

Finding 3: *Added value and niche: Regional and Global:* IWMI is currently involved in systematic efforts to document and collate local research relevant to IWMI's research. This deserves greater attention. The Information and Knowledge group and the Data Base project have been designed primarily to support the Institute's researchers. Opportunities however exist for these facilities to be beneficial to researchers and professionals in developing countries who are not necessarily members of IWMI. This is a clear niche for IWMI, and so too are issues to do with trans-boundary water and land management questions.

Finding 4: *Balance between research focus and development focus:* IWMI is only beginning to pay increased attention to development, in addition to research. This move is to be welcomed.

Finding 5: *Balance between functioning as a knowledge center (broker) and knowledge generation:* IWMI is recognized world wide for its leading role in the generation of knowledge. Current and future opportunities are evident for the institute to increasingly take the lead in knowledge brokerage.

Finding 6: *Review of Benchmark Basin Concept:* The basic concept of focusing on research and action to promote integrated management of water and land in selected Benchmark Basins is strongly endorsed. The idea of working in Benchmark River Basins in a way points to 'integration' at the field level–a situation reflecting reality. The concept is clearly progressive and would enable IWMI to deliver research results that would present little difficulties of applications since they are derived from field conditions. However the basins selected under the Challenge Programme on Water and Food (CPWF) are far too large to achieve significant impact.

Finding 7: *Quality, Relevance and Impact of Research:* The quality, relevance and impact of IWMI's research is generally accepted by the Institute's peers. Evidence of instances where the work of IWMI have played important roles in the policy and decision making processes concerning water, land and environmental management for poverty alleviation can be traced, although these have to date not been systematically documented. IWMI recognizes the importance of impact assessment of research and efforts are currently underway in developing a systematic impact assessment system. IWMI still has to agree on useful performance indicators to be used to ascertain research progress and impact. The general conclusion, however, is that the IWMI's research has been having some impact in national, regional and global arenas.

Finding 8: *Staff Resources Available: Appropriateness and Adequacy:* Recruitment of staff into IWMI follows a well laid-down and rather rigorous process, beginning from the agreement on the description of the position, through the public vacancy announcement to the interview and final engagement. This process ensures that staffs are recruited to suit identified disciplinary requirements. The number of research staff doubled from around 50 in 1999/2000 to over 100 in 2002/2003. There are however noticeable shortages in research management and modeling skills in the IWMI establishment.

Finding 9: *Generation and Use of Financial Resources:* IWMI's performance in this area in the last two to three years can only be described as impressive. Total funding generated almost doubled from US$8.8 million in 2000 to some US$16.5 million in 2002. Restricted funds have however risen from around 55% of total funds in 2000 to around 66% in 2002, indicating that IWMI is

having to increasingly 'work on what the donors are willing to pay for'. This may also spell the start of a negative trend, and IWMI needs to monitor this development very closely, so as to avoid being increasingly drawn into 'routine / consultancy' type of work as opposed to meaningful pure and applied research in integrated water and land management. The finances of IWMI are clearly well managed with a small surplus of some US$100,000 or so reported for the year 2002.

Finding 10: *Matrix Management: Effectiveness and Functioning:* IWMI is managed in a matrix structure with the themes providing the programmatic focus (with the theme leaders controlling the funds), and the regional offices providing the personnel. IWMI is currently experiencing the typical textbook disadvantage associated with matrix management, namely that of personnel having to be answerable to two supervisors. The challenge is for IWMI to continue working at increasing their realization of the benefits of the matrix structure while minimizing the disadvantages and frustrations expressed by researchers.

Finding 11: *Integration, Synergy, Coordination of Research:* IWMI recognizes the need for 'integration' in research, and is attempting to do this on an ongoing basis by making use of multi-disciplinary research teams. However, 'integration' still needs to be formalized. Coordination of research at the regional level is clearly a responsibility of the Regional Directors. Effective coordination of research at the global level however still has to be effectively operational.

Finding 12: *Functioning of Partnerships and achieving impact through partnerships, dissemination of research results:* IWMI's current policy of developing and implementing selected research programmes jointly with NARES is a major step towards collaborative research. Working through partnerships is clearly a very positive development for IWMI. It brings about tremendous benefits to both IWMI and its partners. Ideally, the partners (NARES, universities, other research institutions) provide IWMI and vice versa with extended opportunities for fulfilling its research mandate through joint work. The many graduate students/postdoctoral fellows from the South mentored by seasoned IWMI scientists can be useful instrument in revitalizing research, influencing their countries' policies on research priorities and directions. Opportunities for harnessing the excellent social skills of selected NGOs in disseminating IWMI's research findings are increasingly being recognized. Results of the Institute's research are being disseminated through policy briefs, working papers, Research papers and full-length publications. The Institute's own research findings are treated as a public good accessible freely to any interested person or organization. Though the information is available on the website, its actual reach and use is perhaps not sufficiently widespread especially in the developing countries. Supplying hard copies of research and discussion papers free may be too expensive. The major challenge facing IWMI and other CGIAR centers in working through partnerships is that of ensuring that the partnerships are mutually beneficial.

Finding 13: *Functioning within CG System and Adaptation to Changes in CG System:* IWMI can be considered a learning organization as it adapts to the various reforms in the CG system, facing the realities of declining budget for research globally and meeting the challenge of improving the productivity of water for food, health and the environment. The leadership role of IWMI as shown in the Challenge Programme for Water and Food (CPWF), the Comprehensive Assessment of Water Management in Agriculture (CA), and the System-wide Initiative on Malaria and Agriculture (SIMA) is well acknowledged within the CG system. The Challenge Programmes are seen as bringing in the needed reforms within the CGIAR. They will shape the strategic direction

of the CGIAR. New partnerships and positive working relationships are developed. New models of governance are emerging. Planning for CPs requires a clear set of strategic priorities, with a strategic niche for CPs identified. In principle the CPWF could be a good test case for effectively and efficiently managing research for development at the global level. It is also a good way of ensuring synergy among the activities of the CGIAR centers. A framework for case studies of river basins within the CA has been developed. The CA is still at an early stage but it has been quite successful in getting world attention on water issues and the role of science and technology and the CGIAR in averting water crisis. SIMA was reviewed favorably under the IWMI Theme 5 Water, Health and Environment last November 2002.

Finding 14: *Research Priorities and involving NARES in priority setting:* The IWMI Strategic Plan (2000-2005) indicates the research themes as the key instrument to IWMI's strategic priority setting and to integrate research agenda across physical locations. The five research themes reflect the broadened scope of IWMI from exclusively water resources to water and land resources management. These changes were the result of discussion with the IWMI Board, staff, donors, NARES, and international institutions. Theme syntheses have been prepared by the theme leaders and circulated to the Board for comments during the May 2003 meeting.

Finding 15: *Integration of Gender Issues In Research and IWMI:* In the IWMI May 1, 2003 staff list provided for this review, a total of 365 staff is indicated, 72 % males (261), and 28 % females (104). Forty-eight staff (44 males, 4 females) occupy Senior Researchers position and above. The total number of researchers (including post doctoral scientists) is 109 (85 males, 24 females). The leadership has supported a policy on spouse employment and has succeeded in attracting four women in senior research positions. Moreover, the new Leadership Program of IWMI has identified 7 promising women (out of 12 promising men and women for research and research support) for career development in the next 3 years. In terms of governance, there is gender balance in the Board of Governors of IWMI, with more women coming from the South. The current IWMI DG serves as the Chair of the CGIAR Gender and Diversity Programme Advisory Board. In terms of integrating Gender Concerns in Themes/Activities, Gender was not explicitly addressed in the Strategic Plan (2000-2005) log frame. There is very little reference to gender concerns in the thematic areas, in the planned activities and in the planned impact assessment. In terms of achievements and outputs, this review was informed that a paper on Gender Performance Indicator for Irrigation: Concepts, tools, and applications was adjudged as best paper during a research related event in 2002. Discussions among Theme leaders (Themes 2 and 4) and the gender expert were initiated, and requests from IWMI colleagues to "genderize " proposals were made and granted. Work in this respect is ongoing.

Recommendations:

The following are recommended:

Recommendation 1: *Mission, Policies, Strategies, and Research Priorities:* Methodological research to develop concepts, tools and techniques for improving the data base and for facilitating

integrated management of water and land is to be continued. Adequate attention must be paid to the interactions between land and water, irrigated and rain-fed agriculture, and surface and groundwater. Research under 'Groundwater Management', needs to be placed in the wider context of land-water management research rather than groundwater per se. The pay off to research under this theme (groundwater) will be greatly enhanced by focusing on different types of situations (hard rock and alluvial formations, sole and conjunctive use, low and high levels of exploitation, and abundantly and poorly endowed areas). Expansion of the scope of several components of the IWMA research theme to include: water productivity, water accounting, remote sensing-GIS and to bring in a larger number of locations with greater attention to conjunctive use of surface and groundwater, and their impact is recommended [Research Priorities].

Recommendation 2: *Planning, Monitoring, and Evaluation:* It is recommended that joint planning for research priorities and programs involving Theme Leaders and Regional Directors should be strengthened and institutionalized to achieve maximum impacts of the mission within given resource constraints. Full use must be made of the planning and monitoring procedures and processes to be developed under the QMS project. Also agreement on, and adoption of a consistent set of terminologies for planning and implementation, in order to smoothen communication among the staff (Log Frame, progress reports, etc.). [Planning, Monitoring, and Evaluation].

Recommendation 3: *Added value and niche:* Regional and Global: Greater attention should be paid to the systematic efforts to document and collate local research relevant to IWMI's work. Tapping these resources systematically and updating them periodically will substantially add to the stock of knowledge both for IWMI's own research and to interested users the world over. Extension of the work of the Information and Knowledge Group to involve researchers and professionals in developing countries deserves serious consideration. In collaborative work, IWMI could play a key role in selecting locations, bringing together researchers and evolving a common design and methodology, and integrate the results by analysis of variations across locations. Multi-centre studies on common topics using comparable methodology can greatly enhance the impact of the institute, particularly concerning research dealing with trans-boundary water and land management questions. [Added Value and Niche].

Recommendation 4: *Balance between research focus and development focus:* A 50-50 split between the efforts necessary for the generation of new knowledge, and that necessary for the successful application of the knowledge so generated in reaching the broad goal of poverty alleviation, as a starting target would not be misplaced. The scope of irrigation impact studies should be broadened to include other effects and of different kinds of land and water projects would make a richer contribution. The scope of research on 'institutions' should include comparative case studies of different institutional arrangements for managing land and water; water rights: their legal basis, content and enforcement; and formal and informal mechanisms of conflict resolution. Also, the application of recent developments in institutional economics to the study of the structure and functioning of public institutions for management of common pool resources like land and water is worth exploring [Balance, Research and Development].

Recommendation 5: *Balance between functioning as a knowledge center (broker) and knowledge generation:* IWMI should consider working with a network of repository libraries for all its working

papers, published research papers, and collected water and land resource knowledge from other institutions in selected developing country institutions. This will increase the relevance of IWMI as a knowledge broker [Balance, Knowledge Broker and Generator].

Recommendation 6: *Review of Benchmark Basin Concept:* Work in the benchmark basins should continue, and a workable framework for 'integration', both within the office (mainly in the form of truly multi-disciplinary teams), and in the benchmark basins, must be put in place as soon as possible. The Regional Director will have to play the role of overall Research (and findings) Integrator. On this criterion, small, compact basins in which IWMI has been active and those covered under the CA offer compelling advantages for inclusion in the CPWF. Failing that, the proposal of the Strategic Plan to include 10-12 small and medium basins in its own programme is strongly recommended. It is recommended that work in the CPWF benchmark basins be undertaken in an incremental fashion based on a series of smaller sub-basins with adequate background information and local research capability. [Integration/Benchmark Basins].

Recommendation 7: *Quality, Relevance and Impact of Research:* Besides peer recognition of the scientific value of its work, impact assessment should focus on the range and quality of professionals trained under the capacity building programme, response of policy makers to ideas and advice, and their willingness and ability to incorporate them in policy decisions, and, to some extent, the seriousness with which they are implemented. The completion of the ongoing development of the framework for impact assessment should see this issue being addressed during the life of the next Strategic Plan. Further, consideration and adoption of additional indicators of performance for researchers in addition to refereed publications, for instance: Funds raised from non-Traditional IWMI donors (on the basis of successful research proposals), and the number of outputs (policy briefs, tools, methodologies, etc.) actually 'adopted' as objectively reported by users. It would be useful to build an impact monitoring and evaluation framework 'from scratch' based on a new project such as APPIA in Ethiopia. Also, promote the institutionalization of the practice of Impact Monitoring with university partners [Quality, Relevance and Impact of Research].

Recommendation 8: *Staff Resources Available: Appropriateness and Adequacy:* The successful expansion of the research capability (more researchers and funding) and the increased capacity building program should now be consolidated. IWMI should provide opportunities for selected researchers to be trained in research management. The employment of at least one researcher with strong systems modeling competence in each regional office will assist in the modeling aspects of the various projects. Post-docs should not be engaged unless funding for the research projects they are to work on is in place. However, they should be encouraged to work on proposals for raising external funds to finance extensions to their contracts beyond the two years. This would constitute part of their capacity building. Also, IWMI should complete and adopt a 'manual' for post-docs, spelling out how the program operates. The employment of additional research support staff (Research Assistants) should be speeded up to meet the rational target of 2–4 research support staff per senior researcher, and the promotion of gender balance in staffing the research ranks, and the mainstreaming gender in research should be strengthened [Staff Resources].

Recommendation 9: *Generation and Use of Financial Resources:* IWMI should keep up its efforts at generating and using financial resources while at the same time guard against receiving funding to undertake projects with little or no pure/applied research character [Financial Resources].

Recommendation 10: *Matrix Management: Effectiveness and Functioning:* Clarify the role of thematic groups in doing their own thematic research and providing inputs / support in the other thematic areas. Also, IWMI should continue working at increasing the realization of the benefits of the matrix structure while minimizing the disadvantages and frustrations expressed by researchers [Internalization of Matrix Management].

Recommendation 11: *Integration, Synergy, Coordination of Research:* It is recommended that the research on selected themes is conducted at a number of locations within each region and as much as possible across regions using comparable methodologies to facilitate meaningful comparative analysis and synthesis. Also that participating researchers are encouraged to interact in the process of research; and there is provision for comparative analysis and synthesis of the findings of completed studies. Further, coordination of research at the regional level is clearly a responsibility of the Regional Directors, and this should be continued. Effective coordination of research at the global level should urgently be implemented [Integration, Synergy, Coordination].

Recommendation 12: *Functioning of Partnerships and achieving impact through partnerships, dissemination of research results:* For IWMI to sustain the collaboration with NARES, NGOs, private sector, international institutions, roles and property rights must be well defined with partners, targets clarified, resources provided, and maximum participation encouraged from planning to implementation and monitoring of collaborative projects, as well as the dissemination of research results to target beneficiaries. Fund generation should be a shared responsibility of IWMI and its partners. A mechanism for leveraging funds with partners and donors must be adopted so that the limited IWMI funds can generate co –financing or counterpart funding from partner institutions. Further, a research re-entry plan at least for 2-3 years should be required and agreed among the scientist, the mother institution and IWMI to sustain the gains from this collaborative research through scholarship /fellowship. IWMI should develop a more demand-driven and systematic way of awarding scholarship/fellowship attuned to the needs of the NARES, taking into account gender balance, disciplinary gaps, and NARES research priorities and programmes. IWMI to tap these local experts in future collaborative work to further hone their skills and expose them to new tools and techniques so they can become better researchers. In addition, IWMI and the NARES to provide science-based information to advocacy group such as NGOs, fully harness their social skills in disseminating and promoting sustainable technologies with clear targets and "sunset principles". Finally, IWMI is to explore a more strategic cost effective way of disseminating research information (including policy briefs) though the NARES and NGOs [Partnerships and Information Dissemination].

Recommendation 13: *Functioning within the CG System and adaptation to Changes in CG System:* For IWMI and its partners to aggressively pursue fund raising for Challenge Program on Water and Food projects, ensure the active participation of the NARS/NARES, systematically document the process, nurture the partnerships, share and scale up best practices, innovate, and make provisions for eventual institutionalization of the "CP way" within the system. For the CA to ensure a more active participation of NARES and that capacity building takes place at the individual,

institutional, policy levels. The links among CA, CPWF and Dialogue on Water, Food and Environment should be strong yet smooth and seamless. Moreover, for IWMI to document the process, the involvement of promising IWMI junior staff in the technical and research management aspect of the program should be strengthened. This will expose them to the complexity (or simplicity) of a client-oriented, participatory alternative to IWMI's way of doing business. Finally, IWMI is to nurture the scientific excellence the CGIAR is known for and continue to recognize outstanding accomplishments in the many activities inherent in the integrative, facilitative roles of its researchers. Accordingly, performance indicators should be adopted as per task definition, and realistic targets should reflect a balance between scientific output (scientific publications) and "non-scientific" ones [Functioning within the CG System].

Recommendation 14: *Research Priorities Involving the NARES in Priority Setting:* That IWMI engages in regional/sub regional research prioritization through its Regional Offices and in coordination with regional/sub regional groupings (APAARI, SEAFAR, FARA, etc) for increased efficiency and leading to more participatory development and enhanced synergism. Depending on the needs, strength, and weaknesses of NARES, countries could be clustered to promote South-South exchange. That IWMI increasingly tap the expertise of regional institutions such as SEARCA and other similar institutions in the regions in regional prioritization. Also, that the theme syntheses are to be more inclusive of IWMI research investments (funds and scientists time) in any priority area over time and across regions, particularly when the time tracking system is fully implemented [NARES in Priority Setting].

Recommendation 15: *Integration of Gender Issues in Research and IWMI:* IWMI should endeavor to achieve reasonable gender diversity of research staff from its current 28% to at least 30 % female composition in the researcher category during the next plan period (2004-2008). At the same time, the next Strategic Plan (2004-2008) should clearly indicate the scholarship/postdoctoral fellowship targets by gender and geographic locations, and aim for increased representation of women from the South. The Leadership Program of IWMI for promising young men and women should be sustained not only by supporting these future leaders' graduate work but also in nurturing their professional career in IWMI. That the Headquarters provide support in strengthening implementation capacity for gender research in all regions by recruiting a senior gender specialist (who will be part of the Global Research Division providing assistance to all regions through themes) and providing funds for gender analysis and study gender relations, disaggregate data, etc. Such assistance should enhance capacity of both male and female researchers of IWMI on gender analysis, etc. thus ensuring gender visibility in themes and activities. This senior specialist can also work with the Human Resource officer in monitoring gender staffing [Gender Issues].

ACRONYMS

ADB	-	Asian Development Bank
AGM	-	Annual General Meeting
AIT	-	Asian Institute of Technology
APAARI	-	Asia Pacific Association of Agricultural Research Institutions
APPIA	-	Improving the Performance of Irrigation Schemes in Africa
ARC	-	Agricultural Research Council
ARI	-	Advanced Research Institute
ARM	-	Annual Review Meeting
AWIRU	-	African Water Issue Research Unit
BK	-	Bangkok
CA	-	Comprehensive Assessment of Water Management in Agriculture
CARE	-	Cooperative for American Relief Everywhere
CCER	-	Center Commissioned External Review
CG	-	Consultative Group
CGIAR	-	Consultative Group on International Agricultural Research
CIAT	-	Centro Internacional de Agricultura Tropical
CIFOR	-	Center for International Forestry Research
CIMMYT	-	International Maize & Wheat Improvement Centre
CN	-	Concept Note
CPWF	-	Challenge Program on Water & Food
DG	-	Director General
EPMR	-	External Programme and Management Review
FAO	-	Food and Agriculture Organization of the United Nations
FARA	-	Forum for Agricultural Research in Africa
GIS	-	Geographical Information Systems
GMO	-	Genetically Modified Organisms
GRID	-	Global Resource Information Database
GWP	-	Global Water Partnership
GWP-RC	-	Global Water Partnership Resource Center
HQ	-	Headquarters
IBSRAM	-	International Board for Soil Research and Management
ICARDA	-	International Center for Agricultural Research in the Dry Areas
ICID	-	International Commission on Irrigation & Drainage
ICM/ IPM	-	Integrated Crop Management / Integrated Pest Management
ICRAF	-	International Council for Research in Agroforestry
ICRISAT	-	International Crops Research Institute for the Semi-Arid Tropics
ICT	-	Information and Communication Technology
IFAD	-	International Fund for Agriculture Development
IFPRI	-	International Food Policy Research Institute
IIMI	-	International Irrigation Management Institute
IITA	-	International Institute of Tropical Agriculture
ILRI	-	International Livestock Research Institute
ILWM	-	Integrated Land & Water Management

IMPACT	-	Irrigation Management Policy Advisory Committee (Sri Lanka)
IMT	-	Irrigation Management Transfer
IOPs	-	Individual Operating Plans
IPGRI	-	International Plant Genetic Resource Institute
IPTRID	-	The International Programme for Technology and Research in Irrigation and Drainage
IRD	-	Institut de Recherche pour de developpement
IRRI	-	International Rice Research Institute
ISO	-	International Organization for Standardization
IUCN	-	The World Conservation Union
IWMA	-	Integrated Water Management for Agriculture
IWMI	-	International Water Management Institute
IWMI-HQ	-	International Water Management Institute, Headquarters
IWMI-SA	-	International Water Management Institute, South Africa
IWRM	-	Integrated Water Resource Management
ILRI	-	International Livestock Research Institute
M&E	-	Monitoring & Evaluation
MOU	-	Memorandum of Understanding
MSEC	-	Management of Soil Erosion Consortium
NARES	-	National Agricultural Research & Extension Systems
NARS	-	National Agricultural Research Systems
NEPAD	-	New Partnership for Africa's Development
NGOs	-	Nongovernmental Organizations
NIA	-	National Irrigation Administration
NRM	-	Natural Resource Management
OSSO	-	Office Support System Office
PCARDD	-	Philippine Council for Agricultural and Natural Resources Research and Development
PGR	-	Plant Genome Research
PK/CA	-	Pakistan / Central Asia
QMS	-	Quality Management System
R&D	-	Research & Development
ROSA	-	Regional Office for Southern Africa
RR	-	Research Report
SADC	-	South African Development Community
SANREM	-	Sustainable Agriculture and National Resource Management
SARS	-	Severe Acute Respiratory Syndrome
SE Asia	-	Southeast Asia
SEAFAR	-	South East Asian Forum for Agricultural Research
SGM	-	Sustainable Groundwater Management
SIDA	-	Swedish International Development Agency
SIMA	-	System-wide Initiative on Malaria and Agriculture
SISIP	-	Second Irrigation Systems Improvements Project
SLURP	-	Semi-distributed Land Use-based Runoff Processes
SWMLMS	-	Sustainable Smallholder Water and Land Management System
SWIM	-	System-wide Initiative on Water Management

TAC	-	Technical Advisory Committee of the CGIAR
TOR	-	Terms of Reference
UN	-	United Nations
UNEP	-	United Nations Environmental Program
UNESCO-IHE	-	Institute for Water Education
UNRES	-	Un-restricted
UP	-	University of Philippines
UPLB	-	University of the Philippines Los Baños
USA	-	United States of America
WANA	-	Western Asia and Northern Africa
WARDA	-	West Africa Rice Development Association
WH&E	-	Water, Health & Environment
WRI	-	World Resources Institute
WRIP	-	Water Resources Institutions and Policies
WSSD	-	World Summit on Sustainable Development
WWF	-	World Wildlife Fund

1. Introduction

Background

A Centre Commissioned External Review (CCER) of the International Water Management Institute, Headquarters (IWMI-HQ) was carried out in Colombo in the period 20 – 28 May 2003. This came immediately after the reviews of the Regional Offices (Africa – by Prof. Alaphia Wright, Asia – by Prof. A. Vaidyanathan, and South East Asia – by Dr. Beatriz Del Rosario). The review was undertaken within the context of the (then) ongoing IWMI review and strategic planning process for future priority setting. The IWMI strategic planning exercise had been planned to take a year, and included external reviews covering Regional Offices in Africa, Asia, and South East Asia. The reviews were commissioned in order to give independent views on the achievements, strengths, and weaknesses of IWMI both as inputs into the new strategic plan and as a precursor of the External Programme and Management Review (EPMR) of IWMI that the CGIAR is likely to commission in 2004. The Terms of Reference (TOR) is appended to this report (Appendix 1). The following were examined/considered by the team members during the HQ review:

- Mission, Policies, Strategies and Research Priorities,
- Planning, Monitoring and Evaluation,
- IWMI's added value and niche: regional and global,
- Balance between research focus and development focus,
- Balance between functioning as a knowledge center (broker) and knowledge generation,
- Capacity Building,
- Quality, relevance and impact of research,
- Staff resources available: appropriateness and adequacy,
- Generation and use of financial resources,
- Matrix management: effectiveness, functioning,
- Integration, synergy, coordination of research,
- Review of the Benchmark basin concept,
- Functioning of partnerships and achieving impact through partnerships, dissemination of research results,
- Functioning within CG system and adaptation to changes in CG system,
- Research priorities and involving the NARES in priority setting, and
- Integration of Gender issues in research and IWMI.

The understanding was that each team member would prepare a HQ sectional report covering his or her allocated aspects. The three sectional reports will then be consolidated into the HQ report. This report-the consolidated report-brings together the three sectional reports.

Review Methodology

Coming as it did after the review of the Regional Offices, the HQ review benefited from insights originally gained from the regions, and later refined in light of information obtained at the HQ. Overall, the approach employed in the HQ review consisted of:

- Review of relevant background information and documents. Some 100+ different documents, including books, work plans; memoranda of understanding, progress reports, annual reports, and written comments from several IWMI staff members were consulted. Appendix 2 is a listing of the documents consulted. This is a consolidated list including material reviewed in both the Regional Offices and HQ.

- Discussions and in-depth interviews with selected IWMI staff.

- Discussions and in-depth interviews with selected partners / stakeholders. A list of persons contacted and/or interviewed is given in Appendix 3. This list includes persons contacted both during the regional reviews and in HQ. By and large, the interviews were conducted on the basis of a checklist consisting of a collection of questions (Appendix 4). Every interviewee was not necessarily asked all the questions in the list. At the same time the interviewees were free to supply additional information they considered to be important. The reviewers found this approach to generate better information than following the checklist point by point.

- Attendance at a staff seminar, in which a researcher was reporting on research progress and outcomes. This was done in order to get a feel of the types of interactions associated with such in-house seminars. The reviewers also attended an induction meeting for the Board.

- Finally, the initial findings of the HQ review were presented to the Board in a preliminary pre-debriefing session.

Layout of this Report

This report consists of three main parts (after the introduction). The first part (II to VII) covers the findings from the review, and some interpretation of the same. The second part (VIII and IX) deals with the conclusions and recommendations. The third part is made up of the appendices. Each of the first two parts is arranged in two broad sections under elements of the TOR; the first broad section deals with the achievements (= overall satisfactory states of affairs), while the second broad section covers concerns /challenges in addition to opportunities associated with the work of IWMI-HQ.

2. Mission, Policies, Strategies and Research Priorities

Thematic Research in General

Research priorities in IWMI are broadly reflected under the global research themes introduced with the launch of the Strategic Plan 2000-2005. The research and programmatic focus shifts emphasis to working in benchmark basins and is operated through the five global research themes:

- Integrated water management for agriculture
- Sustainable smallholder water and land management systems
- Sustainable groundwater management
- Water resources institutions and policies, and
- Water, health, and environment

Thematic Research: Integrated Water Management for Agriculture

The core of the Institute's expertise, knowledge base and research, built over the years, centres on this theme. The Strategic Plan 2000-2005 seeks to expand and deepen the research to cover issues relating to sustainable and integrated management of water and land at the local and river basin level as well as strategic issues relating to water at the global level. Research activities aim at developing, testing and validating concepts and tools for better management in this broader perspective, strengthening the information base and techniques (such as water accounting, application of remote sensing and GIS techniques, performance assessment) and application of models developed by the institute (Water and Climatic Atlas of the world, PODIUM and SLURP models). The programme covers several countries and specific basins of Africa, Middle East and Central Asia, South Asia and China. Projects taken up under this theme include studies on conjunctive use of surface and groundwater (Pakistan), assessing productivity per unit of water and its determinants (South Asia, Tanzania); scope for and methods of saving water (China and South Asia); Operation and maintenance of systems; use of remote sensing data for assessing irrigation performance, benchmarking of irrigation performance; and integrated modeling of water management in selected river basins (South Asia and South Africa). These projects are funded partly from core funds of the Institute; partly by various donors and partly under the CA programme. Most are being implemented in collaboration with other CGIAR institutes, international organizations and national institutions.

Thematic Research: Sustainable Small Holder Water and Land Management

This is a new area for IWMI and reflects the broadening of the scope of its work to cover to sustainable land and water management. The programme incorporates a number of research activities of IBSRAM aimed at helping small cultivators to farm their land more profitably and in a sustainable manner. A notable feature is that it works mainly through partnerships and networks of local organizations. The research focus is on control of soil erosion on sloping areas, farmer managed irrigation systems, productivity of small cultivators and reversing the processes of degradation of natural resources through community effort. While the objective of the revamped programme remains the same, the emphasis is now more on application of the findings on the ground. The geographical focus of this programme will continue to be SE Asia but a strong expansion

in Africa is envisaged. There are also some significant changes in priorities towards a more participatory and holistic research, greater attention to integrated land and water management and practical application. Project leaders of most of the ongoing projects are IWMI staff. The majority of projects (about 60 percent) are implemented in collaboration with professionals from national and, in some cases, international organizations. This thematic research is largely donor funded, some under CA.

Thematic Research: Water Resource Institutions and Policy

The broad aim of research under this theme is 'to produce knowledge-based guidelines and best practices in institutions and policies that allow countries to deal with specific types of water management problems'. The 1990s were marked by extensive work on irrigation management transfer and participatory management and case studies to assess impact of reforms. The focus then shifted to basin level management and it is now proposed to further broaden it to 'water governance.' The precise scope and thrust of this programme is in process of being formulated. Ongoing projects (currently some 24) are a rather mixed bag covering several different topics: policy options for efficient utilization of water and land resources (some very broad such as global water policy, some specific to countries and systems); financing water service delivery systems; legal and institutional frameworks for river basin and catchment area management (again some general and some specific); and water and poverty alleviation. Global water policy, irrigation impact on poverty, irrigation investment strategies in Africa, and integrated water management of Ferghana valley account for the bulk of the allocations. The project leaders are in most cases IWMI staff but a majority of the projects (including the large projects) are collaborative in nature. This division also provides inputs into projects under other themes on socio-economic aspects.

Thematic Research: Sustainable Groundwater Management

This is a relatively new and fast expanding area of IWMI research. Much of the research has so far been concentrated in South Asia, particularly India, but its geographical coverage is being rapidly extended to include Africa and China. The programme priorities are: assessment of the extent of groundwater use, its economic value and contribution to agrarian wealth creation; understanding basin level impacts of local water harvesting and recharge; linkages between groundwater irrigation and poverty; and practical approaches to sustainable groundwater management. Work so far has focused on the challenges of groundwater governance in South Asia, efficacy of technocratic and regulatory instruments for sustainable development and possible alternative strategic approaches. Groundwater governance figures prominently in the ongoing programmes. Projects relate to comparative analysis of national institutions and policies in Asia and Africa, strategies for regulation and adaptation and international workshops on the subject. Notable among these is a large-scale project involving a large number of researchers and partners (75) from all over India on management of groundwater and more generally water management issues. The precise scope and objectives of this project are however not clear from the material available to the reviewer.

Thematic Research: Water, Health and Environment

IWMI has a record of sustained research on the links between irrigated agriculture and malaria, mapping risks of malaria and interventions in environmental and water management as a means of controlling incidence. This work has earned wide appreciation. Initially concentrated in Sri Lanka, and to some extent in India and Pakistan, this work is currently being extended to Africa. Malaria risk mapping and water management for malaria control is continuing in Sri Lanka. Attempts to

broaden the scope of research to health and environment initiated during the late nineties has not made much head way despite the prominence given to environmental aspects of water management under the Strategic Plan 2000-2005. However, the Strategic Plan envisages a significant expansion of research on reuse of urban wastewater in peri-urban agriculture. Ongoing projects covering Pakistan, India, Vietnam and Ghana are designed to explore ways of improving the effectiveness and assessing costs and benefits of such reuse and the health, environmental and livelihood aspects of waste water farming communities in peri-urban areas. The other major area of research is on multiple uses of water. It is currently limited to domestic water supply and sanitation in Pakistan, water management to increase productivity along with reduction of health risks and environmental damage in Sri Lanka and heavy metal pollution in Thailand. These may however be merged with other themes. The third focus area is 'eco systems'. Being a relatively new area the group is in the process of forming a research group and developing a prioritized work programme. The projects currently underway seek to build up the database and directory of wetlands, riverine fisheries and develop strategies for bio-diversity conservation in large water resource projects and sustainable land use. A distinguishing feature of this group is the combination of research with action in close collaboration with local researchers, joint research publications with local collaborators, and sustained, focused work in a number of locations.

Research Support

Two important steps to strengthen and modernize research support facilities are the creation of the Information and Knowledge Group and the Database project. The former aims to help research groups across all of the IWMI in searching for information relevant to their work, accessing journal articles through electronic library and also to improve dissemination of research results through innovative publishing and communication techniques. The Database project seeks to develop, validate and implement a geo-relational data model for a common database management system covering research data from regional offices and their research projects (including basin information on river basins).

Capacity Building

Capacity building is sought to be achieved through seminars and short courses as part of research projects; roundtables to create awareness among top policymakers about water issues and IWMI's research findings; sabbaticals and fellowships for staff from collaborating universities and research institutes; and institution of a Ph D and post doctoral fellowship programme aimed at training some 50-55 professionals in the next 5 years. In addition IWMI provides intellectual guidance, research supervision and facilities to graduate students to work at its research sites on topics closely to its research interests.

Thematic Research - Achievements

Considerable thought has evidently gone into formulating the Institute's strategy. The enlargement of the scale and scope of its research, the focus on integrated water and land management, the emphasis on developing sustained, long-term, action oriented research in selected basins in collaboration with national institutions, and the launching of a training programme are all welcome features of the Strategic Plan 2000-2005. So is the conscious effort to bring a multi-disciplinary approach drawing on the specialized knowledge and expertise available in various international organizations. The system-wide CA and CPWF have opened new vistas of opportunity to forge wider collaborations with other research organizations and also expand its activities. They have

the potential to contribute significantly to national and international efforts to promote more prudent and efficient use of land and water. These reflect a growing realization in the international organizations that better management of land and water is a critical pre-condition for realizing the full potential for increasing food and agricultural production created by breeding better varieties and agronomic practices. The addition of land management and groundwater, the inclusion of reuse of urban wastewater as part of research on water and health, and the emphasis on collaborative problem oriented research and its geographical scope are welcome developments.

Thematic Research - Challenges

The research areas of the Institute are presently grouped under 5 main themes. While all themes are relevant to the integrated management of water and land expertise in some areas limits the magnitude and range of research it can take up. Environment is a case in point. In other areas the substantial expansion and diversification of staff has increased the capacity to cover the expanded scope of research. By how much and in what areas will however depend on the composition of new staff in terms of disciplines and experience in relation to the institute's research programme. In respect of institutions, the focus has progressively broadened from policy advice design and implementation of institutional reforms in specific countries and projects, to more general issues (such as irrigation management transfer, participatory management, and integrated basin level management). Advice/support to governments on general water policy issues and contributing to the discussions on global water policy will no doubt continue. However the scope of research on institutions needs to be narrowed down and made more concrete.

3. Planning, Monitoring, and Evaluation

Planning, Monitoring and Evaluation

Planning in IWMI occurs at several scales: HQ – Global scale, Theme and/or Regional Office Level, and Researcher / Project Level. The HQ-Global scale plan is currently captured as the IWMI 2000 – 2005 Strategic Plan. The Theme / Regional Office Plans are mirrored in the various Annual Work Plans. The Researcher Plans are captured in the Individual Operating Plans (IOPs). The implementation of each of these plans is accompanied by the relevant monitoring and evaluation practice adopted by IWMI. These three sets of plans together with their accompanied monitoring and evaluation schemes are examined in the next several paragraphs.

The IWMI 2000–2005 Strategic Plan in General

The 2000–2005 IWMI Strategic represents a major undertaking which spells out a road map for strengthening the work of the Institute. The plan covers two major overall strategies:

Firstly, the reorganization, expansion and strengthening of the internal working and functions of the institution, for effective and efficient program delivery (= Internal management efficiency and effectiveness). In addition, major decentralization are being undertaken with the opening of regional offices in Africa, India, and Thailand, with one planned for China during the life of the strategic plan. The internal management efficiency and effectiveness is being driven through four high-priority change projects:

- The Time-writing project,
- The Intranet project,
- The Database project, and
- The Quality project (QMS).

The second aspect involves sharpening the programmatic focus to cover improving water and land resources management for food, livelihoods, and nature (= research / programmatic focus). The Strategic Plan (2000-2005) was formulated after consultations with the IWMI Board, staff, and stakeholders from the donors, NARES and international research communities. The overall designs of the strategies are summarized in a series of Logical Framework Matrices (Log Frames): one for IWMI as a whole, one for each of the five research themes, one for the CA (previously the System-wide Initiative on Water Management (SWIM-2)), and one for the System wide Initiative on Malaria and Agriculture (SIMA). The Log Frames make use of a hierarchy of objectives consisting of Goal, Intermediate Goal, Purposes, and Outputs. Further, the strategic plan also makes use of a 'Common Goal' for all the constituent Log Frames. A particular characteristic of the strategic plan is that it explicitly indicates the linkages to relevant CGIAR Log Frame outputs. To date overall progress made with the implementation of the Strategic Plan 2000-2005 are given in the annual reports.

Highlights of the Strategic Plan

IWMI's Strategic Plan 2000-2005 marks a major departure from earlier periods: Between 1985 and the mid nineties, the focus was on irrigation management and active involvement in operational research on rehabilitation and modernization of systems, changing their organization and management with greater user participation. During this period the Institute was closely and actively involved in operational research and in advising government on reform measures in Sri Lanka and in Pakistan. Between 1995 and 2000 the emphasis was on knowledge generation by conducting high quality research, publishing them in reputed international scientific and technical journals and being recognized by the international scientific and research community as a premier research institution. While high quality research continues to be an important objective of the Strategic Plan 2000-2005, there is a strong emphasis on ensuring that the knowledge generated in the process reaches intended users and that it has an impact. The scope of work has also further broadened from water management to integrated and sustainable management of water and land. Even as it seeks to expand and strengthen its research activities, the programme intends to promote and facilitate wider application of available knowledge in selected basins in different parts of the world in collaboration with, and as partners of, governmental and non-governmental organizations. The scale of activity is being substantially expanded. The country coverage is being increased and a number of regional offices are being set up to decentralize the activities and bring them closer to the countries. Though the Strategy document spells out activities to be undertaken over five years (2000-2005), they are seen as part of a long-term engagement spread over the next 15-20 years.

An Overview of IWMI's Work under the Strategic Plan

As a member of the CGIAR, IWMI seeks to contribute to the System's mission of 'poverty eradication, food security and environmental conservation in developing countries' through its

research on integrated management of water and land resources for food, livelihood and nature'. The research programme of the Institute is organized around five major themes namely: Integrated water management for agriculture; sustainable smallholder water and land management systems; sustainable groundwater management; water resource institutions and policies; and water, health and environment. The sustainable groundwater management theme and the water, health and environment theme are relatively new areas and reflect the broadening of the scope of research. Researchers both at headquarters and in the regional offices take up projects on specific topics on various themes within the framework of priorities set out under the Strategic Plan. Some are funded wholly from the Institute's core funds. Donors sponsor the large majority of them directly or under two system-wide initiatives namely the CA, and the CPWF.

The IWMI 2000–2005 Strategic Plan - Achievements

The completion and ongoing implementation of the 2000 – 2005 strategic plan could not have taken place without decisive and visionary leadership, and committed staff. IWMI must be congratulated for not only initiating an innovative process, but also for boldly sticking to the agreed-upon change programs. The strategic planning process was largely participatory, the general impression is that stakeholders are pleased with the process and the progress made so far. The vision for internal management efficiency and effectiveness are clearly articulated (see A Vision of IWMI in 2005, p5 of the strategic plan). Explicit targets (indicators) are given for the size and professional weight: Each senior researcher to be supported by 3-4 junior researchers and research assistants, a doubling of the number of scientists in the institute from 50 to 100, and a doubling of the budget by the end of 2005. The indications are that these targets will be surpassed by the end of 2005. The mission: Improved management of water and land resources for food, livelihood, and nature is quite clear. All the IWMI members interviewed could easily explain this mission.

The IWMI 2000–2005 Strategic Plan - Challenges

In contrast to the internal management efficiency and effectiveness vision, the vision for research/ programmatic is captured in the broad goal of 'poverty eradication, food security and environmental conservation'. No targets are given for this goal. There is a varied understanding of the vision and there is the urgent need to ensure that staff at all levels internalizes the vision and are aware of the changes and rationale for implementation. Performance indicators for judging the attainment of the mission have been given as:

- Indicator 1: Policy and institutional reforms seen in the water sector of developing countries,
- Indicator 2: Adoption of research tools, methodologies and findings by partners, and
- Indicator 3: Research and institutional capacity of partners strengthened.

Indicators #1 and #2 are legitimate measures of the mission. Indicator # 3, on the other hand does not appear to be a valid measure for the mission. In fact, Indicator # 3 is more of an output, since the research and institutional capacities of the partners first have to reach a given level before they will be in a position to 'improve the management of water and land…' as envisaged in the mission. Further, in the same Logical Framework, Purpose #3 is given as: Enhance NARES' research and institutional capacities – which for all practical purposes is a clear example of Indicator # 3 given above. The question then is: which is which? What is more, the indicators do

not capture the required quantities and time targets, necessary for complete measurement of the attainment of the mission. In addition, the IWMI Logical framework differentiates between the mission and the purpose(s). This follows the approach employed with the CGIAR Logical Framework. This is flawed, as in practice the mission is usually the same as the purpose. A further challenge with the planning is that posed by the mix-up between purposes and outputs. For instance in the theme Integrated Water Management for Agriculture (IWMA), purpose #2 states: 'develop and update tools and methodologies for water resources assessment'. At the same time output #2 (second bullet) states: 'improved tools for assessment, accounting, planning and use of water resources'. Also it is not clear how the different themes complement each other and how findings from the research will contribute to achieving the mission and the vision. These challenges are due basically to the use of a very complicated Log Frame format, which makes use of Goal, Intermediate Goal, multiple Purposes, and Outputs.

The IWMI Annual Work Plans

The annual work plans are constructed on the basis of the research themes and the system-wide initiatives. Generally, the work plans are presented in two broad sections under each theme / system-wide initiative. The first section captures general overviews of the themes such as overall achievements in the previous year, and the general trend in the work for the year of the plan. The second section presents the work plans by projects, using a two-column format with the following headings in the first column:

- Project code,
- Short Title,
- Location,
- Donor,
- Duration,
- Budget for the year,
- Project Leader,
- Total Grant,
- Collaborators/ Researchers,
- Description,
- Planned activities for the year, and
- Planned outputs for the year.

Usually the length of the individual work plans by projects is half-a-page, one page or two pages. The planning process is apparently kicked off by a theme leader, who in consultation with researchers, collects a series of important research questions, thus identifying several possible research areas. The Regional Directors in turn collect possible research priorities for their respective regions (from both their external stakeholders, and the researchers). Discussions of both sets of research areas, usually during the Annual Review Meeting (ARM) will result in the crafting of a Research Priority Matrix showing all the projects, and flagging those, which will be funded for the year in question. These are then captured in the Annual Work Plans.

The IWMI Annual Work Plans - Achievements

The Annual Work Plans are products of collaborative efforts. The entries in the annual work plans are concise and clear on the broad types of activities, which will be undertaken during the course of given years.

The IWMI Annual Work Plans - Challenges

The fundamental challenge here is that by simply stating the activities which will be undertaken in the course of the year, 'progress' can technically only be checked on an annual basis, and this may be too late for major corrective actions where these would have been necessary. The quality and usefulness of the work plans would benefit from capturing deadlines for major activities in quarterly or half-yearly time scales within the annual plans. Here also the linkages between the projects and the overall objectives are not evident.

The IWMI Individual Operational Plans (IOPs)

The individual operational plans are drawn up by the individual researchers. This is done by taking individual involvement in the various projects into account. The details are captured in Time Tracker, and show the number of days given researchers are expecting to invest in the various projects and activities. Also, the IOPs will give the expected outputs from the researchers (usually publications) and the due dates.

The IWMI Individual Operational Plans (IOPs) - Achievements

The use of Time Tracker in trying to keep track on the times spent by researchers in various activities is a step in the right direction. This will clearly assist the Institute in apportioning cost in a more accurate manner – a prerequisite for improved management. At the same time the fact that the researchers have to plan their activities in a fairly detailed manner presents them with the opportunity of managing their research projects more efficiently and effectively.

The IWMI Individual Operational Plans (IOPs) - Challenges

The levels of competence in the use of Time Tracker (by the researchers) can be improved. Also, IWMI does not have in place details on 'standard efforts' for performing the various tasks. As such, the timings captured in Time Tracker can be over, or under estimated. The fundamental issues of 'charging costs' to given projects still has to be fully understood (by the researchers) and internalized. For instance, several of the researchers complain that they do not feel comfortable in spending time exploring/discussing programmatic issues with colleagues, because after about five minutes or so, the question as to how the time spent will be charged always comes up. In another instance, a joint work with a partner had started quite well and the partner was expecting

a certain amount of follow-up activities or meetings, which never took place. One of the reviewers was informed of this, and the IWMI staff was asked about the follow-up that did not materialized. The answer was along the following lines: "I had booked/used up all my allocation for visits."

Monitoring and Evaluation (M&E) at IWMI-HQ

There is clear evidence that the implementation of the various plans are from time to time being monitored and evaluated. The Annual Reports (2000-2001, and 2001-2002) presented various achievements scored by IWMI during the course of the respective years. These include:

- The doubling of the Research Capacity (Researchers, from under 50 to over 100, Funding, from USD 9.00 million in 2000 to over USD 16.00 million in 2002),
- The hiring of young researchers from Asia and Africa,
- The establishment of the new Regional Offices, in South Africa, South East Asia, Central Asia,
- Decentralization, with over half the researchers stationed outside of headquarters,
- Joint staff appointments with several sister CGIAR/Future Harvest Centers,
- The integration of IBSRAM's sustainable land management research into IWMI's portfolio,
- The development of tools and concepts for Improved Water Management, including the completion of the World Water and Climate Atlas, the successful use of the IWMI Water Accounting System, the successful use of the IWMI Policy Dialogue Model, PODIUM, and progress made in testing and refining a Gender Performance Indicator for Irrigation,
- The increasingly important roles being played by IWMI in positioning water high on the international agenda,
- The leading role being played by IWMI in the System-wide Initiative on Malaria and Agriculture (SIMA),
- IWMI's catalytic role in the creation of the Dialogue on Water, Food and Environment,
- IWMI's part in the major international research initiative – the Comprehensive Assessment of Water Management in Agriculture: Costs, Benefits and Future Directions,
- Setting the agenda for the Challenge Program on Water and Food,
- Progress in the 5-Basin Study–meeting the challenges faced by water-sector institutions,
- The IWMI-IUCN Cooperation–Investigating how irrigation development impact natural ecosystems,
- Reviewing 50 years of water-malaria research in Sri Lanka,

- The growth of programs through partnerships,
- Upscaling alternative water-saving irrigation practices for rice in China,
- Finding realistic approaches to wastewater reuse for agriculture,
- Managing water to meet the needs of traditional agriculture,
- Progress made with work with conservation farming villages in the Philippines,
- Increasing numbers of publications,
- Improving domestic water supply in water-scarce villages,
- The promotion of technologies for small scale farmers, e.g. the Treadle Pump,
- Guidelines for the conservation of sloping lands, and, of course,
- The various training/capacity building activities.

In addition to the Annual reports, the DG and management submit written reports to the Board. With regards to the Annual Plans, the reviewers also examined several progress reports on the change management projects, as well as on research projects. At the time of the review, the theme leaders were completing 'Synthesis Reports' of their respective themes. These report 'took stock' of research progress and achievements within the themes in the last several years. For the IOPs, the Performance Appraisal system adopted by IWMI is, in effect, an M&E system for staff performance

Monitoring and Evaluation (M&E) at IWMI-HQ - Achievements

In a way the current review is a clear indication IWMI's awareness of the need for on-going evaluation of its work. The Performance Appraisal System is a documented M&E system, and in a way meets a very important requirement of M&E systems, namely that of being able to capture and compare 'planned vs. actuals'. The IOPs give the planned issues, and the final annual appraisals give the actuals. The presentations on achievements in the Annual Reports could only have been possible in a condition in which IWMI keeps track (monitors) the said achievements, and this is a clear achievement.

Monitoring and Evaluation (M&E) at IWMI-HQ - Challenges

The major challenge here is that IWMI does not have a formalized documented M&E System for the monitoring and evaluation of both the management of research, and the progress of given research projects. This point should be contrasted with the Performance Appraisal System, which is formalized and documented. A formalized M&E system should make provision for capturing 'planned vs. actuals' of both the management of research and the progress of the research projects themselves. The system will have to be built / developed on the basis of prior-agreed upon performance indicators for the various aspects of management and progress of research. What is more, such a system will enhance the management of research within IWMI, reduce subsequent review efforts, and support the process of impact monitoring and evaluation.

4. Quality, Relevance and Impact of Research

Categories of Research in the Institute

The research projects of the Institute fall into three broad categories:

- Those meant to develop concepts, tools and analytical techniques relevant to integrated management of land, water and environment of general applicability;
- Research on specific issues under the five theme areas; and
- Research relevant for the benchmark basins.

Development of Tools and Techniques - Achievements

The Institute has made significant contributions to developing concepts, tools and techniques for water resource management. The ongoing work on the application of GIS and remote sensing techniques could make a significant contribution to build more comprehensive and reliable world-wide data base on water and further explore its uses to estimate water balances, groundwater extraction, area under irrigated crops and for water management. Modeling techniques help rigorous analysis of the numerous complex and inter-related factors affecting food production, poverty and environment and the ramified effects of different interventions to change land and water management. Research to develop better methodologies and techniques in all these spheres is essential to help improve the quality of thematic and operational research for integrated water and land management. It is but appropriate that such research should continue to be supported and strengthened.

Development of Tools and Techniques - Challenges

However testing and validation of the techniques and their practical application deserves much more attention. Some amount of it is being done within the Institute especially in respect of database using remote sensing and GIS. The big expansion in field level thematic and basin-centric research provides an opportunity for testing and application on a wider scale. Full use should be made of this opportunity. At the same time possibilities of wider field-testing of some of the techniques cited above should be explored.

Quality of Research - Achievements

The quality of IWMI's research is underscored by the various outputs which include tools and techniques, and an impressive collection of refereed publications. The scientific quality of the work of IWMI is recognized in the scientific community.

Quality of Research - Challenges

Social scientists provide support to research on other themes. There is however a feeling that this involvement tends to be rather limited and ad hoc and that their involvement in designing the objectives and methodology of research under other themes requiring a social science input is necessary. In general research on most issues relating to land and water are multi-faceted and require expertise and perspectives drawn from different disciplines. Integrated multi-disciplinary

approach to research is essential if it is to contribute significantly to promoting integrated management of land, water and environment on the ground.

Impact of Research

The Strategic Plan avers that "IWMI does research for one reason: to have a positive impact on the activities and perspectives of policy makers, water managers and poor rural communities in developing countries." It seeks to have an impact at three levels. 1. on the way water is managed to achieve food and environmental security at the global level; 2. on '...whether or not the anticipated results of individual research projects are being achieved'; and 3. capacity building and transfer of practical knowledge and tools to various levels of users in developing countries as the reason for its doing research.

The first two types of impact of the Institute's work are very difficult to assess. Part of the reason is that the Institute is but one of the numerous sources of knowledge and advice, and disentangling its influence from that of others even in the realm of ideas is practically impossible. The task may be more tractable in the case of location and problem specific research or policy advice. But even here, discussions during meetings with officials, field visits and the stakeholder workshops highlighted the need for a differentiated concept of 'impact'. Besides response of peers in the scientific community, at least four levels need to be distinguished:

- Is the target audience–managers, policy makers, and stakeholders–aware of the research results/policy recommendations?

- If they are aware, are they convinced about the relevance and validity of the results/ advice?

- Being convinced is of course not enough: they must understand their implications, be willing and able to actually make or change decisions on that basis.

- And having adopted them, to what extent are they actually implemented on the ground and how does it affect final outcomes in terms of water use efficiency, productivity and equity?

Of these, the first two, and possibly the third, are amenable to objective measurement through surveys. But the rest depend on factors quite beyond the Institute's sphere of influence. Policies and their implementation are subject to numerous influences: political considerations, differing advice from different sources, misreading of the nature of the problem, incomplete knowledge of relevant facts, and misapplication of techniques. Partial, approaches and piecemeal interventions may not produce expected results and may often result in unanticipated consequences. These limitations argue for circumspection in the domain over which 'impact' is assessed.

Viewed from a different perspective, the 2000 – 2005 strategic plan strives for impact at three levels:

- The global impact of irrigation (water for food and environmental security),

- The individual impact of IWMI's various research projects, and

- Capacity building and the transfer of practical knowledge and tools to various levels of users in developing countries.

The above can be unpacked into the major groups of 'receivers' and the 'goods and services' delivered by IWMI in order to assist in capturing the essence of the impacts involved. Receivers include: Governments, Research Institutions and Universities, NGOs (and private sector?), and Natural Resources Managers (farmers?). Goods and services include: Publications, improved knowledge/understanding of prevailing issues, data sets, and methodologies/tools for improved management of water and land resources. Further, it is worthwhile to draw a common understanding on the context of use of 'impact', and a working understanding is therefore required. The reviewer will refer to the following understanding of 'impact':

- Type-1: Changed action/state/attitude/knowledge/understanding, etc. as a result of encounter with IWMI or its outputs, and

- Type-2: Use of IWMI's outputs (for managing natural resources, particularly water and land more efficiently and effectively).

By and large, it appears that IWMI is currently using the definition given in the first bullet. The foregoing perspective was used as a basis for analysis IWMI's research impacts.

Impact of Research - Achievements

The institute has been associated closely, and over a long period of time, in wide-ranging research and policy advice for improving irrigation management in Sri Lanka and Pakistan. It would be useful, both as a means of learning from experience and for better understanding the dynamics of institutional change, to commission a systematic documentation of the implementation of interventions based on this advice and assess whether and to what extent they were adopted, expected effects were realized and the underlying factors. A structured interaction with a sample of grass roots irrigation functionaries (vel vidanes, ditch riders and community leaders) would also be useful to get a better understanding of the perceptions, reactions and problems at the local level. That some of the professionals closely involved in these two country programmes over fairly long periods are still on the Institute's staff gives an excellent opportunity to undertake such an exercise.

Further, IWMI's impacts to date are clearly of the 'encounter' type-1 nature as discussed above. IWMI had succeeded in creating an impact with its presence. Evidence of such impacts includes:

- Government departments consult IWMI and recommendations made by IWMI are taken into account by the authorities (impact on government).

- IWMI's publications are in great demand in the Africa region. The number of hits on the IWMI web site is on the rise (impact on the scientific community),

- Schreiner and Van Koppen (2002) studied the processes of creation and growth of a catchment management agency in the Olifant river basin in South Africa using participatory methods, which ensured that the views of smallholder farmers are explicitly taken into account. The process, which aims at achieving a much more equitable, and hence more acceptable distribution of water among households, small and large enterprises, agricultural and others has attracted organizations from many countries who travel to South Africa to learn from the said case (impacts on scientific community, government, and NGOs).

- IWMI-Africa cooperated with the Agricultural Research Council (ARC) and produced a local version of the treadle pump that can be made from off-shelf parts. This work won a World Bank prize for innovation (impacts on scientific community and NGOs), and

- In a way, the many participants to the various seminars, workshops and conferences where the work of IWMI was showcased were impacted to varying degrees. So too are the various post-doc fellows, M.Sc. and Ph.D. students in the capacity building program, and students and staff members at universities where staff from IWMI delivered guest lectures (capacity building impact on water and land managers, and students).

Impact of Research - Challenges

IWMI faces interesting challenges for determining impacts. In referring mainly to the type-1 impacts, as described above, the basic assumption is that encounter with IWMI or its products and services would have created an impact on the recipients. However the extent to which the encounter has prompted the recipients to 'act differently' or 'have acted differently' for better water and land management are not known. Also, the outcome of the actions of the recipients of the outputs from IWMI is not known. In short systematic determination of the impacts of the work of IWMI on the various groups of stakeholders is still to be done. IWMI recognizes this state of affairs and currently has a staff member leading the development of a comprehensive framework for measuring and reporting on the various impacts that can be traced to the work of IWMI. Two major challenges in this respect are agreeing on suitable performance indicators, which can then be used to assess impacts as time progresses, and adopting an effective process for mapping impacts, long after projects with direct IWMI's involvement have been officially closed. Appendix 5 explores a possible framework to address the second of the foregoing challenges. Also, it should be possible to build an impact monitoring and evaluation framework 'from scratch' based on a new project such as APPIA in Ethiopia. That way the difficulties associated with evaluating projects for which there are no comprehensive M&E framework are avoided.

There is the urgent need for the institute to improve its institutional memory in order to better understand long-term impact and to learn from experience. For this purpose it is desirable that the primary data from the numerous surveys conducted in the course of its research be preserved in digitized. This will both facilitate further analysis, and provide a basis for resurveys to track changes over time. It needs emphasizing that the impacts (both positive and especially the negative ones) of interventions to improve land and water management take a long time, sometimes 10-20 years, to manifest. Resurveys of intervention sites repeated periodically over such long periods are therefore essential to a proper assessment of sustained impact.

5. The Benchmark Basin Concept

Benchmark Basin Concept

Benchmark Basins are IWMI's field laboratories. Each Benchmark Basin is a long-term partnership where IWMI works with host country universities and research institutes. The partners study the Benchmark Basin's hydrology, its institutional arrangements for managing water and land, socio-economic conditions, health and environmental factors. The data is analyzed to present a dynamic profile of the basin's natural resources and how they are evolving. Current Benchmark basins are:

- The Ruhuna in Sri Lanka,
- Rechna Doab (Indus River Sub-basin), in Pakistan, and
- Olifants–Limpopo, in Southern and Eastern Africa.

IWMI's target is to establish some 10 – 12 Benchmark Basins by 2005. The Strategic Plan 2000-2005 rightly recognizes that, to be effective, problem oriented research on cross-cutting themes specific to different situations as well as efforts to encourage application of the knowledge gained in the process has to be located and institutionalized in governmental and non-governmental agencies in the selected basins. IWMI's role, and that of CPWF, is to catalyze the process by funding it for a reasonably long period and actively promote collaborative research and action programmes involving international researchers and local government agencies, researchers and NGOs. The approach is trying to break new ground both intellectually and in terms of organization.

Benchmark Basin Concept - Achievements

The concept is innovative, and it takes into account the reality on the ground. It has the overwhelming positive aspect of promoting collaborative research. As noted earlier, "land and water management 'on the ground' evidently occur within the context of the multiple influencing entities, such as diverse (and usually conflicting) demands from various stakeholders, disjointed sectoral rules and regulations, available water (surface water or groundwater, and the quality of the same), the technologies being employed, and local beliefs, and customs". Working in the Benchmark Basins actually takes cognizant of reality, and the research findings are therefore likely to be more meaningful and useful. In fact working in the Benchmark Basins will present increased opportunities for 'integration' at the field level.

Benchmark Basin Concept - Challenges

There is little experience to guide its implementation. The mechanisms and processes envisaged by IWMI and CGIAR as a whole are fine as a conceptual scheme. But there is the risk of assuming that they can be effectively implemented smoothly or soon in all respects and in all situations. The larger the basin the more difficult is likely to be the task. The problems will be more tractable and chances of success much greater in smaller basins like Ude Walawe, Kirindi Oya, Rechana Doab and Oliphant and the basins covered under the Comprehensive Assessment study. They have the advantages of being compact and manageable in size; considerable amount of data being available on the current situation, past development activity and its impact; and having been the subject of considerable research in the past. It is easier to ensure sharpness of focus in research and action, build collaborative networks in these basins and sustaining them over a longer period. An added advantage is that IWMI knows of, and has contacts with, agencies involved in water management, institutions engaged in research and NGOs working with local communities. In discussing the concept of the Benchmark Basins, the Review Team was of the opinion that work in the individual basins must be undertaken in an incremental manner – starting with smaller sub-basins and progressively 'fanning out' to the complete river basin as a whole. The major reason for this is that by starting 'small' the chances of really observing improvements in land and water management are improved, and it should be possible to capture the different scales at which certain innovations or practices are valid or invalid. The whole concept of working in the Benchmark Basins in itself presents interesting challenges for IWMI.

6. Staff Resources Available: Appropriateness and Adequacy

Staff Resources Available

At the time of the review IWMI had a total of 365 staff members distributed as follows:

- Researchers–30%,
- Research Support Staff–24%, and
- Non-Research Staff–46%.

Researchers include staff in the grades of: Principal Researchers, Senior Researchers, Researchers, Post Doctoral fellows (post docs), and Associate Experts. Research Support Staff are in the grades of Senior Research Officers, Research Officers, Field Assistants, Research Assistants, Junior Consultants, and Water Engineers. Of the 109 researchers in the Institute, only 42 were based in HQ primarily in the Global Research Division. The discussions here will be limited to the researchers at HQ. In terms of gender, males constitute 78% while females constitute 22% of the research staff at IWMI. With the initiation of the decentralization exercise the majority of researchers are in the regions. The specialties of the research staff cover Social Science and Economics (31%), Natural/physical/biological Science including biology, ecology, life sciences, geology, hydrology, earth sciences, chemistry, and GIS/Remote sensing (38%), and Engineering – mainly civil engineering and agricultural engineering (31%). Researchers (with the exception of a few are all qualified to at least master degree level, with some 75% holding doctorate degrees. Also, the specializations of Natural Sciences, Social Science and Economics, and Engineering cover the areas necessary for meaningful research in the management of water and land. In particular, the various research posts have been created with the view of providing the necessary disciplinary expertise for given projects within the five global research themes of:

- Integrated water management for agriculture
- Sustainable smallholder water and land management systems
- Sustainable groundwater management
- Water resources institutions and policies, and
- Water, health, and environment.

With the increased decentralization, IWMI had recently created the Global Research Division primarily consisting of those HQ research staff that had not been re-located to the regions and sub-regions. The division will carry out research and offer technical support services to all of IWMI's regional and thematic programs. The division houses IWMI's GIS, remote sensing, and database facilities.

Staff Recruitment and Deployment

Staff recruitment (for researchers) follows laid down procedures which include: vacancy announcements in the international press, comparison of the qualifications, and experiences of the

applicants with the profile and job requirements of the vacancies, interviews, and assessments of references. This rigorous process ensures that best qualified candidates are recruited for vacant posts. Almost all the IWMI staff interviewed during the review were satisfied that their deployment was fully in line with their respective position descriptions. The exception to this was that of some post docs who, for up to six months after commencing work at IWMI were not quite clear as to what exactly their research programs were. At the time of the review, the processes had been started for filling the senior position of Director, Global Research Division. It is envisaged that the person recruited will also function as a 'Global Research Manager' for IWMI.

Staff Resources Available: Appropriateness and Adequacy - Achievements

IWMI has an extensive and comprehensive process in place for the recruitment of staff (researchers). This is basically to ensure that personnel recruited meet the disciplinary requirements for given projects and programs. Further, the researchers were overwhelmingly satisfied with the research contents of their work. What is more IWMI is recognized worldwide as having the ability/ capability of attracting and retaining qualified staff. As such the review concludes that staff are appropriately recruited and deployed in a manner that enhances the work of the Institute.

Staff Resources Available: Appropriateness and Adequacy - Challenges

The overall challenge with staff resources has to do with the perception of staff that they are overworked. The somewhat slow pace of settling down to productive research work experienced by some post docs has already been mentioned. Further, the ability of IWMI to speedily put in place the necessary functional database facilities (from the CA, in support of the CPWF, and as a common IWMI data management tool) still has to be confirmed. Two different expert sources, one on GIS/Remote Sensing, and the other on database facilities, expressed doubts as to IWMI's current capability to take the lead in research knowledge management and brokerage. There appears to be some shortages in research management and 'integration' skills within IWMI. Also the rational target of 2- 4 research support staff for each senior researcher is still to be met.

7. Generation and Use of Financial Resources

Fund Raising

The review Team examined a comprehensive Financial Update for 2003 which was prepared for the Board of Trustee in addition to holding discussions with the Deputy Director General on the finances of IWMI. The report shows that total donor funding increased from US$8.8 million in 2000 to US$16.5 million in 2002, being from restricted funds (US$4.9 million to US$9.9 million), and from unrestricted funds (US$3.9 million to US$6.6 million). The funds raised have also been judiciously used, in that IWMI consistently showed small surpluses of US$320,000, US$95,000, and US$103,000 for the years 2000, 2001, and 2002 respectively. The spectacular rise in funding is an indication of the successful implementation of the strategy of expansion and increase in research capability.

Use of Financial Resources

The proportion of restricted funds as a percentage of total funding received, increased from around 55.5% in 2000 to 60% in 2002, and is projected to rise to around 66% in 2003. This rise conveys

several important messages. Firstly, it can be interpreted to mean that IWMI increasingly has to undertake research work for which the donors have identified a need. This will mean that the work of IWMI is clearly clients' needs oriented. Secondly this may also mean that IWMI would have to guard against simply 'customizing' its fund raising efforts to be able to bring in financial resources into the Institute. This is particularly important for projects that are more of routine applications/consultancy types, as opposed to pure or applied research. A possible example of this type of project is the Second Irrigation Systems Improvements Project (SISIP), described as: A project to reduce poverty among the target beneficiaries by increasing family income through increased agricultural productivity. These improvements are to be achieved by improvements to the irrigation facilities of the nine selected schemes in the Leyte Province.

Generation and Use of Financial Resources - Achievements

The rapid increase in the financial resources raised by IWMI since 2002 is a noteworthy achievement. Also, the fact that IWMI has been able to continue to operate with a small surplus for several years now indicates good financial management within IWMI. Finally, the increased importance of restricted funding when compared to unrestricted funding may mean that IWMI's work is being increasingly client- oriented.

Generation and Use of Financial Resources - Challenges

The major challenge with the generation and use of financial resources is that IWMI has to guard against receiving funding to undertake projects with little or no pure/applied research character.

8. Matrix Management: Effectiveness, and Functioning

Matrix Management in General

IWMI works with a matrix structure, fundamentally defined by the regional offices (x-axis), and the research themes (y-axis). The Theme leaders have authority over the program budgets, while the Regional Directors control the staff on the ground. Overall, advantages of the matrix structure include one of having specific expertise in an organization being available across projects (in this case, themes). The rationale here is that certain expertise would not have to be duplicated in the various sections, thus introducing operational performance improvements. Matrix structures are supposed to 'break down the barriers' between major departments that are organized along disciplinary lines. The major disadvantage of the matrix structure is that individual staff members would then have 'to report' to two supervisors, and this brings with it uncertainty and frustration. The implementation of the matrix structure in IWMI demonstrates these typical textbook advantages and disadvantages in reality.

Matrix Management - Achievements

It is generally accepted that IWMI works with a matrix structure. Management understands the functioning of the structure and efforts are been made to get it to work properly.

Matrix Management - Challenges

Unlike the management, who understands the functioning of the matrix structure quite well, the researchers do not seem to have reached the same level of understanding. There is a certain

amount of frustration among the researchers concerning the seemingly increased efforts necessary for completing concepts notes, which end up not been taken further (for funding) for one reason or the other, but mainly 'because the theme leader does not understand'. Thematic supervision appears to be weak – the researchers would appreciate stronger contacts with the theme leaders. This is particularly true for the post-docs. Two of the post-docs spent up to six months without actually knowing the substantive research they should be working on. There is a certain amount of frustration among the researchers concerning the apparent shortage of funding, which they have (wrongly or rightly) attributed to the rapid growth of the institute as seen from increased recruitment.

9. Integration, Synergy, and Co-ordination of Research

Integration in General

The issue of integration was already covered during the review of the Africa Regional Office, and some suggestions made concerning possible ways of handling integration. The discussions of integration have been refined, making use of additional information from the HQ review. The overall meaning of 'integration' in this case comes from Integrated Water Resources Management (IWRM). The ultimate goal of IWRM, as captured in the Dublin Principles, and in Agenda 21 simple says 'equitable access to safe water (for the various uses) in economical and environmentally sustainable manner'. Two immediate implications of this are:

- Firstly, water and land management 'on the ground' evidently occur within the context of the multiple influencing entities, such as diverse (and usually conflicting) demands from various stakeholders, disjointed sectoral rules and regulations, available water (surface water or groundwater, and the quality of the same), the technologies being employed, and local beliefs, and customs.

- Secondly, water and land management research has to be conducted in such a way that the multiple influencing aspects present in any given case are successfully accounted for– preferable in an integrated manner (systems approach). At the very minimum, water and land management research must simultaneously account for biophysical and socio-economic aspects of the research question at hand. This is absolutely necessary, if for no other reason save that of taking cognizance of the reality on the ground – where the findings will have to be applied.

The question then is how can integration at the research level be implemented? An evident answer is that one must work with multi-disciplinary teams.

Integration - Achievements

Efforts are being invested in trying to 'integrate' research in IWMI. There are several multi-disciplinary teams active in given research projects. Possibly a major achievement here is the realization that the integration function needs to be strengthened.

Integration - Challenges

Almost without exception, the researchers are not yet comfortable with the 'integration' aspect of their work. In general the researchers understand that there are several cross-influencing issues in water, land, food, the environment, and institutions and policies, particularly at the basin level. They are however not sure as to what has to be integrated? How are they to work in multi-disciplinary teams? Who takes care of the crosscutting issues? As one researcher puts it: "we are still working very much in isolation and not in true multi-disciplinary teams". Appendix 6 explores a possible way of accomplishing integration at the research level.

Coordination of Research

By and large the coordination (and management) of research occurs at several levels. The front line manager is clearly the individual project leader. The review was shown a Project Leader – Job Description (supplement to the individual job descriptions). This document describes the project leader as 'holding a unique position in the IWMI management matrix – it is they alone who have both human and financial resource management authorities'. The next level is that of the Regional Directors at the region and sub-regional levels. The next level up is that of the HQ, and there is a position of Research Coordinator at HQ. The coordination of research at the regional and sub-regional levels is currently taking place (through the Regional Directors). Coordination of research at the global level is currently not taking place in an inspiring manner. The question is: "who coordinates the themes (Theme Leaders)?" Some researchers believe that this coordination should be done by the DG. Several others are of the opinion that the coordination of research at the global scale must be done by the Research Coordinator. The Research Coordinator is however currently tasked with developing a comprehensive system for monitoring and evaluating of the impact of research. Several IWMI staff members expressed the view that the newly to be appointed Director of the Global research Division will have to take over the coordination of research at the global level.

Coordination of Research - Achievements

IWMI recognizes the importance of coordination of research, and efforts are being invested to get the research coordination role effectively functional.

Coordination of Research - Challenges

IWMI still has to get the function of research coordination at the global level effectively operational.

10. Functioning of Partnerships and Achieving Impact Through Partnerships, Dissemination of Research Results

Partnerships in General

This review fully acknowledges that IWMI is strengthening (or enhancing) its management of science (knowledge generation) and technology (application of knowledge)-nurturing a culture of scientific excellence, fostering greater accountability, and increased efficiency, and fine-tuning a more client/user-oriented/participatory approach in producing and delivering quality science-based international public goods, in the area of integrated land and water management research and

development. In this regard, IWMI has developed multiple partnerships through its research activities, policy dialogues, training and capacity building, and dissemination of research results.

Partnerships at the Project Level

In research (at the project level), the Strategic Plan 2000-2005 indicated that IWMI works closely with the NARES, universities, NGOs, local authorities, advanced research institutions, regional centers of excellence, and other CGIAR centers (IFPRI, IRRI, ICRISAT, ICRAF, CIAT, ILRI, etc). IWMI also links with international NGOs to get access to field sites across the developing world, for testing and application of IWMI research. Partnership with institutions and governments will help IWMI achieve its goal to have a positive impact on water and land management policies for the benefit of the poor. In the Strategic Plan 2000-2005, IWMI targeted to (a) develop close partnerships with 25 institutions in 8-10 IWMI priority countries to create a network of institutional and policy research groups that will share research results, (b) organize 25 policy dialogues over 5 years and do necessary follow up activities annually in India, Pakistan, China and South Africa.

Bringing Research Results to Users

To bring research results to the users, IWMI signed a series of strategic partnerships with national agencies, international NGOs with broad local links and have dissemination and social mobilization expertise, and research institutes with complementary expertise. In the Strategic Plan 2000-2005, IWMI targeted adoption of promising smallholder land and water management systems by 100,000 poor farmers in Asia and Africa within 3 years (from 2000), and by 1 million smallholders over a 5-year period.

Capacity Building

Capacity building is an integral part of IWMI's research program. IWMI's Capacity Building Program formally started in 2001. The major focus is the development of research capacity in the South. In the Strategic Plan 2000-2005, IWMI indicated its longer-term wish that it is remembered for improving the capacity of national partners and strengthening developing countries' research capacity in the field of water (and land) resources management. In this regard, IWMI has forged alliances with universities in the North and South to help build professional capacity of graduate students (Ph.D., M.Sc. students) and postdoctoral scientists. The component activities of the IWMI capacity building include: Ph.D. scholarship program; M.Sc. Fellowships; Post-doctoral Fellowship program; NARES Partnership Program; Private sector program; Policy Roundtables; and Workshops, Seminars and short courses.

New Partnerships

IWMI is involved in 3 new international research and capacity-building initiatives such as the Comprehensive Assessment of Water Management in Agriculture (CA), the CGIAR Challenge Program on Water and Food (CPWF), and the Dialogue on Water, Food and Environment. The 3 are linked, i. e. the CA helps build the Dialogue's knowledge base and the Dialogue provides local stakeholder involvement and a key delivery channel for results. The CPWF delivers the public-goods research (from drought resistant plants to improved water policies) based on priorities identified by the Dialogue and the CA. IWMI expands its collaboration with the Global Water Partnership (GWP) by hosting its Global Resource Center (RC) beginning 5 December 2001 until 1 March

2004 through a formal agreement with the Swedish International Development Agency (SIDA) representing the GWP. The Global Water Partnership is an independent network open to national governments, research and non-profit organizations, private companies, and other institutional stakeholders involved in water resources management, which facilitates the exchange of knowledge and experience on integrated water resources management.

Policy Brief and Other Communication Tools

IWMI researchers acquire the culture of knowledge sharing as shown in the Concept notes prepared for the Challenge Program on Water and Food. Appendix 7 shows the extent of CG Centres participation in developing concept notes for the Challenge Programme. For greater impact in terms of timely and effective, credible delivery of communication messages to intended clientele, researchers need the necessary skills and resources. The policy briefs, circulated widely gratis, provide a summary of ongoing activities and research findings. The Information and Knowledge Group's Communication Unit targets to brand the Water Policy Briefing series internationally, building its reputation as a credible science-based title. The first IWMI policy brief (water productivity) was published in March 2003 and 2 are planned in May. A Water Policy Briefing web site has been created and a marketing effort is planned at all levels. Other communication tools include training manuals, strategy papers, books, web sites, e-mail conference. This wide variety of communication tools necessitates the integration of these activities into a Communication Plan both at the Regional Offices and at the Headquarters. This review was informed that such plans have already been developed and agreed with most regional offices. There is progress but core funds are limited. Implementation of the plan should be more strategic.

Partnerships - Achievements

The review of the research and development programs at the IWMI Regional Offices and the Headquarters noted that IWMI works in partnership with many institutions and organizations in varying degrees. In general, the linkages with universities, international institutions and some CGIAR centers are considerably strong. Some progress is noted with the NARES, advanced research institutions, intergovernmental institutions, NGOs, the private sector and the local government authorities (please refer to individual regional CCER report for details). Some examples are given in the next few paragraphs.

Partnerships IWMI Southeast Asia - Achievements

IWMI-Southeast Asia is relatively young but it has endeavored to establish collaborative activities in research, education, training and capacity building, and information exchange in sustainable management of land and water resources through collaboration with the NARES, Universities, NGO's, farmer organizations and networks, and to a limited extent the local governments, and the private sector. Its relative strength lies in the network and consortium partners it has inherited from IBSRAM. The major areas of activities that have been initiated with the partners and collaborators are in smallholder land and water management systems (Theme 2) and policy and governance (Theme 4). IWMI's limited work on health issues (Theme 5) in Thailand is paving the way for a concerted effort by all sectors (water, agriculture, health) to address the issue. IWMI-SEA's big programs MSEC and ASIALAND involve the NARES in a network mode, and NGO's such as CARE and WWF, and the local government authorities are active in disseminating/ promoting conservation farming technologies. The French Institute for Rural Development (IRD),

an advanced research institution (ARI), is playing an important role in strengthening the research aspect of these programs.

Partnerships IWMI-Africa - Achievements

IWMI-South Africa Office had succeeded, in a very short space of time, in initiating and cultivating several (potentially) mutually beneficial partnerships with some 30 institutions. In addition IWMI actively participates in the African Water Task Force – a panel of representatives from major regional, national and UN initiatives and institutions working on water in Africa. The panel is seeking to define and synthesize Africa's water priorities, positions and programs for action. The original aim of the Task Force was to ensure that the identified priorities are addressed at the World Summit on Sustainable Development (WSSD) in Johannesburg, the 3rd World Water Forum in Kyoto, and in other forthcoming major international development forums.

Partnerships Private Sector - Achievements

IWMI has forged partnership with the private sector (UNILEVER-3 years, Arcadis Consulting firm- 6 months, and the World Bank-2 years) through secondment (6 months to 3 years) of private sector staff to IWMI-HQ to disseminate IWMI research results and gain from private sector perspective/knowledge.

Partnerships CGIAR and others - Achievements

Joint staff appointments with sister CGIAR centers such as: IFPRI (2 IWMI-IFRI researchers working on global food water modeling to integrate IFPRI's IMPACT model and IWMI's PODIUM model); IRRI (joint appointment of an IRRI-IWMI researcher working on water savings in rice cultivation); WARDA (joint appointment for work on water management in the Senegal River Valley); and ICARDA (joint appointment for work on wastewater reuse). Provision of office space, equipment, Coordinator and Administrative Officer, core team and scientific inputs to the IWMI-GWP-Resource Center. IWMI-GWP-RC provided inputs to and facilitation of a range of activities.

Partnerships - Challenges

IWMI partners and collaborators articulated several concerns about the future sustainability of the current collaborative work and partnership arrangement. These concerns include funding, joint planning, implementation of demand- driven projects and sometimes low levels of feedback, involving other stakeholders/sectors for better synergy, using local expertise in conducting research in order to build or strengthen local capacity, among others. All partners recognize the need for long term funding for research that is required to observe the changes over time. Commitment of funding for continuity of long-term research in selected sites for generating new knowledge is vital to the success of the partnership. But different institutions have different financial capacity and capability to generate additional resources. For instance, while some institutions in the NARES could provide bridging funds to sustain activities of an ongoing project such as MSEC in Southeast Asia (while continued financing is being negotiated with the interested donor), such arrangement will not be sustainable.

Partnerships IWMI & CG Centers - Challenges

The major challenge facing IWMI and other CGIAR centers in working through partnerships is that of ensuring that the partnerships are mutually beneficial. This review noted effective partnership

between IWMI (then IIMI) and a National Irrigation Administration (NIA, Philippines), which created some impacts on the way NIA carried out its business. The Thai collaborators under a more recent project on cadmium contamination in rice grains (under Theme 5 Water, Health and Environment) appreciated IWMI's capacity building of a Thailand soil laboratory and its staff. This review also noted the desire of some partners in Southeast Asia (SEARCA) and South Africa to reactivate partnership activities contained in the previously signed MOU, which has been quite inactive for a while. SEARCA, a regional center of excellence for graduate studies in agriculture, believes its special skills in capacity building and natural resource management will be of value to IWMI.

Partnerships Researchers - Challenges

At the researchers' level, some researchers feel that they are simply being used as 'data collectors' for IWMI, while some others feel that IWMI's staff does not spend sufficient time in the field (could be explained by time tracker). While IWMI staff is concerned with refereed publications as an output, partners are concerned about clarity in their roles, funding resources available and the extent of collaborative work and timelines. Partners wish that IWMI staff improved its relationship with partners through joint planning of collaborative projects, more exchange of ideas and more feedback. The overall challenge is, of course, for IWMI to successfully manage the various partnerships to the satisfaction of the parties concerned.

Partnerships Intellectual Property Rights - Challenges

IWMI researchers develop toolboxes in partnership with others. For example, a "smallholders toolbox" is currently being developed under the leadership of the Theme 2 Leader (based in Africa) and a modeler. To address the property rights issue, the individual or group involved in its development shall be duly recognized. Contributors, donors or funding agency should be acknowledged in the document or in the copy of the toolbox. Original contributors should likewise be mentioned in any revision or upgrading of the tools. Similarly, the source of the data should be properly cited.

Knowledge Sharing Initiative - Challenges

Supplying hard copies of research and discussion papers free may be too expensive. Perhaps a more effective and affordable way would be to identify a number of research institutions in the developing countries as repository institutions and supply all the past and future research output of IWMI on CD-ROMs and provide other soft copies of particular papers on request and at cost of making copy. Also IWMI will have to systematically document 'Grey literature' as an initial step in consolidating its role as a knowledge broker.

11. Functioning within the CG System and Adaptation to Change, and IWMI's Niche

IWMI, A Learning Organization

IWMI can be considered a learning organization as it adapts to the various reforms in the CG system, facing the realities of declining budget for research globally and meeting the challenge of

improving the productivity of water for food, health and the environment. Some of the significant processes and hallmarks of IWMI during the review period are:

- Initiation of the pilot Challenge Program on Water and Food (CPWF) as approved during the 2002 Annual General Meeting (AGM) in Manila. The CPWF seeks to scale up impact, improve partnerships (within CGIAR and outside CGIAR), identify important issues related to food security, poverty alleviation, health and environment and build platforms that can mobilize additional funds.

- Water and Food issues are now recognized in the international development agenda, and were emphasized in important conferences such as the Johannesburg World Summit on Sustainable Development, and the Kyoto World Water Forum.

- IWMI's leadership role in benchmark basin work is highly recognized.

- IWMI is effectively leading the system-wide programs (CA and SIMA). SIMA was reviewed favorably under the IWMI Theme 5 Water, Health and Environment last November 2002.

- An active gender –balanced, impact conscious IWMI Board of Governors is in place. IWMI is a gender aware organization with the Director General serving as Advisor to the CGIAR Gender and Diversity Program. IWMI is consciously aiming for gender balance in its staffing, and making some progress in integrating gender concerns in its thematic research.

- Change management projects are in progress (Time tracking, QMS, Performance-based evaluation system) though there is varied appreciation among staff at both the Headquarters and the Regional Offices.

- IWMI takes impact assessment seriously, working on impact indicators in consultation with other CGIAR centers.

- IWMI has decentralized through regional offices, and on its way to institutionalizing the networking arrangements inherited from IBSRAM, linking more and more with NARES for greater impact.

- IWMI and its staff are conscious of the importance linking science and policy and are facilitating and providing significant inputs to the Dialogues at the Global, regional, and national levels.

- IWMI is nurturing the culture of scientific excellence the CGIAR is known for – IWMI Principal Scientist Tushaar Shah was awarded by the CGIAR the 2002 Outstanding Scientist Award during the AGM 2002 in Manila, Philippines.

- IWMI's role as a knowledge broker is being sharpened as IWMI ICT and knowledge management group defines its program focus.

- IWMI is broadening its partnership with the NARES, NGOs, private sector, local government authorities, river basin commissions, international and intergovernmental organizations.

The following sections will highlight selected milestones related to the CPWF, the CA (SWIM 2), and the Culture of Scientific Excellence.

The Challenge Program on Water and Food

The CPWF seeks, through collaborative research, extension and capacity building to evolve policies and institutional strategies of integrated water and land management in 9 major river basins around the world (called the benchmark basins), encourage authorities to actually implement them and demonstrate that significant and sustainable increase in food production can be achieved without increasing water use. In each selected basin research will focus on the following major themes: crop water productivity improvement, multiple use of upper catchments, aquatic ecosystems and fisheries, and integrated basin water management systems. The synthesized results will feed into the work on the global and national food and water system, the fifth theme of the programme. The agenda, methodology and analytical framework of research on each theme identified under the CPWF will be developed, and the policy implications analyzed and synthesized, by specialist groups of experts. The responsibility for coordinating and synthesizing research on each theme is vested with a designated institution. For the benchmark basins the coordinating role is located in the NARES of the country. It will be responsible to develop baseline data, prioritize and integrate research in the basin on various themes, and work in close collaboration with stakeholders to test findings and innovations for adoption.

The Challenge Program on Water and Food - Achievements

The Challenge Program on Water and Food Secretariat was established after the program's approval in November 2002 Annual General Meeting. The CPWF Partners and Secretariat developed work plans and budget for central activities, such as the themes, basins and secretariat. Call for proposals started in December 2002. IWMI initially prepared nearly 100 concept notes that were reviewed internally and resulted to 43 IWMI led concept notes submitted to the CPWF (Appendix 8 and 19). In the Director General's report to the May 2003 Board of Governors meeting, this review noted that fund raising was progressing well: major contribution of new money from France (6 M Euro for 3 years) and regular annual CGIAR contribution from World Bank, Denmark, Germany and Switzerland totaling 4.5-5 M US$/yr. Here also, IWMI is playing a leading role. The secretariat for CPWF is independent of the IWMI but physically located in its premises. The Director General of the Institute is its chairman. One of the CPWF theme leaders is an IMWI staff member (for this theme, integrated basin water management systems, IWMI is the lead institution). Its regional offices are providing, informally, support to some of the Benchmark Basin Coordinators. IWMI also expects to contribute significantly to the research activities under the programme. Thematic groups are eligible, and encouraged, to submit project proposals funded by CA and CPWF. The proposals have to go through their respective review procedures. The review process under the CPWF, done through independent panels of experts, is quite stringent. Both encourage, and insist on, inter institutional collaboration within the CGIAR family, with other international institutions, and national organizations.

The CPWF conditions in this respect are more stringent. Projects sponsored under these programmes are expected to be a substantial source of funds for the Institute.

The Challenge Program on Water and Food - Challenges

In general, there were more concept note submissions from the CGIAR centers than the other partners. This review is informed that NARES submissions are low and generally did not meet

the basic CPWF requirement (Appendix 9). NARES though should be more actively involved in the CPWF. Many NARES need capacity building even in preparing good proposals worth funding. Developing regions need stronger NARES to help weaker NARES. There is however great concern for the possible reduction of the Dutch contribution from the committed level of 5 M Euro per year for 5 years. Discussions with other donors (IFAD, Norway, and Japan) are ongoing.

The Comprehensive Assessment of Water Management in Agriculture

Research under Comprehensive Assessment aims at improving the knowledge base for improved management of water and land resources for food, livelihoods and nature. Several outputs are planned:

- An assessment of water, agriculture, rural development and environment. A research-based reference library containing peer-reviewed reports, journal articles, assessment book and a packaged body of information on water resources in agriculture, including a dataset of new analyses, maps and statistics on irrigated and rainfed agriculture, cropping patterns and impacts on ecosystems and groundwater use.

- Water management tools. Participatory assessment and scenario-development tools that planners can use to support their rural development decisions.

- Innovative water management solutions. Analysis of promising local water management approaches and practices to understand which ones are successful, and why, for the purpose of wider dissemination.

- Capacity-building program. Supporting 30 PhD and 30 MSc students, doing hands-on work with a variety of partners in the assessments, engaging local communities to carry out assessments and providing scientific substance that will form the basis of training materials and guidelines

- Knowledge sharing – Policy, information and communication. Policy and technical communication, which will package conclusions and recommendations for action and present them to the potential user audiences. Briefings and guidelines for a variety of users including NGOs doing community development work, the international development community and governments making choices about future water development.

The Comprehensive Assessment of Water Management in Agriculture - Achievements

The first call for proposals (September 15, 2002) under the CA Competitive Grant scheme yielded 34 proposals submitted by the CGIAR centers and NARES partners. Total grant amounts to US$ 600,000. There are about 50 partners working on the CA. For example the CA collaborates with UNEP, IUCN, GRID-Geneva, WRI, and University of Hampshire in the development of Water Resources and Wetlands E-Atlas, an interactive web–based information service on water policy and management issues. Three research papers, three draft papers and several working papers were produced during the reporting period. A framework for case studies of river basins within the CA was developed. Data base management workshop conducted with partners in May 2003.

The Comprehensive Assessment of Water Management in Agriculture - Challenges

The CA is still at an early stage but it has been quite successful in getting world attention on water issues and the role of science and technology and the CGIAR in averting water crisis. CGIAR partners appreciate IWMI's leadership in CA. It appears that CA projects are predominantly led by CGIAR centers. How much of it is capacity building for the NARES? The links with the Dialogue and the CPWF should be smooth and seamless for greater impact.

Scientific Excellence-Refereed Journals and other Indicators of Impact

The CGIAR centers generate new knowledge and have established international reputation for producing quality peer-reviewed scientific publications. IWMI produced a number of peer-reviewed articles in 2000-2002. The following are IWMI's scientific contributions to the body of knowledge on integrated land and water management during 2000-2002 (previous years were indicated for comparison):

Year Articles	No. Journal Journals	No. Refereed
1998	37	13
1999	29	6
2000	27	14
2001	26	10
2002	58	30

N. A.– Not available

Scientific Excellence-Refereed Journals and other Indicators of Impact - Achievements

The Outstanding Scientist awarded by the CGIAR to IWMI's Principal Scientist in November 2002 speaks well of IWMI as a premier international scientific institution. During 2000-2002, IWMI's scientific work is recognized in more diverse international journals (irrigation and water management, policy, health, ecology and environment) as reported in the Publications Catalogue (April 2002) provided to this review. This review noted though that while work on irrigation water management is consistently published in 2000 and 2001, the number of publications in this area significantly dropped in 2001(2000= 25, 2001=10). On the other hand, scientific publications on: a. water, health and environment has increased from 2 (2000) to 5 (2001); and b. policy, institutions, and gender collectively has increased from 4 (2000) to 7 (2001).

Scientific Excellence-Refereed Journals and other Indicators of Impact - Challenges

If each researcher is required to produce 2 journal articles per year as per the Institute's current policy, and there are about 48 researchers (senior and above category), the current productivity is below what it has targeted. This HQ review recognized that scientific publications are not the only means of assessing productivity and impact of IWMI researchers in particular and IWMI in general. A review of IWMI's regional offices (as part of this review) indicated that researchers' tasks varied from conducting research to fund-raising to enhancing capacity of NARES partners to policy dialogues. Hence, their outputs range from:

i. generating new knowledge (the science), to

ii. research funds committed by partners and other funding sources, to

iii. number of trained staff of partners, degree or non degree, to

iv. increased awareness of partners and policy makers on critical issues on integrated land and water management, and to

v. science-based policies formulated by partners and policy makers, among others (Appendix 10).

This review recognized that an institute with a global mandate to generate new knowledge such as IWMI is also expected to impact at the policy level (local, national and regional). The current awareness of the IWMI researchers about the value of their work for sound decision-making at the policy level and preparation of policy briefs is a big step in that direction. This review is pleased that the on-going work of the management team in clarifying the roles of the researchers (Theme leaders, and Regional Directors) and support staff, their outputs and indicators of performance will do justice to the many activities inherent in the integrative, facilitative roles of IWMI.

12. Research Priorities and Involving NARES in Priority Setting

Research Priority Setting

Resources for agricultural research and development are fast becoming scarce globally. To set research priorities is to pinpoint where resources need to be channeled. Setting priorities influences the direction of research by encouraging researchers or institutions to focus on areas as having top priority. It has, therefore, become increasingly important that the allocation of resources, or priority setting, be made on a more informed basis. Hence, a more careful evaluation of research activities requiring public funds will be necessary. Traditionally, research prioritization adopted by many research institutions was basically subjective. The need for a more objective, formal mechanism that combines quantitative approaches and multi-stakeholder participation has been recognized. The priority setting tool though must be simple, cost-effective and rapid. During the 2000 EPMR of IWMI, the Panel recommended and the TAC endorsed that IWMI adopt a more systematic approach to priority setting and impact assessment. System-wide, this review is also informed that the TAC suggested that CGIAR Centers and NARES should define regional priorities together. The process was started in June 2001 in IRRI by APAARI, the CGIAR Centers, the Global Forum for Agricultural Research, NARES in East and Southeast Asia, NGOs/CSOs, private sector, FAO and ADB. When the Challenge Program came in 2001 with prospects of "new" money, the process was marginalized.

Research Priority Setting - Achievements

The IWMI Strategic Plan (2000-2005) indicates the research themes as the key instrument to IWMI's strategic priority setting and to integrate the research agenda across physical locations. The five research themes reflect the broadened scope of IWMI from exclusively water resources to water and land resources management. These changes were the result of discussion with the

IWMI Board, staff, donors, NARES, and international institutions. The matrix of priorities (Appendix 11) indicates at least 3-4 focus areas of research for each theme. Theme syntheses have been prepared by the theme leaders and circulated to the Board for comments during the May 2003 meeting. In formulating the next Strategic Plan (2004-2008), a series of stakeholders' consultation were conducted in Southeast Asia (Thailand and Philippine only; this was originally designed as regional consultation but did not push through because of SARS), South Asia and South Africa. These consultations generated a wide variety of priority areas, including information on sub-regional priorities resulting from a sub-regional consultation conducted by the Southeast Asian Forum for Agricultural Research (SEAFAR) in February 2002 (Appendix 12) and APAARI in 2001 (Appendix 13 and 14).

Research Priority Setting - Challenges

IWMI is certainly fine-tuning its client-oriented participatory approach to priority setting by consulting various stakeholders. This review sees a bigger role of the Regional Offices in engaging the NARES through regional/sub regional groupings such as APAARI, SEAFAR, FARA in Africa, etc in identifying regional priorities and formulating action plans. Through regional/sub regional groups, common research issues among countries can be collectively addressed to increase efficiency. Moreover, knowledge sharing through networking for development is becoming a norm in many regions/sub regions. This could lead to a more participatory development and enhanced synergism at the regional/sub regional level. A framework for integrated land and water resources management is suggested (Appendix 15). Theme syntheses will be useful guide in understanding the state of knowledge and gaps in terms of research, technology, policy, and capacity building, among others. While the theme syntheses can track the overall scientific contribution of IWMI to the body of knowledge and therefore IWMI's strength, they can also be indicative of the magnitude of work, resources, and time needed to achieve the desired goals. Do all NARES have the core competence and resources to contribute and in what capacity? The present syntheses though are heavy on the technical and scientific aspect, and do not indicate at all the total investments (funding and researchers time) made so far on any priority area or theme over time and across regions. IWMI should not invest in any activity that has a very localized application. IWMI should consider regional concerns by clustering countries in terms of similarities/capacities (e.g. less developed, more developed). Regional network then could function well. IWMI can team up with regional bodies like SEARCA who have the expertise in regional prioritization. While National Consultative Committees can be relied on to identify national priorities, there are too many countries that IWMI will deal with, hence could be costly.

13. Integration of Gender Issues in Research and IWMI

Gender Staffing and Governance

The Strategic plan 2000-2005 indicated IWMI's weakness as follows: "Too few scientists from the South or women in senior positions". The size and professional weight was projected to grow from 50 scientists in 2000 to 100 scientists by 2005. However, it did not target gender diversity in senior positions and geographic locations. In the IWMI May 1, 2003 staff list provided for this review, a total of 365 staff is indicated, 72% males (261), and 28% females (104). Forty-eight staff (44 males, 4 females) occupy Senior Researchers position and above. The total number of researchers (including post doctoral scientists) is 109 (85 males, 24 females) (Appendix 16). There

are more male than female researchers in the Regional Offices of Southeast Asia (18 males, 1 female) and Pakistan/sub office Uzbekistan (6, all males). There are more females (7 out of 17 staff) in the Regional Office Africa/sub regional office Ghana/Ethiopia compared with other regional offices. The Regional Office South Asia/Sub regional office Nepal has nearly an equal number of male (6) and female (4) research staff.

Gender Staffing and Governance - Achievements

This review is informed that there has been a conscious effort to attract women in senior positions, but IWMI has not succeeded so far. The leadership has supported a policy on spouse employment and has succeeded in attracting four women in senior research positions. Moreover, the new Leadership Program of IWMI has identified 7 promising women (out of 12 promising men and women for research and research support) for career development in the next 3 years. In terms of governance, there is gender balance in the Board of Governors of IWMI with more women coming from the South (Appendix 17). The current IWMI, DG serves as the Chair of the CGIAR Gender and Diversity Programme Advisory Board.

Gender Staffing and Governance - Challenges

Overall there are more males than females in all staff category regardless of geographical location. IWMI's current policy on Spouse Employment and Career Development for promising young women through its Leadership Program is a big step towards achieving gender balance in staffing. The gender balance in the IWMI Board of Governors with more women representation from the South is an excellent tribute to the many women farmers in Asia and Africa.

Capacity Building for IWMI Staff and Partners

As per Strategic Plan 2000-2005, IWMI PhD Scholarship and Postdoctoral Fellowship Programs are targeting 25 and 30 individuals, respectively during the period. However, there is no target by gender and geographic location.

Capacity Building for IWMI Staff and Partners - Achievements

The May 1, 2003 Capability Building Program report indicated that there are 27 staff members in the Post Doctoral Scientist and Associate Experts category. Eight are based in the Global Research Division, Colombo.

Capacity Building for IWMI Staff and Partners - Challenges

There is nearly equal representation from the North (12) and South (15). However, there is clear gender imbalance (4 females, 17 males) (Appendix 14). The new Leadership Program of IWMI has identified 7 promising young women (out of 12 promising young men and women) for career development for the next 3 years.

Integrating Gender Concerns in Themes/Activities

Gender was not explicitly addressed in the Strategic Plan 2000-2005 log frame. There is very little reference to gender concerns in the thematic areas, in the planned activities and in the planned impact assessment. Theme 1 is gender blind. Theme 2 has explicit reference to gender in its objective, however, its planned activities, expected outputs and impacts were generally gender blind. Theme 2 explicitly recognized gender issues such as (a) the feminization of agriculture in marginally

productive areas, (b) the impacts of SSWLMS practices on the livelihoods of poor men and women. The planned activities explicitly addressed only (b). Theme 3 Objectives have general reference to "promoting food and livelihood security for the poor men and women in Asia and Africa". The planned activities however are not so explicit about gender. Theme 4 explicitly addressed institutional and policy implications of "building poverty and gender concerns into national and sub national water management regimes." The stated objectives and planned activities are consistent with the stated gender concern. In the case of Theme 5, this review is concerned that this theme as per Strategic Plan 2000-2005 is surprisingly gender neutral when water and health are clearly women's domain even at the household level.

Integrating Gender Concerns in Themes/Activities - Achievements

In terms of achievements, this review was informed that a paper on Gender Performance Indicator for Irrigation: Concepts, tools, and applications was adjudged as one of the best paper during a research related event in 2002; a total of 17 papers were published (various publications, Appendix 18) including 4 case studies published as IWMI Working papers 11-15 on gender and irrigation in India, Sri Lanka and Nepal in 2001 (Theme 4). One gender article was published in a refereed journal in 2001. Discussions among Theme leaders (Themes 2 and 4) and the gender expert (B. van Koppen, coordinator poverty, gender, and water project of IWMI) were initiated, and requests from IWMI colleagues to "genderize " proposals were made and granted.

Integrating Gender Concerns in Themes/Activities - Challenges

Gender is still not very visible in IWMI research. While gender is fully recognized as an important research issue in IWMI, few IWMI researchers started to include gender issues in research proposals. An exchange of e-mails among IWMI gender researchers for this review reflected the need for them to convince other colleagues to operationally integrate gender in their researches. This review suggests that initially, gender researchers can make a stronger case by synthesizing results of gender studies conducted by IWMI and others, and assist project leaders and theme leaders identify gender issues using available gender analytical tools. Eventually, theme leaders should be able to synthesize gender issues in their particular themes and address such in their research proposals. This review was informed that a senior gender specialist has been requested earlier for Africa and outside Africa but the Headquarters has not granted this yet. This review thinks that with the streamlining of the Global Research Division, a senior gender specialist can be recruited to provide assistance to all regions through all themes. This specialist shall work with other less gender- aware researchers to ensure gender visibility in themes and activities. The specialist can also work with the Human Resource officer in monitoring gender staffing.

14. Discussions and Conclusions–Research Priorities, Impact and Niche

Thematic Research-General

In order to make an effective contribution to integrated development with limited resources of human and financial resources, it is important to be

- Selective in the choice of themes focusing on those aspects that have a significant bearing on productivity of land and water or their environmental consequences and on which available knowledge is inadequate or missing;

- Ensure that studies of particular aspects of land and water management place them in the wider context and take cognisance of their relation to other aspects;

- Narrow the scope of research to specific and concrete issues and avoid broad themes;

- Ensure that all relevant disciplines necessary to address the issues are involved from the design through implementation to analysis and that they work as a team;

- Carry out the research on a particular aspect in a number of locations to permit analysis and synthesis of factors accounting for the differences; and

- Evolve a strategy for sustained collaboration with other organizations in respect of subjects of priority for the Institute's research but for which it may not have adequate expertise.

Thematic Classification

Viewed in this light, there is scope for improving the prioritization and design of the research programme. Part of the problem may lie in thematic classification itself: *Integrated Water Management for Agriculture(Theme 1)* is supposed to cover both land and water in irrigated as well as un-irrigated areas. The scope of *Small holder Land and Water Management systems (Theme 2)* also seems to be similar but with an accent on soil conservation and 'small holders'. *Sustainable Groundwater Management (Theme 3)* is a separate theme though it too is clearly an integral part, and a key element, in land and water management. There is thus considerable overlap between the three. It may be better to have Integrated Land and Water Management (ILWM) as a unified theme with three sub themes focusing on (a) river basins and sub basins; (b) irrigated land; and (c) rain-fed lands. Land use planning, soil and water management (surface and groundwater) enter into each of them but in different degrees and combinations. The nature of problems involved in each of these and appropriate measures to solve them are also different. In irrigated areas, regulating the allocation and scheduling of water from surface sources, conjunctive use surface and groundwater, and matching the timing and quantum of irrigation to crop needs, prevention/control of salinity and water-logging are key problems. They involve management of large, complex organizations. In rain-fed tracts the problem is to check soil erosion, harvest local rainfall to improve soil moisture and groundwater recharge, regulate land use and cropping to make optimum use of available moisture through integrated watershed development. Here local community institutions play a more important role. Issues relating to equitable distribution of water and ensuring that small holders are enabled to make more productive use of land and water are common to both. Integrating these two components at the basin/sub-basin level is the task of basin planning. In the foregoing schema 'groundwater' would not be a stand-alone theme. Even if it were to remain so, it is important to distinguish between issues relating to areas under surface irrigation, and those of augmenting recharge and making more efficient use groundwater on rain-fed lands and lands irrigated solely by groundwater.

Organizational Pattern

Accepting this categorization need not involve any change in the present organizational pattern. But it will have implications for the design of thematic research projects on land and water. For instance:

- Work on the benchmark basins will necessarily have to take a composite view of land and water, irrigated and rain fed land, surface and groundwater and their interactions.

- Current research under the theme IWMA is largely centred on, and adequately covers, various aspects of surface irrigation. There is scope for expanding it to a larger number of locations and greater attention to conjunctive use of surface and groundwater and their impact.

- Emphasis on thematic research on rainfed areas and in particular integrated watershed development will need to be increased.

- While these issues figure under 'groundwater management', they need to be placed in the wider context of land-water management research rather than groundwater per se.

Water Resources Institutions and Policy

The main thrust areas of research under *Water Resources Institutions and Policy (Theme 4)*, and its relation to other themes also deserve to be clarified and defined more sharply. Its research has three components: economics, institutions and policy advice.

- Measurement and evaluation of externalities is an active area of research in which the Institute is making significant contributions and should be strengthened.

- On socio economic aspects, irrigation's impact on poverty figures prominently. Broadening their scope to capture a wider range of impacts not only of irrigation but also of different kinds of land and water projects would make a richer contribution.

- Conceptual and methodological issues relating to estimation of investment costs of water resource development and its effects on land use, cropping and productivity, and land quality is a subject deserving greater emphasis in the programme.

Water, Health and Environment

Research on Water Health and Environment is a good model with respect to the multi-faceted aspect of water research. It has combined scientific research with action, sustained close and fruitful collaboration with other scholars and official agencies, and has an impressive record of both of scientific publications and ground level impact. That this approach is manifest in the design of projects under urban wastewater reuse is a welcome feature. The only somewhat uncertain area concerns the scope and direction of work on environment.

15. Discussions and Conclusions–Planning, Resources, Impact and Matrix Management

Planning, Monitoring, Evaluation and Impact Assessment of Research

Planning within IWMI spans the global level down to the individual researcher level. The 2000 – 2005 Strategic Plan in effect captures the global plan for the work of the Institute. The annual plans capture the work parcels for the various themes and regional offices, and the IOPs capture the work plans for the individual researchers. Monitoring and Evaluation of the implementation of

the various plans does take place – in a very formal manner in the case of the Annual Performance Appraisals based on the IOPs, and in a somewhat less formal manner with regards to the progress of research projects. The importance of impact assessment of research is recognized by IWMI and efforts are currently in progress in developing a systematic impact assessment system. Two major challenges in the areas of planning, monitoring, evaluation and impact assessment are those of ensuring that effective 'joint planning' takes place, and that useful performance indicators to be used to ascertain research progress and impact are agreed-upon.

Staff Resources Available: Appropriateness and Adequacy

Recruitment of staff into IWMI follows a well laid-down and rather rigorous process, beginning from the agreement on the position description, through the public vacancy announcement to the interview and final engagement. This process ensures that staff is recruited to suit identified disciplinary requirements. As such, the review considers staff in post to be appropriate for the work being undertaken. The rapid expansion of the number of research staff at IWMI, from around 50 in 1999/2000 to over 100 in 2002/2003 clearly goes towards confirming the adequacy of the staff. There are however noticeable shortages in research management and modeling skills in the IWMI establishment.

Generation and Use of Financial Resources

IWMI's performance in this area in the last two to three years can only be described as impressive. Total funding generated almost doubled from US$8.8 million in 2000 to some US$16.5 million in 2002. Restricted funds have however risen from around 55% of total funds in 2000 to around 66% in 2002, indicating that IWMI is having to increasingly work 'on what the donors are willing to pay for'. This may spell the start of both a positive and negative trends, and IWMI needs to monitor this development very closely. This is necessary so as to avoid being increasingly drawn into 'routine / consultancy' type of work as opposed to meaningful pure and applied research in integrated water and land management. The finances of IWMI are clearly well managed with a small surplus of some US$100,000 or so reported for the year 2002.

Matrix Management: Effectiveness and Functioning

IWMI is managed in a matrix structure with the themes providing the programmatic focus (with the theme leaders controlling the funds), and the regional offices providing the personnel. Typically, the matrix structure has the advantage of effectively sharing disciplinary expertise across departmental boundaries. It is however accompanied by the disadvantage of personnel having to report to two supervisors and the inherent confusion and frustration that this might bring. IWMI is currently experiencing these typical textbook advantages and disadvantages associated with management with the matrix structure. Senior management appreciates the advantages of the structure. The challenge is for IWMI to continue working at increasing their realization of the benefits of the matrix structure while minimizing the disadvantages and frustrations expressed by researchers.

Integration, Synergy, Coordination of Research

IWMI recognizes the need for 'integration' in research, and is attempting to do this on an ongoing basis by making use of multi-disciplinary research teams. The researchers however believe that the attempts are still of an ad-hoc nature, and that IWMI would benefit from using formalized integration processes and procedures. Coordination of research at the regional level is clearly a

responsibility of the regional Directors. Effective coordination of research at the global level however still has to be effectively operational.

Benchmark Basin Concept

The idea of working in Benchmark Basins in a way points to 'integration' at the field level –a situation reflecting reality. The concept is clearly progressive and would enable IWMI to deliver research results that would present little difficulties of applications since they are derived from field conditions. There is a strong case for persuading the CPWF to include more of IWMI's benchmark basins in the programme since this would lead to benefits of synergy. The Strategic Plan 2000-2005 in fact indicates that 'the benchmark basins will be developed progressively' and will potentially total 10-12 small to medium basins. This proposal is strongly endorsed. That the benchmark basin approach will require sustained effort over a 10-15 year period is well recognized by IWMI and the CGIAR initiatives. While donors seem to generally appreciate the rationale and importance of the new approach, few are willing to commit funds for more than 2 years at a time. Changing priorities and agendas of donors introduce an added element of uncertainty. Continuing, not to speak of increasing, financial support from usual funding channels cannot be taken for granted. It would therefore be prudent for IWMI to explore other avenues like the following:

a. get one or more donors inclined to be liberal in giving long term, programme-related funding to support benchmark basin work;

b. encourage advanced research institutions in the relatively better-off countries to implement the approach of the CPWF in some of the smaller basins along the CGIAR on a matching grant basis; and

c. get national governments and their major donors for water-agriculture-environment related programmes to earmark a small part of the loans for research and action to promote integrated development in selected basins.

16. Discussions and Conclusions–Partnerships and Dissemination

Collaborations and Partnerships

The Strategic Plan 2000-2005 envisages thematic research, as well as the benchmark basin projects being done in collaboration with multi-country networks of research institutions. This is an excellent way of building knowledge bridges across countries and stimulating creative intellectual interaction among participating researchers. Bringing together researchers across countries will generate comparable data from diverse locations opening possibilities of analysis of the factors underlying variations and also providing the basis for comparative studies of dynamics of change. Working through partnerships is clearly a very positive development for IWMI. It brings about tremendous benefits to both IWMI and its partners. Ideally, the partners (NARES, universities, other research institutions) provide IWMI and vice versa with extended opportunities for fulfilling its research mandate through joint work. The many graduate students/postdoctoral fellows from the South mentored by seasoned IWMI scientists will acquire the necessary tools, skills, and perspective to pursue multidisciplinary, interdisciplinary, holistic research in integrated water and land resources management. Should they return to their mother institutions, they can beef up the current cadre of

scientists normally limited in international experience, and become more responsible researchers/ scientists collaborating with IWMI and other partners in future work. They can be useful instrument in revitalizing research, influencing their countries' policies on research priorities and directions. In developing countries where training and advanced studies are points for promotion, the likelihood of them remaining in lowly-paid scientist/researcher positions is not certain; some may be promoted to managerial/administrative post upon return. For those who remain as researchers, they must be tapped for future collaborative work to further hone their skills and expose them to new tools and techniques so they can become better researchers.

The Challenge Program on Water and Food

The Challenge Program on Water and Food is still in an early stage. IWMI staff looks at CPWF as potential source of funds for their thematic research (Appendix 8 and 19). To date, IWMI staff has submitted a total of 43 IWMI led concept notes, requiring a total budget of US$47.2 million for 5 years (Appendix 19). The CPs are seen as bringing in the needed reforms within the CGIAR. They will shape the strategic direction of the CGIAR. New partnerships and positive working relationships are developed. New models of governance are emerging. Planning for the CPWF requires a clear set of strategic priorities, with a strategic niche for the CPWF identified. This review thinks that in principle the CPWF could be a good test case for effectively and efficiently managing research for development at the global level. It is also a good way of ensuring synergy among the activities of the CGIAR centers. While the goal to improve the productivity of water for food, health and environment is clear, the process could take longer (or shorter) as there are new players and new systems put in place. What is important is that the process is well documented, partnerships are nurtured, best practices are shared and scaled up, lessons learned are springboard for innovations, and the " CP way" of doing business is institutionalized eventually within the system. For a learning organization like IWMI, the CPWF, in addition to its already progressing change projects, is a golden opportunity to innovate and make a difference.

The Comprehensive Assessment of Water Management in Agriculture

IWMI is the lead institution for this initiative. An important part of this initiative is a comprehensive and detailed review of the evolution and current status of water management, institutions and policies in 10 selected river basins in different parts of the world, their present and emerging problems and possible ways of addressing them. These are expected to facilitate and feed into discussions of future directions of water management as part of the Dialogue on Water, Food and Environment. IWMI has played an important role in shaping the CA and it is managed by a senior member of its staff.

Collaboration and Benchmark Basins

In benchmark basins, a conscious effort needs to be made to knit researchers not only across the theme groups but also within each basin into an interactive network. Periodic meetings of researchers at basin level is essential to foster better understanding of the relevance of different themes and their inter relations for integrated planning and policy. Success will depend on the choice of collaborators, cultivating and fostering an attitude of equality and mutual learning among the collaborating entities. It requires that the collaborative spirit is manifest even from the planning stage. Networks should be formed around well-defined specific topics. Partners should be actively involved in reviewing the current state of knowledge, identifying key problem areas needing

investigation, prioritizing the agenda, and deciding the concepts and methodology of investigation. Close and continuing interaction at different stages of the research is essential. Care needs to be taken to ensure that the programme is not confined to or dominated by government agencies. On each theme/basin considerable data and knowledge is often available outside the government agencies from research of academics, knowledgeable local citizens and NGOs. Tapping this body of local knowledge and including non-official scholars and experts in the collaborative network will significantly enrich the research. Also necessary are mechanisms to make 'change agents', officials and stakeholders aware of the issues, the findings of research and the actions needed to ensure more efficient and equitable use of water. Creating and nurturing such networks is a challenging task. Achievements in this respect should be an important criterion in assessing the effectiveness of the Institute.

Documentation and Information Services

Over the years the Institute has accumulated a great deal of knowledge on the current state of the arts, and ongoing developments in different parts of the world. It has itself made significant contributions to methodology and techniques and has first hand knowledge of the potentials and limitations of their practical application. The research results are published in reputed scientific and technical journals and monographs. However they have a limited reach among water researchers and professionals in developing countries. As a premier international public institution, IWMI is in a position to play an important role in remedying this lacuna. The expansion of documentation and information services as well as training programmes are meant to address this task. Some suggestions to increase their reach and impact may nevertheless be in order. The Institute has an excellent library on water and water related issues, a bibliographic database and information on various websites from which more details can be accessed. Efforts are currently underway to substantially augment and improve this facility. However, neither the library collection nor the standard international bibliographies adequately cover work done in the developing countries. This is because few of them have mechanisms for systematic compilation and updating of bibliographies of research. The few that there are tend to be scattered, incomplete and not widely known or accessible.

Material from Local Sources

Only a small part of the research (post graduate research, large scale sample surveys, data from research stations and research projects sponsored by various national and international agencies) is published. Much of it is in local journals, (in many countries in local languages), and do not figure in the international bibliographies. Even larger caches of data and information are available in un-published reports of research organizations, official committees, and consultants and NGOs that have not been systematically documented. How vast and rich the local sources can be has been demonstrated by recently commissioned reviews of work on malaria in Laos and water resources in the Yellow river basin. It is recommended that a vigorous effort be made to document local data and research as part of the preparation for the field research projects. Tapping these resources systematically and updating them periodically will substantially add to the stock of knowledge both for IWMI's own research and to interested users the world over. The newly created Information and Knowledge Group can play major role to play in this respect. If need be, a small part of the project budgets may be earmarked for strengthening these activities.

Publishing of Research Findings

Results of the Institute's research are being disseminated through policy briefs, working papers, Research Reports and full-length publications. A comprehensive and detailed review of its work from its inception to date is also available. The Institute's own research findings are treated as a public good accessible freely to any interested person or organization. Though the information is available on the website, its actual reach and use is perhaps not sufficiently widespread especially in the developing countries. Supplying hard copies of research and discussion papers free may be too expensive. Perhaps a more effective and affordable way would be to identify a number of research institutions in the developing countries as repository institutions and supply all the past and future research output of IWMI on CD-ROMs and provide other soft copies of particular papers on request and at cost of making copy. The policy briefs, circulated widely gratis, provide a summary of ongoing activities and research findings. There is a suggestion that this information should be made available to the wider public by presenting them in local language and in a way that a the general public can understand. The Institute cannot afford the extra effort involved in producing such materials. This task should be left to interested local organizations, NGOs and extension services.

Training

Besides dissemination of knowledge, IWMI also has initiated a programme to familiarize water professionals and train them to actually apply recent developments in methodology and analytical techniques. The fellowships programme will make a significant contribution to this end. The diffusion effect could however be greatly enhanced and institutionalized through workshops for collaborating researchers/institutions to tackle issues methodology, techniques and their practical application in several important areas: remote-sensing, construction of water balances at different levels, estimation of crop water requirements, community mobilization, systems modeling and impact assessment. One way would be to organize workshops for professionals from remote sensing institutes and research institutions. The workshops would introduce them to the techniques and their application, work out a structured programme for applying them in specific selected locations in their home locations, devise and implement a properly designed ground truth verification procedure and then analyze the results to assess the potentials and problems of widespread application.

17. Recommendations

Research on Groundwater

Specifically on groundwater, research needs to go beyond underscoring well-known general features of its exploitation and use. The pay off to research effort will be greatly enhanced by focusing on different types of situations (hard rock and alluvial formations, sole and conjunctive use, low and high levels of exploitation, and abundantly and poorly endowed areas). The following are some specific suggestions:

- Sample surveys of groundwater irrigation to get a better and more reliable assessment of the current situation and the evolution of extraction, use, areas and crops irrigated, and ground level mechanisms for regulation/conflict resolution.

- Sample surveys to assess the contribution of groundwater to meeting urban demand, trends in water table, and water quality will make a significant contribution to improving the knowledge base for policy.

- A critical assessment of design, management and impact of selected initiatives –successful and not successful, governmental and non governmental- to regulate use of groundwater, and increase its recharge and underlying factors.

- Exploring the use of remote sensing to evaluate impact of recharge and watershed programmes on biomass, groundwater, land use and agricultural productivity.

- Legal framework and institutional mechanisms governing access to and use of groundwater, the extent, organization, functioning and impact of water markets under different types of situations.

Water Resources Institutions and Policy

The following are some specific suggestions on topics for research:

- Critical and comparative studies based on careful and objective research, of long-term performance of different arrangements and of attempts to change them in diverse situations should be encouraged.

- Explore the possibilities of using recent developments in institutional economics to the study of the structure and functioning of public institutions for management of common pool resources like land and water.

- The conceptual basis, content and interpretation of different kinds of 'rights' of different entities (individuals, communities, state) and of different types (ownership, use, transferable –non transferable, contractual, etc) over land, water and environmental services in selected countries, and mechanisms of protection and enforcement.

- The scope, nature and modalities of stakeholder involvement in land and water management at level of local communities and in the case of larger multi-community systems in their different tiers; and

- Nature, functioning and effectiveness of formal and informal mechanisms of conflict resolution at different levels over these resources.

In all these areas the main role of the Institute should be to develop concepts and tools, demonstrate their application in selected cases and work with local partner networks to apply them in a number of locations both as a means of validation and of spreading the skills. These are ideal subjects for collaborative research with local partners in different countries. IWMI could play a key role in selecting locations, bring together researchers and evolve a common design and methodology, and integrate the results by analysis of variations across locations. Multi-centre studies on common topics using comparable methodology can greatly enhance the impact of the institute.

Benchmark Basin Concept

The following are the recommendations offered with regards to the Benchmark Basins:

- Work in the benchmark basins should continue, and a workable framework for 'integration,' both within the office (mainly in the form of truly multi-disciplinary teams), and in the benchmark basins must be put in place as soon as possible. The Regional Director will have to play the role of overall Research (and findings) Integrator [Integration/Benchmark Basins].

- It is recommended that work in the CPWF benchmark basins be undertaken in an incremental fashion based on a series of smaller sub-basins with adequate background information and local research capability. [Integration/Benchmark Basins]

- Also it is recommended that an extension of the program to cover the 10-12 basins being studied under the CA program be effected. This has the advantage of having considerable knowledge based on systematic and comprehensive data/analysis of past trends and current problem areas. With potential local research collaborators more readily identified the chances of making significant impacts will be greatly enhanced. [Integration/Benchmark Basins]

- The involvement of NGOs, scholars and research institutions knowledgeable about specific themes region/basin should be significantly increased. This would help to tap a wider body of expertise and enrich the perspectives in designing and conducting research. [Integration/ Benchmark Basins]

Planning, Monitoring, Evaluation and Impact Assessment of Research

The following are recommended:

- Joint planning for research priorities and programs involving Theme Leaders and Regional Directors should be strengthened and institutionalized to achieve maximum impacts of the mission within given resource constraints. Full use must be made of the planning procedures and processes to be developed under the QMS project. [Planning]

- Agreement on and adoption of a consistent set of terminologies for planning and implementation, in order to smoothen communication among the staff (Log Frame, progress reports, etc.). [Common terminology]

- IWMI should continue with the implementation of the change management initiatives, and encourage staff to also appreciate the bigger picture of IWMI's vision. This will help IWMI in benefiting from using the matrix structure [Common Vision].

- Consideration and adoption of additional indicators of performance for researchers in addition to refereed publications. For instance: Funds raised from non-traditional IWMI donors (on the basis of successful research proposals), and the number of outputs (policy briefs, tools, methodologies, etc.) actually 'adopted' as objectively reported by users. [Performance Indicators]

- Complete the development and implementation of the impact assessment system (procedures, policies, indicators, practices) and ensure that impacts, including the extent of adoption of improved water and land management options, are systematically recorded. [Impact Assessment]

- It would be useful to build an impact monitoring and evaluation framework 'from scratch' based on a new project such as APPIA in Ethiopia [Impact Assessment].

- Promote the institutionalization of the practice of Impact Monitoring with university partners. [Impact Monitoring with universities]

Staff Resources Available: Appropriateness and Adequacy

Recommendations on staff resources are:

- The successful expansion of the research capability (more researchers and funding) and the increased capacity building program should now be consolidated. [Consolidation of expansion].

- IWMI should provide opportunities for selected researchers to be trained in research management [Research management skills].

- The employment of at least one researcher with strong systems modeling competence in each regional office will assist in the modeling aspects of the various projects [Modeling skills].

- Post-docs should not be engaged unless funding for the research projects they are to work on is in place. However, they should be encouraged to work on proposals for raising external funds to finance extensions to their contracts beyond the two years. This would constitute part of their capacity building. Also, IWMI should complete and adopt a 'manual' for post-docs, spelling out how the program operates. [Post-docs]

- The employment of additional research support staff (Research Assistants) should be speeded up to meet the rational target of 2 – 4 research support staff per senior researcher [Research support staff], and

- The promotion of gender balance in staffing the research ranks, and mainstreaming gender in research should be strengthened [Gender]

Generation and Use of Financial Resources

The review offers only one major recommendation to IWMI with respect to financial resources, namely that IWMI should keep up its efforts at generating and using financial resources while at the same time guard against receiving funding to undertake projects with little or no pure/applied research character [Financial resources].

Matrix Management: Effectiveness and Functioning

Two recommendations are offered here, namely:

- Clarify the role of thematic groups in doing their own thematic research and providing inputs/support in the other thematic areas. [Matrix, Integration]

- That IWMI should continue working at increasing their realization of the benefits of the matrix structure while minimizing the disadvantages and frustrations expressed by researchers [Internalization of matrix].

Integration, Synergy, Coordination of Research

The following are recommended:

- IWMI recognizes the need for 'integration' in research, and is attempting to do this on an ongoing basis by making use of multi-disciplinary research teams. Formalizing the integration processes and procedures should strengthen this aspect of IWMI's work. The Regional Directors might very well serve as the 'integrators' of research and findings [Integration].

- That the research on selected themes is conducted at a number of locations within each region and as much as possible across regions using comparable methodologies to facilitate meaningful comparative analysis and synthesis [Synergy],

- That participating researchers are encouraged to interact in the process of research; and there is provision for comparative analysis and synthesis of the findings of completed studies [Synergy].

- Coordination of research at the regional level is clearly a responsibility of the Regional Directors, and this should be continued. Effective coordination of research at the global level however still has to be made effectively operational [Coordination].

Collaboration and Partnerships

The current policy of developing and implementing regional research program jointly with NARES is a major step towards collaborative research. Moreover, funding under CA and CPWF is contingent on collaboration with national organizations. Besides securing wide participation both in planning, formulating the research and implementing it, it is important to ensure that the research is implemented in a networked, interactive mode. For IWMI to sustain the collaboration with NARES, NGOs, private sector, international institutions, roles must be well defined with partners, targets clarified, resources provided, and maximum participation encouraged from planning to implementation and monitoring of collaborative projects, as well as the dissemination of research results to target beneficiaries.

Funding

Fund generation should be a shared responsibility of IWMI and its partners. A mechanism for leveraging funds with partners and donors must be adopted so that the limited IWMI funds can generate co –financing or counterpart funding from partner institutions. The following approaches have been tried successfully by other CGIAR centers such as IPGRI. IWMI should try them as appropriate:

- Negotiate country co-financing by partner institutions: IWMI will bring a project to the country if the latter can provide a co-financing (cash contribution) on a 50:50 basis depending

on capability. As a fallback, a minimum of 50:50 counterparts funding (in cash and in kind contribution) is accepted.

- Negotiate with country or donor funding to replicate or expand project: Based on successful co-financed projects, IWMI can convince the country or other bilateral donors to fund the extension or replication of the project to cover more areas and provide more impact and public awareness. This is usually negotiated at the level higher than the Institute/Center Director such as the Director General or the Minister of Agriculture.

- Train country staff for proposed country-funded project: IWMI negotiates to train a country researcher who will implement a re-entry research funded by the country. This is agreed in the selection of trainees and is considered important in new areas of research. This is feasible in countries which have bilateral projects funded externally which can support re-entry planned research.

- Generate in-kind contribution: IWMI supports a project if succeeding project is funded nationally. For example, IWMI can support research on conservation farming technologies if the country can fund the nationwide scaling up.

- Negotiate increased national staff positions: IWMI provides opportunities for participation in research, training, conferences and research projects if additional staff positions are provide to ensure quality project implementation.

- Co-financing by donors: IWMI commits resources of other donor funds provided to IWMI as co-financing budget in related research areas to be funded by another donor. As many donors require a 50:50 co-financing, a project could increase its budget by two times.

NGOs, Dissemination of Research Results

International NGOs such as CARE International, WWF, and others have extensive development and advocacy experience from which IWMI and the NARES could learn. Scientists from IWMI and the NARES should tap their expertise in policy advocacy and provide them with science-based information and options. Their excellent social skills could be fully harnessed when disseminating and the promotion of adaptation of research findings. International NGOs such as CARE, WWF and others have extensive experience in promoting results of research. Their "sunset principles" in implementing projects with the local community should guide IWMI and the NARES when implementing action research in order to sustain appropriate interventions (example: conservation farming technologies) after the life of the project. This review was informed in Northern Thailand that WWF, a collaborator of ASIALAND project, will move out of the community after staying there for 5 years, and having trained them in nursery establishment and other livelihood enterprises, ensuring a self-reliant community when the project is completed. It is therefore recommended that IWMI and the NARES to provide science-based information to advocacy groups such as NGOs, fully harness their social skills in disseminating and promoting sustainable technologies with clear targets and "sunset principles."

Effectiveness of Partnerships

IWMI to improve the effectiveness of its partnerships at the institutional and researcher levels through:

- Institutional level – review existing MOU's with partners, determine their special skills and strengths (comparative advantages), assess through appropriate methodology status of collaboration and how effective it has been, identify gaps and bottlenecks and either continue with renewed interest, support and well defined roles and targets, or prematurely terminate. Adopt a more demand-driven, participatory approach to planning, priority setting, implementation and monitoring of collaborative projects.

- Individual or researcher level- sensitize staff on people, cultural issues; train them on soft skills (interpersonal relationships, team work, leadership and management), planning and priority setting and monitoring.

Intellectual Property Rights

For IWMI to address property rights issue in developing toolbox and other outputs of collaborative research. This must be clearly indicated in the MOUs to be signed with the partners.

Dissemination Strategies and IWMI's Knowledge Sharing Initiatives

For IWMI to explore a more strategic, cost effective way to disseminate research information such as through the NARES which have the mandate as repository of research information. IWMI can provide all its past and future research outputs on CD-ROMs, soft copies of particular papers on request and on cost recovery basis.

"Grey" Literature

It is recommended that a vigorous effort be made to document local data and research as part of the preparation for the field research projects. Tapping these resources systematically and updating them periodically will substantially add to the stock of knowledge both for IWMI's own research and to interested users the world over. In this regard the newly created Information and Knowledge Group should strengthen work on this aspect through the Regional offices.

Information and Knowledge Group

For the IWMI Information and Knowledge Group to strengthen work on the documentation of local data and research through the Regional Offices in order to enhance the existing body of knowledge for IWMI's future work and other interested users.

On Policy Briefs and Other Communication Tools

For IWMI to rationalize and support implementation of a Communication Plan aimed at the timely, effective and credible delivery of communication messages to intended clientele for greater impact.

On the Challenge Program on Water and Food

For IWMI and its partners to aggressively pursue fund raising for Challenge Program on Water and Food projects, ensure the active participation of the NARES, systematically document the

process, nurture the partnerships, share and scale up best practices, innovate, and make provisions for eventual institutionalization of the "CP way" within the system.

On the Comprehensive Assessment of Water Management in Agriculture

For CA to ensure a more active participation of NARES and that capacity building takes place at the individual, institutional, policy levels. The links among CA, CPWF and Dialogue should be strong yet smooth and seamless. For IWMI to make provisions for the institutionalization of the CA process within its system. Moreover, for IWMI to document the process, involve promising IWMI junior staff in the technical and research management aspect of the program. This will expose them to the complexity (or simplicity) of a client-oriented, participatory alternative to IWMI's way of doing business.

On Scientific Excellence-Refereed Journals and Other Indicators of Impact

IWMI to nurture the scientific excellence the CGIAR is known for and continue to recognize outstanding accomplishments in the many activities inherent in the integrative, facilitative roles of its researchers. Accordingly, performance indicators should be adopted as per task definition, and realistic targets should reflect a balance between scientific output (scientific publications) and "non-scientific" ones.

Involving NARES in Priority Setting

For IWMI to engage in regional/sub regional research prioritization through its Regional Offices and in coordination with regional/sub regional groupings (APAARI, SEAFAR, FARA, etc) for increased efficiency and leading to more participatory development and enhanced synergism. Depending on the needs, strength, and weaknesses of NARES, countries could be clustered to promote South-South exchange. For IWMI to tap the expertise of regional institutions such as SEARCA and other similar institutions in the regions in regional prioritization.

Theme Syntheses

For theme syntheses to be more inclusive of IWMI research investments (funds and scientists' time) in any priority area over time and across regions, particularly when the time tracking system is fully implemented.

Gender Balance

IWMI should endeavor to achieve reasonable gender diversity of research staff from its current 28% to at least 30% female composition, researcher category during the next plan period (2005-2009).

Integrating Gender Concerns in Themes/Activities

For the Headquarters to provide support in strengthening implementation capacity for gender research in all regions by recruiting a senior gender specialist (who will be part of the Global Research Division providing assistance to all regions through themes) and providing funds for gender analysis and study gender relations, disaggregate data, etc. Such assistance should enhance capacity of both male and female researchers of IWMI on gender analysis, etc. thus ensuring gender visibility in themes and activities. This senior specialist can also work with the Human Resource officer in monitoring gender staffing.

Capacity Building for IWMI Staff and Partners

The next Strategic Plan (2004-2008) should clearly indicate the scholarship/postdoctoral fellowship targets by gender and geographic locations, and aim for increase representation of women from the South. The Leadership Development Program of IWMI for promising young men and women should be sustained not only by supporting these future leaders' research work but also in nurturing their professional career in IWMI.

APPENDICES

APPENDIX 1

Terms of Reference
Centre Commissioned External Review (CCER) of
International Water Management Institute (IWMI)

1. Background and purpose of the review

In 2003 IWMI will carry out a Review and Strategic Planning process for future priority setting. The previous strategic planning process took place quite recently in 2000. But a new strategic planning process for the period 2004-2008 is considered important at this point for the following reasons:

- Much has been achieved since the Strategic Plan 2000-2005 was developed. In many ways the goals set in the 2000-2005 Strategic Plan have been reached and the plan no longer provides much guidance or shared thinking about future developments. Do the five themes appropriately reflect the priorities of the stakeholders? How will the organization look in 3 to 4 years from now? How many people will move to regional offices? How will the challenge program affect IWMI? Fore these reasons there is a need to review our progress and update the Strategic Plan.

- During the previous strategic planning process, considerable attention was paid to internal, operational issues–and increasing "inputs". The envisaged process for 2003 will look more at "outputs"–at impact of research and at partnership approaches.

- The development of the previous plan involved a wide cross-section of IWMI staff, but relatively few of our external stakeholders. More emphasis on impact also implies more emphasis on - and understanding of - stakeholders' perspectives is required.

The entire exercise will take a year and will result in two main products:

- External Review of IWMI
  This report will both summarize the views expressed by the various stakeholders on the role that IWMI plays at the moment and its overall impact, as well as contain an assessment of external reviewers. The intention will be to give an independent view of the achievements, strengths and weaknesses of IWMI, in essence a center commissioned external review of the organization – both as an input to the Strategic Plan and a pre-cursor of the external evaluation of IWMI that the CGIAR is likely to commission in 2004.

- Updated Strategic Plan
  The updated strategic plan will be a short concise document, focusing on future directions based on the achievements thus far and the view of stakeholders and IWMI staff on the future. It should provide new guidance, shared internally and externally, on key developments in both the research agenda as well as the way in which we implement it. In other words, to make sure we are relevant and effective, as well as efficient.

External reviewers will be contracted to undertake reviews of the following regional offices: Asia, SE Asia, Africa, India, and West Africa. The conclusions of these reviews will be complemented by stakeholder workshops in these regions. This Terms of Reference covers the review of IWMI by external reviewers.

2. Review Process

The review will consist of reviews of regional offices and an overall review of IWMI. Initially three regional offices will be reviewed: Africa, SE Asia, and South Asia. At the end of these three office reviews the reviewers will jointly review the overall organization at IWMI HQ. The reviewers will also take part in the stakeholder workshops convened by the regional offices and the Coordinator Strategic Plan.

At a later stage (September/October) two reviewers will undertake a review of the offices in India and Ghana. This review will have a slightly different character. It will take into account the results of the first part of the review, and hence focus on issues arising from this (needing further confirmation or investigation). Further, the draft sections of the Strategic Plan, to be completed in July, will be taken up for discussion with these offices. A more detailed ToR of the latter two reviews will be agreed upon at a later date.

3. Areas to be Covered

The following areas/questions will be covered during the review:

- IWMI's Mission, Policies, Strategies and Research Priorities: how appropriate and relevant are they (in the regional as well as global context)?

- Quality, relevance and impact of research:
  Possibly focus on 1 theme per office (e.g. Asia: WRIP, Thailand: SSWLMS, Africa: IWRM, Ghana: WH&E, India: SGM) for the following questions:

  - Quality and relevance of research undertaken by the regional office

  - Appropriateness and effectiveness of research strategy such as choice of geographic locations, type of activities, approaches, scales

  - Assess actual achievements and output in relation to what was planned in the Strategic Plan 2000-2005

  - Impact of IWMI's work: what is the impact of IWMI's projects / activities at different levels: policy, research, implementation, user

- Added value of IWMI's presence in the region and IWMI's niche in this region as compared to other players

- Working through Partnerships:

  - Are partnerships arrangements appropriate and effective?

  - How do partners assess their working relationship with IWMI?

- Are the communication and dissemination strategies of the Regional office appropriate and effective?
- Are higher levels of impact achieved, or expected to be achieved as a result of more emphasis on working through partnerships?

- Organization and Management:
  - Are the staff and other resources available to the office adequate and appropriate to fulfill its tasks?
  - Are planning monitoring and evaluation procedures appropriate and sufficient?
  - Is the organizational structure of the office appropriate?
  - Is communication with HQ and other regional offices sufficient and effective?

4. Review Methodology

The reviewers will:

- Review relevant background information and documents
- Have discussions and in-depth interviews with selected IWMI staff
- Have discussions and in-depth interviews with selected partner organizations and potential partners/stakeholders
- Visit a few selected research sites
- Participate in stakeholder workshops to be organized by the Regional Office and the Coordinator Strategic Plan

The reviewers are expected to apply methods ensuring active participation of IWMI staff and stakeholders during discussions.

At the start of the assignment the reviewer will prepare a detailed programme together with the head of the Regional office and in consultation with the Coordinator Strategic Plan.

5. Review Team

Three reviewers will be selected for the review of each regional office, from the regions itself. The reviewers should have the following background and skills:

- More than 15 years work experience in relevant areas
- International experience
- Familiarity and understanding of international research institutions
- Good understanding of water management issues

- Capability to analyze institutional and management issues
- Extensive experience in review and evaluation

The reviewer for the South Asia office will be expected to spend relatively more time on IWMI HQ. Hence an institutional/management background will be more crucial here than experience in water management.

6. Reporting Requirements and Time Schedule

A draft report including conclusions and recommendations should be presented and discussed with the IWMI Regional office and IWMI HQ management at the end of the assignment. The final report should be completed within two weeks after completion of the review.

The review of each regional office will take two weeks. Thereafter all three reviewers will meet at the HQ for a period of one week. There will be a gap between the regional office reviews and the HQ review. Regional office reviews are expected to take place during the following periods:

- Asia office (Colombo): 2-15 March
- SE Asia (Bangkok and Philippines): 21 April–4 May
- Africa (Pretoria): 2-16 May

The HQ review is planned for the period 19-26 May. At the end of this week a draft report will be presented to IWMI management. On 27 May the conclusions and recommendations will be presented to the IWMI Board.

APPENDIX 2

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APPENDIX 3

List of Persons Contacted/Interviewed

Name	Organization	Function
Prof. Frank Rijsberman	IWMI HQ	Director General
Mr. Gerard O'Donoghue	IWMI HQ	Deputy Director General
Mr. S. S. Sharat Kumar	IWMI HQ	Head, Human Resources
Dr. David Molden	IWMI HQ	Principal Researcher
Dr. Madar Samad	IWMI HQ	Theme Leader, Water Resources, Institutions and Policies
Dr. Felix Amarasinghe	IWMI HQ	Theme Leader Water, Health and Environment
Dr. Meredith Giodano	IWMI HQ	Research Coordinator
Prof. Dr. Wolfgang-Albert Flugel	IWMI HQ	Principal Hydrologist
Ms. Julie van der Bliek	IWMI HQ	Coordinator, Strategic Plan
Mr. Tissa Bandaragoda	IWMI HQ	Principal Researcher
Dr. Sarath Abeywardena	IWMI HQ	Acting Director, Global Research Division
Dr. Vladmir Smakhtin	IWMI HQ	Principal Researcher
Dr. Randolph Barker	IWMI HQ	Principal Researcher
Dr. Hugh Turral	IWMI HQ	Senior Researcher
Dr. Francois Molle	IWMI HQ	Principal Researcher
Dr. Zhongping Zhu	IWMI HQ	Principal Researcher
Dr. Francis Gichuki	IWMI HQ	Principal Researcher
Dr. Deborah Bossio	IWMI HQ	Senior Researcher
Dr. Intizar Hussain	IWMI HQ	Senior Researcher
Dr. Upali Amarasinghe	IWMI HQ	Senior Researcher
Dr. Mark Giordano	IWMI HQ	Senior Researcher
Ms. Upeka Kariyawasam	IWMI HQ	Project Leader – QMS
Mr. Sunil Weeresinghe	IWMI HQ	Head, ICT
Mr. Michael Devlin	IWMI HQ	Chief Knowledge Officer
Ms. Sarah Carriger	IWMI HQ	Head, Writer / Editor
Ms. Ramya de Silva	IWMI HQ	Head, Electronic Library and Resource Centre
Ms. Shanti Weerasekera	IWMI HQ	Training, Career Dev. and Capacity Building Officer
Mr. Gamini Halvitige	IWMI HQ	Financial Controller
Mr. Daya Samaraweera	IWMI HQ	Manager, Admin Services
Mr. Eardley De Silva	IWMI HQ	Actin Manager, Building Engineering Services and Transport
Mr. S.M.B. Seneviratne	IWMI HQ	Officer, OSSO
Ms. Janitha Godamuduna	IWMI HQ	Senior Secretary
Ms. Coretta De La Zilwa	IWMI HQ	Senior Secretary
Ms. Rebecca Tharme	IWMI HQ	Researcher
Mr. K. Jinapala	IWMI HQ	Researcher
Dr. Mathew Kurian	IWMI HQ	Associate Expert
Dr. Madhusudan Bhattarai	IWMI HQ	Post Doctoral Scientist
Dr. Francis Canisius	IWMI HQ	Post Doctoral Scientist
Dr. Regassa Namara	IWMI HQ	Post Doctoral Scientist
Dr. Mobin-ud-Din	IWMI HQ	Post Doctoral Scientist

Mr. Nicolas Roost	IWMI HQ	Post Doctoral Scientist
Dr. Ania Grobicki	Challenge Program Secretariat	Coordinator
Dr. Jonathan Woolley	Challenge Program Secretariat	Competitive Grants Specialist
Mr. Yogesh Bhatt	Dialogue Secretariat	Local Action Coordinator
Dr. Herath Manthritilaka	Dialogue Secretariat	Coordinator
Ms.Domitille Vallee	Dialogue Secretariat	Researcher/Acting Coordinator
Mr. Lalith Dassenaike	GWP Secretariat	Coordinator, IWMI-GWP Resource Centre
Dr. Hammond Murray-Rust	IWMI-Asia	Theme Leader, Integrated Water Management for Agriculture
Dr. Douglas Merrey	IWMI-Africa	Regional director
Dr. Frits Penning de Vries	IWMI-Africa	Theme Leader, Sustainable Smallholder Land and Water Management Systems
Dr. Hilmy Sally	IWMI-Africa	Senior Researcher
Dr. Clifford Mutero	IWMI-Africa	Coordinator, SIMA
Ms.Tshepo Khumbane	IWMI-Africa	Senior Advisor
Dr. Matthew McCartney	IWMI-Africa	Researcher
Dr. Nicolas Faysse	IWMI-Africa	Researcher
Dr. Mutsa Masiyandima	IWMI-Africa	Researcher
Dr. Arlene Inocencio	IWMI-Africa	Researcher
Ms.Marna de Lange	IWMI-Africa	Researcher
Mr. Herve Levite	IWMI-Africa	Researcher
Dr. Aidan Senzanje	IWMI-Africa	Visiting Scientist
Dr. Nitish Jha	IWMI-Africa	Post Doctoral Scientist
Dr. Abdul Kamara	IWMI-Africa	Post Doctoral Scientist
Dr. Daniel Yawson	IWMI-Africa	Post Doctoral Scientist
Mr. Tendani S. Nevondo	IWMI-Africa	Program Officer SIMA
Mr. Litha Magingxa	IWMI-Africa	Ph.D. Fellow
Mr. Kobus Ras	IWMI-Africa	Network Administrator
Ms.Mary Njonge	IWMI-Africa	Office Manager
Mr. Sylvester Makgwadi	IWMI-Africa	Accounts Clerk
Ms.Portia Ndlovu	IWMI-Africa	Office Assistant
Ms.Rachel Mashele	IWMI-Africa	Junior Secretary
Mr. Philippe Lemperiere	IWMI-Africa, Ethiopia	Leader of APPIA project
Mr. Ian W. Makin	IWMI, SE Asia	Regional Director
Dr. Douglas Vermillion	IWMI, SE Asia	Principal Researcher
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Dr. Andrew Noble	IWMI, SE Asia	Principal Researcher
Mr. Jean Louis Janeau	IWMI, SE Asia	Researcher
Mr. Jean Pierre Bricquet	IWMI, SE Asia	Senior Researcher
Dr. Suraphol Chandrapatya	IWMI, SE Asia	Senior Researcher
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Mr. Rungnadhee Phonkarm	IWMI, SE Asia	Research Assistant (Database)
Ms.Lakana Sangkhakorn	IWMI, SE Asia	Research Assistant (Information)
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Ms.Wannipa Soda	IWMI, SE Asia	Research Assistant
Ms.Jutima Anumatratchakit	IWMI, SE Asia	Secretary to Regional Director
Mr. Suparuek Puttakhot	IWMI, SE Asia	System Network Administrator

Ms. Jirapar Boonyasurakul	IWMI, SE Asia	Secretary
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Ms. Darakul Srichoorom	IWMI, SE Asia	Accountant
Ms. Orn Uma Polpanich	IWMI, SE Asia	Accounts Assistant
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Mr. Pornchai Luechatmatikul	IWMI, SE Asia	Office Administrative Aide

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Mr. Willie Lotz	Water Institute of Southern Africa	Director
Dr. Sizwe Mkhize	Water Research Commission	Researcher
Ms. Carin Martin	Medical Research Council	Researcher/GIS Specialist
Dr. Peter Reid	Lowveld College of Agriculture	Head of Department
Dr. Sylvian Perret	University of Pretoria	Agricultural Economist
Ms. Juliana Rwelamira	University of Pretoria	A. Director Postgraduate School of Agric
Dr. Anthony R. Turton	University of Pretoria	Director, AWIRU
Prof. T.E. Simalenga	University of Venda	Head, Agriculture and Rural Engineering
Prof. R. Mwalyosi	University of Dar es Salaam	Director, Institute of Resource Assessment
Dr. Charles S. Sokile	University of Dar es Salaam	Consultant
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Mr. Phera Ramoeli	SADC Water Unit	Water Sector Coordinator
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-	Anti Malaria Campaign	-
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Mr. M.S.Wickramaarachchi	Ministry of Irrigation and Water Management	Secretary
Mr. K.A.U.S. Imbulana	Ministry of Irrigation and Water Management	-
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Mr. Nanda Abeywickrama	Lanka Jalani	-

Philippines

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Mr. Rafael V. Cardona	National Irrigation Administration	Systems Mgt. Department
Mr. Johnny M. Garcia	National Irrigation Administration	Systems Mgt. Department
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Mr. Raul de la Rosa	CARE Philippines	SUMMIT Program
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Dr. Eduardo P. Paningbatan	College of Agriculture, UPLB	Chairman Department of Soil Science
Teresa Agarrado	PCARRD	Sr. Sci. Res. Specialist, ARMD
Dr. Senen M. Miranda	-	Former Scientist, IIMI
Dr. Marianne delos Angeles	ICRAF	Philippine Coordinator ICRAF
Mr. Francisco R. Manipon	BPI-LBNCRDC	Agricultural Center Chief IV
Dr. Felino P. Lansigan	UPLB	Institute of Statistics

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Ms. Adoracion B. Armada	PCARRD	ARMRD-PCARRD
Dr. Rebecca B. Cagmat	Central Mindanao University	-

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Mr. Charoon Pojsoontorn	Royal Irrigation Dept.	Director of Water Management Division
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Ms. Sukontha Aekaraj	Dept. of Water Resources	Director
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Dr. Pitchit Pongsakul	Dept. of Agriculture	-
Mr. Athorn Boonsaner	Royal Forestry Dept.	-
Dr. Manu Srikhajon	Land Development Department	-
Dr. Bancha Kwanyuen	Kasetsart University	-
Mr. Kukiat Soithong	Department of Agricultural Extension	-
Ms. Somkit Buapheng	Department of Groundwater	-
Dr. Supamard Panichsakpatana	Kasetsart University	Vice President for Academic Affairs
Dr. Kassemsan Chinnavaso	National Economic and Social Development Board	Director of Economic Project Division
Farmer Network Leader, Khon Kaen	-	-
Prasanee Tipraqsa	Bonn University, Germany	PhD Student

APPENDIX 4

Checklist/Discussion Points for Interviews and Email Enquiry

Please respond to the following points/questions in one or two sentences:

1. Who are you?

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2. What do you know or understand about the current review?

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3. What is IWMI? Vision, Mission, Outputs, etc?

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4. Are you a client of IWMI? Are there any other IWMI's clients you know of?

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5. What do you receive or expect to be delivered to you by IWMI?

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6. How would you describe the 'performance' of IWMI in delivering / responding to you?

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7. Is there a question or issue you were expecting me to raise, which has not been raised?

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8. Have you got any question for me?

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APPENDIX 5

Institutionalizing Impact Monitoring and Evaluation at Local Partner Universities

1. Introduction

General

By and large, program and project evaluation can be a complicated undertaking, particularly so when the Monitoring and Evaluation (M&E) function had not been incorporated into the whole planning and implementation cycle in the first place. The issue is even much more complicated when dealing with post program and project Impact Monitoring and Evaluation. In this case the usual practice is the commissioning of external impact evaluation studies, really major undertaking in themselves. Difficulties encountered with impact evaluations include:

- Differentiating between 'treatment' and 'control' populations and whether these were originally contemplated in the said programs or projects;
- Deciding on variables for evaluation, particularly when objectively verifiable performance/impact indicators had not been agreed upon at the start of the programs or projects, or relevant baseline values have not been captured, and
- Even in cases where the above two aspects do not pose difficulties, the overall question as to whether observed impacts can be attributed to the interventions of the programs or projects will still have to be answered.

Root Causes

Root causes of the above difficulties are embedded in the absence of an appropriate M&E system or framework, the operation of which will supply necessary and sufficient data and information from which assessment of relevant impacts can be made. The discussions in this note explore some modalities as to how impact M&E can be institutionalized in local partner universities.

Common Understanding

It is advantageous to start with a common understanding of several basic concepts and practices. The following are of importance:

- IMPACT is taken to mean 'Use of outputs (from IWMI) by selected IWMI's customers/clients/ target groups in doing things differently for the better'.
- IMPACT INDICATORS: There are three major implications derived from the definition of impact given above. Firstly, the 'things' to be done differently by the customers/clients/target groups must be agreed upon. Secondly, the extent (by how much, by when) to which things are expected to be done differently must be captured. Thirdly, the expected 'benefits' to be gained by doing things differently to the expected extent must also be captured. The things to be done, the extent, and the benefits are captured in impact indicators. Here is an example:

- Output from IWMI: Policy Brief on smallholder irrigation schemes (IMT) stating that simply transferring management to the smallholder is not enough, without sufficient access to inputs, adequate extension support, and guaranteed markets for produce, among other aspects. Further that the transaction costs are disproportionately high as the number of smallholders increases.

- Clients/customers/ target groups: The Government water and agricultural departments

- Things to be done differently: IMT

- Extent: IMT accompanied with appropriate arrangements for inputs, extension services, and market access. In addition, the number of smallholders in given schemes is to be reduced (= larger schemes and reduction in transaction costs). This can be achieved by simply increasing/ consolidating the sizes of the farm holdings. This is clearly most likely to occur on a trial/pilot basis over a given period of time (say five or six years) in a given location in the country concerned.

- Benefits: Improved viability of (the larger) irrigation schemes on purely commercial lines. Also abolition of the relevant Government subsidies.

2. Impact Monitoring

Questions from the Example

The issue then (from the above example) is to keep track of two major aspects:

- Did the government adopt the recommendations and agree to go for larger scheme sizes (at least on trial basis)?

- Is the larger scheme experiencing improved viability?

- The answer to the first question is very simple. One simple have to observe whether the government has initiated the setting up of larger schemes (on a trial basis, say)

- The answer to the second question can only be got from keeping track of the performance of the larger scheme, and comparing this with the performance prior to consolidation, and or with the performance of smaller schemes. This then calls for 'taking measurements' of the values of given viability variables over time–the classical survey research.

Implications from the Example

Two important implications are derived from the above example. The first is that sufficient thought must be given to 'what IWMI wants the target group (in the first place the government in this case) to do differently and how things can be done. The second is that of measuring (monitoring) viability of the larger scheme.

3. Working with Partner Universities

University Programmes

The students in several programmes in African Universities normally have to pass courses in Research Methods. The degree programmes in clued Agriculture, Social Studies, Environmental Studies/Sciences,

Engineering, Business Studies, etc. The research Methods courses will normally include sections on survey research, and the students would be required to do some practical work or projects in this.

Proposal for IWMI

The proposal is then for IWMI to agree with given universities in selected sites (benchmark basins), to have on-going student survey research projects undertaken on the basis of adopted impact monitoring frameworks. The agreements have to be with the universities (preferably with the Academic Registry), and not just with individual lecturers. The universities can maintain the necessary records on the data and information collected (for the same sites) on an annual basis. Of course, the data collection would have to be done by different groups of students from year to year, as new students go through the said research Methods courses.

Costs

Evidently, the costs for such survey research projects have to be built into the universities' costs. IWMI would have to make provision for the necessary (additional) administrative costs to be paid to the universities. Further, the university fees for several of the programmes noted above would normally include some provision for field work and projects, and as such part of the costs for the projects would normally be covered by the various scholarships held by the students.

Advantages

An overriding advantage with institutionalizing impact monitoring in partner universities is that the survey research projects can be made to be not only practical but also of immediate developmental value to the countries concerned. At the same time IWMI gets ready information on the impacts of its work. Further, it is likely that the universities would be around for a long time to come.

Disadvantages

Possibly, an immediate disadvantage would be that of the reduced amount of contract given out to impact evaluation consultants. There is, of course, the risk of poor quality work being done. Agreeing on the procedures and processes to be employed for the survey research projects, and for IWMI to audit these from time to time to ensure that all is well however can minimize this.

APPENDIX 6

Integration in Water Resources Management Research

1. Introduction

General

The overall meaning of 'integration' in this case comes from Integrated Water Resources Management (IWRM). The ultimate goal of IWRM, as captured in the Dublin Principles, and in Agenda 21 simple says 'equitable access to safe water (for the various uses) in economical and environmentally sustainable manner'. Two immediate implications of this are:

- Firstly, water and land management 'on the ground' evidently occur within the context of the multiple influencing entities, such as diverse (and usually conflicting demands from various stakeholders), disjointed sectoral rules and regulations, available water (surface water or groundwater, and the quality of the same), the technologies being employed, and local beliefs, and customs.

- Secondly, water and land management research has to be conducted in such a way that the multiple influencing aspects present in any given case are successfully accounted for – preferable in an integrated manner (systems approach). At the very minimum, water and land management research must simultaneously account for biophysical and socio-economic aspects of the research question at hand. This is absolutely necessary, if for no other reason save that of taking cognizance of the reality on the ground – where the findings will have to be applied.

Question of Integration

The question then is how can integration at the research level be implemented? An evident answer is that one must work with multi-disciplinary teams. The following paragraphs explore a possible way of accomplishing integration at the research level. The discussions are based on a hypothetical case of the use of wetlands for increasing food production.

2. The Research Situation

Overall Research Objective

The overall objective of the research is to develop some system(s) for increasing crop production in given communities by making use of selected wetlands. Of necessity, the research (including the necessary trials) will be undertaken at given test sites.

Issues and Expertise Involved

The issues involved would include:

1. The physical location and characteristics of the selected wetland must be determined (by a hydrologist?)

2. The environmental water requirements and the bio-diversity of the wetland must also be determined (by an ecologist?)

3. The water situation upstream, in the wetland, and downstream of the wetland must be determined (by a hydrologist?)

4. The local beliefs, and cultural practices associated with the wetland must be known (determined by a sociologist?)

5. The types of crops, and the production management practices to be tested/ investigated must be decided upon (by an agronomist?)

6. The expected effects on the water and bio-diversity situation on the wetland (and the accompanying effects both upstream and downstream), as a result of producing the crops in the wetland must be investigated (by the hydrologist, and the ecologist?)

7. The perception of the community on the whole idea of growing crops in the wetland, and the participation of both men and women in such a venture has to be known (investigated by the gender specialist?)

8. The dissemination strategies to be undertaken with the findings from the research must be considered (by a sociologist, anthropologist, or dissemination specialist?)

9. Ensuring that all the above fit in well with the conduct of the research (the design led by the project leader?)

10. Considering the economic implications of both the project and the situation on the ground should the envisaged (positive outcomes) are adopted (to be done by an economist?),

11. Invariably it is always advantageous for the issues involved in the research to be captured in a 'model'. This has two major advantages. Firstly at the end of the work, and with a model at hand, the efforts necessary for studying and investigating a similar situation are grossly reduced, as the model can be run to explore and eliminate none promising configurations. Secondly, an authoritative model is always useful for planning purposes (Clearly, the expertise to the team would have to be provided by someone competent in modeling. Further the modeler would be instrumental in assisting the Regional Director in undertaking the necessary integration).

12. The validity of the design and the feasibility of conducting the research controlled and approve by the 'integrator' (in this case the Regional Director in consultation with the Theme Leader?).

3. Integration at the Research Level

Joint Planning of the Research

Clearly to bring all the above expertise together in crafting the research immediately imply some structured joint planning. The planning would identify the various inputs, processes, and outputs to be delivered by the different expertise, and most importantly, around what points in time in the project cycle the said inputs, processes, and outputs will be required. Contributions expected and to be made by personnel outside the research team should also be identified, and the said personnel alerted, and their acceptance to contribute

confirmed. Control points (milestones) should be explicitly identified and agreed-upon. Consideration must be given to both the most optimistic and pessimistic outcomes of the research, and how (in the case of a favourable outcome) the research findings will be used. Accompanying risks are to be identified, discussed, and proposals for minimizing such risks adopted. Further, the necessary efforts for the various contributions will have to be estimated and allocated the necessary costs. Finally, the various participants in the project should see clearly what the overall vision is, and can confidently position their individual contributions in the scheme of activities in working towards the overall goal.

Implementation of the Research

Similar to the joint planning noted above, the implementation will have to undertaken jointly according to the agreed-upon plans, under the leadership of the project leader. In leading the implementation, the project leader relies heavily on the soundness of the plan. In any case in the event of major deviations (including the occurrences of unforeseen circumstances), the practice would be to undertake a certain amount of re-planning.

Advantages

The advantages of integration at sthe research level include:

- Multi-disciplinary research takes cognizance much more closely of what in reality is happening on the ground with water and land management;
- Working in teams provide improved opportunities for meaningful ongoing peer review, and in way contributes to quality assurance;
- It is easier to identify bottlenecks earlier in the research process because of the various viewpoints that are brought to bare on the work;
- The possibilities of the work having improved impacts are enhanced, as a result of the improved consideration of realities.

Disadvantages

The disadvantages of integration at the research level include:

- The seemingly extraordinary efforts to be invested at the planning stage. In reality, this disadvantage is only valid in cases where the professionals involved are not skilled in planning;
- The risk that ‘every single project’ is then likely to become unwieldy large. This is fundamentally a misconception. Imagine for one moment what will happen in a high-rise building project if the architect, builder, electrical engineers, etc. do not sit together at a given point in the design and planning of the project!

APPENDIX 7

Challenge Program on Water and Food
CG Centre Participation in Concept Notes

CG Centre	As Project Manager (Pm)	Among 5 Principal Investigators (Excluding Pm)	Appears as Consortium CG Centre
CIAT	13	52	55
IFPRI	8	23	24
IRRI	10	29	46
IWMI	43	155	188
World Fish	5	5	29
CIFOR	1	2	-
CIMMYT	11	19	-
ICARDA	21	33	-
ICRAF	3	27	-
ICRISAT	9	30	-
IITA	0	2	-
ILRI	1	3	-
WARDA	0	1	-

No participation by CIP, IPGRI, ISNAR has yet been detected in the database (CIP personnel may appear as “CONDESAN” and were not counted)

Summary IWMI Submission CP Concept Notes Across Regions: Classification by IWMI-Office

IWMI-Office	No. of CNs	Total CN budget ($000)
IWMI-Africa, Ghana	2	1,749
IWMI-Africa, South Africa	8	11,415
IWMI-HQ	18	19,280
IWMI-Pakistan	3	2,600
IWMI-SA, India	7	5,553
IWMI-SEA, Laos	1	2,000
IWMI-SEA, Thailand	4	4,581
Grand Total	43	47,178

Summary IWMI CP Concept Notes by IWMI Themes: Classification by IWMI-Themes

IWMI-Theme	No. of CNs	Total CN budget ($000)
CA	4	4,582
1	15	14,441
2	4	6,204
3	6	6,371
4	7	8,282
5	7	7,297
Grand Total	43	47,178

APPENDIX 9

Number of Concept Notes Led by Different Types of Institutions

Type of Institution	Consortium Members	Non-Consortium Members
NARES (universities)	0	49
NARES (non-universities)	44	73
CG Centre	80	46
Advanced Research Institute	11	25
NGO	4	3
Consultancy Company	0	2
Other International Organization	0	2
International Project	0	2
Total	139	202

APPENDIX 10

Suggested Indicators and Classification of Output Across Projects and Across Themes

No.	Output	Themes / Projects					Total
Generated Knowledge							
1	Soil erosion, land use, and catchment size						
2	Relationship between factors and erosion						
3	On-site cost of soil erosion						
4	Off-site impact of soil erosion						
5	Concept note						
6	Trigger value						
7	Bright spot/lesson learned/best practice						
8	Knowledge gap/ recommendation						
9	Paradigm						
Innovative Land Management Options							
10	Conservation farming village						
11	Identification/introduction of innovative land management option						
Tools							
	Network						
12	Network						
	Scale						
	Catchment/sub-catchment						
	Farmer						
	Experimental sites						
13	Farmers' field experimental site						
	Decision support systems						
14	Decision support tool (translation)						
15	Decision support tool (revision/enhancement)						
	Model						
	Data collection and analysis						
16	Soil analysis						
17	Data/meta data collection						
18	Analysis (e.g., key drivers, regional, stakeholders, perspective, legal, risk)						
19	Guideline						
20	Legal analysis						
21	Government regulation						
22	Government decree						
Methodologies							
23	Methodology/protocol/strategy/procedure						
24	Framework						
25	Monitoring & evaluation						
26	Case study						

No.	Output	Themes / Projects						Total
The participatory process								
27	Stakeholders meeting							
28	Forms (e.g., quarterly, annual, financial reports; work plan)							
29	Dialogue with farmers							
30	Contract/MOU							
31	Participatory development studies with farmers							
32	Country visit							
33	Workshop							
34	Questionnaire							
35	Countrywide survey							
	country							
	village							
36	Needs assessment							
37	Focus group interviews							
Enhanced National Capacity								
38	Training courses							
	Number							
	Scientist							
	Institution/group							
39	Assistance to grad student							
40	On-farm researcher-managed study site/ technology based educational site							
Cost-effective IEC Modalities								
41	Paper presented							
42	Proceeding							
43	Web-based extension tool (translation)							
44	Report							
45	Journal or feature article/paper published							
46	Participation in international conference/meeting /workshop							
47	Student thesis							
48	Presentation/resource person							
49	Literature review							
50	Policy brief							
51	Farmer shar˙ng/interaction							
52	Draft manuscript/research paper							
	Total							

APPENDIX 11

The Matrix of Priorities of IWMI by Themes/Regions for 2002

Topic	Asia		India		PK/CA		BK		AF	
	Ongoing	New	Ongoing	New	Ongoing	New	Ongoing	New	Ongoing	New
1. Integrated Water Resources Management for Agriculture										
1.1. Integrated modeling for water management	✓	✓*	-	-		✓*	✓	-	✓	-
1.2. Productivity of water	✓	✓*	-	-	✓	✓	-	✓	✓	-
1.3. Operation/ maintenance and management of irrigation systems	-	✓	-	-	✓	✓	-	✓	-	✓
2. Sustainable Small-holder Water and Land Management Systems										
2.1. Improving catchment land and water management	✓	✓	-	-	-	-	✓	✓*	-	✓
2.2. Increasing productivity of smallholders with additional water	-	-	-	-	-	✓*	-	✓	✓	-
2.3. Understanding how land degradation affects food security	-	✓	-	-	-	✓	-	✓	-	✓
3. Sustainable Ground-water Management										
3.1. Assessment of groundwater use, productivity, economic value in agriculture (including regional modeling)	-	✓	-	-	✓	-	-	✓	✓	-
3.2. Basin level impacts of local water harvesting and recharge (including RS, and GW modeling)	-	✓	-	-	-	✓	-	-	✓	-
3.3. Groundwater irrigation and rural poverty	-	-	-	-	-	✓*	-	✓	✓	-

Topic	Asia		India		PK/CA		BK		AF	
	Ongoing	New	Ongoing	New	Ongoing	New	Ongoing	New	Ongoing	New
3.4. Conjunctive use of surface and groundwater (including modeling)	-	✓	-	-	✓	✓	-	-	✓	-
3.5. Approaches to sustainable groundwater management	-	✓	-	-	-	✓	-	-	✓	-
4. Water Resources Institutions and Policy										
4.1. Policy options for the efficient utilization of water and land resources	-	✓	-	-	✓	✓	✓	✓*	✓	-
4.2. Financing water service delivery systems	✓	✓	-	-	-	✓	-	✓	-	✓
4.3 River basin management	✓	✓*	-	-	-	✓	✓		✓	-
4.4. Irrigation interventions for poverty alleviation	✓	-	-	-	✓	✓	✓	-	✓	-
5. Water Health and Environment										
5.1 Malaria and agriculture	✓	-	-	-	-	-	-	✓	✓	-
5.2. Reuse of urban waste in agriculture	-	✓	-	-	✓	-	✓	✓*	✓	-
5.3 Domestic uses of irrigation water	✓	✓	-	-	✓	✓	-	-	-	✓
5.4. Ecological aspects of irrigation in river basins	-	✓*	-	-	-	✓	-	-	-	✓
6. Comprehensive Assessment										
6.1.Impact and scenarios	-	✓	-	-	✓	-	✓	-	-	✓
6.2. Innovative approaches	-	-	-	-	-	-	-	-	-	✓
6.3. Basin and local case study	✓*	-	-	-	✓	-	✓	-	✓	-
6.4. Improved - information	✓*	-	-	-	✓	-	-	-	-	✓

Ongoing – Existing projects
New – Proposing new concept notes/projects etc.
* – High priority

National Research Priorities as Reported by the NARES of the 10 Southeast Asian Countries

Thrust/themes	Country									
	Camb	Lao	Myan	Viet	Phil	Thail	Indon	Singa	Malay	Brunei
1. FOOD SECURITY										
a. Increase productivity/quality	X	X	X	X	X	X	X	X	X	X
b. Germplasm improvement	X	X	X	X	X	X	X	X	X	X
c. Cutting-edge technology/biotechnology	-	-	X	X	-	-	X	X	X	-
d. Bio-safety	-	-	-	X	-	-	X	-	X	X
e. Product/technology development	-	X	-	-	X	-	X	-	-	X
f. Postharvest/processing	X	X	-	-	X	X	X	-	X	-
g. Global competitiveness							X	-	X	-
2. NATURAL RESOURCE MANAGEMENT										
a. Soil and water management	X	X	X	X	X	-	X	-	X	-
b. Integrated pest management	X	X	-	X	-	-	-	-	-	X
c. Biodiversity conservation	X	X	-	X	X	X	X	-	X	X
d. Forest management/agroforestry	X	X	-	-	-	-	-	-	X	-
e. Environmental protection	-	-	-	X	X	X	-	-	X	-
3. KNOWLEDGE MANAGEMENT										
a. Information technology	X	X	-	X	X	X	-	-	X	X
b. Networking/sharing	-	-	X	-	X	-	X	-	-	X
c. Technology promotion	-	-	-	-	X	X	X	X	-	-
4. POLICY IMPROVEMENT										
a. GMO issues	-	-	-	-	X	-	X	-	X	-
b. Policy studies/recommendations	X	-	-	-	X	X	X	-	-	-
c. IPR–related issues	-	-	-	X	-	X	X	-	-	-
5. CAPACITY BUILDING										
a. Human resource development	X	X	X	X	X	X	-	-	X	-

Source: Southeast Asian Forum for Agricultural Research: Prospects and Opportunities, 14-16 February 2002, Bangkok, Thailand

NARES Regional Areas, 2001

Regional R&D Areas	Proc	Kor	Thai	Viet	Cam	Mal	Myan	Indo	Lao	Jap*	Tai*	Phil	High
1.Food Security													
- Increase production	//	/	//	/	//	//	//	//	//	-	/	//	8
- Increase quality/ competitiveness	//	//	//	//	//	//	//	//	/	-	//	//	10
- Increase biosafety	//	/	//	//	/	//	/	//	/	-	//	//	7
- Biotech/cutting edge technology (for new industry)	/	//	//	/	/	//	-	//	-	//	//	//	7
2. Natural Resources Management													
- Environmental degradation (conservation)	/	/	/	-	/	//	/	//	-	//	//	//	5
- Shifting cultivation/ agriculture	//		/	/	/	/	//	/	//	-		/	3
- Biodiversity conservation	/	//	//	//	//	//	//	//	//	-	//	//	10
- Management (soil, water)	/	//	/	/	//	//	//	//	-	-	/	//	6
- Climate change	-	-	-	-	/	/	-	/	-	-	//	/	1
- Integrated pest management	//	/	//	-	//	/	//	/	/	-	//	//	6
3. Increase Farmers' Income/Rural Economy													
- Marketing (processing and distribution system)	//	-	//	//	//	//	/	//	//	//	//	//	10
- Enterprise development	//		//		/	//	/	//	//	-	-	//	6
- Credit	-	-	/	/	/	/	-	//	-	-	-	//	2
- Sustainable agricultural development (multiple -- function of agriculture, forestry and fisheries)	-	-	//	-	/	/	-	/	-	-	//	//	4
4. Research Support													
a. Capacity building	/	-	//	/	-	-	//	//	-	-	-	-	3
- Human resource management			//		//	/	-	//	//		//	//	6
- Gender issue	-	-	//	-	/	/	-	/	-	-	-	-	1
b. Information technology	-	-	//	//	//	//	/	/	/	-	//	//	6
c. Policy	-	-	-	-	-	-	-	-	-	-	-	-	-
- R&D impact assessment	/	-	//	/	/	/	-	//	-		/	//	3
- Stakeholders' participation	-	-	/	-	/	/	/	/	-	-	-	//	1
- GMO issue	/	//	//	/	/	//		//	-	-	//	//	6
- Strengthen structure of agriculture, forestry and fisheries	-	-	-	/	-	-	-	-	//	//	-	2	-

// = means high priority; 1 = low priority

*Did not attend, but provided updates/inputs after the workshop. NARS that provided updates/validation: Indonesia, Malaysia, Philippines, Taiwan, Cambodia, Japan, Vietnam, Thailand.

APPENDIX 14

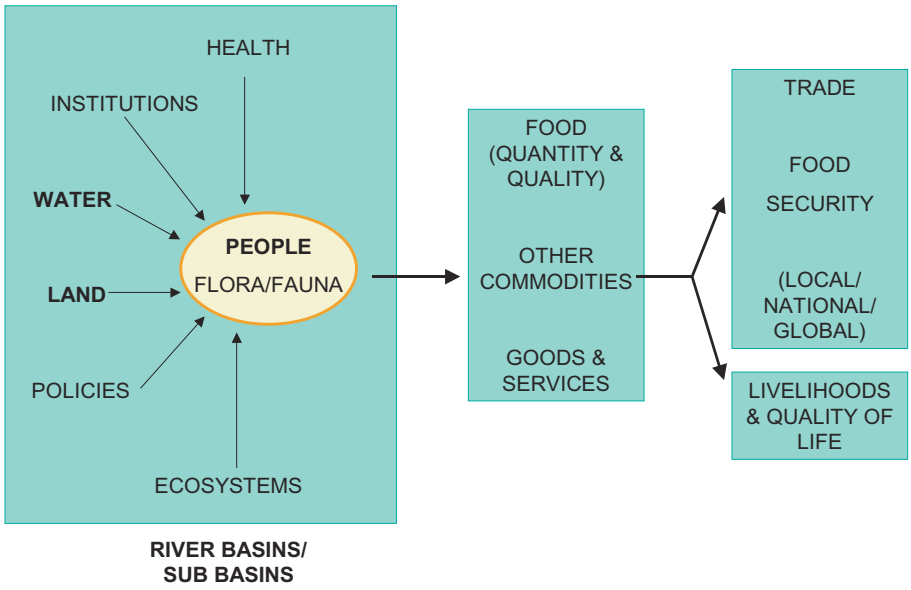
Regional Priorities for the Asia-Pacific Region

1. Natural Resource Management
   - 1.1 Integrated NRM and Integrated Crop Management (ICM/IPM)
   - 1.2 Policy development and Institutional issues related to NRM
   - 1.3 Watershed management
   - 1.4 Land management and soil fertility
   - 1.5 Rehabilitation of degraded and marginal lands
2. Genetic Resources Enhancement and Agro-biodiversity Conservation
   - 2.1 PGR conservation and improvement
   - 2.2 Livestock selection and improvement (includes fisheries)
   - 2.3 Microbial functional agrobiodiversity
   - 2.4 Bio-safety issues/policy/GMOs/IPRs
3. Commodity Chain Development (Linking Farmers to Markets)
   - 3.1 Commercialization, marketing and trade
   - 3.2 Policy–International agreements
   - 3.3 Input/supply and demand analysis (industry and macro level)
   - 3.4 Production and marketing economic analysis (firm/farm and micro level)
   - 3.5 Value adding
   - 3.6 Competitiveness
   - 3.7 Product/quality improvement and standards
   - 3.8 Quarantine and bio-security
4. Meeting the Protein Demand of a Growing Population (Animal)
   - 4.1 Feed resources: fish, poultry, ruminants and non-ruminants (forage, pasture, fodder, grain, constituted feedstocks and crop residues)
   - 4.2 Disease management (poultry, ruminants, non-ruminants, aquaculture)
   - 4.3 Production systems (crop/livestock, aquaculture, mariculture)
   - 4.4 Waste management and by-product utilization
5. Meeting the Protein Demand of a Growing Population (Plants)
   - 5.1 Grain legume productivity improvement
   - 5.2 Legumes in farming systems
   - 5.3 Quality and nutrition improvement (human)
   - 5.4 Food safety: aflatoxins and anti-nutrition factors
6. Tree and Forest Management for Landholders
   - 6.1 Natural forest management
     - 6.1.1 Harvesting regime and regeneration
     - 6.1.2 Cutting cycle analysis
   - 6.2 Forest plantation, productivity and health
   - 6.3 Agro-forestry in production systems
7. Cross-cutting Issue: Information Management for Agricultural Development
   - 7.1 Packaging, access and use: Research, methodologies and modalities
8. Cross-cutting Issue: Capacity Building
   - 8.1 Human resource development
   - 8.2 Institutional development
     - 8.2.1 Research management, stakeholder management
     - 8.2.2 Technology transfer facilitation
   - 8.3 Research policy development
     - 8.3.1 Food insecurity and poverty mapping

Source: P.S. Faylon, 2001. APAARI Paper

APPENDIX 15

Framework for Integrated Land and Water Resources Management



APPENDIX 16

Total Staff Region-Wise Breakup by Gender as of May 1, 2003

Region	Researchers			Research Support			Non-Research			Total		
	M	F	Tot	M	F	Tot	M	F	Tot	M	F	Tot
Headquarters/IWMI Hosted Programs	5	3	8	-	-	-	56	37	93	61	40	102
Global Research Centre Sri Lanka and USA/Global Research Division	33	9	42	22	2	24	0	8	8	55	19	73
Regional Office Africa/ Sub Regional Office Ghana	17	7	24	5	3	8	6	6	12	28	16	44
Regional Office South East Asia	18	1	19	1	5	6	4	6	10	23	12	35
Regional Office Pakistan/ Sub Regional Office Uzbekistan	6	0	6	35	5	40	33	5	38	74	10	84
Regional Office South Asia/Sub Regional Office Nepal	6	4	10	9	2	11	5	1	6	20	7	27
Total	85	24	109	72	17	89	104	63	167	261	104	365

APPENDIX 17

Composition of IWMI Governing Board (Region) by Gender as of May 1, 2003

Region	M	F	Total
Asia	3	1	4
Europe	4	-	4
Latin America	-	1	1
North America	-	1	1
Sub-Saharan Africa	-	1	1
WANA	-	1	1
Total	7	5	12

Other IWMI Staff: Seconded, Post Doctoral Scientists/Associate Experts as of May 1, 2003

	North			South			Total		
	M	F	Tot	M	F	Tot	M	F	Tot
Seconded	11	1	12	-	-	-	11	1	12
Post Docs/Assoc. Experts	8	2	10	9	2	11	17	4	21
Total	19	3	22	9	2	11	28	5	33

APPENDIX 18

IWMI Publications on Gender and Water 2000-2003

1. Van Koppen, Barbara. 2000. Gender and Poverty Dimensions of Irrigation. Techniques for Technical People. Key Note Address. Proceedings 6th International Micro-Irrigation 2000 Congress. Cape Town, 24 October 2000
2. Van Koppen, Barbara. 2000. Discussion Note Policy issues and options for gender-balanced irrigation development. Paper. Proceedings 6th International Micro-irrigation Congress. Cape Town 22-27 October 2000.
3. Van Koppen, Barbara. 2000. Gendered water and land rights in construction: rice valley improvement in Burkina Faso. In: Bruns, Bryan, and Ruth Meinzen-Dick (eds). *Negotiating water rights*. New Delhi: SAGE
4. Van Koppen, Barbara. 2001. Gender in Integrated Water Management: An Analysis of Variation. In Natural Resources Forum 25 (2001) 299–312. United Nations. Elsevier Science Ltd.
5. Van Koppen, Barbara. 2001. Women and Water Rights. In: Quisumbing, Agnes, and Ruth Meinzen-Dick (eds). 2001 Empowering Women to Achieve Food Security. Focus 2020–6. IFPRI Policy Briefs. Washington: IFPRI
6. Van der Molen, Irna. An assessment of female participation in minor irrigation systems of Sri Lanka. 2001. IWMI Working Paper 7.
7. Van Koppen, Barbara, Rashmi Nagar and Shilpa Vasavada. 2001. Gender and Irrigation in India: the women's irrigation group of Jambar, South Gujarat, IWMI Working Paper 10
8. Harmeet Saini and Barbara van Koppen. Gender in Lift Irrigation Schemes in East Gujarat, India, IWMI Working Paper 11
9. Van Koppen, Barbara, Jacobijn van Etten, Prabina Bajracharya and Amitha Tuladhar. 2002. Women Irrigators and Leaders in the West Gandak Scheme, Nepal. IWMI Working Paper 15
10. Schreiner, Barbara, and Barbara van Koppen. 2001. From bucket to basin: poverty, gender, and integrated water management in South Africa. In: Abernethy, C. (ed) Proceedings of the Workshop Integrated Water Management in Water-Stressed River Basins in Developing Countries 16-21 October 2000
11. Van Koppen, Barbara. 2002. A Gender Performance Indicator for Irrigation: Concepts, Tools, and Applications. IWMI RR 59
12. Van Etten, Jacobijn, Barbara van Koppen, and Shuku Pun. 2002. Do equal land and water rights benefit the poor? The case of the Andhi Khola Irrigation Project in Nepal. Working Paper 38. Colombo, Sri Lanka: International Water Management Institute
13. Schreiner, Barbara, Barbara van Koppen, and Tshepo Khumbane. 2002. From bucket to basin: a new paradigm for water management, poverty eradication, and gender equity. In 2002 Turton and Henwood (eds) Hydropolitics in and the developing world: a Southern African perspective. Pretoria: African Water Issues Research Unit. Center of International Politics. University of Pretoria pp 127 - 140
14. Schreiner, Barbara, and Barbara van Koppen. 2002. Catchment Management Agencies for Poverty Eradication in South Africa. Journal: Physics and Chemistry of the Earth. Devon: Elsevier Publishers
15. Van Koppen, Barbara. 2002. Gender Analysis for Improved Irrigation Performance. In: Sally and Abernethy (eds). Private Sector Participation in Irrigation Expansion in Sub-Saharan Africa. FAO-IWMI-CTA Regional Seminar, Accra, Ghana, 22-26 October 2001. Pretoria: International Water Management Institute
16. Van Koppen, Barbara. 2002. Towards a Gender and Water Index. Contribution to the Water Poverty Index. Appendix 9.17. In: Sullivan, Caroline, J.R. Meigh, and T.S. Fediw. Final Report Derivation and Testing of the Water Poverty Index Phase 1. Centre for Ecology and Hydrology and Department for International Development, Wallingford, London, United Kingdom
17. Van Koppen, Barbara, and Barbara Schreiner. 2003. Water Policy and Legislation to Eradicate Poverty and Redress Racial and Gender Inequities: the Case of South Africa. Chapter submitted to Water Policy Special Issue

APPENDIX 19

IWMI Concept Notes for Challenge Program Water and Food: Profile

No.	CN ID	Title	MGR	IWMI Office	IWMI Theme	Budget	Duration	CP Themes					Basins										
								Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Yr	Nile	Limp	Sao	Mekong	Karkeh	Indo	Andean	Volta	Other
1	19	The Agricultural Policy-Water Use Nexus: Creating a New Path for National Water Savings and Transboundary Water Cooperation	Mark Giordano	IWMI-HQ	4	883,000	3	0	0	0	60	40	-	-	-	-	-	-	Y	-	Y	-
2	20	Developing a Hydrology-based Desktop Methodology for Estimation of Environmental Water Requirements at the Global Scale and its Application to Support Environmental Water Allocation Policies in Benchmanrk Basins	Smakhtin, Vladimir	IWMI-HQ	5	1,300,000	3	0	0	30	30	40	Y	Y	Y	-	Y	-	Y	-	-	-
3	21	Increasing Crop Productivity Through Soil and Water Synergies Associated with Enhanced Organic Matter and Clay Management in Rain Fed Production Systems	Andrew Noble	IWMI-SEA, Thailand IWMI-HQ	2	1,451,470	4	80	20	0	0	0	-	-	-	-	Y	-	-	-	-	-
4	25	Institutional Matrices of the Indo-Gangetic Basin: Institutional Mapping and Performance Assessment for Developing an Institutional Decision Support System	R. Maria Saleth	IWMI-HQ	4	643,000	3	15	0	10	60	15	-	-	-	-	-	-	Y	-	-	-
5	26	Decision Support for Agricultural Investment Strategies in the Volta Basin with Special Reference to Informal Smallholder Irrigation	Pay Drechsel	IWMI-Africa, Ghana	2	844,000	3	10	20	0	45	25	-	-	-	-	-	-	-	-	Y	-
6	27	Protecting Food Security, Human Health, Environmental Integrity and Rural Livelihoods in Irrigated Rice-Based Agricultural Systems from the Detrimental Impacts Associated with Elevated Levels of Heavy Metals	Robert Simmons	IWMI-SEA, Thailand	5	1,223,000	4	0	0	0	100	0	-	-	-	-	Y	-	-	-	-	-
7	28	Transboundary Water Governance for Agricultural and Economic Growth and Improved Livelihoods in the Limpopo and Volta Basins: Towards African Indigenous Models of Governance	Douglas Merrey	IWMI-Africa, South Africa	4	1,755,000	3	0	0	0	40	60	-	-	Y	-	-	-	-	-	Y	-
8	29	Planning and Evaluating Ensembles of Small, Multi-Purpose Reservoirs for the Improvement of Smallholder Livelihoods and Food Security: Tools and Procedures	Marc Andreini	IWMI-Africa, Ghana	1	904,500	3	0	30	0	60	10	-	-	Y	Y	-	-	-	-	Y	-
9	30	Smallholder Agroforestry for Income and Environmental Security and Implications for Basin Level Hydrology	Deborah Bossio	IWMI-HQ	1	655,400	2	50	0	0	50	0	-	-	-	-	-	-	Y	-	-	-
10	34	Groundwater Governance at the International Scale: Lessons for Policy Development in International Challenge Program Basins	Mark Giordano	IWMI-HQ	4	340,231	3	0	0	0	50	50	-	Y	Y	-	Y	-	Y	-	Y	-
11	35	Potential Impact of Arsenic Contamination of Groundwater on Irrigated Agriculture, and Livelihoods of the Lower Indo-Gangetic Basin	M. Mainuddin	IWMI-SEA, Thailand	3	702,000	3	20	0	0	60	20	-	-	-	-	-	-	Y	-	-	-
12	36	Improved Planning of Large Dam Operation: Using Decision Support Systems to Optimize Livelihoods, benefits, safeguard health and protect the environment	Matthew McCartney	IWMI-Africa, South Africa	5	656,740	3	0	0	30	70	0	-	Y	Y	-	-	-	-	-	-	-
13	37	Integrated Management to Safeguard and Enhance Diverse Wetland Benefits in the Upper Nile and Volta Basins	Matthew McCartney	IWMI-Africa, South Africa	5	1,417,450	5	0	15	60	25	0	-	Y	-	-	-	-	-	-	Y	-
14	38	Tree-Based Systems for Sustainable Wastewater Use and Treatment	Robert Zomer	IWMI-HQ	5	810,500	3	70	0	10	10	10	-	Y	-	-	-	-	Y	-	-	-
15	39	Water Use Implications of Carbon Sequestration Under the Clean Development Mechanism	Deborah Bossio	IWMI-HQ	1	455,000	2	0	0	0	80	20	-	Y	-	-	-	-	-	Y		-
16	40	Wetlands-based Livelihoods in the Limpopo Basin: Balancing Social Welfare and Environmental Security	M. Masiyandima	IWMI-Africa, South Africa	5	673,640	3	0	30	50	20	0	-	-	Y	-	-	-	-	-	-	-
17	41	Models for Implementing Multiple-Use Water Supply Systems for Enhanced Land and Water Productivity, Rural Livelihoods and Gender Equity	Frits Penning de Vries	IWMI-Africa, South Africa	2	1,908,500	5	20	50	10	10	10	-	Y	Y	-	Y	-	Y	Y	Y	-

No.	CN ID	Title	MGR	IWMI Office	IWMI Theme	Budget	Duration	CP Themes					Basins											
								Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Yr	Nile	Limp	Sao	Mekong	Karkeh	Indo	Andean	Volita	Other
18	42	Strategic Analysis of India's Proposal to Link 37 Himalayan and Peninsular Rivers	Tushaar Shah	IWMI-SA, India	3	975,000	3	5	5	5	80	5	-	-	-	-	-	-	Y	-	-	-
19	43	Effective Strategies for Governing Water Resources in Developing Countries	Douglas L. Vermillion	IWMI-SEA, Thailand	4	1,204,600	3	5	5	15	70	5	Y	-	-	-	Y	-	Y	-	-	-
20	44	Improved Water and Land Management in the Lake Tana Catchment of the Ethiopian Highlands and its Impact on Downstream Stakeholders Dependent on the Blue Nile	Douglas Merrey	IWMI-Africa, South Africa	1	1,355,000	4	10	50	0	40	0	-	Y	-	-	-	-	-	-	-	-
21	45	Living with Floods and Droughts: Responding to Climate-Related Vulnerability and "Water-Risk" in the Limpopo and Nile Basins. A basin-wide knowledge and capacity building initiative to improve land and water management for resilient livelihoods.	Hilmy Sally	IWMI-Africa, South Africa	1	1,665,500	3	10	15	0	60	15	-	Y	Y	-	-	-	-	-	-	-
22	46	Groundwater Governance in the Ganga-Meghna-Brahmaputra and Yellow River Basins	Tushaar Shah	IWMI-SA, India	3	1,995,000	3	10	5	0	65	20	Y	-	-	-	-	-	Y	-	-	-
23	94	Pumps, Productivity, and Poverty Alleviation in Monsoon Asia: Effective Strategies for Conjunctive Management of Pumps, and Canal Irrigation Systems to Improve the Livelihood o f the Poor in the Indo-Gangetic and Mekong Basins	Randolph Barker	IWMI-HQ	3	1,297,450	3	30	0	0	30	40	-	-	-	-	Y		Y	-	-	-
24	107	Integrated River Basin Management in Nepal: Impacts and Future Trends in the Development and Management of the Indrawati and Bagmati Basins	Christopher Scott	IWMI-SA, India	1	343,500	3	0	20	0	80	0	-	-	-	-	-	-	Y	-	-	-
25	110	Energy Supply, Pricing and Power Infrastructure Management: Indirect Tools for Groundwater Management in the Indus-Ganges Basin	Chritopher Scott	IWMI-SA, India	3	651,700	3	0	0	0	75	25	-	-	-	-	-	-	Y	-	-	-
26	115	Spatial and Temporal Dynamics of Food Insecurity, Poverty and Vulnerability in Rural Areas	Upali Amarasinghe	IWMI-HQ	4	1,661,250	3	0	60	0	40	0	-	-	-	-	-	-	Y	-	Y	-
27	117	Impacts of Irrigation: Implications for Poverty Reduction, Environment, Financing, and Water Management at Irrigation System Scale	David Molden	IWMI-HQ	CA	405,000	2	20	10	10	20	40	-	-	-	-	-	-	Y	-	-	-
28	119	Evaluating the Potential Role of Wastewater in the Alleviation of Poverty and Improved Food Security, while Simultaneously Minimizing Risk to Human Health and the Environment	Liqa Raschid	IWMI-HQ	5	1,216,000	3	0	0	0	100	0	-	Y	-	-	-	-	Y	-	Y	-
29	122	Mitigating Water Stress in the Yellow River Basin: Strategies for Agricultural Water Savings and Improved Water Productivity	David Molden	IWMI-HQ	CA	1,201,500	3	80	0	0	20	0	Y	-	-	-	-	-	-	-	-	-
30	221	Integrated Water Management of Karkheh River Basin with Emphasis on Irrigation, Drainage, and Water Productivity Issues of Irrigation Networks in the Lower Basin	Francois Molle	IWMI-HQ	1	2,600,000	5	15	5	10	70	0	-	-	-	-	-	Y	-	-	-	-
31	235	Analyzing Agricultural Productivity Growth and Identifying Options for Enhancing Productivity for Food Security and Poverty Alleviation	Intizar Hussain	IWMI-HQ	4	1,795,000	5	30	5	5	55	5	-	-	Y	-	-	-	Y	-	-	-
32	237	Linking Community-Based Water and Forest Management for Sustainable Livelihoods of the Poor in Fragile Upper Catchments of the Indus-Ganges Basin	Dhruba Pant	IWMI-SA, India	1	318,300	3	20	50	0	20	10	-	-	-	-	-	-	Y	-	-	-
33	239	Enhancing Food and Environmental Security in Sub-Saharan Africa: A Multi-Scale Assessment of Strategies and Trade-offs	Douglas Merrey	IWMI-Africa, South Africa	CA	1,983,250	5	10	0	10	50	30	-	Y	Y	-	-	-	-	-	Y	-
34	268	Managing groundwater through skimming wells in the Indus Basin of Pakistan	Asad Sarwar Qureshi	IWMI Pakistan	3	750,000	3	25	0	0	75	0	-	-	-	-	-	-	Y	-	-	-
35	272	Drought mitigation through integrated water resource management by incorporating seasonal climate variability and climate change risks	Asad Sarwar Qureshi	IWMI Pakistan	1	1,191,000	3	100	0	0	0	0	-	-	-	-	-	-	Y	-	-	-

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36	279	Virtual Water: Assessing the Actual and Potential Role of International Trade in the Mitigation of Global and Regional Food and Water Scarcity	Charlotte de Fraiture	IWMI-HQ	CA	992,000	3	0	0	0	20	80	Y	Y	-	-	-	-	-	-	-	-
37	340	Improving total value of water productivity in irrigated agricultural systems through promotion of diversified uses of water	Hammond Murray-Rust	IWMI-SA, India	1	534,250	3	40	0	0	60	0	-	-	-	-	Y	Y	Y	-	-	-
38	341	Scaling Up of Water Productivity from Field to Basin: Capturing the Benefits of Farm-Level Improvements in Water Management at Higher Levels	Hammond Murray-Rust	IWMI-SA, India	1	735,500	3	50	0	0	50	0	-	-	-	-	Y	Y	Y	-	-	Y
39	343	Information Base Development of Shandong and Henan Irrigation Districts	Zhongping Zhu	IWMI-HQ	1	500,000	2	0	0	0	90	10	Y	-	-	-	-	-	-	-	-	-
40	347	Regional Impacts of Conjunctive Use of Surface and Groundwater Resources on Soil Salinity and Groundwater Quality	Asad Qureshi	IWMI-Pakistan	1	659,000	3	40	0	0	60	0	-	-	-	-	-	Y	Y	-	-	Y
41	362	Decision Support System for Improving Basin Performance	Francis Gichuki	IWMI-HQ	1	1,582,500	5	10	10	10	60	10	-	Y	Y		Y		Y	-	-	-
42	369	Maximizing Crop Yields and Biomass Productivity per Unit of Water: Quantifying, Mapping, and Modeling Variability at Various Spatial Scales and Time Periods in the Aral Sea Basin of Central Asia Using Satellite Sensor Data of 3 Eras	Prasad Thenkabail	IWMI-HQ	1	942,000	5	34	0	0	33	33	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
43	373	Multiscale and Integrated Land and Water Management Strategies to Combat Poverty, Natural Resource Degradation and Downstream Impacts in Upper Catchments	Christian Valentin	IWMI-SEA, Laos	2	2,000,000	5	10	70	10	10	0	-	-	Y	-	Y	-	-	-	-	-

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