

ANNEX I
IWMI 3rd EPMR Panel Composition and Biodata

CHAIR

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EASTER, Kenneth, W. (USA)

Position: Professor, College of Food, Agricultural and Natural Resource Sciences, Department of Applied Economics, University of Minnesota.

Expertise: Resource economics and development, irrigation and water management.

Education: Ph.D. Michigan State University, USA (1966); M.S/B.S., University of California-Davis.

Experience: Dr. Easter has been on the faculty of the University of Minnesota since 1970 and Director of the Center for International Food and Agricultural Policy from July 1999 to June 2003. During 1991-93 he worked with the World Bank and was senior author of their Water Resources Management Policy. He has been a consultant to FAO, USAID, The Ford Foundation and The World Bank. He is a member of the American Agricultural Economics Association, 1961-present; Member of the American Economics Association; member of Association of Environmental and Resource Economists; and Program leader for natural resources and the environment in the Center for International Food and Agricultural Policy, 1987-1991, and 1993-present. He is author of over 200 publications, many of them journal articles and has co-authored, edited, or co-edited 12 books dealing with a range of natural resources and environmental economics issues, but with a focus on water resources. One of his more recent efforts is an edited volume on the Economics of Water Resources: Institutions, Instruments and Policies for Managing Scarcity.

ABEYRATNE, Shyamala (SRI LANKA)

Position: Independent consultant.

Expertise: Rural & agricultural development, water supply & sanitation, irrigation management.

Education: PhD, Development Sociology, Cornell University, USA, 1990; MSc, Development Sociology, Cornell University, 1982; BA (Honors), Sociology, York University, Canada, 1976

Experience Currently Senior Associate, Winrock International, USA and Member of the Board of Governors for Winrock International India and Winrock Philippines. Previous positions: 1999-2003 President, Winrock International India; 1997-99 India Country Director, Winrock International; 1996-97 Consultant Socio-Economist, Hofman Anderson and Partners, Denmark, and Institutional Specialist to the World Bank, COWI Consult, Denmark; 1992-1996 Chief Adviser, Danish Ministry of Foreign Affairs; 1990-92 Monitoring and Evaluation Advisor, Danish Ministry of Foreign Affairs; 1986-1987 Research Fellow, International Irrigation Management Institute, Sri Lanka; and 1976-1986 Research and Training Officer, Agrarian Research and Training Institute, Sri Lanka, Dr Abeyratne has worked in several countries and been a consultant to the World Bank, Cornell University, CIDA, FAO, WHO, ADB and USAID, among others. She is a member of the National Honor Society of Agriculture (Cornell Chapter), USA; Fellow of the India Water Resources society; and Member of the Rural Sociology Association, USA.

BENNETT, Jeff (AUSTRALIA)

Position: Professor, Crawford School of Economics and Government, Australian National University.

Expertise: Environmental Economics, Natural Resource Economics, Agricultural Economics and Applied Micro-Economics.

Education: PhD, Environmental Economics, Australian National University, 1982.; BAgEc (Hons), Agricultural Economics, University of New England, 1976.

Experience: Professor and Director (Environmental Management Programme), Crawford School of Economics and Government, Australian National University. Previous positions: Senior Lecturer and subsequently Associate Professor, Department of Economics and Management, The University of New South Wales (ADFA), 1986-2000; Henry Schapper Visiting Fellow, Department of Agricultural and Resource Economics, University of Western Australia, 1999; Visiting Professor, Institut für Volkswirtschaftslehre, Universität der Bundeswehr, München, Germany, 1993; Research Officer, Australian Bureau of Agricultural and Resource Economics, 1976-78: project evaluation; Research Assistant, Center for Resource and Environmental Studies, ANU, 1980: Gordon River Scheme Assessment. Science and Information Board member, New South Wales Department of Natural Resources; President of the Australian Agricultural and Resource Economics Society, 2004; pro-bono Director of Wetland Care Australia, 2000-04; and, Principal of the consulting group Environmental & Resource Economics.

MAILLAT, Jean-Yves (FRANCE)

Position: Independent Management Consultant and Executive Coach.

Expertise: Management, management consulting and executive coaching in the international, public, private and non-profit sectors, strategic planning, organization development, executive development.

Education: Master in Business Administration, New-York University, 1972.; Master in Economics, Université de Nancy, France, 1969.

Experience Current position since 2000 - Independent Management Consultant and Executive Coach; Management audit of international agricultural research centers; One-on-One coaching of managers at the World Bank, International Monetary Fund, Inter-American Development Bank, ICRAF and private clients. Between 1983 and 1999 held different positions at the World Bank, Washington DC: Senior Internal Management Consultant; Manager, Internal Management Consulting Unit; Manager, Economics and Sector Training Programs, Manager of a major service unit; Previous positions: Senior Management Consultant with Booz.Allen & Hamilton International based in Algeria and Egypt; Independent Management Consultant working for small and medium size French companies, for Booz.Allen & Hamilton International and for Qatar Petrochemical Company. Co-founder and first manager of a small consumer cooperative, Cofac, France. Participated in project appraisal, supervision and evaluation missions for the World Bank to assess/evaluate the effectiveness of proposed/actual organization structures, policies, systems and procedures of public sector organizations in Burkina Faso, Burundi, Colombia, Egypt, India, Ivory Coast, Kenya, Mauritania, Mexico, Peru, Senegal, Tanzania, Vietnam. Participated in the EPMRs of four CGIAR centers: CIAT, ICRISAT, CIP, WARDA.

WALTER, Michael (USA)

Position: Professor, Biological and Environmental Engineering, Cornell University.

Education: PhD in Water Resource Engineering, University of Wisconsin, Madison.

Expertise: Civil engineering, agricultural engineering, water management.

Experience: A specialist in water management, Walter joined Cornell University in 1974 after completing his graduate studies. His prior experience includes work as a civil engineer for the Bureau of Water Resources of the Illinois Division of Waterways. At Cornell he has served on the

Faculty Council of Representatives and the University Council. He teaches hydrology, watershed engineering, and soil and water conservation engineering. Walter is a member of the American Society of Civil Engineers, American Society of Agricultural and Biological Engineers, and the Soil Conservation Society of America. Selected research projects: Non-Point Source Pollution Control for Animal Agriculture , Variable Area Hydrology in NY City Water Supply, Irrigation Support Project for Asia and the Near East ; Hill Area Land and Water Development Project-India); Diversified Cropping-Philippines ; Private Tube Well Development-Pakistan ; Transport Pathways and Fate of *Cryptosporidium parvum* Oocysts from Infected Dairy Wastes. He has served as the BEE department chair since 1994.

ANNEX II
Terms of Reference
for External Program and Management Reviews
of CGIAR Centers

BACKGROUND

Context

The Consultative Group on International Agricultural Research (CGIAR) is an informal association of over 50 members that supports a network of 16 international research centers in agriculture, forestry and fisheries. The CGIAR aims, through its support to the Centers, to contribute to promoting sustainable agriculture for food security in developing countries. Because the Centers constitute the core of the CGIAR, the effectiveness of each Center is crucial to the continued success of the CGIAR (as a System).

Each Center is an autonomous institution operating within the mandate assigned to it by the CGIAR, and is governed by a legally constituted Board that has full fiduciary responsibility for managing the Center. To ensure accountability in an essentially decentralized system, each Center is expected to be responsive to the CGIAR, which provides financial support for its work.

The CGIAR has established a tradition of External Program and Management Reviews (EPMRs) to provide a mechanism of transparency and accountability to the Members and other stakeholders of the CGIAR System. EPMRs are the joint responsibility of SC and the CGIAR Secretariat, and are conducted for each Center approximately every five years. As each Center is autonomous, EPMRs provide a measure of central oversight and serve as an essential component of the CGIAR's accountability system.

Integrated System of Reviews of Each Center

Besides the EPMRs, Center Commissioned External Reviews (CCERs) are undertaken at each Center. These CCERs are commissioned by the Center Boards to periodically assess the quality and effectiveness of particular aspects of a Center's work. The terms of reference (ToRs) for each CCER are determined by the Center, based on broad principles endorsed by the CGIAR at ICW95 (ref. document entitled *Improving the Quality and Consistency of CGIAR's External Center Reviews*, dated October 24, 1995).

EPMRs complement the CCERs by providing a CGIAR-commissioned and comprehensive external assessment of the Center's program and management, especially its future directions and the quality and relevance of its research. The ToRs for the EPMRs (which update the "standard ToRs" endorsed by the CGIAR at MTM95) are provided below. Guidelines for undertaking the reviews are issued separately.

TERMS OF REFERENCE

Objectives and Scope

EPMRs seek to inform CGIAR members that their investment is sound, or recommend measures to make it so. Members of the CGIAR and other stakeholders can be informed whether the Center is doing its work effectively and efficiently. EPMRs are both retrospective and prospective; and help ensure the Centers' excellence, relevance and continued viability, and the CGIAR System's coherence. Each review is expected to be strategic in orientation and as comprehensive as the situation warrants.

The broad objectives of EPMRs are to: a) provide CGIAR members with an independent and rigorous assessment of the institutional health and contribution of a Center they are supporting; and b) to provide the Center and its collaborators with assessment information that complements or validates their own evaluation efforts, including the CCERs.

The EPMR panel is specifically charged to assess the following:

The Center's mission, strategy and priorities in the context of the CGIAR's priorities and strategies;

The quality and relevance of the science undertaken, including the effectiveness and potential impact of the Center's completed and ongoing research;

The effectiveness and efficiency of management, including the mechanisms and processes for ensuring quality; and

The accomplishments and impact of the Center's research and related activities.

The topics expected to be covered by the EPMRs are listed below.

TOPICS TO BE COVERED

A. Mission, Strategy and Priorities

The continuing appropriateness of the Center's mission in light of important changes in the Center and its external environment since the previous external review.

The policies, strategies, and priorities of the Center, their coherence with the CGIAR's goals (of poverty alleviation, natural resources management, and sustainable food security), and relevance to beneficiaries, especially rural women.

The appropriateness of the roles of relevant partners in the formulation and implementation of the Center's strategy and priorities, considering alternative sources of supply and the benefits of partnerships with others.

B. Quality and Relevance

The quality and relevance of the science practiced at the Center.

The effectiveness of the Center's processes for planning, priority setting, quality management (e.g. CCERs, peer reviews and other quality and relevance assurance mechanisms), and impact assessment.

C. Effectiveness and Efficiency of Management

The performance of the Center's Board in governing the Center, the effectiveness of leadership throughout the Center, and the suitability of the organization's culture to its mission.

The adequacy of the Center's organizational structure and the mechanisms in place to manage, coordinate and ensure the excellence of the research programs and related activities.

The adequacy of resources (financial, human, physical and information) available and the effectiveness and efficiency of their management.

The effectiveness of the Center's relationships with relevant research partners and other stakeholders of the CGIAR System.

D. Accomplishments and Impact

Recent achievements of the Center in research and other areas.

The effectiveness of the Center's programs in terms of their impact and contribution to the achievement of the mission and goals of the CGIAR.

E. List of Strategic Issues Identified by the Science Council to be Addressed by the 3rd IWMI EPMR Panel as a Supplement to the Standard EPMR ToRs

1. What is the IPG nature of IWMI research? Is there sufficient consideration ex-ante of constraints and options for uptake of the foreseen results of the research?
2. Does IWMI have an appropriate strategic alliance with partners for IPG research? Does the large number of partners give added value to the IPG research? At what cost are the large transaction costs for the partnerships?
3. What strategic changes, if any, should IWMI make to respond to the new System priorities? What areas of research do not fit the Systemwide priorities (i.e. the 20 percent); what research has IWMI forgone in response to the new system priorities?
4. What is the demarcation between the CP water and Food and IWMI programs?
5. Assess where the comparative advantage of the Center lies in the context of the CGIAR System priorities. How has IWMI developed a niche on water issues?
6. Is there an appropriate mix of social versus biological and related sciences considerations? What role does social science have in the research program (e.g. in investigating allocation and access issues, water markets)?
7. How will natural resources and environment be considered and dealt with in the IWMI research agenda? Has IWMI suitably involved other centers such as WorldFish and World Agroforestry in the planning of its research at the catchment and landscape scale?
8. How successful has IWMI been in integrating the International Board for Soil Research and Management (IBSRAM) into its program? To what extent has soil related research been integrated with water research?
9. Does IWMI Board have in place an independent and effective CCER program; how can the IWMI CCER system be improved to streamline the next EPMR?
10. IWMI is implementing a strategy to become an international knowledge Center on water, food and the environment. Is the Knowledge Center approach an appropriate vehicle to re-orient the role of IWMI as an international research center vis-à-vis its partners?
11. In the context of its recent growth and expansion (from US\$8.6M (1999) to US\$22M (2005), has the Center maintained an appropriate balance between research and other activities (facilitation, coordination, knowledge sharing), between the global and national programs, and between strategic and applied research?
12. Does IWMI's work focus sufficiently on the relationship between poverty, gender and access to water and incorporate these concerns explicitly in research design?
13. How has the Health and Environment Program evolved since the last review? Has the scope been defined appropriately as research on the environment and health topics that are endogenous to irrigation? Has IWMI given high priority to work in the area of irrigation related health issues relating to the provision of safe water for the poor?

ANNEX III
Itinerary of the EPMR Panel

Schedule:	6-9 March, 2006:	Bill Easter and Jean Yves Maillat attend the IWMI Board Meeting in Penang, Malaysia (incl. joint sessions with WorldFish Center Board).
	8-15 June, 2006:	Initial phase: entire Panel, including panel consultant, visit IWMI headquarters in Colombo, Sri Lanka.
	16-19 June, 2006:	Bill Easter, Jeff Bennett and Mike Walter visit field sites and IWMI (ICRISAT HQ) office in Hyderabad, India.
	24-26 July, 2006:	Shyamala Abeyratne visits field site and IWMI office in Hyderabad, India.
	29-31 July 2006:	Mike Walter and Shyamala Abeyratne visit field sites and IWMI/IRD office in Luang Phrabang, Laos.
	15-18 Oct. 2006:	Bill Easter, Mike Walter, Shyamala Abeyratne, Jeff Bennett visit field sites and IWMI office in South Africa.
	19-31 Oct. 2006:	Main Phase: entire Panel visited IWMI headquarters in Colombo.

ANNEX IV
People Contacted/Interviewed by the Panel

Government/Ministry

Sri Lanka

T M Abayawickrama, Secretary, Ministry of Agriculture, Irrigation and Mahaweli Development, Colombo

K A U S Imbulana, Director, Water Resources Division, Ministry of Agriculture, Irrigation and Mahaweli Development, Colombo

J. A. S. A. Jayasinghe, Executive Director, River Basin Planning and Management, Mahaweli Authority

N. C. M. Navaratne, Project Director, Uda Walawa Left Bank Project, Mahaweli Authority

B.M. Samasekera, Director General, Irrigation and Water Management, Dept of Irrigation, Colombo

H. M. Jayatilleke, Director, Irrigation and Water Management, Dept of Irrigation, Colombo

Karunasena Hettiarachchi, Chairman, Central Environmental Authority, Colombo

India

S P Tucker, Principal Secretary to the Govt. of AP, Irrigation and Command Area Development, Hyderabad, A.P.

Sanjay Gupta, Addl. Commissioner, Command Area Development Authority, Ministry of Irrigation, Hyderabad, A.P.

S Narasing Rao, Commissioner, Rural Development, Hyderabad, A.P.

Subba Rao, Secretary, Ministry of Health, Hyderabad, A.P.

Vengala Reddy, Head of Social Development, Andhra Pradesh Urban Services for the Poor (APUSP)

Gayathri Ramachandran, Environment Protection Training and Research Institute, Hyderabad, A.P

R.C. Jain, Superintending Hydrogeologist, Ministry of Water Resources, New Delhi

S.K. Sinha, Sr, Scientist, Ministry of Water Resources, Haryana

Chinmaya Kumar Acharya, Project Mgt Specialist, USAID, New Delhi

S. Chandra, Principal Scientist and Vice President, ISWAM, Indian Ag. Res. Inst., New Delhi

S.K. Kamra, Principal Scientist, ICAR, Central Soil Salinity Research Institute, Haryana

Ashwani Kumar, Director, ICAR, Water Technology Center for Eastern Region, Bhubaneswar

South Africa

Francois Van Der Merwe, Water and Forestry

Ashwin Seetal, Water and Forestry

Barbara Schreiner and staff, Dept of Water Affairs, Pretoria

Gerahard Backberg, Water Research Commission

Sizwe Mkhize, Chief Director: Engineering Services and Resrouce Management, Dept of Agriculture

R.J. Sebola, Director, Dept of Agriculture

Ashwin Seetal, Director, Water Allocation, Department of Water Affairs

Francois van der Merwe, Senior Specialist Engineer, Department of Water Affairs

NARS

Ratna Reddy, Center for Social and Economic Studies, Hyderabad, A.P.

B Ramamurty, Program Director, Environment Protection and Training Institute, Hyderabad, A.P.

K V Raju, Institute for Economic and Social Change, Bangalore, India

Mishack Molohe, Group Executive, Agricultural Research Council, South Africa

Lindiwe Sibanda and Douglas Merrey, FANRPAN, South Africa

Advanced Research Institutes

Alain Pierret, Management of Soil Erosion Consortium, IWMI/IRD Team, Laos
Hoanh Chu Thai, Management of Soil Erosion Consortium, IWMI/IRD Team, Laos
Olga Vigiak, Management of Soil Erosion Consortium, IWMI/IRD Team, Laos
Stefano Farolfi, University of Pretoria/CIRAD, South Africa

Ernest Letsoalo, Researcher, University of Limpopo (UL)
Graham Jewitt, Associate Professor, University of Kwazulu Natal, South Africa
Jean Marie Fritsch, Professor, Institut de Recherche pour le Development, South Africa
Janitha Liyanage, University of Kelaniya, Sri Lanka
Margreet Zwarteween, Wageningen University, The Netherlands
Henri Vidal, CEMAGREF, France
Patrice Garin, UMR G-EAU, CEMAGREF, France
K. Palanisami, Director, CARDS, Tamil Nadu Agricultural University, Tamil Nadu, India
K.K. Singh, Professor, G.B. Pant University of Agriculture and Technology, Pant Nagar, India
Sylvana Y. Li, Agricultural Research Advisor, USDA, Washington, D.C., USA
Rivka Kfir, Water Research Commission (WRC)
Gerhard Backeberg, Director: Water Utilisation in Agriculture

NGOs

Anshuman Saikia (and staff), Program Coordinator, IUCN, Colombo
Channa Bambaradeniya, IUCN, Colombo
Palitha Jayaweera, COSI, Sri Lanka
Arun Pandhi, IWMI – Sir Ratan Tata Trust Partnership, Gujarat
Kinsuk Mitra, Winrock International, India
Bob Yoder, Consultant, IDE, Colorado (also ex-IWMI staff)
Stephen Mcfarlane, World Vision, South Africa
Kusum Athukorale, Sri Lanka Water Partnership
Niyangoda, Sri Lanka Water Partnership
I.P. Abrol, Director, CASA, New Delhi, India

CGIAR Center Staff

Joachim von Braun, DG, IFPRI
Ruth Meinzen-Dick, IFPRI
Mark Rosegrant, IFPRI
Claudia Ringler, IFPRI
Carlos Sere, DG, ILRI
Michael Blummel, ILRI-IWMI collaboration
Steve Hall, DG, WorldFish Center
Patrick Dugan, WorldFish
William Dar, DG ICRISAT
Cynthia Bantilan, ICRISAT
V Balaji, ICRISAT
Barry Shapiro, ICRISAT
Suhas Wani, ICRISAT
Dyno Keatinge, ICRISAT
Jonathan Wooley, Director, CPWF
Massoud Shaker, Coordinator, CPWF Limpopo Benchmark Basin Coordinator
Bob Ziegler, DG, IRRI

Dennis Garrity, DG, ICRAF
Brent Swallow, Theme Leader, Principal Scientist, ICRAF
Kanayo Nwanze, DG, WARDA
Mahmoud Sohl, DG, ICARDA
Emile Frison, DG, IPGRI
Joachim Voss, DG, CIAT
Pamela Anderson, DG, CIP
Peter Hartmann, DG, IITA
David Kaimowitz, DG, CIFOR
Masaru Iwanaga, DG, CIMMYT
John Fitzsimon, Head, Internal Audit Unit, CGIAR
Vicki Wilde, Gender & Diversity Program Leader, CGIAR
Manny Lantin, Secretariat, CGIAR
Namita Datta, Governance Adviser, CGIAR Secretariat
Shey Tata, Finance Adviser, CGIAR Secretariat

IWMI Board

Nobusama Hatcho, current Board chair
Remo Gautschi, former Board chair
Rivka Kfir, current Board member
Margaret Catley-Carlson, current Board member
Akiça Bahri, former board member

Ex-IWMI staff

Randy Barker,
Michael Devlin,
Patrick Fuller,
David Governey,
Ania Grobicki,
Initizar Hussein,
Ian Makin,
Douglas Merrey,
Francois Molle,
Hammond Murray-Rust,
Gerry O'Donaghue,
Frits Penning de Vries,
Chris J. Perry,
R. Sakthivadivel,
Chris Scott,
Douglas Vermillion

Donors

Theo Van de Sande, Netherlands
Eija Pehu, Advisor, Agriculture and Rural Development Department, World Bank
Salah Darghouth, Senior Water Advisor, Agriculture and Rural Development, World Bank
Ariel Dinar, World Bank
Preeta Lal, Swiss Development Corporation, India
Sommer, Swiss Development Cooperation

Wouter Arriens, Asian Development Bank, Manila
Robert Bertram, USAID
Scott Bode, Natural Resources Advisor, Office of Environment and Science Policy, USAID
Timothy Miller, USAID
Jean-François Giovannetti, Direction générale de la coopération et du développement, Ministère des
Affaires Etrangères, France
Harry Palmier, IRD, France

Other Stakeholders

Carlos Garces, IPTRID, FAO, Rome Italy
Robert Herdt, ex-Rockefeller Foundation
Jack Keller, Utah State University
Mark Svendsen, Consultant, Oregon, USA
Saberwal Vasant, the Ford Foundation, India
Per Pinstrup Andersen, Chair, CGIAR Science Council
Gil Levine, Prof. Emeritus, Cornell University, Ithaca, N.Y. USA
Aasiri Gunasekera, Partner, Ernst & Young, Sri Lanka
Philip Merry, consultant, Philip Merry Consulting Group Pte Ltd, Singapore

ANNEX V
List of Documents Reviewed by the Panel

1. ToR and Guidelines for External Program and Management Reviews of CGIAR Centers.
2. Report of the Second External Program and Management Review of ILRI.
3. Summary of actions taken in response to the last EPMR.
4. CGIAR research Priorities 2005-2015.
5. The latest Board-approved Strategic Plan of the Center: Strategic Plan 2004-2008.
1. Medium-Term Plans of the Center for the period of the review.
2. SC commentaries of the Center's Medium-Term Plans.
3. Center Commissioned External Review Reports:
 - CCER of IWMI Theme Agriculture Water Management - Theme 1.
 - CCER of IWMI-Tata Water Policy Research Program.
 - CCER of Human Resources (2001 and update 2004).
 - CCER of IWMI 2003 (Consolidated Report).
 - Africa Regional Office.
 - SE Asia Regional Office.
 - South Asia Regional Office and HQ.
 - CCER of Water Health and Environment.
4. List of achievements/outputs: publications (peer-review and other):
 - IWMI Performance Indicators 2003, 2004 and 2005.
 - IWMI Publications 2000 – 2006.
 - Results and synthesis of IWMI research 1996-2005.
 - Project (Theme) and Systemwide Program Syntheses (research question; project objectives, methods used, brief abstract of key results, outputs, staff).
5. A paper prepared by Center management and Board on:
 - main issues of current concern;
 - vision of clients needs in intermediate (5 years) and long (10 years) term;
 - vision on CGIAR and donor status in intermediate and long term;
 - state of the relevant science in intermediate and long term;
 - plan of action reflecting these vision statements: IWMI Vision Document (March 2006, revised May 2006).
6. Toward a New Visions and Strategy for the CGIAR.
7. New Monitoring and Evaluation System for the CGIAR Centers.
8. Recent EPMR reports of CGIAR Centers.
9. The CGIAR Charter.
10. IWMI Annual Report 2004/2005.
11. The latest annual funding request: funding request for 2006.
12. List of professional staff with short CVs including standard set of information as instructed by the SC Secretariat (publications, key memberships, invited lectures, prizes/awards; students supervised).
13. The current organization chart, with a brief description of the Center's internal management structure, including the composition and terms of reference of each major committee.
14. List of reports of major planning conferences, internal reviews, expert meetings, etc. which have had a major influence on the direction of specific Center programs:
 - Consultative Committee Meeting Minutes: South Africa (4), Iran(1), Sri Lanka (7)
 - Regional Planning Workshops (Africa, Iran, India, Sri Lanka)
 - Annual Research Meeting 2005
15. List of the agreements for cooperative activities with other Centers and institutions.
16. List of ongoing and recently completed contracted projects for Themes.
17. Most recent CGIAR financial guidelines and manual:

18. Reference Guides for CGIAR International Agricultural Research Centers and their Boards of Trustees
19. IWMI Charter and other basic documents establishing the Center:
20. Composition of the Board over the last five years
21. Board handbook:
 - The IWMI Board of Governors
 - Responsibilities of the Board of Governors
 - About IWMI
 - Documents of Governance
 - The CGIAR System
22. IWMI Board Self-Evaluation Questionnaire
23. IWMI DG's feedback instruments (e.g. results of 360 degree feedback)
24. Gender & Diversity Report to the IWMI Board of Trustees
25. Allowances, benefits, and salary ranges for each category of staff
26. Personal data on professional staff
27. Staff turnover
28. List of international staff vacancies
29. Minutes of Board and Board committee meetings since the last External Review
30. Staff Manuals (Personnel Policies for IRS and NRS):
31. Local compensation survey reports: Sri Lanka, Ghana, South Africa, Tashkent)
32. Annual Reports of external auditors for (2000-2005)
33. Most recent internal audit reports
 - CGIAR Internal Audits (2002-2005)
 - IWMI Quality Management System (2002 – 2005)
 - KPMG Ford, Rhodes, Thornton & Co (2000 – 2005)
34. Audit reports of the Challenge Program on Water and Food
35. IWMI Financial Authorization Limits
36. Staff Satisfaction Surveys (2003; 2005)
37. IWMI internal customer satisfaction surveys
38. CGIAR's SAS-HR Good Practice brochures and documents, e.g. "The One Staff Approach, IWMI's Journey"
39. SAS-HR Summary of Work Plan
40. Sri Lanka Program – Results Based Management framework July 2005)
41. International Public Goods and the CGIAR Niche
42. Key Questions for the IWMI EPMR
43. Center Response to list of strategic issues identified by the SC for 3rd IWMI EPMR
44. Key IWMI Partners (2003/2004 list; 2004/2005 list)
45. IWMI Partnership Strategy Document.

ANNEX VI

2nd IWMI EPMR Recommendations: IWMI's Response and Panel Comments

Recommendation 1: The Panel recommends that IWMI add crop physiology expertise to the IWR program in order to facilitate incorporating or adapting components of complex plant growth models and to communicate better with other institutes that have this expertise.

IWMI's 2000 Response: IWMI agrees with the Panel that crop physiology expertise is essential for a full understanding of crop water productivity. However, this kind of expertise is available in other CGIAR centers as well as universities and research institutes around the world including many of our NARS partners. We do have an excellent crop modeler on our staff. But IWMI has no real comparative advantage in the highly specialized area of crop physiology. Therefore IWMI will respond positively to this recommendation by strengthening our cooperation with interested CGIAR centers, specialized university departments and research institutes, and NARS having crop physiology expertise. We may also use top scientists on regularly scheduled short term assignments as Fellows. The planned workshop on crop water productivity under SWIM later in 2000 will also provide the opportunity to establish these partnerships.

IWMI's 2006 Updated Response: Implemented as foreseen in 2000. A SWIM Workshop on water productivity was held and a key reference book on water productivity was produced (Kijne et al., 2003). Crop physiology is a major component in both the Comprehensive Assessment (SWIM2) and the Challenge Program on Water and Food – through the contribution of other CGIAR centers and partners. The Challenge Program on Water and Food mobilizes the crop physiology expertise from other centers (e.g. to develop drought resistant varieties of a range of key crops such as rice, wheat, maize and barley), and IWMI collaborates where relevant.

Panel's Comments: IWMI has adequately addressed the recommendation as per their original response.

Recommendation 2 The Panel recommends that the IWR program should increase its emphasis on the groundwater depletion problem.

IWMI's 2000 Response: IWMI agrees with the recommendation to increase its emphasis on groundwater depletion issues. In fact we are pleased the Panel has highlighted this issue. In mid-1999 the Institute recruited Dr. Tushar Shah, a leading expert in groundwater, to the staff. The Institute is leading a special session on groundwater at the World Water Forum meetings in March 2000, and has during the past year been seeking additional financial support for this work. As part of the priority setting exercise to be carried out later in 2000 we anticipate that groundwater depletion will emerge as a major thrust.

IWMI's 2006 Updated Response: Implemented as foreseen in 2000. Groundwater was one of IWMI's major themes from 2000-2005 and IWMI has produced a major body of work on groundwater management. The key reason for this special attention was practical, i.e. to give special attention to groundwater. At the same time it was always felt that as surface and groundwater are inextricably linked, the appropriate approach from a research perspective is a basin-wide approach that encompasses both surface and groundwater. In the latest revision of IWMI's themes, it was felt that by now the management of groundwater had become sufficiently developed that it could be combined into the first theme, Basin Water Management for Agriculture, where all water in the hydrological cycle is included in an integrated approach.

Panel's Comments: IWMI did address this by leading a special session at the WWF in The Hague in 2000, developed a body of literature on groundwater management to raise awareness of this problem. However, the Panel does not believe that "by now the management of groundwater had become sufficient developed" such that it no longer needed special attention. The Panel agrees that groundwater is an intrinsic part of the hydrologic cycle and needs to be addressed in the context of a basin-wide approach.

Recommendation 3 The Panel recommends that IWMI staff should examine what further role PIM should have, if any, in IMT issues, particularly how much attention should be given to new and emerging problems often associated with IMT, such as equity in access to water, capacity of the private sector to manage water resources, and evaluation of turnover programs and policies that have failed.

IWMI's 2000 Response: IWMI agrees with this recommendation. IWMI does not intend to invest further in irrigation management transfer (IMT) case studies on impacts and processes, of the kind carried out during the late 1980s and early 1990s. However, having built up a corpus of case studies, IWMI does intend to make modest investments in synthesizing the lessons through comparative analysis. Many countries are still designing new management transfer programs despite the pitfalls. IWMI believes that carefully targeted investment in examining programs with innovative approaches, such as private sector involvement in water management, may have high pay-off in terms of both impacts and new knowledge. As the Panel notes, countries which have implemented IMT policies are facing new "second generation" problems. These include inequitable access to water, management capacity and financial viability of local water users' associations, and sustainability of physical infrastructure. Further, "irrigation management transfer" is only a part of a larger package of institutional reforms. These include such questions as: 1) how to design and implement effective river basin management policies and institutions; 2) where do local water management organizations fit into these larger basin-level institutions; 3) how can countries provide a supportive environment for these new local water management institutions and specifically for locally managed irrigation by small farmers; 4) how to encourage productive use of water while also achieving equity in access to water; and 5) how to design and enforce water rights regimes. IWMI will not be able to address all of these issues itself, but will focus on those which are judged to have the highest potential impact.

IWMI's 2006 Updated Response: IWMI has developed a large body of literature, totaling over 250 publications, on Irrigation Management Transfer. The literature ranges from initial assessments of IMT as a method to improve the management of agricultural water resources, to gender analysis and the impact of IMT on poverty, to evaluations and assessments of past IMT experiences and from that related implementation and policy recommendations. IWMI has recently synthesized the impacts of IWMI's past work on IMT. In addition, IWMI maintains a limited capacity on IMT to continue to build on the lessons learned from past IWMI research on IMT, with an active IMT-related project in one sub-region, i.e. the IWRM in the Ferghana Valley project in Central Asia. In other regions IWMI primarily retains a capacity for advice and comparative research on experience with IMT in a variety of settings (through Dr Madar Samad in India and Mehmood ul-Hassan in Ghana).

Panel's Comments: Given the large public investment in irrigation infrastructure that is needed for rehabilitation in Asia and interest in Africa for expansion of irrigation, and the growing dependence on local management of irrigation, IWMI should probably revisit its work on water users associations and opportunities for local irrigation management. This would directly involve policy, institution and management related work and could focus on why some turnover policies have failed.

Recommendation 4 The Panel recommends that IWMI's work on poverty, with special emphasis on its relationship with gender, be pursued in two directions; namely (i) investigating more precisely the

relationship between poverty, gender and access to water and, (ii) incorporating more explicitly poverty and gender concerns in the design and conduct of research activities in programs other than PIM; and consider the implications of research results for the poor.

IWMI's 2000 Response: IWMI agrees with the recommendation. Indeed, the Institute has already made considerable progress in both directions identified by the Panel. For example, with regard to poverty-water linkages, IWMI has recently been exploring these linkages for both large-scale and small-scale irrigation in different agro-ecologies. Two broad patterns seem important: in regions—such as the Ganga-Jumna-Meghna-Brahmaputra basin— where 500million of the world's poor live, improving poor women's and men's access to groundwater for irrigation can improve livelihoods significantly. IWMI is initiating work with India's Planning Commission on how best to do this. With regard to incorporating poverty and gender concerns more explicitly, poverty reduction has already become the central concern of research in other IWMI programs in addition to the Policies, Institutions and Management Program. For example, the Irrigation and Water Resources and PIM Programs are collaborating on three donor-supported projects in India and several African countries specifically addressing how poverty can be reduced through small-scale irrigation. A proposed new donor-funded project in 15 Asian countries on "Pro-Poor Irrigation Investments" will also entail collaboration between these two programs. The Applied Information and Modeling Systems Program is helping to developing a poverty-map of South Africa.

IWMI's 2006 Updated Response: Research on water and poverty has been a major component of IWMI's work ever since the 2000 EPMR. Much of this work was concentrated in the ADB-funded project on Pro-poor Irrigation in Asia, completed in 2005. Water and poverty related research has also been mainstreamed in many other IWMI's projects, however, and is the driving force behind Theme 2, that focuses on livelihoods. As of 2005, IWMI has initiated work in several of its benchmark basins (notably the Krishna, Karkheh and Syr Daria) on a new concept developed at IWMI, water poverty mapping. Much of IWMI's poverty research has a special emphasis on gender issues. The former small "gender program" (in essence one researcher with, at times, one or more associate experts) has been mainstreamed, in the sense that rather than doing separate gender studies, the gender researchers play a key role as social scientists with a gender-specialization in IWMI's water and poverty research. The number of social scientists with a gender specialization has increased to one Principal Researcher (Dr B van Koppen, Pretoria), one Researcher (Dr D Joshi, Hyderabad), one Post-Doc (Dr M Ebato, Addis Abbeba) and several more junior researchers and scientists with a "livelihoods" specialization (including gender issues).

Panel's Comments: IWMI has continued its work on poverty with the focus being on developing and refining the concept of water poverty mapping. The ADB Pro-Poor Intervention Strategies in Irrigated Agriculture project was completed in 2005 but several peer reviewed outputs are delayed. The gender work has not been mainstreamed adequately.

Recommendation 5. Given the limited number of professional staff and finances available for achieving the broad mission of the PIM program, the Panel recommends that careful attention be given to planning future PIM activities, based on a more formal, and more transparent, priority setting process.

IWMI's 2000 Response: IWMI is aware of the gap between the limited human and financial resources and the broad mission of the Policies, Institutions and Management (PIM) Program. The Institute agrees with the recommendation that IWMI should pay careful attention to planning future PIM activities following a more formal and transparent process. The latter will be done as part of a broader priority-setting exercise (see the response to Recommendation 9). For most developing countries, getting their policies right and designing and strengthening their institutions to formulate and

implement policy is the crux of the problem they face. The issues are enormously complex and there is an urgent need to strengthen IWMI's effort in this field. Therefore, as part of the planning and priority-setting process, IWMI will explore ways to enhance the capacity of the Institute and its partners to address these complex issues. We will continue to expand our partnerships with other institutions having specific capacities in policy and institutional research, and as part of a larger effort to strengthen IWMI's capacity building efforts, put more emphasis on supporting Ph.D. and post-doctoral research. If funding permits, IWMI in the future will also further strengthen the senior staff in this Program.

IWMI's 2006 Updated Response: Implemented as foreseen in 2000. The institute's program and capacity, as well as its capacity building, has expanded considerably and allowed increased focus on policies and institutions – as a separate theme in the period 2000-2005, and integrated in a more problem-oriented and less disciplinary approach to priority setting in the new thematic structure. The PIM activities were developed as part of a transparent priority setting process through the 2000-2005 and 2004-2008 Strategic Plan development and consultation processes, as well as the IWMI-wide CCER conducted in preparation for the 2004-208 Strategic Plan.

Panel's Comments: The Panel takes a slightly different view. It feels that priority setting is necessary but that the emphasis should be on strengthening research capacity in the policy and institutions area, and in developing strong links with centers that have strong social science staff such as IFPRI.

Recommendation 6. *The Panel recommends that IWMI should retain the research component dealing with irrigation-related health issues.*

IWMI's 2000 Response: IWMI agrees with this recommendation, which is an endorsement of the current irrigation related health work. The Institute is pleased that the Panel has recognized the importance of this work. IWMI will continue to address irrigation-health related issues with a small interdisciplinary team of researchers, making use of associate experts, interns and students wherever possible. An effort will be made to obtain funding for research in Africa on controlling *schistosomiasis* through water management and on health impacts of small scale irrigation projects.

IWMI's 2006 Updated Response: Implemented as foreseen in 2000. It is noted here that in 2001 IWMI, on request of CDC, convened a Systemwide Initiative on Malaria and Agriculture (SIMA). In its November 2005 meeting the IWMI Board decided to respond positively to suggestions from African national partners to pass on the responsibility for the SIMA network to one or more African national or regional partners. The CDC (now AE) responded positively to this suggestion at its meeting in Marrakech in December 2005. Discussions are ongoing with NEPAD. The year 2006 is a transition year; by the end of 2006 IWMI will have transferred SIMA and it will no longer be a CGIAR Systemwide initiative. In the reorganization of IWMI's research themes from a more disciplinary to a more problem oriented focus, IWMI no longer has "health and environment" as a research theme, but it is a cross-cutting issue wherever health is important (similar to "policies and institutions", or "poverty", or "gender", all of which have been themes or programs in the past and are now cutting across the themes – still important but not organized as free-standing programs). Health and environment research is important for all themes, but particularly for theme 3, which deals with the re-use of wastewater for agriculture.

Panel's Comments: IWMI is phasing out SIMA though an institutional home has still not been found for the program to continue. The anticipated work on *schistosomiasis* also did not materialize. IWMI under its Theme 3 on Water, Cities and Agriculture has been addressing health concerns especially as they relate to wastewater use.

Recommendation 7. The Panel recommends that IWMI should increase its capacity to develop a research effort on the effects of irrigation on downstream water resources by recruiting appropriate expertise in water quality and associated natural resource management.

IWMI's 2000 Response: IWMI agrees with this recommendation. The Institute has so far found it difficult to raise sufficient funds to expand its work on environmental issues. However, IWMI agrees that more expertise on water quality and other environmental issues is needed to be able to be more successful in fund raising activities and in the building of a significant research effort on the effects of irrigation on downstream water resources. The Institute will also develop strong partnerships with interested universities and research institutes specialized in water-related environmental issues. Recruitment of expertise and the positioning of the environment work within IWMI will be addressed as part of the priority-setting exercise (see Recommendation 9).

IWMI's 2006 Updated Response: IWMI's work on environmental issues has increased very significantly over the last five years, as IWMI has prioritized work on the overall water-food-environment nexus, specifically targeting the interfaces between the core agriculture / food-production system with the 2 key systems with which this interfaces: 1) cities, with a strong focus on water quality, pollution and health and environmental impacts of wastewater reuse; and 2) ecosystems, with a strong focus on the impact of irrigation on the environment, agriculture-wetland interactions, and environmental flows to maintain ecosystem services, i.e. balance between food and environment. IWMI has strengthened its capacity in this area both in terms of ecology and eco-hydrology, has developed key partnerships with environmental organizations (and is now the only CGIAR center that is formally a member of IUCN, the World Conservation Union). In late 2005 IWMI's contribution in this field was recognized by the Conference of the Parties of the RAMSAR Conventions (on wetlands) when it adopted a resolution to recognize IWMI as the fifth International Organization Partner of the Convention.

Panel's Comments: The Panel concurs that IWMI has addressed this recommendation, as this has been an area of significant growth over the past five years, with significant expertise added in environmental science / ecology. The approach taken by IWMI has assured that the environment will be a major consideration of any water-food program. Recognition of IWMI's contribution to wetlands at the RAMSAR conventions was testimonial to the work done on this critically important topic in the past five years. However, less significant is the capacity of IWMI to explore economic aspects.

Recommendation 8. The Panel endorses the investment in researching the use of relevant information technology, remote sensing and modeling for use in irrigation and water management and recommends that this work should continue and, with respect to various modeling systems, that IWMI should continue to follow its current position of being a user, tester and adapter of existing models rather than being a primary developer.

IWMI's 2000 Response: The Panel's endorsement of our investments in applications of information technology, remote sensing and modeling in irrigation water resources is welcome. IWMI's objective is to continue to play a leading role in the application of appropriate techniques. IWMI will integrate new techniques into its work in collaboration with recognized leaders in the relevant disciplines.

IWMI's 2006 Updated Response: IWMI has strengthened this area of its work and believes it is now internationally recognized as a center of excellence on Remote Sensing and GIS as related to water resources management. IWMI maintains its position that it should not be a "model developer", certainly not in basic hydraulic and hydrologic or climate models (all of which require major investment and are available from various sources), although IWMI has developed a water-food-

economics model (WaterSim, with IFPRI) where it has unique strengths. The focus of the RS/GIS work is the development of water-related applications for development, generally for data-sparse tropical environments, focusing on: (a) mapping irrigated areas; (b) mapping water productivity at basin scale; (c) mapping wetlands (and wetland-agriculture interaction). IWMI has also served as the coordinator of the CGIAR's Consortium on Spatial Information – in essence a knowledge sharing network - for the past 3 years.

Panel's Comments: IWMI has addressed this recommendation fully.

Recommendation 9. *The Panel recommends that IWMI adopt more formal procedures for priority-setting and impact assessment.*

IWMI's 2000 Response: Recommendation 5 (above) makes a similar recommendation with respect to the Policies, Institutions and Management Program. IWMI agrees with this recommendation and will review how best to make its priority-setting more transparent and its impact assessment procedures more systematic. The Institute has struggled with these twin issues of procedures for priority-setting and for impact assessment since its inception without finding a satisfactory solution. With the arrival of a new Director General later in 2000, IWMI will be reviewing its entire program and strategy. Setting priorities in a transparent manner and assessing impact will be a central component of this review. The starting point for this exercise will be IWMI's mission statement and its underlying logic. The goals to which IWMI's work contributes are food security and poverty eradication. IWMI contributes to achieving these goals through achieving its objective of fostering sustainable increases in the productivity of water. Better management of irrigation and other water uses in river basins is the means to achieve the objective. In Recommendation 4, the Panel recommends that IWMI should investigate more precisely the relationship between poverty, gender and access to water, and incorporate poverty and gender concerns more explicitly into the design and conduct of the Institute's research. The analysis IWMI will carry out, to respond fully to this recommendation, will form a major basis for setting the Institute's priorities more transparently.

With regard to impact assessment, the complexity of water management systems and the intangible form of our primary products make most of IWMI's impacts "invisible." These impacts largely occur through the stimulus of new research-based ideas and concepts, which lead to changed behavior among policy makers, donors, other scientists, and water managers. There is generally a long time-lag, and a large number of intervening variables, between the stimulus and the outcome. IWMI seeks to achieve a reasonable balance between long-term strategic research, and applied research involving testing interventions in field situations. For the latter, impacts are more directly measurable; for strategic research the measures are indirect and imprecise; but we would argue, more substantial. The priority-setting exercise that we will undertake later in 2000 will include specific attention to how we propose to assess impact in future. IWMI is looking forward to learning new ways of doing this through its participation in the Workshop in May on "The Future of Impact Assessment in CGIAR: Needs, Constraints and Options," organized by the Standing Panel on Impact Assessment of TAC.

IWMI's 2006 Updated Response: IWMI believes it has, over the past 6 years, developed and implemented an effective approach to priority setting. The center piece of the longer term priority setting process has been the 2000-2005 and 2004-2008 Strategic Plans. These plans served to focus the institute's attention on the long term issues and have had a major impact on priority setting. For the medium term the Institute has started to use the MTPs as the primary tool for priority setting, sharpening the research agenda and helping to shape the impact pathway from output to outcome to impact. We believe the MTPs have gradually improved and taken on a more useful function within the institute's work, from a largely "external / administrative" document to a realistic tool that serves to link short term project goals to medium term institute goals. In addition, IWMI has undergone

several Center Commissioned External Reviews (CCERs) of its Themes (MTP Projects) to assist the Institute with its priority setting. These CCERs include reviews of the following MTP Projects:

- 2002: Water, Health and Environment, former MTP Project 5
- 2003: Center-wide Program review in conjunction with Strategic Planning process
- 2004: IWMI-Tata Water Policy Program, within the former Groundwater Management MTP Project 3
- 2005: Agricultural Water Management, former MTP Project 1

In terms of impact assessment, IWMI did not have an effective program of impact assessment at the time of the 2nd EPMP. Over the past five years, IWMI has tried to build up its expertise in NRM impact assessment by networking with other NRM centers and organizations, becoming involved in the recent set of SPIA sponsored NRM impact assessment case studies, undertaking a series of pilot studies on impact/outcome assessment, and directly incorporating impact assessment into the research lifecycle. More recently, in 2005 IWMI started to develop a collaborative relationship with CIFOR and WorldFish on impact assessment that aims to develop a single NRM impact assessment function shared by the three centers. IWMI is also participating in efforts to develop complementary approaches to economic cost benefit analysis as the basis for impact assessment of “upstream” policy research. It has taken an active interest in the use of alternative methodologies, particularly “Outcome Mapping” (as developed by IDRC) and methods such as Most Significant Change and Impact (or Adoption) Pathways. Several staff members have attended training courses, several projects are implementing the new approaches on a pilot basis and IWMI expects to introduce these approaches on a larger scale in coming years.

Finally, complementing the impact assessment work, IWMI has embraced the idea of “knowledge management” or “knowledge sharing” (through its Strategic Plan objective to become a world class knowledge center on water, food and environment). This is contributing to increased reflection on the ways and means through which knowledge is shared, and used, from the very start of the research project cycle. We believe that the increasing emphasis on developing a “knowledge culture” at IWMI will also contribute to improved definition of impact pathways and impact assessment. To further strengthen the synergies between impact assessment and knowledge management, IWMI is currently in the process of recruiting a post doctoral fellow who will contribute to Knowledge Sharing in Research initiative and the IWMI-WorldFish-CIFOR impact assessment alliance. While more work is clearly required, we believe that the steps taken thus far have established a stronger foundation, network and overall impact culture at IWMI, which in turn will help the Institute in its efforts to establish a robust NRM impact assessment program with CIFOR and WorldFish.

Panel’s Comments: The issue of impact assessment, especially as it relates to research planning is considered in Chapters 2 and 5. The Panel concludes that IWMI’s efforts to date in this area have not been sufficient given its importance to the Centers’ future, and have recommended that IWMI invest in the employment of their own professional staff in this field. This would not exclude cooperation with other centers but would rather enhance IWMI’s capacity to interact. The Panel also makes a recommendation regarding the use of CCERs. While IWMI is praised for commissioning CCERs, the Panel recommends regular and rigorous CCERs across all Themes.

Recommendation 10. *The Panel recommends that the Board formulate and implement an ongoing Board development program aimed at ensuring the Board meets, in particular, its responsibilities for strategic planning, policy formulation and monitoring of performance.*

IWMI’s 2000 Response: IWMI agrees with this recommendation. As noted in the report, the Board invited the Management Advisor from the CGIAR Secretariat to attend a 1997 Board meeting to facilitate a discussion on Board roles and responsibilities and sent two members to the workshop

that followed ICW99. We discussed at the meeting just concluded plans to orient new members in a more structured way, including briefings by Program Leaders, the Board Chair, and an experienced Board member who will be asked to act as a mentor. We will continue the practice of inviting new members to attend a meeting as an observer prior to taking office. We also initiated discussion at the recent meeting of ways in which the agendas of Board and Committee meetings might be restructured to ensure better oversight of program and finance and experimented with a self-assessment methodology. In the interim before our next gathering, we will look at useful procedures developed at other Centers.

IWMI's 2006 Updated Response: Implemented as foreseen in 2000. IWMI has participated in the Center Board Chair led board induction programs and is regularly revisiting its self-assessment tools. The IWMI Board has emphasized a careful nomination process and as a result is now composed of a well-balanced group of very experienced individuals – many of whom have come from outside the CGIAR – and with ample experience in finance and governance (through their careers in senior management and other board positions, rather than their educational backgrounds). The IWMI Board shares (or has shared) a board member with four other CGIAR centers (ICARDA, Maggie Catley Carlson through May 2006; CIFOR, Sunita Narain; CIMMYT, Uraivan Tan-Kim-Yong through March 2006; and WorldFish, Asger Kej) and has agreed with the WorldFish Board to attempt to identify candidates for additional joint Board positions.

Panel's Comments: The Panel agrees with IWMI's comments on the use of a revised self-assessment tool and the quality of its nomination process and of its current Board members. However, the Panel found the participation of new Board members in the orientation process wanting. There also doesn't seem to be a Board development program.

Recommendation 11. *The Panel recommends that the Board should establish an Audit Committee with responsibilities for audit matters of both a financial and operational nature.*

IWMI's 2000 Response: IWMI agrees with this recommendation and took action at the meeting just concluded to establish an Audit Committee and to appoint a chair and membership. New terms of reference will be prepared, drawing from the audit functions previously included in the terms of reference of the Executive and Finance Committee. As has been our usual practice, the full Board met with the Institute's External Auditors, in the absence of management staff, to discuss the current year's audit and plans for 2000 and will continue to retain this aspect of audit responsibility.

IWMI's 2006 Updated Response: Implemented as foreseen in 2000. IWMI has joined the CGIAR's Internal Audit service and this has resulted in an active program of internal audits of both a financial and operational nature.

Panel's Comments: Implemented by IWMI as indicated.

Recommendation 12. *The Panel recommends that the Board's Terms of Reference, Rules and Procedures and the terms of Reference for its Chair, standing committees and Secretary should be reviewed and revised to more clearly specify responsibilities.*

IWMI's 2000 Response: IWMI agrees as well with this recommendation. In the next months, we will systematically review the full set of documents that specify the responsibilities of the Board and its Committees and, as indicated above, will reconsider meeting and other procedures. Noting a comment in the EPMR report, we also took action to appoint a Vice Chair of the Board and will retain this position in the future.

IWMI's 2006 Updated Response: The ToRs have been updated regularly. In light of recent developments and recommendations in the CGIAR on board structure and functioning (notably the recommendations of the CIMMYT EPMR and the Africa Task Force), and in light of the rapidly evolving strategic alliance with WorldFish, the IWMI Board has established a Task Force on Board Restructuring that will evaluate all elements of the Boards charter, terms of reference, structure and functioning, and report back to the Board later in 2006.

Panel's Comments: The Task Force was scheduled to present its conclusions at the October 2006 Board meeting. The Panel doesn't know the results of that work.

Recommendation 13. The Panel recommends that the Board should meet twice a year and that at each of these meetings of the Board there be meetings of its standing committees.

IWMI's 2000 Response: IWMI agrees with the importance of having two Board meetings each year. Since 1998, as a cost saving measure, the Executive and Finance Committee, rather than the full Board, met in the autumn following our Spring Annual Meeting. However, we take the point made by the Panel and agree that the expenditure involved in a full meeting is justified. We had already decided to have two Board meetings in 2000 and will continue this practice.

IWMI's 2006 Updated Response: Implemented as foreseen.

Panel's Comments: Implemented as indicated.

ANNEX VII

Review of the Comprehensive Assessment (CA) of Water Management in Agriculture

So far, three books and eleven research reports published by IWMI are the primary visible output of CA. The research reports cover a range of topics from virtual water trading to integrated water management and intersectoral water transfers. Some of the reports seem clearly to fill research gaps, such as Research Report 7 on the "Impacts of Irrigation on Inland Fisheries: Appraisals in Laos and Sri Lanka" by Sophia Nguyen-Khoa et al. (2005), while others seem to be designed to promote an approach, or review past research, such as "Integrated Land and Water Management for Food and Environment Security" by F. W. T. Penning de Vries et al. (2003), Research Report #1.

Penning de Vries et al. provides a good statement of the problems involved in an integrated approach to land and water management to meet our food and environmental objectives. The research issues that are selected by Penning de Vries et al. for future research first appear to be very broad but the accompanying discussion provides clearer identification of potential research topics. The discussion lists a number of interesting topics, some of which don't seem to belong under a particular heading. For example, under the poverty reduction heading you find "what are the most appropriate water-allocation procedures within river basins and within irrigation systems that encourage sustainable land and water-conservation practices?" This just illustrates the problem of grouping research issues under five very broad headings. It also tends to hide a number of important sets of issues that have not been included. One of these sets is research dealing with institutions and policies that influence water use and management. The legal framework is only one small part of this important area.

Research Report #2, "Taking into Account Environmental Water Requirements in Global-scale Water Resources Assessments," is a natural extension of the first report and focuses on environmental water requirements. It provides an overview of the general problem of how much water to reserve for the environment. The authors point out that one threshold figure is not adequate without considering frequency and assurance of water flow. One strength of the report is the list of several important research topics that were left out of the first report, such as policy and institutional constraints and challenges, and the need to coordinate institutions and water policies among countries with international rivers.

Research Report 3# by Giordano et al. (2004), "Water Management in the Yellow River Basin: Background, Current Critical Issues and Future Research Needs," provides readers with an overview of the complex issues facing the managers of the Yellow River with its wide variation in rainfall and runoff (spatially and temporally). Almost half of the paper discusses the early development of the Yellow River, highlighting why it is named the Yellow River (at times there is as much soil flowing in the river as water). The authors see the report as background information for both researchers and policy makers. They argue that past successes in managing the river have reduced flooding enough so that new issues have moved to the top of the management agenda. These new issues include water scarcity, soil conservation, water quality, and environmental damage. There also was a change in approach to water development and management, during the 1990s as the Ministry of Water Resources moved away from engineering dominant strategies to one based more on demand management and the value of water resources. Even so, basin management continues to have overlapping authority, unclear responsibilities, and competing interests. How management copes with these overlapping responsibilities is a major unanswered question, as it implements new allocation policies designed to cause the least disruption to farmers, particularly low income farmers, and agricultural output.

This is a country-specific study that may have some value to other countries as a prototype. Clearly in basin management we need the types of information discussed in the study. In addition, all basins will face the institutional gap they highlight, that “The natural unit for administration is usually...the river basin while the actual units of governance have other boundaries” (p. 35). Still their historical analysis would have been more useful if they had evaluated, in some detail, the effectiveness of past institutional arrangements in the basin.

Research Report #4, “Does International Cereal Trade Save Water? The Impact of Virtual Water Trade on Global Water Use,” does a review of what impact past cereal trade has had on water use. It makes the point that there is a wide difference in the amount of water used to produce a ton of cereal. Water use can be reduced by producing more grain in areas that use less water. However, they find that water “savings” through trade is more strongly correlated with water productivity than with water scarcity. Because of data limitations, they feel this topic deserves a separate study that goes beyond the scope of the report.

Research Report #5, “Evolution of Irrigation in South and Southeast Asia” by Barker and Molle (2004), provides a long-term, broad overview of how irrigation has evolved over the past century and a half. They argue that in recent years the benefits of irrigation development have gone largely to consumers. Yet they fail to point out that there are many small farmers in south and Southeast Asia who are also consumers, as are landless agricultural labor. They also argue that the main emphasis is now on improved water management to increase water productivity and diversify production. In addition, the role of the state in planning, managing, and investing in irrigation has diminished as use of groundwater has accelerated. Yet the state may become more important as water scarcity increases and water must be reallocated among sectors and users. The strength of this report is that it provides an excellent history of irrigation development. Where it is weak, is in its suggestions for the future. They provide a long list of old reasons why economic incentives (pricing and markets) have not worked well in the past. This is nothing new but they go on to argue that since economic incentives haven’t worked in the past, they will not work in the future. What they should have done is challenge the research community to determine what actions need to be taken to make economic incentives more effective in this region. As part of such research they may find that in some cases the transaction cost of making the necessary changes is too high, while in others they may be quite modest.

Research Report 6, “Macro Policies and Investment Priorities for Irrigated Agriculture in Vietnam” by Bocker et al. (2004), is a very comprehensive report on investments in Vietnam where water is only one of the investments. They argue that private sector investment in wells and pumps was the most important single factor affecting water resources in Asia during the past decade (1990s). They do an excellent job of estimating irrigation’s contribution to gross agricultural output in Vietnam. Although the report is country focused, it can be a useful guide for similar case studies in other countries to help them better establish water investment and research priorities. IWMI can also use studies such as this to help them set research priorities. For example, this report clearly indicates that IWMI should consider devoting more time and money to conduct research on a range of groundwater problems.

Research Report #7 (2005), as indicated above, appears to be directed at one of the research gaps, although it is specifically focused on assessing the impact of irrigation on fisheries and income in Laos and Sri Lanka. The problem with the report is that it provides little detail about the surveys that were used to collect the data. The analysis was based on surveys and workshops but the report leaves the reader in the dark concerning the data and analysis. Given this lack of detail, the report cannot serve as a useful guide to do similar studies in other countries.

Research Report #8 by Joshi et al. (2005), “Meta-Analysis to Assess Impact of Watershed Program and People’s Participation,” provides an excellent overview and assessment of watershed projects in India.

They use a meta-analysis of 311 case studies of watershed programs in India to assess the benefits in terms of efficiency, sustainability, and employment. The mean benefit cost ratio was 2.14, and it was higher in low income watersheds, ones with rainfall between 700-1,000 mm and where people's participation was high. They argue that past watershed projects have tended to only involve large and influential farmers in the process of assessing stakeholders' needs. These projects also have not been sensitive to the needs of women and the landless. One of the key steps to correct these problems is to develop institutional arrangements that assure a broad-based level of participation by all stakeholders. Equally important is the need to train stakeholders and to develop mechanisms for sharing benefits in accordance with costs incurred. Although this is a country-specific study, the authors provide enough information about the methodology and data so that it can be used by other countries or regions to conduct similar studies. Hopefully, such studies will go beyond this report and identify local institutions that have facilitated participation by a wide range of stakeholders and institutional arrangements that improve the distribution of project costs and benefits.

Research Report #9 by Courcier et al., "Historical Transformations of the Lower Jordan River Basin (in Jordan): Changes in Water Use and Projections (1950-2025)," is basically a hydrology report that looks at the water balance over time. They make projections to 2025 based on projects that are started, accepted, or very likely to be accepted. They argue that you can't depend on demand management to reduce water use in agriculture; therefore, the only way to meet future water needs is by desalinizing water or importing water from other basins. The strength of the paper is its historical discussions of the changes in water use over time, which highlight the over commitment of surface water and the over drafting of groundwater. The main weakness is that the authors fail to understand how demand management can play a helping role in meeting future water demands.

Research Report #10 by Molle and Berkoff, "Cities Versus Agriculture: Revisiting Intersector Water Transfers, Potential Gains and Conflicts" (2006), provides a very good historical review of past water transfers. It seems to make a number of generalizations from only a few case studies. The paper basically is developed around the "strawman" that a large number of people think urban growth is being held back by agriculture's wasteful use of water. Consequently, these same people believe a lot of water must be taken away from agriculture. The authors also have a strong view that economic incentives will surely fail to help reduce water use. Yet, in their conclusion, they do make one good point that water shortages in urban areas are due to the lack of political will to make the necessary investments for clean water and sewage systems, and are not due to the cities' inability to get water from agriculture.

The Resource Report #11, "Prospects for Productive Use of Saline Water in West Asia and North Africa" by J. Stenhouse and J. W. Kijne, focuses on the potential for using saline water to irrigate land in Egypt, Syria, Jordan, and Tunisia. It begins by highlighting the water scarcity problem in North Africa and Asia and the extensive salinity problems in irrigated areas of the world. Approximately 20 percent of irrigated land and about 3% of the dry land agricultural areas are affected by salinity. The paper goes on to discuss the primary and secondary causes of salinization and the effects of salinity. They also include a discussion of economic incentives to help reduce salinization but rather quickly conclude that most economic mechanisms can't be used because of measurement problems. However, they fail to recognize that this situation is beginning to change in a number of developing countries as water scarcity increases and low cost measurement devices become readily available. They use four brief case studies from Egypt, Tunisia, Jordan, and Syria, given during a two-day workshop conducted at ICBA in Dubai, June 2004, to illustrate the need for saline irrigation. Yet, their idea that saline irrigation will require larger farms seems to contradict their hope that saline water use will help poor farmers.

The last major section on the rural poor draws heavily from the FAO report by Dixon et al. (2001) on Farming Systems and Poverty. They argue that West Asia and North Africa (WANA) should focus its efforts on introducing saline irrigation in areas with mixed irrigation and with mixed rainfed farming systems. This might work best in areas in the four case study countries where the demand for forage is greater than the supply at reasonable prices. Finally, the authors recommend that optimal use of saline water should be part of long-term government drought management policies. However, as pointed out in the conclusion, someone needs to do a careful economic analysis to determine what options, if any, offer reasonable economic returns without damaging the soil. Another problem, which the authors highlight, is that it is unlikely all the conditions they list as necessary for successful induction of biosaline agriculture systems can be satisfied anywhere. Still the report is a good overview of the technical feasibility of saline irrigation and it attempts to indicate how it might help reduce poverty.

The first book in the comprehensive assessment (CA) series is *Water Productivity in Agricultural: Limits and Opportunities for Improvement* edited by Kijne, Barker and Molden. The focus of the book is on what is known about increasing the productivity of water in agriculture. The book discusses concepts, constraints and methodologies concerning water productivity from different disciplinary perspectives and then uses country examples from around the world to explore water productivity in specific countries. Individual chapters consider water productivity in different settings such as rice cultivation, cropping under saline conditions, and rainfed agriculture. Several chapters look at the possibilities for plant breeding to improve water productivity under both rainfed and irrigated conditions. The last nine chapters are case studies illustrating issues discussed in the earlier chapters. Several chapters look at different strategies for improving water management to improve water productivity: one focuses on the importance of an integrated farm-resource management approach while another emphasizes the benefits of integrated watershed management to improve the use of rainwater. Others consider specific crops or tree planting including agroforestry, drought-resistant potato varieties, and wheat-rice production systems. In a chapter on Thailand the author wastes considerable space arguing against the use of economic incentives. One of the more interesting chapters in the book is the final chapter which looks at the use of deficit irrigation. This is an area that has been neglected for many years and deserves more in-depth research to determine its real potential for increasing water productivity.

Overall this book is a good addition to the literature, particularly on the physical and technical side of water productivity, including such things as plant breeding and water use under different crops, and cropping systems. If there is a gap in the book's coverage, it is on the socio-economic side. Improvements in water productivity eventually have to be done by people in the irrigated or rainfed areas. The brief discussion of socio-economic concerns in a few of the chapters focuses primarily on the appropriate measures of water productivity. The somewhat limited discussions regarding economic incentives and farmer response are based on very large Asian systems that are poorly managed and lack key infrastructure. None of the papers looks at how economic incentives have worked effectively when the appropriate institutions, including water rights, are in place. It would have been more helpful if someone had asked why economic incentives have not worked or have not been tried in the past, and what changes in institutions, infrastructure, and organization are needed to make them effective management tools in the future? With water scarcity increasing, transaction costs are not an excuse for doing nothing. When water becomes scarce, it pays to invest in new institutions and organizational arrangements to better allocate and manage water.

The second book in the CA series edited by Hoanh et al. (2006), *Environmental and Livelihoods in Tropical Coastal Zones: Managing Agriculture-Fishery-Aquaculture Conflicts*, focuses on an area that has largely been ignored by those working on irrigation and agriculture. The book is written to help planners, resource managers, and donors make better investment decisions regarding the use and

development of coastal zones, as well as taking into account how actions upstream impact coastal zones. The coastal zones contain 40% of the world's population and are an important source of the world's food production. This is also a zone of very rapid change with both development and environmental degradation. A key land-use change in the coastal zone is the rapid growth in shrimp aquaculture and the resulting clearing and converting of mangrove forests and salt marshes. This has been pushed by strong global demand and lack of government policies regarding the conversion of those lands. Yet the clearing of mangroves is also the result of their exploitation for timber, fuelwood, and other forest products. The major problem is that the coastal zone supports three resource-dependent enterprises: agriculture, shrimp farming, and fishing. These have been very competitive enterprises with externalities from one impacting the other.

The book also explores the social and environmental impact of shrimp farming, which is a major export industry. It is not as labor intensive as rice cultivation in the local area but overall rice production (compared to shrimp production) doesn't require as much employment of ancillary activities. Problems created by pollution from shrimp production have caused conflicts in both India and Bangladesh while there seems to be somewhat less conflict in Vietnam. Still the problem is that farmers have not experienced appropriate signals regarding the external costs associated with their private investment decisions. Yet the book finds that no one approach will solve the problems caused by increased use of the coastal zone. The options considered range from government regulation of effluent levels and design standards to the promotion of best management practices and coastal zone management with its focus of improving our use of coastal zones. This book seems to fill an important gap in our knowledge about water management in Asia. As the book argues, these issues will become more important as the population grows and water is used more intensively both upstream and downstream. It is critical in the future that river basin management explicitly include the coastal zone. It has been ignored in the past, which has caused serious problems for coastal communities and fisheries all over the world.

In 2002 the book edited by Bouman et al., *Water-wise Rice Production*, was published and is listed as a CA publication, although it is based on a workshop held in IRRI in the Philippines. The objectives were to present and discuss the development, dissemination, and adoption of the latest water-saving technologies in rice production from the field to the irrigation system. Therefore, most of the chapters are country specific or even system specific. The reason they focus on rice is that more than three quarters of Asian rice production comes from 79 million ha. of irrigated land. In addition, it takes 3,000 - 5,000 liters of water to produce 1 kg of rice, but this is 2 to 3 times more water than is required to produce other cereals such as wheat or maize. The hope is that the workshop and publication will help enhance a more coherent research program on water savings approaches for rice-based cropping systems in Asia. This book is a good first step in such a process although it would have been good to have a concluding chapter that highlighted some of the key findings of the workshop.

ACRONYMS

AC	Audit Committee
ACIAR	Australian Center for International Agricultural Research
ADB	Asian Development Bank
AGM	Annual General Meeting of the CGIAR
AWC	Agriculture, Water and Cities
BFP	Basin Focal Project
BWM	Basin Water Management
CA	Comprehensive Assessment of Water Management in Agriculture
CABI	CAB International
CAPRI	Collective Action and Property Rights (CGIAR Systemwide Program)
CCER	Center Commissioned External Review
CDC	Center Directors' Committee of the CGIAR
CIAT	International Center for Tropical Agriculture
CIDA	Canadian International Development Agency
CIFOR	Center for International Forestry Research
CIMMYT	Centro Internacional de Mejoramiento de Maiz y Trigo
CInI	Central India Initiative
CoP	Community of Practice
COSI	Foundation for Technical Cooperation, Sri Lanka
CGIAR centers	CGIAR centers
CPWF	World Food Challenge Program
CSD	Convention on Sustainable Development
DANIDA	Danish International Development Agency
ECA	East Central Africa
EFC	Executive and Finance Committee
EPA	Environmental Protection Agency
EPMR	External Program and Management Review
FAO	Food and Agriculture Organization of the United Nations
IAASTD	Int'l Assessment on Agricultural Science & Technology for Development
IAHS	International Association of Hydrological Sciences
IAU	Internal Audit Unit
IBSRAM	International Board for Soil Research and Management
ICARDA	International Center for Research on Dry Areas
ICRAF	World Agroforestry Center
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
ICT	Information and Communication Technology
IDE	International Development Enterprises
IDRC	International Development Research Center
IFPRI	International Crops Research Institute for the Semi-Arid Tropics
IIMI	International Irrigation Management Institute
IITA	International Institute for Tropical Agriculture
ILRI	International Livestock Research Institute
IMT	Irrigation management transfer
IPG	International Public Goods
IPGRI	International Plant Genetic Resource Institute
IRC	International Water and Sanitation Center
IRD	Institut de recherche pour le développement
IRRI	International Rice Research Institute
IRS	Internationally Recruited Research Scientists

IRSS	International Research Support Services
ISNAR	International Service for National Agricultural Research
ITP	IWMI-Tata Program
IUCN	The World Conservation Union
IWMA	Irrigated Water Management Agriculture
IWMI	International Water Management Institute
IWRM	Integrated Water and Resources Management
LAC	Latin-America and the Caribbean
LDP	Leadership Development Program
LWL	Land, Water and Livelihoods
MoU	Memorandum of Understanding
MSEC	Management of Soil Erosion Consortium
MTP	Medium-Term Plan
NAFRI	National Agriculture and Forestry Research Institute
NARS	National Agricultural Research Systems
NC	Nominating Committee
NEPAD	New Partnership for Africa's Development
NGOs	Non-governmental Organizations
NRM	Natural Resources Management
NRS	Nationally Recruited Scientists
PC	Program Committee
PDF	Post Doctoral Fellows
PIM	Policy, Institutions and Management
PwC	Price Waterhouse Coopers
R&D	Research and Development
RRS	Regionally Recruited Scientists
RWAF	The Resource Center on Urban Agriculture and Forestry Network
SC	Science Council
SEA	South-East Asia
SGM	Sustainable Groundwater Management
SIDA	Swedish International Development Cooperation Agency
SIMA	System-wide Initiative on Malaria & Agriculture
SPIA	Standing Panel on Impact Assessment
SSLWMS	Sustainable Smallholder Land and Water Management Systems
SWAT	Soil and Water Assessment Tool
SWIM	Systemwide Initiative on Irrigation Management
SWP	Systemwide Program
TAC	Technical Advisory Committee
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development
WARDA	Africa Rice Center
WASPA	Wastewater Agriculture and Sanitation for Poverty Alleviation in Asia
WHE	Water, Health and Environment
WHO	World Health Organization
WME	Water Management and Environment
WRIP	Water Resources Institutions and Policies