

Annual Report 2006-2007



IWMI
International
Water Management
Institute

www.iwmi.org

Thinking *Differently* about Water for Food and Water for Life

Our Mission

Improving the management of water and land resources for
food, livelihoods and nature

Challenging People to Think Differently about Water for Food and Water for Life

The water management challenges of today and those of tomorrow are very different from the ones encountered in the past. With the global population steadily increasing, more water will be needed to feed more people, and the type of agricultural investments that are made now will determine the impacts on poverty and ecosystems.

We need to think differently about water if we want to achieve the triple goal of ensuring food security, reducing poverty and conserving the environment.

Core Values

- Excellence
- Impact Orientation
- Partnerships
- Teamwork
- Knowledge Sharing
- Respect for Diversity

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Joint Message from the Board Chair and Director General

In March 2000 one of the candidates for the position of Director General of the International Water Management Institute (IWMI) proposed in his interview presentation that the institute ought to play a major role in answering the question: "How much water does irrigated agriculture really need?" Shortly after the IWMI Board appointed that candidate, Frank Rijsberman, to the DG position, he started a discussion on how IWMI could take up that question in a major way. This led to the creation of the CGIAR systemwide program called the Comprehensive Assessment of Water Management in Agriculture (CA). The final report of the CA has now been published. The CA provides answers to that key question as well as many other critical questions.



Improving agricultural productivity in rainfed areas of Sub-Saharan Africa and Asia has the greatest potential to reduce hunger and poverty.

Photo Credit: Peter McCormick

The CA has managed to bridge two worlds. It started out as a research program to try and find answers to some of the key knowledge gaps related to water, food and the environment. David Molden, the CA Leader, and his colleagues in the CA Steering Committee, then gradually transformed it into a true assessment of the state of water management in agriculture, over the last 50 years and for another 50 years into the future.

Much has changed in the world of water, food and environment, IWMI's chosen niche, over the last seven years. Many useful bridges have been built between the agriculturalists and the environmentalists involved in water. Agriculture and wetlands is now a topic discussed among the ecologists in the Ramsar Convention while biodiversity in agro-ecosystems is on the agenda for agriculturalists. There is improved dialogue on many fronts between the two sectors.

The CA focuses on agriculture but with a firm input from the environmental perspective. The CGIAR Challenge Program on Water and Food (CPWF) addresses many of the key issues identified as priorities in the CA in the field. IWMI has played a key role in the development and implementation of both the CA and CPWF and is pleased – and proud – to be associated with the emerging results and recommendations from both programs.

So what does this assessment conclude? Is there enough water or are we running out? The CA's answer is that we are running out of water to satisfy all demands in many locations - the closed and closing river basins - and that this will worsen if present policies continue. That is the bad news. But the CA also presents key opportunities to alleviate or prevent such water crisis situations. One of the most surprising conclusions presented with authority by the CA is its optimistic view on rainfed agriculture, particularly in Sub-Saharan Africa. The CA concludes that one of the key opportunities to address poverty and improve water productivity lies in Africa's savannahs.

While many may be skeptical that major progress can be made in such a difficult environment, where real success has escaped us despite decades of trying, the evidence shows that this is indeed possible. In Brazil, the savannahs – called 'cerrados' there – have been developed successfully and crop and water productivity has increased dramatically.



Prof. Frank Rijsberman
Director General

The assessment puts forward key recommendations for improving water management in agriculture to address the world water crisis, backed by the authority of over 700 scientists and careful analysis in this report and a series of companion volumes. We are confident that the CA – with proper translation to regional, national and basin level realities – will prove to be a crucial guide for water policy in agriculture. It has already been important for sharing knowledge among researchers and research organizations and for setting research agendas. We hope and expect that the investments made by so many in this assessment will turn out to be a stepping stone out of poverty for many of the millions of poor rural people that struggle with water scarcity today.

The Board is convinced that IWMI is well positioned to face its challenges in the years to come and make an impact on the health and well-being of poor people through improved management of their natural resources - first and foremost their water and land resources.

May 2007



Prof. Nobumasa Hatcho

Board Chair



Prof. Frank Rijsberman

Director General



Prof. Nobumasa Hatcho
Board Chair



It is important to empower women and marginalized groups who have a stake but currently no voice in water management.

Photo Credit: Nadia Manning

By coincidence, Frank Rijsberman, who initiated the Comprehensive Assessment when he joined IWMI in the year 2000, is leaving the institute as the CA is completed. The Board is in the process of recruiting a successor and has appointed David Molden to the position of Acting Director General from June 1st, 2007.

The Board would like to commend Frank for his successful leadership of the Institute during the past seven years. As is well documented elsewhere, IWMI has grown and blossomed over the period under his leadership. The overall conclusion of the 3rd External Program and Management Review of IWMI was that the institute has emerged from its period of rapid growth as a larger, more diverse, more proactive and generally stronger research organization, with enhanced human resources management. IWMI has benefited greatly from the leadership of a strong and dynamic Director General since 2000. The IWMI Board fully agrees with this endorsement of the external review panel and wishes Frank well as he goes on to new challenges in helping to build Google's new philanthropic arm, google.org.

Highlights of the Year

Findings of the Comprehensive Assessment of Water Management in Agriculture



Agriculture uses up to 70 percent of the world's freshwater resources. How we manage our water resources will be the key to future food, livelihood and environmental security. IWMI's research consistently shows that thinking differently about water is essential if we are to achieve the triple goal of ensuring food security, reducing poverty and conserving ecosystems.

Dr. David Molden - Leader, Comprehensive Assessment

The Comprehensive Assessment of Water Management in Agriculture (CA) a five-year program spearheaded by IWMI, evaluated the benefits, costs and impacts of the past 50 years of water development and determined what future actions are needed for the next 50 years.

The Assessment pulled together the work of more than 700 scientists and practitioners from around the world who looked at the water management challenges communities face today, and the solutions people have developed in different parts of the world, to meet these challenges. IWMI contributed to the Comprehensive Assessment through its thematic research which covers critical areas such as basin water management; improving water productivity; land, water and livelihoods; peri-urban agriculture; and environmental water needs. The CA findings will enable better investment and management decisions for the future.

The last 50 years have seen remarkable progress in water resources development and in agriculture. Massive developments in infrastructure have given more people access to water. The world population jumped from 2.5 billion in 1950 to 6.5 billion today and the area under irrigation doubled, while water withdrawals tripled. New crop varieties, fertilizers and additional irrigation water boosted agricultural productivity. As a result, world food production actually outstripped population growth.



How we manage our water resources will be the key to future food security.

Photo Credit: Iskandar Abdullaev



Good agricultural practices like managing soil fertility and land degradation are important for increasing crop per drop.

Photo Credit: Sharni Jayawardena

The greater use of water benefited farmers and poor people, drove economies, improved livelihoods and fought hunger. However, there still remains a lot of unfinished business. In 2003, 850 million people in the world were food insecure, with 70% of the world's poor living in rural areas. The last fifty years also witnessed unprecedented changes in ecosystems with negative impacts. The growth in agriculture was responsible for much of this change. These problems will intensify unless they are addressed. Only if water use in agriculture is improved will we be able to meet the acute freshwater challenges facing the world over the next 50 years. According to the Assessment, targeting smallholder farmers in both rainfed and irrigated areas offers the best chance for reducing poverty quickly in developing countries.

CA Recommendations

Policy Action 1:

Change the way we think about water and agriculture

Instead of a narrow focus on rivers and groundwater, view rain as the ultimate source of water that can be managed. View agriculture as a multiple use system and an agro-ecosystem providing services and interacting with other ecosystems.

Policy Action 2:

Fight poverty by improving access to agricultural water and its use

Target the livelihood gains of smallholder farmers by securing water access through water rights and investments in water storage and delivery infrastructure, improving value obtained by water through pro-poor technologies and operating multiple water use systems.

Policy Action 3:

Manage Agriculture to Enhance Ecosystem Services

In agro-ecosystems there is scope to promote services beyond the production of food, fiber and animal protein. Because of increased water and land use however, some ecosystem change is unavoidable and difficult choices are necessary.

Highlights of the Year

Policy Action 4:

Increase the productivity of water

Gaining more yield and value from less water can reduce future demand for water, limiting environmental degradation and easing competition for water. More food can be produced per unit of water in all types of farming systems. The poor can benefit from water productivity gains in crop, fishery, livestock and mixed systems.

Policy Action 5:

Upgrade rainfed systems. A little water can go a long way

Rainfed agriculture is upgraded by improving soil moisture conservation and providing supplemental irrigation. These techniques hold great potential for quickly lifting large numbers of people out of poverty and for increasing water productivity in Sub-Saharan Africa and Asia.



Improving the performance of existing systems and adding new irrigation can reduce poverty by increasing farmer incomes and providing employment for the landless.

Photo Credit: IWMI Southeast Asia

Policy Action 6:

Adapt yesterday's irrigation to tomorrow's needs

Modernization, a mix of technological and managerial upgrading to improve responsiveness to stakeholder needs, will enable more productive and sustainable irrigation.

Policy Action 7:

Reform the reform process - targeting state institutions

A major policy shift is needed for water management investments important to irrigated and rainfed agriculture. The divide between rainfed and irrigated agriculture must be broken down and fishery and livestock practices must be linked to water management. Civil society and the private sector are important actors but the state is the critical driver.

Policy Action 8:

Deal with trade-offs and make difficult choices

Bold steps are needed to engage with stakeholders because people do not adapt easily to changing environments. Informed multi-stakeholder negotiations are needed to make decisions on water use and allocation. Other users such as fishers and smallholders must develop a strong collective voice.

The Consultative Group on International Agricultural Research (CGIAR), the Secretariat of the Convention on Biological Diversity, the Food and Agriculture Organization of the United Nations and the Ramsar Convention on Wetlands are co-sponsors of the Assessment.

A summary of the findings is available at:

▶ www.iwmi.cgiar.org/assessment

The book *Water for Food, Water for Life* is available at
▶ www.earthscan.co.uk



The past 50 years witnessed unprecedented changes in ecosystems with negative impacts.

Photo Credit: IWMI Southeast Asia



Greater food production has come at the expense of biodiversity and ecosystems services that are often important to poor people's livelihoods

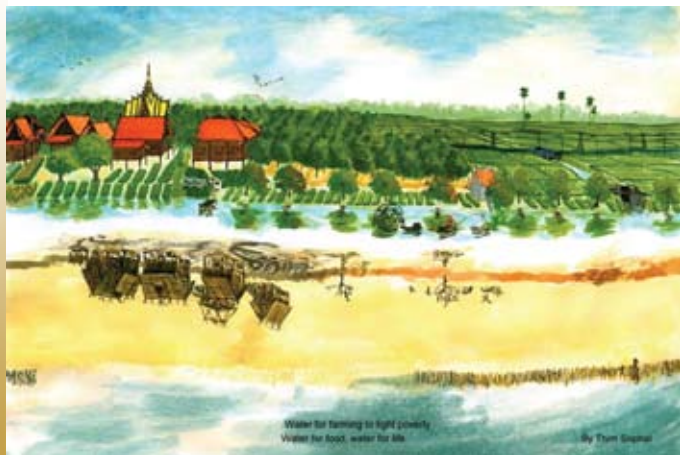
Photo Credit: Waqas Ahmad

Highlights of the Year

Communicating without Words to Learn about Water and Agriculture

Using artwork to present the messages of the Comprehensive Assessment of Water Management in Agriculture

As the Comprehensive Assessment of Water Management in Agriculture was nearing the completion of its assessment and writeup phases, it began to embark on a number of communication and outreach activities, including the official launch of the CA publications. In order to appeal to a wide audience and to explore innovative ways of getting its messages across, the CA introduced a global art competition titled: "Communicating without words to learn about water and agriculture - Using artwork to present the messages of the CA" to visually capture its key messages.



Water for farming to fight poverty

*By Tim Sophal, Cambodia, painting on water colors on paper
Courtesy: Comprehensive Assessment*



Water for food, water for life

*by Nitu Andreea, Rumania, painting on paper
Courtesy: Comprehensive Assessment*

The art competition was launched at the 4th World Water Forum held in Mexico in March 2006. Flyers and posters advertising the competition were prepared in English, French and Spanish and distributed widely using many partner networks. Open to anyone, the CA welcomed submissions from any interested adult, young person or child. Each submission was meant to visually represent one of the 18 key messages coming out of the CA.

The winning entries have been used by the CA in a number of ways to communicate its messages. A key highlight of the recently launched book titled *Water for Food, Water for Life: A Comprehensive Assessment of Water Management in Agriculture* is the display of the winning art entries at the beginning of each chapter.



Basins squeezed

*by Michaela Roswitha Klein, Germany, painting in water colors
Courtesy: Comprehensive Assessment*

Highlights of the Year

Performance Indicators 2006

The CGIAR Performance Measurement (PM) System was first piloted in 2004. It has helped IWMI and other centers to understand their own performance and has also brought in a higher level of accountability, while helping in decision making for fund allocation. From its inception, this system was evaluated and refined to better reflect the performance of centers in the CGIAR system. This is why in 2006 some criteria were changed and new indicators were added. The following data is extracted from IWMI's 2006 performance indicators and covers selected areas: output targets, significant outcomes, publications, gender and diversity, staff training, governance and partnerships.



IWMI believes in training staff to improve their individual skills and abilities and enhance organizational performance.

Photo Credit: IWMI HR Division

Notes:

1. Only non-ISI peer reviewed journal articles counted for 2006. This is a change from previous years where all peer reviewed journal articles were counted. The total number of peer reviewed journal articles in 2006 was 85, but only 21 are counted here as 64 are ISI. If the criteria used in previous years were applied to 2006, then the total peer-reviewed publications will be 180 and the indicator will be 1.94.
2. Definition: "Management positions" include: Director General, Deputy Director General, Directors of major programs /divisions and senior heads of administration if they report directly to the DG. Please note that the indicator definition of "management positions" changed between 2005-2006 so the figures may not reflect the actual position.
3. Listed partners:
Nile Basin Initiative (NBI)
International Center for Integrated Mountain Development
Government of Israel

INDICATOR	ACHIEVEMENT	
	2006	2005
Number of peer-reviewed publications per scientist in 2006 (excluding articles published in journals listed in the Thomson Scientific/ISI) <i>1. See notes</i>	1.92	1.72
Percentage of scientific papers per scientist published with developing country partners in refereed journals, conference and workshop proceedings in 2006	33%	23%
Gender & Diversity Percentage of women in management <i>2. See notes</i>	50%	30%
Diversity in recent PhDs : Percentage of scientists receiving a PhD in the last five years (2002-2006)	34%	28%
Two most prevalent nationalities	Indian 19% French 14%	French 16% Indian 13%
Governance percentage of board leadership: (Chair, Vice-Chair and Committee Chairs from developing countries)	25%	69%
Percentage of board leadership positions (Chair, Vice-Chair and Committee Chairs) held by women	25%	61%
Staff Training The percentage of overall budget spent on staff training such as computer, language, project management leadership training	2%	2.1-3%
Partnerships How many new and substantive partnerships did the Center establish with new partners in 2006 <i>3. See notes</i>	3	Not Asked

M I L E S

Over the past few years IWMI re-engineered its business systems, refined its research agenda and set in motion the mechanisms that would make it a knowledge center on water, food and environment. These pages highlight the key developments.

RESEARCH

In 2005 IWMI developed a new conceptual framework to better carry out its mission—and tightened the focus of its research by adopting four new research themes.



Basin Water Management



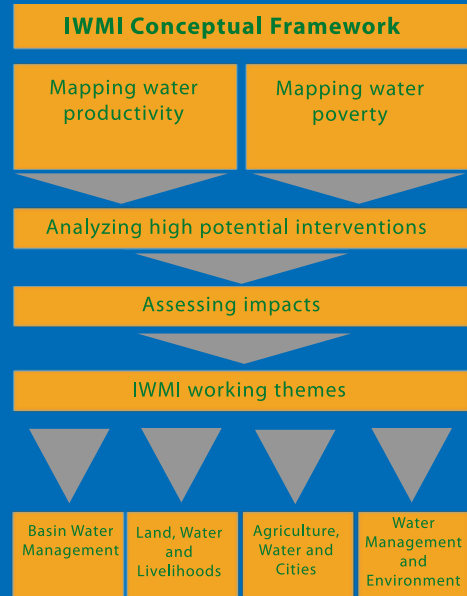
Land, Water and Livelihoods



Agriculture, Water and Cities



Water Management and Environment



ORGANIZATIONAL CHANGE

Everything moved at an accelerated pace to speed up IWMI's transformation into a modern, dynamic center in the CGIAR.



In 2003 IWMI introduced "TimeTracker", a web-based time recording system which records time spent by researchers on projects and which integrates project planning (budgeting) and project implementation with the financial administration system.



The IWMI Intranet helps staff communicate internally and links IWMI offices around the world, providing instant access to a range of useful data and information to stay up-to-date with organizational progress.



IWMI's Quality Management System updates and streamlines policies, internal processes and procedures, putting in place a total Quality Management System (QMS) against which all aspects of IWMI's work can be measured and improved.



The Database Project provides better management and sharing of data across IWMI research projects and regions.

Photo Credits for Milestones: Nadia Manning, Sharni Jayawardena, Sanjini De Silva, Prisca Ting, Pay Drechsel, Maria G. Bellio, Dominique Perera, Iskandar Abdullaev, The Comprehensive Assessment of Water Management in Agriculture, The CGIAR Challenge Program on Water and Food IWMI Ghana, IWMI South Africa.

T O N E S

Cross-cutting Themes

IWMI defined three cross-cutting research areas that work towards:

- ♦ Increasing the understanding of land and water productivity and its relationship to poverty.
- ♦ Identifying interventions to improve the productivity and sustainability of natural resources.
- ♦ Assessing the impacts of such interventions on productivity, livelihoods, health and resource sustainability.

IWMI leads the CGIAR Challenge Program on Water and Food



More Crop per Drop



The Comprehensive Assessment of Water Management in Agriculture (CA)



IWMI contributed to the CA through its thematic research which covers critical areas such as basin water management; improving water productivity; land, water and livelihoods; peri-urban agriculture; and environmental water needs.



Beyond More Crop per Drop ... Water for Food, Water for Life



The first Leadership Development Program (LDP) was launched in 2003.



IWMI won the 2004-2005 Center-of-the-Year Award for "Best Staffing Goals Achievement" from the CGIAR Gender & Diversity Program.

In 2006 IWMI introduced **SAP** - a fully integrated Information Technology Solution for :

- Financial Accounting
- Purchasing Management
- Project Management



h Senid was introduced in 2007 for more streamlined HR services and procedures.



In 2006 WorldFish and IWMI formed a Strategic Alliance and identified priority areas for collaboration.



IWMI Finance



WorldFish Finance

In 2006 International Research Support Services (IRSS) was launched as a joint venture between WorldFish and IWMI in a move to increase center collaboration, improve efficiency and maximize on economies of scale.



HR4U, an online human resources facility for staff, was launched as a joint venture between WorldFish, IWMI and CIFOR in 2007.

KNOWLEDGE SHARING

IWMI's Knowledge Center Initiative promotes knowledge sharing and management approaches and resulted in the creation of IWMI's Information and Knowledge Group (IKG).



The Annual Research Meeting and Knowledge Fair bring together researchers from HQ and regional offices to present research and share knowledge.



IWMI identified four knowledge roles to ensure the generation of scientific outputs have a positive impact on food production, livelihoods and the environment:

Knowledge Roles

Knowledge generation

Knowledge sharing

Knowledge brokerage

Knowledge application



IWMI meets water user associations (WUAs) in Central Asia



Documenting farmer concerns in Gujarat, India

OUTCOMES AND IMPACTS

Ideas, concepts and tools developed by IWMI have influenced the way water issues, their impacts and solutions are approached and evaluated at both global and local levels.



IWMI's research helps recognize rainfed agriculture as the frontier of opportunity because of its pivotal role in meeting future food and livelihood needs.



IWMI's research on river basin institutions and the linkages between irrigation and poverty alleviation influenced the development agenda of the Asian Development Bank (ADB). IWMI is a founding partner of the ADB's Water and Poverty Initiative.

As a result of IWMI's research policymakers recognize the socioeconomic importance of environmental flows as well as their strategic significance in facilitating major water productivity improvements in agriculture.

The IWMI-Tata Water Policy Program (ITP) has brought water issues, in particular groundwater, to the center stage in India. ITP recommended a broad program of groundwater recharge to combat resource degradation. In 2006, the Government of India adopted this recommendation in its 2007-2008 Union Budget.



T O N E S



The Knowledge Sharing in Research Pilot Project is distilling best practices that employ innovative approaches to address key questions and make this information available to the wider research community.

IWMI became an active member in the CGIAR's ICT-KM Program which promotes the use of ICT and Knowledge Management to make the Institute's work more effective.



IWMI increasingly uses innovative knowledge sharing approaches like Open Space, and Peer Assists.



IWMI also uses impact assessment and monitoring approaches like Impact Pathways, Outcome Mapping and Most Significant Change.



The "World Cafe" concept promotes the generation of new ideas.



A member of the Communications and Knowledge Sharing division (CKS) interviewing a smallholder in the Ruhuna Basin of Sri Lanka during a field trip.



IWMI's research on wastewater influenced key international public health guidelines:

- Hyderabad Declaration on Wastewater Use in Agriculture, 2002
- Guidelines for Water Reuse, 2004 USEPA/USAID
- Revised Guidelines for the Safe Use of Wastewater, Excreta and Greywater, WHO, 2006



IWMI presented a key document—"Beyond More Crop per Drop"—at the 4th World Water Forum 2006.



The Ramsar Convention recognized IWMI's research on the ecological aspects of agricultural systems by confirming IWMI as its fifth International Organization Partner.



The positive income and productivity benefits seen in IWMI's research on small-scale land and water interventions in East Africa is helping spur broader uptake of project findings.



The work of IWMI and partners in Central Asia on Integrated Water Resources Management (IWRM) has influenced water policy in Uzbekistan, Kyrgyzstan and Tajikistan.

Research Theme 1

Basin Water Management

Coping with Competition for Water: Improving Basin Water Management and Water Productivity

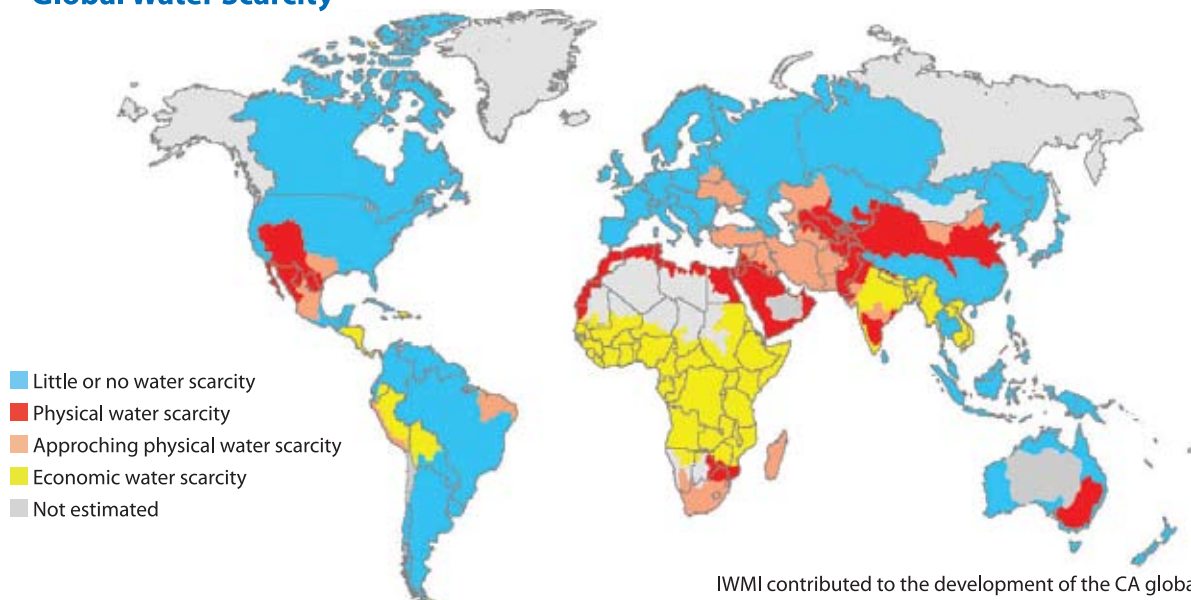


“Many of the key issues and associated analysis that have emerged in the CA – water accounting and water depletion at the basin scale, quantifying and improving water productivity, understanding the benefits, costs and governance issues of the agricultural use of groundwater and of irrigation more broadly – derive from the work of Theme 1 in its various incarnations over the past 10 years, and contributed strongly to understanding trends, defining and modeling the scenarios for the future”.

Hugh Turrall - Theme 1 Leader

In many river basins, water for domestic, agricultural or industrial use is approaching or exceeding the amount of renewable water available. The results are over-allocated basins, where more water is used than is environmentally desirable or than is renewably available, leading to declining fish stocks, salinization, declining groundwater, conflicts over water allocation and contributing to water pollution problems. IWMI’s Theme 1 research, “Basin Water Management” shows that the challenge for these basins is to weigh different options for water management and allocation while examining trade-offs between increased equity and productivity. As river basin management becomes more holistic, it has to come to grips with a much more complex set of issues such as population growth, urbanization and the diversity of competing values, livelihoods and economic interests, all depending on the same hydrological cycle. Individual basins present almost unique combinations of physical, demographic and political administrative situations and require carefully tailored adaptive management strategies based on sound integrated principles.

Global Water Scarcity



Under Theme 1, IWMI contributed to the Comprehensive Assessment of Water Management in Agriculture (CA) through extensive research with other partners. This research is outlined in the following chapters of the CA Synthesis Book:

- Chapter 2 Trends in water and agricultural development
- Chapter 3 Looking ahead to 2050: scenarios of alternative investment approaches
- Chapter 5 Policy and institutional reform: the art of the possible
- Chapter 7 Pathways for increasing agricultural water productivity
- Chapter 9 Reinventing Irrigation
- Chapter 10 Groundwater: a global assessment of scale and significance
- Chapter 16 River basin development and management

In its research for the CA, IWMI advocated acknowledging rainfall as the ultimate freshwater resource and identified opportunities to increase water productivity across the entire hydrologic cycle including rainfed-irrigated and the surface-groundwater continuum. It concluded that improved water management in both irrigated and rainfed agriculture holds considerable scope for increasing water productivity. The emergence of small groundwater pumps in South Asia, while improving livelihoods of millions of poor farmers, has also led to over-exploitation of the resource. IWMI recommends increasing opportunities for off-farm livelihoods to ease population pressure on agriculture and thereby on groundwater use. IWMI also looked at the significance of intersectoral water transfers and implications of climate change for water and agriculture. New water storage (in reservoirs, aquifers or as soil moisture) may be needed to abate the effects of increased rainfall and streamflow variability.

Some 1.2 billion people live in basins where water resources are already overcommitted. And with growing population, urbanization and more affluent lifestyles, this number may increase without appropriate investments. There are two types of water scarcity as identified by IWMI: physical water scarcity, where water resources are insufficient to meet all demands; and economic water scarcity, where lack of investments and capacity limit access to water resources. IWMI contributed to the development of the CA global map showing water scarce areas, along with statistics. This was prominently featured in the international media during World Water Week in 2006. IWMI also contributed to several research reports and books put out by the CA, on river basin management, irrigation investment priorities in Southeast Asia, and the impact of food trade on global water use.

IWMI contributed to the development of the CA global map showing water scarce areas along with statistics.

Research Theme 2

Land, Water and Livelihoods

“Bright Spots”: A Shining Example of Improved Yields, Income and Livelihoods



“The CA has not only provided strong evidence that increasing yields and reversing degradation in smallholder farming systems are compatible goals, and can have very strong positive benefits for water productivity, but has also given us a clear idea of what can be achieved globally if we apply ourselves to those goals.”

Deborah Bossio - Theme 2 Leader

Greater food production in the past has come at the expense of biodiversity and ecosystem services that are often important to poor people’s livelihoods. When land productivity declines, so does food and livelihood security. Smallholders carry out 60 percent of global agriculture, and provide 80 percent of the food in developing countries. As most developing economies are not growing fast, it is not likely that income-earning opportunities will keep pace with population growth. IWMI’s research under the Theme “Land, Water and Livelihoods” shows that land and water productivity can be improved through the application of best practices and new technologies.

IWMI contributed to the Comprehensive Assessment of Water Management in Agriculture through its “Bright Spots” research in Central Asia, Africa and Southeast Asia. “Bright Spots” are areas where land and water degradation have been successfully reversed through selected interventions. They also represent agricultural sustainability by maximizing on the use of ecological goods and services without permanently damaging these assets. In an analysis of 286 cases from 57 countries, the impact of “Bright Spots” development influenced 10.9 million households, covering an area of 31.6 hectares.



Land and water productivity can be improved through the application of best practices and new technologies.

Photo Credit: David Molden

Research by the CA shows that 75 percent of the additional food we would need over the next few decades could be met by bringing the production levels of the world’s low yield farmers up to 80 percent of what high yield farmers get from comparable land. According to the Assessment, targeting smallholder farmers in both rainfed and irrigated areas offers the best chance for reducing poverty quickly in developing countries. The largest population of the world’s undernourished people are concentrated among smallholder agricultural groups. Therefore, it makes sense to intensify land and water sector development investments at this level. The importance of such a focus has also been highlighted in other strategy documents such as the 2004 Copenhagen Consensus. The smallholder unit is the single most promising sector for influencing land and water use management and having a visible, positive impact on rural livelihoods.



“Bright Spots” are areas where land and water degradation have been successfully reversed through selected interventions.

Photo Credit: Nadia Manning

Under Theme 2 research IWMI also wrote Chapter 15 of the CA report under the title “Conserving Land—Protecting Water”. This chapter makes the following observation: “The key to effective management of water resources is understanding that the water cycle and land management are intimately linked. Every land use decision is a water-use decision. Improving water management in agriculture and the livelihoods of the rural poor requires mitigating or preserving land degradation”. IWMI is currently co-authoring a book, “Conserving Land, Protecting Water”, which expands on the ideas and concepts of the Assessment. The purpose of this book is to 1) advance understanding of the essential linkages between land and water management, 2) to put forward in a single volume a variety of promising trends in both the social and physical sciences as related to reversing degradation, and 3) to present a global compilation of case study evidence for the gains that can be made in reversing current trends in resource degradation.

Research Theme 3

Agriculture, Water and Cities

From Waste to Wealth: Maximizing the Benefits of Wastewater in Urban and Peri-Urban Agriculture



“To integrate urban water resources management in its basin context, with due consideration to upstream and downstream implications of urban development on cross-sectoral water allocation, water poverty and wastewater generation, is a key issue highlighted by the CA which we are now taking up in Theme 3.”

Pay Drechsel – Theme 3 Leader

Water flowing out of cities should not be seen as waste but as a resource for the poor. In and around cities in Africa, South Asia, Southeast Asia and Latin America, poor farmers have often no alternative to polluted stream water or even untreated wastewater from predominantly domestic sources to irrigate their crops. While wastewater is nutrient-rich, for crops, it also carries pollutants and pathogens harmful to human health. Both farmers who use wastewater and consumers who eat food grown with wastewater are at risk. However, trends show that wastewater will become an increasingly important component of future agricultural water supplies, particularly in water-scarce countries. Under Theme 3 research on “Agriculture, Water and Cities”, IWMI is assisting WHO and FAO in testing the new wastewater use guidelines looking at safe farming practices and realistic policies that will enable farmers to maximize on the benefits generated from the use of polluted water, while minimizing risks to public health and the environment.

IWMI research in 2006 contributed to the CA by analyzing wastewater generation and wastewater use in more than 50 cities in developing countries. The study found that wastewater irrigation is a common reality in three of four cities. IWMI also carried out a comprehensive assessment of informal irrigation in urban and peri-urban West Africa with a new in-depth country study on wastewater use in Ghana. While IWMI contributed to the CA, the CA also influenced



Poor farmers have often no alternative to untreated wastewater to irrigate their crops.

Photo Credit: S.Buechler

IWMI. In 2006, the Comprehensive Assessment produced a research report on “Cities versus Agriculture” which started a discussion which led to the revision of IWMI’s Theme 3 structure and the addition of a new sub-theme on the “Integration of urban development, agriculture and the environment”.



Trends show that wastewater will become an increasingly important component of future agricultural water supplies, particularly in water-scarce countries.

Photo Credit: IWMI Ghana

IWMI’s Theme 3 also contributed to Chapter 11 of the Comprehensive Assessment Synthesis Book, under the title “Agricultural Use of Marginal-Quality Water—Opportunities and Challenges”, where policymakers are urged to consider wastewater as a resource requiring good management, financially and institutionally, and where the establishment of property rights could motivate efficient use of wastewater. To raise awareness of potential health risks and impacts of wastewater use, public awareness campaigns and realistic guidelines are recommended together with public funding of research, development and outreach at farm level. The latest WHO–FAO guidelines on wastewater use in agriculture (2006), which were influenced by IWMI’s research, are currently being tested for their application and institutionalization potential.

It is expected that by 2030, 60 percent of the world’s population will be urban with the majority living in slums. Most urban growth will occur in less developed regions like Sub-Saharan Africa and South Asia. The major challenge for policymakers is the provision of safe drinking water, sanitation, livelihood opportunities and nutritious food. The general perception among policymakers is that using untreated wastewater in agriculture is unsanitary and unhealthy and that the practice should not be promoted. The CA recommends that in resource-poor situations, it might be wiser to manage or minimize risk rather than trying to eliminate risk. For most developing countries, wastewater treatment is a long term strategy. Interim solutions may be needed to protect farmers and public health. These findings support the new WHO-FAO-UNEP guidelines on the safe use of wastewater in agriculture

Research Theme 4

Water Management and Environment

Environmental Equity: Striking the Right Balance between Agricultural Expansion and Ecosystem Health



"The ecosystem component of the Comprehensive Assessment presented an opportunity to highlight the 'costs of going too far' with agricultural and water development. This does not mean that agricultural and water resource practitioners need to curtail their efforts to provide more food and water to people; rather, it means that some smart

(smarter) thinking is necessary if we are to obtain a sustainable balance between the production of food and the provision of other ecosystem services."

Max Finlayson – Theme 4 Leader

Agricultural systems depend greatly on ecological processes and the services provided by wetlands, lakes and rivers as well as agro-ecosystems such as rice fields, forests and coastal areas. Ecosystems support agriculture, produce fiber and fuel, regulate freshwater and purify wastewater. They regulate the climate, provide protection from storms, mitigate erosion and provide opportunities for recreation and tourism. In 2006, under its Theme 4 research, "Water Management and Environment", IWMI developed and tested best practice frameworks that included the environment in water resources management. Research looked at enhancing the benefits in agriculture-wetlands interactions through appropriate policies and practices as well as tools for aiding resource allocations and decision making. It also outlined tools for assessing the economic value of the range of ecosystem services to basin water and land productivity, poverty reduction and livelihood strategies. It emphasized the importance of biodiversity which strengthens ecosystem resilience and the maintenance of agro-ecosystems and fisheries.

Through research for the CA, Theme 4 examined past activities, assessed opportunities and closed several knowledge gaps. One priority area for Theme 4 research was the integrated management of agriculture and wetlands with an emphasis on examining how wetlands could be used in a sustainable way for livelihoods.

IWMI continued its work on integrated analyses of the impacts of uses of wetlands on both livelihoods and wetland functioning. As stated in the Millennium Ecosystem Assessment (MEA 2005) the well-being of people is intimately linked to the capacity of ecosystems to provide a range of vital ecosystem services, especially to the poor who depend directly on ecosystems for their livelihoods.

IWMI developed an inventory of information on wetlands and the many ecosystem services they provide. This inventory is addressing a major knowledge gap about the importance of wetlands for agriculture. Information provided can support the development of tools for better analyzing the synergies and trade-offs within wetlands. The impact of IWMI's research is extended through formal agreements in place between Ramsar and other international bodies such as IUCN and FAO-GTOS, that have an explicit interest in water management and agriculture. IWMI also conducted the first ever global assessment of environmental water needs and how these requirements (environmental flows) can be implemented.

IWMI contributed to Chapter 6 of the Comprehensive Assessment Synthesis Book. This chapter, titled "Agriculture, water and ecosystems: avoiding the costs of going too far", examines the wide scale changes in land cover, water courses and aquifers which have contributed to ecosystem degradation and the undermining of ecosystem services. It states that agricultural technology and management practices must be improved to enhance ecosystem services that benefit the rural poor. These practices should maintain biodiversity which underpins ecosystem services. As far as possible, ecosystems should be managed to mimic their natural state and character. To support these efforts it is important to raise awareness of the role and value of ecosystem services through dialogue and dissemination with diverse stakeholders. Inventories, assessments and monitoring of factors related to ecosystem resilience also need to be closely monitored.



IWMI's research emphasizes the importance of biodiversity for strengthening ecosystem resilience and the maintenance of agro-ecosystems and fisheries.

Photo Credit: Sanjini De Silva



Migrating birds depend on lakes and streams in wetlands for breeding.

Photo Credit: Maria G. Bellio

The CGIAR Challenge Program on Water and Food (CPWF)

The CGIAR Challenge Program on Water and Food (CPWF) is an international, multi-institutional initiative that conducts research for development, focused on nine benchmark river basins in Africa, Asia and Latin America. Its aim is to increase water productivity in agriculture: producing more food with less water, while improving rural livelihoods, in an environmentally sustainable way. In essence, CPWF seeks to convert CA results into action.

Organized around five different themes, CPWF objectives are advanced by input from first call projects, basin focal projects, impact assessment, small grants for impact, synthesis research and capacity building activities.

In 2006, projects made great strides towards increasing water productivity in different production environments, developing mechanisms to facilitate multi-stakeholder dialogue and negotiation, valuing water to produce ecosystem services, and understanding water-food-poverty links and their policy context. Highlights include:

- Using economic 'game theory' to investigate social learning interventions, and build collective capacity and incentives for technology adoption.
- Developing a bio-economic simulation model to estimate the on-farm and off-farm impacts of adopting different farming practices, increasing awareness of both benefits and constraints of a given technology.
- Designing trade-off analysis models, to depict the consequences of different water management regimes on aquatic biodiversity.
- Introducing a multi-agent simulation model that gives insight into the complexity of water uses and users, thereby contributing to effective policy-making and improved institutional arrangements.
- Using research on Multiple-use systems (MUS) in 10 countries to create a generic framework for designing, implementing and upscaling MUS systems. The framework has been adopted for use in five basins.
- Conducting risk assessment studies that have raised awareness of health risks and strategies to minimize health risks associated with wastewater irrigation. Findings are being integrated into the operational procedures of local urban planning and health departments.
- Generating a knowledge base on a wide range of issues and developed tools for optimizing basin level planning through efficient design and operation of small reservoirs.



The CP also seeks to improve rural livelihoods in an environmentally sustainable way.

Photo Credit: Nadia Manning

Basin Focal Projects (BFP) also made a number of advances in the areas of poverty analysis, assessment of water availability, water productivity, institutional analysis, intervention analysis and knowledge management. Improvements to the Water Poverty Index and water-use accounting methods as well as basin water productivity maps are among the outputs developed by BFP research teams.

The CA delivers key inputs into the Challenge Program's research priority setting process. In 2006, CPWF commissioned CA investigators to identify research priorities for the nine Program basins. From their recommendations, six were chosen from which to base a second call for research proposals.

During Stockholm World Water Week, 2006, in collaboration with the CA, CPWF organized several sessions, including: "Turning Assessment Findings into Action: the results of the CA"; "Drought, Risk and Management for Agricultural Water Use"; "Multi-scale River Basin Governance"; "Practical Implementation of Integrated Water Resource Management in Africa" (with the European Union Water Initiative); and "Closing basins – soft or hard landing?" (with SIWI and IWMI).

Researchers from the CA were also active at the CPWF International Forum on Water and Food (IFWF), held in Vientiane, Lao PDR in November 2006. A major CPWF event for synthesis, the IFWF saw 245 agricultural researchers, development professionals and policy experts gather to discuss and debate wise water management strategies, innovative technologies and effective institutional arrangements at multiple scales. An impressive range of scientific outputs, including papers, session outputs and position papers were produced and are available on the IFWF website. Great effort went into designing and implementing an original and stimulating event. Participants commented on the extraordinary energy during the week and described it as a model for future interactions of different types.

Year in Review

This section highlights some significant areas of research that IWMI has been involved in the past year and covers the four overthematic areas of IWMI's research in Africa and Asia.

'Health Impacts of small dams in Morocco: Listening to the community for better planning and management'

Over the past few decades, hundreds of small dams have been constructed across Africa to impound water for multiple uses. In countries with arid and semi-arid climates and erratic patterns of rainfall like Tunisia, Burkina Faso, Morocco, Zimbabwe and Ethiopia, small dams are an important tool in rural poverty alleviation, reduction of rural exodus, aquifer replenishment, prevention of floods and large dam siltation. They are also an important source of water for irrigation, drinking and domestic purposes. However, negative health impacts such as increased transmission of water-related diseases may make investments in dam construction not always result in sustainable development. IWMI and partners are involved in a project in southern Morocco that is developing a participatory methodology to examine the health impacts of small dams.

...See *Water Figures Issue 1, 2006*

The CA: Influencing what happens next

Water scarcity exists in a number of forms, all contributing to persistent poverty in the world today. More water is needed not only to produce more food but also to combat malnutrition and reduce poverty. But putting more water into the service of agriculture threatens environmental sustainability. There are difficult choices to make about how to manage water for food, environmental security and poverty reduction. Overcoming this is critical to meeting the Millennium Development Goals on poverty, hunger and environmental sustainability. The CA was formed to help resolve this water-food-environment dilemma by bringing a diverse group of people to assess the past 50 years of water development, the water management challenges communities are facing today and the solutions people have developed.

...See *Water Figures Issue 2, 2006*

'GIAM: To help answer questions about water for food and nature'

Satellite remote sensing offers a consistent, timely (and increasingly) free resource to estimate and monitor irrigated areas while meeting high scientific standards. In 2002, the Global Irrigated Area Mapping (GIAM) project was initiated, supported by IWMI core funds, and the Comprehensive Assessment of Water Management in Agriculture. Using a wide range of sophisticated remote sensing images and techniques, the project set out to observe changes in vegetation to help make precise definitions of the area and spatial distribution of global irrigation. In areas such as Asia where secondary data on cropping intensities are not accurately recorded, it also helps to identify the extent of multiple cropping.

...See *Water Figures Issue 3, 2006*



The GRD scientists making spectral measurements of crop productivity in an irrigated area in Uzbekistan, Central Asia.

Photo Credit: IWMI Global Research Division



The Asgherkiss Dam in Morocco IWMI is studying the health impacts of these dams which are an important source of water for irrigation, drinking and domestic purposes.

Photo Credit: Eline Boelee



Some 1.2 billion people live in basins where water resources are already overcommitted.

Photo Credit: IWMI Global Research Division

Year in Review

‘Global Wetland Inventory and Mapping (GWIM)’

The need for effective wetland mapping and inventory has been raised in many fora and by many organizations over the past decades. Past mapping and inventory has included the production of continental scale inventories in the late 1980s and early 1990s, with spatial analysis of remote sensing data assuming a greater role in the 1990s and more recently. Acknowledging the identified shortcomings in existing inventory, the lack of an accurate and reliable global assessment, and recognizing the many ongoing efforts to address this issue at various scales, IWMI has developed a Global Wetland Inventory and Mapping (GWIM) project to work with partners and through the framework of the Ramsar Convention to undertake a comprehensive, multi-purpose and multi-scale wetland inventory.

...See *Water Figures Issue 3, 2006*

‘Water Resources Management and Sanitation (in cities)—shouldn’t we be thinking beyond the obvious?’

“People by the millions move to cities in order to improve their lives, find better jobs and have access to goods and services that are not available in rural areas. As they attract more people, cities assemble and provide the goods and amenities that these people need and want. Foremost among these is food...”

This article is based on a paper presented by IWMI researcher and wastewater specialist, Dr. Liqa Raschid-Sally, at the 32nd WEDC Conference on Sustainable Development of Water Resources, Water Supply and Environmental Sanitation, held in Colombo, Sri Lanka from the 13-17 November 2006.

...See *Water Figures Issue 4, 2006*



One of IWMI’s major impacts in the Ferghana Vally project was the decision by the Usbek government in 2003 to restructure and realign its entire water management system along hydraulic boundaries.

Photo Credit: Nadia Manning

‘Understanding farmers’ strategies and land use change in the Northern Uplands of Vietnam’

Over the past two decades, Vietnam has undergone significant changes with respect to land reforms that have had impact on land use systems throughout the country. Farmers have shifted from collectivized agricultural systems managed by cooperatives to household farm systems that are governed by individual decision-making. Land tenure changes and economic liberalization have led to increases in agricultural productivity and poverty reduction. In the uplands however, economic development has been slow and communities still face periodic food shortages. Policymakers, donors and non-governmental organizations (NGOs) have started to focus on rural development in the uplands as a critical issue.

...See *Water Figures Asia Issue 1, 2006*

‘IWRM makes an impact in the Ferghana Valley’

IWMI’s successful Integrated Water Resources Management Project in the Ferghana Valley is now in its third phase. It’s an action research project—located in Kyrgyzstan, Tajikistan and Uzbekistan—funded by the Swiss Development Cooperation and jointly implemented by IWMI and its regional partner in Central Asia, the Scientific Information Center of the Interstate Commission for Water Coordination (SIC-ICWC). In its first two phases, the project developed, tested and adopted major approaches, frameworks and methodologies. It is currently set to consolidate, improve and up-scale these achievements.

...See *Water Figures Asia Issue 1, 2006*



50 liters of water - the amount used per person in cities for drinking, cooking, washing, bathing and other domestic uses.

Photo Credit: IWMI South Africa

Water Policy Briefings

The Water Policy Briefing series brings new and practical approaches to water management and planning into the policy recommendation process.

[Working Wetlands: A New Approach to Balancing Agricultural Development with Environmental Protection WPB21](#)

The trade-off between environmental protection and development is most acute in dynamic and complex ecosystems such as wetlands. Wetlands 'work' for society. They maintain environmental quality, sustain livelihoods and support biodiversity. However, socio-economic pressures mean that we are now pushing wetlands to work even harder, for example, by producing more crops or grazing more cattle. History shows that 'over-working' wetlands can cause them to change significantly—often with negative effects on the communities or even civilizations that depend on them.

[Water Governance in the Mekong Region: the Need for More Informed Policy-making WPB22](#)

Recurring water crises, global water initiatives, and demands for water reforms by development banks, have all pushed water up the agenda of most Mekong-region countries. Many changes have already been made. Now decision makers need to know what has worked, what hasn't, and why. To find out, IWMI has reviewed new water policies, plans and laws, and assessed participation, the new water 'apex bodies', and integrated water resources management (IWRM).

[Promoting Micro-irrigation Technologies that Reduce Poverty WPB23](#)

Micro-irrigation technologies are increasingly seen as a means of addressing the growing competition for scarce water resources. Appropriate low-cost drip systems have shown to have positive effects on yield, incomes, and food security. With the right institutional support, these systems can help poor farmers improve water productivity and incomes.



In many parts of West Africa, informally irrigated urban and peri-urban agriculture supports fast growing cities.

Photo Credit: IWMI Ghana



IWMI has looked at what water policies have worked and what have not worked in Mekong region countries where water is high on the agenda.

Photo Credit: Kim Geheb

[IWRM Challenges in Developing Countries: Lessons from India and Elsewhere WPB24](#)

Converting a philosophy into practice is a challenge. Recent IWRM experiences in developing countries present a case in point. At the operational level, they take a rather narrow view of the concept and have largely tended to be introduced as a blueprint package. The key to successful IWRM implementation is integration—of the local resources and in the local context.

[Does Food Trade Save Water? The Potential Role of Food trade in Water Scarcity Mitigation WPB25](#)

Few people realize that we "eat" between 2,000 and 5,000 liters of water per day—depending on the composition of our diet. With increasing global water shortages and awareness of the environmental impacts associated with irrigation, the concept of trading in virtual water—the amount of water used to produce an agricultural commodity—is receiving attention. Growing food where water is abundant and trading it to water-short areas is being recognized, in theory, as having a large potential to save water and minimize new investment in irrigation infrastructure. However, in practice, sociopolitical interests and economic costs may prove stronger than water scarcity concerns.

[Recognizing Informal Irrigation in Urban and Peri-Urban West Africa WPB26](#)

In many parts of West Africa, informally irrigated urban and peri-urban agriculture supports fast growing cities. With rapid urbanization that is occurring in the region, urban and peri-urban agriculture is thriving with significant benefits for farmers and the urban populations but is little recognized and often handicapped by water pollution. Supporting this sector requires that governments change attitudes to acknowledge the value of informal irrigation and urban agriculture, identify options for health risk reduction and bring together disparate institutions to integrate this development into urban planning.

[Rethinking Tribal Development: Water Management Strategies for Revitalizing Tribal Agriculture in Central India WPB27](#)

A major drawback of India's agriculture, watershed development and irrigation strategy has been the neglect of relatively wetter catchment areas and the tribal people living therein. Investing in small-scale interventions for improved water control can produce a dramatic impact on the productivity and dependability of tribal livelihood systems.

IWMI Board of Governors 2007

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IWMI Board of Governors 2007



Seated (left to right): Dr. Fatma Attia, Dr. U. Tan-Kim-Yong, Prof. Nobumasa Hachō (Board Chair), Ms. Cecilia López Montaño, Dr. Rivka Kfir.

Standing (left to right): Ms. Rokhaya Daba Fall, Mr. Sharat Kumar (Board Secretary), Prof. Frank Rijsberman (Director General), Mr. T.M. Abeyawickrama, Dr. Margaret Catley-Carlson.

Absent: Dr. John Skerritt, Mr. Asger Kej.

Board Statement on Risk Management

IWMI's Board of Governors has responsibility for ensuring an appropriate risk management process is in place to identify and manage high and significant risks to the achievement of the Institute's business objectives, and to ensure alignment with CGIAR principles and guidelines which have been adopted by all CGIAR Centers. These risks include operational, financial and reputational risks that are inherent in the nature, modus operandi and location of the Institute's activities, and are dynamic as the environment in which the Institute operates changes. They represent the potential for loss resulting from inadequate or failed internal processes or systems, human factors, or external events. They include low impact (and therefore irrelevance) of scientific activities; misallocation of scientific efforts away from agreed priorities; loss of reputation for scientific excellence and integrity; business disruption and information system failure; liquidity problems; transaction processing failures; loss of assets including information assets; failures to recruit, retain and effectively utilize qualified and experienced staff; failures in staff health and safety systems; and failures in the execution of legal, fiduciary and agency responsibilities.

The Board has adopted a risk management policy, communicated to all staff, that includes a framework by which the Institute's management identifies, evaluates and prioritizes risks and opportunities across the organization; develops risk mitigation strategies which balance benefits with costs; monitors the implementation of these strategies; and periodically reports to the Board on results. This process will draw upon risk assessments and analysis prepared by the Institute's staff, internal auditors, Institute-commissioned external reviewers, and the external auditors. The risk assessments will also incorporate the results of collaborative risk assessments with other CGIAR Centers, System Office components and other entities in relation to shared risks arising from jointly managed activities. The risk management framework seeks to draw upon best practice promoted in codes and standards promulgated in a number of CGIAR member countries, and it is subject to ongoing review as part of the Institute's continuous improvement effort.

Risk mitigation strategies include the implementation of systems of internal control which, by their nature, are designed to manage rather than eliminate the risk. The Institute endeavors to manage risk by ensuring that the appropriate infrastructure, controls, systems and people are in place throughout the organization. Key practices employed in managing risks and opportunities include business environmental scans, clear policies and accountabilities, transaction approval frameworks, financial and management reporting and the monitoring of metrics which are designed to highlight positive or negative performance of individuals and business processes across a broad range of key performance areas. The design and effectiveness of the risk management system and internal controls is subject to ongoing review by IWMI's internal audit service, which is independent of business units and reports on the results of its audits directly to the Director General and Board through the Board's Audit Committee.

IWMI Donors 2006

During 2006, IWMI's funding support was provided by the following governments, development banks, agencies and foundations;

- African Development Bank
- Asian Development Bank
- Australia (ACIAR)
- Canada (CIDA)
- Denmark (DANIDA)
- France
- Germany (BMZ, GTZ)
- Global Environment Facility - GEF
- International Development Research Centre - IDRC
- Ireland
- Israel
- Japan (JBIC, JICA)
- National Oceanic & Atmospheric Administration
- Netherlands
- Norway
- Sweden (SIDA)
- Switzerland (SDC)
- Sir Ratan Tata Trust
- United Kingdom (DFID)
- United Nations Food and Agriculture Organization
- United States of America (USAID)
- World Bank
- World Health Organization

The Governments of India, Iran and South Africa provided program support for IWMI-related activities in those countries.

Financial Comment

2006 in general ...

For IWMI, 2006 was a year of reforms—developing more effective and efficient structures by embarking on an alliance with WorldFish. This was pursued by setting up shared corporate services for organizational efficiency, programmatic collaboration for more effective research, and joint implementation of the ICT-KM project; to name a few. At IWMI, it meant structural changes in the corporate services, implementation of SAP, best practice sharing and joint projects with WorldFish. This also meant a continuous change process to keep pace with the increased customer demands. 2006 was also a year of the external performance and management review of the Institute.

2006 Financials in particular ...

2006 was a year that demonstrated the proactive approach and strategic thinking by the Institute that helped deal with the blow of a major funding reduction and keeping its impact to a minimum. The reduction by a donor changed the landscape of an otherwise excellent year. In 2006, IWMI recorded a total revenue of \$23.5 million, excluding Challenge Program projects not managed by IWMI. The revenue included \$8.6 million of unrestricted funding; marginally higher than 2005, and \$14.9 million of restricted funding. Total Institute expenses were recorded at \$23.6 million with a resultant deficit of \$0.1 million. The unrestricted funding marginally increased over 2004 and attributes to various increases and decreases in donor funding. IWMI's overheads and personnel cost were maintained around the 2005 level and the cash balances remain healthy.

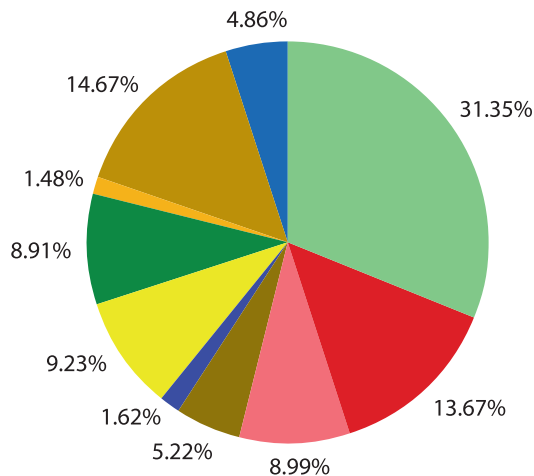
Past years ...

During the period 2000-2006, IWMI's unrestricted funding grew at a compounded annual growth rate (CAGR) of 13% and 2006 was the year of consolidation of the growth of the past years. While the revenues more than trebled, expenses grew at a similar rate with the income to accommodate the growth and expansion. IWMI's overheads as a percentage of total costs remained at 17% in 2006 as compared 23% for 2001 and 29% for 2000. This is mainly the result of the relatively low increase in support function cost in comparison to the increase in operations that more than trebled in the past years.

Financial Indicators...

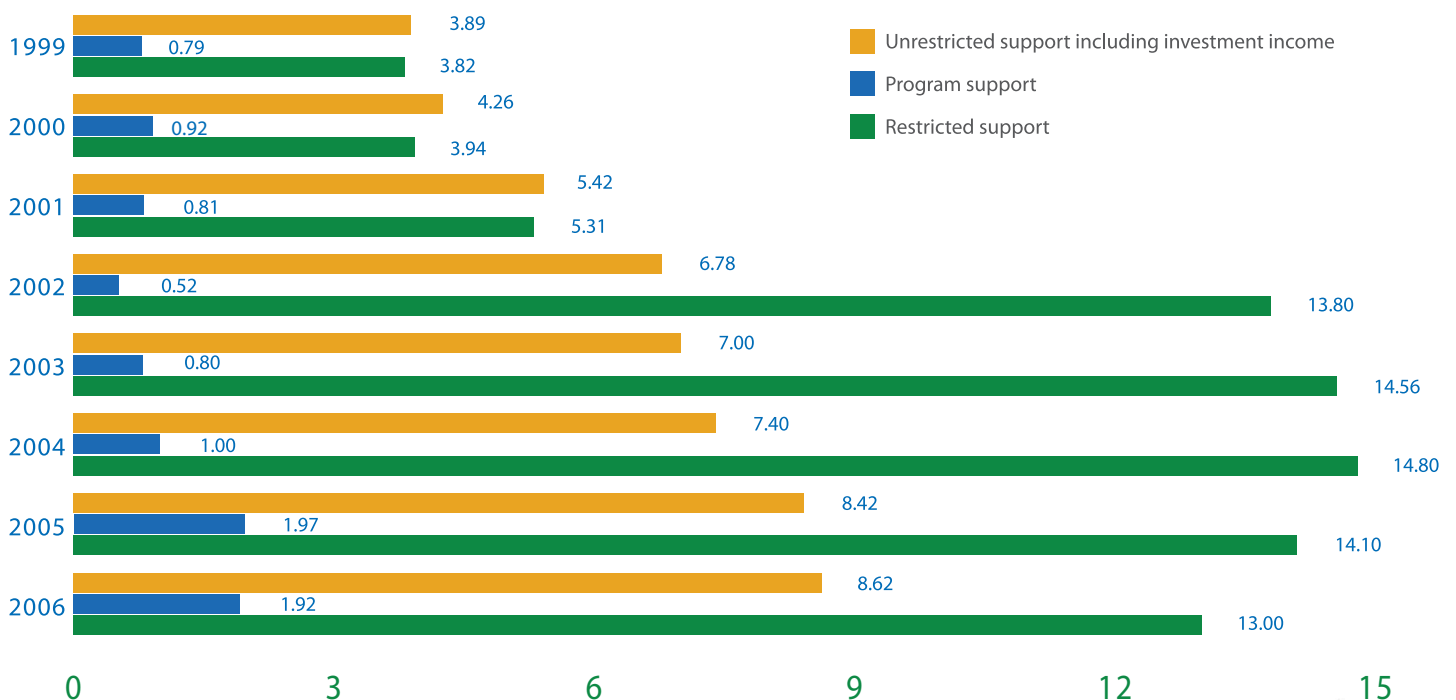
CGIAR has developed four parameters to measure financial health of the centers. These are - long term financial stability (recommended range 75-90 days), short term solvency (recommended range 90-120 days), efficiency of operations (indirect cost to direct cost) and cash management on restricted operations ratio. IWMI's long term financial stability ratio is 64 days at the end of 2006, mainly due to reduced funding from a major donor, and the short term solvency ratio is at 100 days. The efficiency of operations ratio is 21% as in 2006 and the cash management on restricted operations is 30%.

Direct Research Expenditure by Program 2006



	US\$'000	%
Basin Water Management (BWM) Theme 1	5,394	31.35
Land, Water and Livelihoods (LWL) Theme 2	2,352	13.67
Agriculture, Water and Cities (AWC) Theme 3	1,547	8.99
Water Management and Environment (WME) Theme 4	898	5.22
Systemwide Initiative on Malaria and Agriculture (SIMA)	279	1.62
In-kind & Cash Grants	1,589	9.23
Comprehensive Assessment of Water Management in Agriculture (CA)	1,533	8.91
Other Hosted Activities	255	1.48
CGIAR Challenge Program on Water and Food (CPWF)	2,524	14.67
Global Water Partnership (GWP)	836	4.86
Total	17,207	1.00

Income 1999 - 2006 (US \$ Millions)



Auditors' Letter



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Sri Lanka

■ Telephone : (0) 11 2463500
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Report of the auditors

To the Board of Governors of International Water Management Institute

We have audited the accompanying statement of the financial position of International Water Management Institute as at 31st December 2006 and the related statement of activities, changes in net assets and cash flows for the year then ended, together with the accounting policies and notes as set out on pages 3 to 24

Respective Responsibilities of the Institute's Management and Auditors

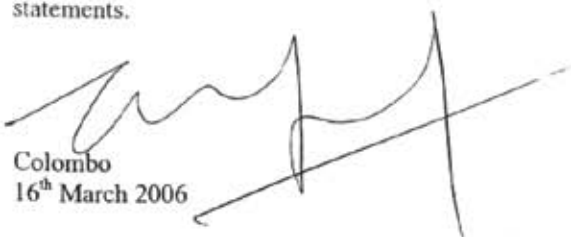
The Institute's management is responsible for preparing and presenting these financial statements in accordance with the recommendations made in the Consultative Group for International Agricultural Research (CGIAR) Financial Guidelines Series No.2-CGIAR Accounting Policies and Reporting Practices Manual (revised March 2004). Our responsibility is to express an opinion on these financial statements, based on our audit.

Basis of opinion

We conducted our audit in accordance with the International Standards on Auditing, which require that we plan and perform the audit to obtain reasonable assurance about whether the said financial statements are free from material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the said financial statements, assessing the accounting principles used and significant estimates made by the Institute's management, evaluating the overall presentation of the financial statements, and determining whether the said financial statements are prepared and presented in accordance with the recommendations made in the CGIAR Guidelines. We have obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of our audit. We therefore believe that our audit provides a reasonable basis for our opinion.

Opinion

In our opinion, so far as appears from our examination, the Institute maintained proper books of account for the year ended 31st December 2006, and to the best of our information and according to the explanations given to us, the said financial position and related statements of activities, changes in net assets, cash flows and the accounting policies and notes thereto, which are in agreement with said books and have been prepared and presented in accordance with the recommendations made in the CGIAR Financial Guidelines Series No 2-CGIAR Accounting Policies and Reporting Practices Manual (revised March 2004) and give a true and fair view of the Institute's state of affairs as at 31st December 2006 and of its activities and cash flows for the year then ended. Supplementary information on pages 25 to 37 are not a required part of the financial statements and have not been subjected to audit procedures applied in the audit of the financial statements.


Colombo
16th March 2006

■ Partners : A D B Talwatte FCA FCMA T K Bandaranayake FCA M P D Cooray FCA FCMA
Ms. Y A De Silva ACA W R H Fernando FCA FCMA W K B S P Fernando FCA ACMA
A P A Gunasekera FCA FCMA A Herath FCA D K Hulangamuwa FCA FCMA LLB (Lond)
A S M Ismail FCA FCMA H M A Jayasinghe FCA FCMA Ms. G G S Manatunga ACA
Ms. L C G Nanayakkara FCA FCMA

New Projects 2006

Project name

Life Budget US\$

Period

DANIDA - IWRM Demonstration Project in SADC region

156,024

20 months

To document an IWRM based implementation process that positively affects people's livelihoods.

- Documenting the detailed project design that is based on IWRM principles and the approach of multiple sources/multiple use systems
- Establishing supportive monitoring systems for IWRM projects
- Disseminating lessons from the project

ERU – SWITCH

160,900

5 years

To improve the scientific basis for long term strategies for sustainable urban water management, equipped to resist negative effects of global change.

- Developing an overall strategic approach to achieve sustainable UWM in the city of the future
- Developing effective storm water management options in the context of the hydrological cycle at urban and river basin levels
- Providing effective water supply services for all at minimum impact for water resources and the environment at large
- Developing effective sanitation and waste management options based on the principles of Cleaner Production
- Integrating urban water services into the ecological and other productive functions of water at city and river basin level
- Developing innovative, effective and interactive institutional arrangements covering the entire urban water cycle in the urban and broader river basin setting

ERU - Sustainable Water Andhra Pradesh

 51,299
€39,370

2 years

To work towards sustainable water management, through the implementation of a groundwater decision support tool.

SIDA - International Training on IWRM (Ramboll) Phase II

161,763

10 months

To support and stimulate the development of Integrated Water Resources Management in the participants' home countries, and encourage participants to become involved in and contribute to regional networking for Integrated Water Resources Management.

USAID - AWM Technology

200,000

Over 2 years

To identify the most promising agricultural water technologies and practices which can be promoted and scaled up in order to contribute to reducing poverty in Africa.

ADB – NARBO

67,906

16 months

To develop and implement a pilot certified training program to benchmark the performance of RBOs through a peer review process. Consequently, expected in the long term is the institutionalization of the peer review process among RBOs in Asia.

Grant Revenue

<i>Unrestricted Income</i>	Grant 2006 US\$' 000	Grant 2005 US\$' 000
Australia	379	362
Canada	698	513
China	10	10
Denmark	355	313
Department for International Development (DFID)	1,171	1,087
Germany	280	309
India	37	37
Iran	0	95
Ireland	509	746
Israel	185	190
Japan	32	101
Netherlands	614	1,089
Norway	320	149
Sweden	349	372
Switzerland	329	331
United States Agency for International Development (USAID)	644	759
World Bank	2,219	1,500
Subtotal Unrestricted	8,131	7,963
<i>Restricted Income</i>		
Australian Centre for International Agricultural Research (ACIAR)	155	254
Asian Development Bank (ADB)	313	297
African Development Bank (AFDB)	(58)	127
Government of Andhra Pradesh (ANP)	2	0
Austria	202	213
BMZ	405	332
BTC	10	0
Canada	13	455
CARE	5	18
Counterpart Consortium – Kazakhstan (CCK)	7	7
Consultative Group on International Agricultural Research (CGIAR)	88	243
CGIAR Marketing Group (CGM)	0	9
International Center for Tropical Agriculture (CIAT)	14	20
Centro Internacional de la Papa (International Potato Center (CIP)	3	2
Danish International Development Agency (DANIDA)	246	575
DFID	3,242	1,095
De Minister van Verkeer en Waterstaat (FutureWaters) (DMV)	6	0
European Union (ERU)	234	1,040
Food and Agriculture Organization (FAO)	174	198
France	1,690	2,018
Global Environmental Facility (GEF)	145	111
Deutsche Gesellschaft für Technische Zusammenarbeit GmbH (GTZ)	335	501
Global Water Partnership (GWP)	352	348
International Centre for Research in Agroforestry (ICRAF)	0	2
International Center for Biosaline Agriculture (ICBA)	26	0
International Commission on Irrigation and Drainage (ICID)	50	0
International Crops Research Institute for the Semi-arid Tropics (ICRISAT)	6	2
International Development Research Centre (IDRC)	297	122
IFAR	0	10
International Food Policy Research Institute (IFPRI)	0	12
International Livestock Research Institute (ILRI)	20	15
International Plant Genetic Resources Institute (IPGRI)	0	18
International Rice Research Institute (IRRI)	0	2
International Union for the Conservation of Nature and Natural Resources (IUCN)	4	0
India	422	408
Iran	73	0
Japan	197	287
Japan International Cooperation Agency (JICA)	2	0
MRC	24	0
Netherlands	1,197	1,872
National Institute for Rural Engineering (NIRE)	10	6
National Oceanic & Atmospheric Administration (NOAA), USA (NOA)	62	64
Norway	278	150
Fund for International Development (OPEC)	45	23
Prairie Farm Rehabilitation Administration (PFRA) (PFR)	28	0
Royal Thai Government (MONRE / DWR) (RTG)	0	7
RTI International	0	37
Swedish International Development Agency, Sweden (SIDA)	460	1,068
South Asian Network of Institutes Economist (SANIE) (SNE)	4	0
South Africa	150	150
Sri Lanka	32	24
Switzerland	2,254	1,570
Taiwan	44	43
United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)	9	5
United Nations Environment Program (UNEP)	76	0
United Nations Educational Scientific and Cultural Organization (UNESCO)	0	1
United States Agency for International Development (USAID)	477	565
United States Department of Agriculture (USDA)	11	11
World Health Organization (WHO)	17	2
Waternet (WNT)	46	55
World Bank	810	1,386
Zentrum für Entwicklungsforschung (ZEF)	213	294
Subtotal (Restricted)	14,927	16,074
GRAND TOTAL	23,059	24,037

Statement of Financial Position December 31, 2006 and 2005

	2006 US\$' 000	2005 US\$' 000
ASSETS		
Current Assets		
Cash and cash equivalents	9,078	13,441
Accounts Receivable: (Net of \$ 150,000 allowance for doubtful accounts)		
Donor	2,188	3,121
Employees	532	402
Other CGIAR Centers	57	561
Others	1,869	1,280
Inventories	49	43
Prepaid Expenses	116	183
Total Current Assets	<u>13,890</u>	<u>19,031</u>
Non-Current Assets		
Property, Plant and Equipment, net	2,516	2,098
TOTAL ASSETS	<u>16,406</u>	<u>21,129</u>
 LIABILITIES AND NET ASSETS		
Current Liabilities		
Accounts Payable		
Donor	3,705	5,276
Employees	110	98
Other CGIAR Centers	57	351
Others	835	1,099
Amount held for the Challenge Program	2,708	5,946
Accruals	132	34
Total Current Liabilities	<u>7,546</u>	<u>12,804</u>
NON-CURRENT LIABILITIES		
Accounts Payable		
Employees	2,302	1,656
Total Non Current Liabilities	<u>2,302</u>	<u>1,656</u>
Total Liabilities	<u>9,848</u>	<u>14,460</u>
NET ASSETS		
Unrestricted		
Designated	3,180	3,180
Undesignated	3,378	3,489
Total Net Assets	<u>6,558</u>	<u>6,669</u>
 TOTAL LIABILITIES AND NET ASSETS	 <u>16,406</u>	 <u>21,129</u>

IWMI Staff

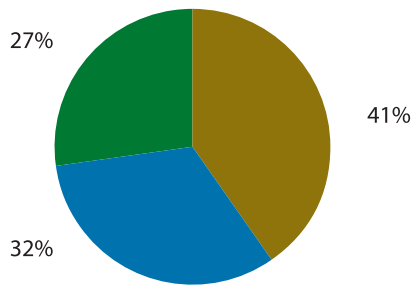
On 31 January 2007, the Institute had 111 researchers of whom 94 were internationally and regionally recruited. The latter includes 5 joint positions (one each with WorldFish, ICARDA, UNESCO - IHE, ICRISAT and IUCN), 1 Associate Expert seconded by Switzerland (SDC) and 16 Postdoctoral Fellows. On 31 January 2007 IWMI's total staff numbered 376.

When categorized by broad disciplines, 41% of the researchers are from Natural/Physical/Biological sciences, 32% from Social Science & Economics and 27% from Engineering.

The nationality composition of the researchers is diverse - 3% Australia, 7% North America, 12% Africa, 31% Europe and 47% Asia.

Engineering	30
Natural/Physical/ Biological Science	45
Social Science & Economics	36
Total	111

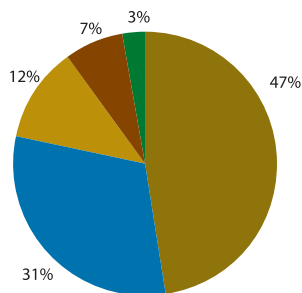
IWMI Researchers (by Discipline, 2007)



■ Social Science & Economics	32%
■ Natural/Physical/ Biological Science	41%
■ Engineering	27%

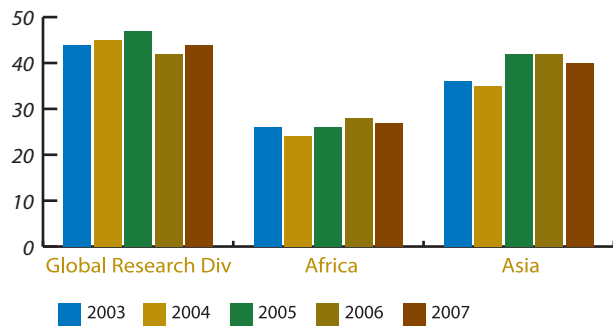
Africa	13
Asia	53
Australia	3
Europe	34
North America	8
Total	111

IWMI Researchers (by Nationality, 2007)



■ North America	7%
■ Europe	31%
■ Australia	3%
■ Asia	47%
■ Africa	12%

IWMI Researchers (by Region, 2003-2007)



Overview of All IWMI Staff (Researchers, Research Support & Non-Research)

(by Nationality as of 31 January 2007)

Country	Researchers	Research Support	Non-Research	Total
Australia	3		2	5
Bangladesh		1		1
Barbados			1	1
China	1	1		2
Canada			1	1
Denmark	1			1
Ethiopia	3	2	3	8
France	15			15
Germany	2		1	3
Ghana		12	16	28
India	17	27	17	61
Iran		3	3	6
Italy	1			1
Japan	2			2
Kenya	2	1	1	4
Malaysia			1	1
Mongolia	1			1
Morocco	1			1
Nigeria	1			1
Netherlands	6		1	7
Nepal	2	1	1	4
Pakistan	4	6	9	19
Philippines	1			1
Russia	1			1
South Africa		1	7	8
Sri Lanka	18	24	108	150
Sudan	1			1
Sweden	1			1
Senegal	1			1
Switzerland	1			1
Tunisia	1			1
Thailand	1	1		2
United Kingdom	6			6
United States	8		1	9
Vietnam	1		1	2
Zambia	1			1
Zimbabwe	3			3
Uzbekistan	4	6	5	15
Total	111	86	179	376

Gender and Diversity

Staffing

IWMI's goal as set out in its 2004-2008 strategic plan was to have 50% of its researchers from the South. This we have achieved and improved upon over the past few years and as of January 2007, 59% of IWMI researchers are from the South. In terms of IRS/RRS (Researchers) North/South balance, IWMI has now achieved the CGIAR average of 51% from the South.

IWMI has also shown progress in its gender balance. The percentage of female researchers has increased from 22% in 2003 to 32% in 2007 (23 to 35 in absolute numbers).

Policies and Practices

IWMI continues with its efforts to establish policies and procedures which support gender and diversity within the Institute and promote IWMI as an "inclusive workplace."

Crèche Facilities

With the primary objective of assisting IWMI staff members with the care of their children, and following a needs assessment, IWMI proceeded with the setting up of crèche facilities at IWMI headquarters as part of its final phase of the building refurbishment plans. The IWMI Crèche (Nursery and Day Care including infant and after school care programs) became operational in mid January 2007 and currently there are 11 children, including 2 infants, using the facilities either part-time or full-time.

Mentoring Program

IWMI held three rounds of the G&D mentoring program where both research and non-research staff participated. The objective of this program is to provide structured development inputs to young staff members by more senior staff members as mentors. A total of 27 mentor/mentee pairs have participated in this mentoring program since it was launched at IWMI in 2003. Of the 27 mentor/mentee pairs, 15 mentees were female. Feedback received from both mentors and mentees have been positive and the intention is to include a fourth round of the program in the 2007 training calendar following a needs assessment.

IWMI Leadership Development Program (IWMI LDP)

IWMI launched its own leadership development program in 2003 with 12 mentees (along with 4 mentors). It is a two-year training intervention where high potential staff across the institute and in particular young male/female staff from developing countries are identified, and inputs through formal courses and close mentoring by senior staff is provided to facilitate their accelerated growth within the organization. The program helps breakdown barriers, demonstrate mobility across the national-regional-international divides, and thereby contributes to the "one-staff" objective as well as to developing leadership skills at all levels across the organization.

The first IWMI LDP program spanning 2003-2005 was a great success. A second round (IWMI LDP-2) consisting of a highly diverse group of 12 mentees – 6 women and 6 men, 8 researchers and 4 non-research staff, 4 NRS staff and 8 RRS/IRS staff - commenced with an induction module in March 2005. This was followed by three 4-day training courses, one focused on 'team-building', the second on 'managerial styles & organizational climates' and the third on 'team styles & cultural values' in August 2005, February 2006, and October 2006, respectively. The LDP-2 is scheduled to conclude in 2007.

Harassment and Discrimination

A group of nominated IWMI Gender and Diversity Associates (GDA) with representation from Human Resources, participated in a 3-day workshop on 'ensuring a workplace of dignity' with special focus on the prevention of discrimination and harassment, facilitated by Vicki Wilde (Program Leader, CGIAR G&D Program) and Swinitha Osuri (Ombuds Services, World Bank). The participants were trained to be the first point of contact for staff on harassment and discrimination issues at the workplace. This group is now called "Respectful Workplace Advisors" (RWA) following the terminology used at the World Bank and are now fully established with a proper terms of reference. Arising from the training workshop, the RWAs took the lead in preparing several documents (IWMI Code of Conduct, Overview & Process on Harassment and Discrimination, ToR and guidelines for Investigation Panels, etc.) that have been approved and implemented.

'Work at IWMI' website

A new website highlighting the family friendly policies at IWMI, the work environment, facilities, etc., was developed and is in the threshold of going live. With today's heavy demands placed on dual career families, we believe this website will give an insight to the work environment at IWMI and attract qualified, experienced, female candidates and thereby ensure to maintain and promote a good gender and diversity balance in IWMI staffing.



Gender and Diversity Associates (GDAs) and Respectful Workplace Advisors (RWAs) at IWMI Headquarters.

Photo Credit: Dominique Perera

Staff List *Staff from 1.1.2006 to 31.3.2007*

Headquarters

Director General's Office

Dr. Frank Rijsberman, Director General, Dr. David Molden, Deputy Director General – Research, Dr. Meredith Giordano, Director – Research Impact, Dr. Deborah Bossio, Director – Research Programs/Theme Leader & Principal Soil Scientist Land, Water and Livelihoods.

Non-Research: *Ms. Shilpi Mahajan, Advisor to the Director General on Process Improvement, Ms. Shalini Kumaresan, Senior Secretary, Ms. Coretta De La Zilwa, Senior Secretary.

Program Office

Non-Research: Ms. Upeka Kariyawasam, Head, Program Office, Mr. Sanjiv de Silva, Program Officer, Ms. Natalia Abeynayake, Donor Relations Coordinator, Ms. B.A.M. Hasinika Piyasena, Quality Management Systems Coordinator, Ms. Nazreen Silva, Conference and Travel Officer, Ms. Chanchala Kariyawasam, Senior Secretary.

Information and Knowledge Group (IKG)

*Dr. Robert Guy Ramsay, Head, Information & Knowledge Group – IWMI/WorldFish, Ms. Sanjini De Silva, Acting Head, Information and Knowledge Group,

Communication and Knowledge Sharing (CKS):

Ms. Nadia Manning, Communications Coordinator/ Researcher, Ms. Samyuktha Varma, Communications Coordinator/ Researcher, Ms. Dawn Rodriguez, Communications Coordinator/Writer, Ms. Sharni Jayawardena, Communications Coordinator, Mr. Dominique Michael Perera, Web Master, *Mr. Asela W.S. Dassanayake, Web Services Officer, Mr. Mahendra Palliyaguruge, Web Developer, Mr. L.G.G.N. Sandaruwan Wickrama, Web Developer, Mr. G.K. Udeesha Indira Wijenayake, Web Services Officer, Mr. Manoj Pradeepa Dias Jayasuriya, Web Designer, Ms. Sharmani Gunawardena, Administrative Officer.

E - Publishing: Ms. Pavithra Amunugama, Administrative Officer – Workflow/Traffic, Mr. Mahen Chandrasoma, Senior Production Editor, *Mr. Joseph Perera, Production Editor, Mr. Harshana Rambukwella, Production Editor/Entry-level Science Writer, Mr. Sumith Fernando, Layout and Graphics Specialist, Ms. Shyamine Faleel, Layout and Graphics Specialist, Mr. Nimal Attanayake, Layout and Graphics Specialist.

E – Library: Ms. Prasannalakshmi Sambandamurthy, Head of Library – IWMI/WorldFish, Mr. Chandima Gunadasa, Electronic Library Resources Specialist, Ms. Manik de Alwis, Information Management Assistant, Ms. Sandya Suriyarachchi, Information Management Assistant, Mr. Kaushalya Moragaspiya, Information Resources Assistant, Ms. A.G.N. Subashinie Abeyratne, Information Management Assistant.

Corporate Services Division

Mr. Sharat Kumar Sadashivpeth, Director Corporate Services, Mr. Amol J. Khisty, Head, Finance & Administration.

Administration

Mr. Sepala Amarasuriya, Head, Purchasing and Administrative Services, Mr. Upali Karunanayake, Senior Purchasing Assistant, Ms. Shahanaz Makawita, Secretary.

Office Support Systems

Mr. S.M.B. Seneviratne, Head - Office Support Systems Office, Mr. Ajith Wijayarathne, Distribution Officer, Ms. Sujatha Dassanayake, Receptionist/Junior Secretary, Ms. Viranga Kularatne, Receptionist/Junior Secretary, Mr. A. Joseph, Junior Clerk, Mr. K. Punchibanda, Junior Clerk, Mr. N.S. Ranjithsinghe, Junior Clerk, Mr. S.M. Edirimanne, Production Assistant/Clerk, Mr. Lal Abeykoon, Junior Clerk, Mr. S.M.H.P. Samarakoon, Office Aide/Steward.

Transport & Maintenance

*Mr. Eardley De Silva, Acting Head, Building and Transport, Ms. Dilini Wijeweera, Head, Facilities Management/Advisor IKG, Mr. Kapila Pathiraja, Assistant Manager, Building Engineering Services & Transport, Ms. Thusitha Jayatilleke, Administrative Officer, Mr. Ravi Dissanayake, Transport Assistant, Ms. Iresha Dharmawardhana,

Administrative Assistant, Mr. S. Arockiam, Plumber, Mr. P.W. Pathirana, Electrician, Mr. S. Krishnarajah, Junior Clerk, Mr. P.A. Rezel, Electrician, Mr. Sunil Jayatillake, Carpenter/Fitter, Mr. K.G.S. Kumara, Driver, Mr. Priyantha Chandrasena, Driver, Mr. Ajith Perera, Driver, Mr. Ajantha Perera, Driver, Mr. K.K.R. Kumara, Driver, Mr. W.D. Upali, General Labourer.

Travel Office

Mr. Nihal Silva, Officer – Travel & Visa, Mr. Adams Vasudeva Aloysius, Coordinator – Travel & Visa.

International Research Support Services (IRSS)

Non-Research: Dr. Barry K.C. Tan, Director, International Research Support Services – IWMI/WorldFish.

Finance

Ms. Fahima Mubarak, Finance and Operations Development Manager, Mr. Gamini Halvitige, Financial Controller, Ms. Sanjeevani Fernando, Manager – Project Accounting, Ms. Shabeena Zafrullah, Manager, Budgets & MIS, Mr. Ranjith Samarakoon, Accountant, Mr. Kushan Perera, Officer - Financial Systems, *Mr. Shantha Kumara Gamage, Assistant Budget Officer, *Mr. Tissa Rajanayake, Accounts Officer, *Mr. Kumara Dharmasiri, Cashier/Accounts Clerk, *Ms. Sriyani Seneviratne, Accounts Officer, *Mr. Manoj Gunasekera, Accounts Officer – Financial Systems, Mr. Manjula Rowel, Officer – General Accounting, *Ms. Avanthi Enoka Amuhengoda, Officer – Project Accounting (Asia), *Ms. Upulika Hettiarachchi, Officer – General Accounting (GRD), *Mr. Shehan Kahandagamage, Officer – General Accounting, Ms. Kokila Muttiah, Officer – Project Accounting, Mr. Lakshitha Munasinghe, Officer – Project Accounting, Mr. E.A. Laksha Dananjaya de Alwis, Officer – Project Accounting, Mr. Chrishan Dunuwila, Junior Accounts Assistant, Mr. Mahilal Jayawardena, Stores Officer, *Mr. D.M. Gunasekera, Stores Helper, Ms. Dhanushi Samaranyake, Junior Secretary.

Human Resources

Ms. Shanthi Weerasekera, Manager, Human Resources, Ms. Kamani Rajanayake, Human Resources Operations Manager, Mr. David Van Eyck, Training, Career Development & Capacity Building Officer, Ms. Anusha De Silva, Human Resources Administrator, Ms. Thushari Dissanayake, Human Resources Administrator.

Information & Communications Technology (ICT)

*Ms. Ruwanthi Fernando, Head, Information and Communications Technology, Mr. Nirudha Perera, Network Administrator, Mr. M.Z.M. Riazzi, Database Developer/Administrator, Mr. Shaminda Illangatilaka, Assistant Network/Systems Administrator, Ms. H. Sunari Elizabeth Silva, Software Engineer, Ms. Woranga Palingu Kumari Atukorale, Software Engineer, Mr. Ajantha Ihalawela, Software Engineer, Mr. Sanjeeva Amarasekera, Help Desk Coordinator, Mr. Arshad Razali Iyne, Help Desk Coordinator, Mr. Ranjith Wickremasinghe, ICT Support Officer, Mr. Shantha Marasinghe, PC Support Technician, *Ms. Veronica Lumanauw, Administrative Officer.

Global Research Division (Sri Lanka)

Principal Manager: Ms. Julie van der Blik, Director Global Research Division.

Principal Researchers: Dr. Hugh Turral, Theme Leader, Basin Water Management, Dr. Max Finlayson, Theme Leader, Water Management and Environment, Dr. Vladimir Smakhtin, Principal Eco-Hydrologist, Dr. Francis Gichuki, CP Theme Leader - Integrated Basin Water Management Systems, *Dr. Naoya Fujimoto, Deputy Coordinator Comprehensive Assessment, Wetland Ecology, Dr. Hideto Fujii, Principal Researcher, Dr. Prasad Thenkabail, Head, RS/GIS & Natural Resources Management, Dr. Mark Giordano, Head, Institutions and Policies (GRD), Dr. Rathinasamy Maria Saleth, Senior Institutional Economist, Dr. Francois Molle, Water Management Specialist, Dr. Claudia Sadoff, Principal Economist (Joint Appointment with IWMI & IUCN).

Senior Researchers: Dr. Charlotte de Fraiture, Head, Global Change and Environment, Dr. Robert Zomer, Senior Landscape Ecologist, Dr. Mobin-ud-din Ahmad, Senior Researcher – Hydrology & Remote Sensing, Dr. Sarath Abayawardana, Head, Sri Lanka Program, *Dr. Intizar Hussain, Senior Economist, *Dr. Karen Villhoh, Ground Water Modeling Specialist, Dr. Marc Andreini, Hydrologist.

Researchers: Ms. Rebecca Tharme, Researcher, Dr. Sophie Nguyen Khoa Man, Water & Fisheries (Joint Appointment with IWM & WorldFish), Mr. Olivier Briet, Medical Entomologist, Dr. Luna Bharati, Researcher – Hydrology and Water Resources, Dr. Sonali Senaratna Sellamuttu, Researcher – Livelihood Systems, Dr. Sithara Atapattu, Coastal Zone Ecologist, Comprehensive Assessment of Water Management in Agriculture, Mr. Dhananjaya Niriella, Environmental Engineer, Mr. S.C Piyankarage, Chemist, Mr. K. Jinapala, Institutions Specialist, Mr. Manju Hemakumara, Benchmark Basin Coordinator, Mr. Parakrama Weligamage, Agricultural Economist, Mr. P.G. Somaratne, Sociologist, Ms. Alexandra Clemett, Researcher-Livelihoods/Water Quality/Waste Water, Mr. Lal P. Muthuwatte, Hydrologist/Mathematical Modeler, *Dr. Pierre Marchand, Researcher/Data Warehouse Architect, *Ms. Domitille Vallee, Water, Food, Environment Specialist/Assessment Facilitator-Comprehensive Assessment of Water Management in Agriculture, *Dr. Jean-Luc Sabatier, Water Management Specialist.

Post-Doctoral Scientists: *Dr. Lisa Freja Schipper, Post-Doctoral Fellow - Comprehensive Assessment of Water Management in Agriculture, *Dr. Line Gorden, Post - Doctoral Fellow - Comprehensive Assessment of Water Management in Agriculture, Dr. Yongsong Liao, Post-Doctoral Fellow - Global Modeling, Dr. Vinay Nangia, Post-Doctoral Fellow – Irrigation, Dr. Aditi Mukherji, Post-Doctoral Fellow – Economics, Dr. Chandrashekar M. Biradar, Post-Doctoral Fellow - Remote Sensing, Dr. Nidhi Nagabhatla, Post-Doctoral Fellow - Landscape Ecology, Dr. Lisa Maria, Rebelo, Post-Doctoral Fellow - Wetlands Remote Sensing.

Research Officers: Mr. B.R. Ariyaratne, Benchmark Basin Coordinator, Mr. Noel Aloysius, Water Resources Engineer, Mr. Neelanga Weragala, Water Resources Engineer, Ms. Nishadi Eriyagama, Water Resources Engineer, Ms. Priyanka Dissanayake, Environmental Scientist, Ms. Charmini Kodituwakku, Research Officer – Forestry and Environmental Specialist, Mr. Deeptha Wijerathna, Agricultural Economist, Mr. Markandu Anputhas, Biometrician, Ms. Shyamalie de Silva, Social Scientist, Mr. Priyantha Jayakody, Agricultural Engineer, Mr. M.G.S.D. Nilantha, Remote Sensing/GIS Specialist, Ms. R. Wasantha Kulawardhana, Remote Sensing/GIS Specialist & Web Developer, Mr. Jagath Chandralal Vithanage, Remote Sensing/GIS Specialist, Mr. Athula Sanjeewa Manamperi, Water Resources Engineer, *Mr. Shahriar Pervez, GIS Specialist, Mr. Chandana Gangodagamage, Remote Sensing Specialist, Ms. Yuan Jie Li, Research Officer – RS/GIS Expert, Mr. Aminul Islam, Research Officer – RS/GIS, Mr. Dheeravath Venkateswarlu, RS/GIS Expert, Mr. Velpuri Naga Manohar, Remote Sensing Specialist, Mr. Praveen Noojipady, Research Officer – RS/GIS Specialist, Mr. D.G.S. Gunasinghe, Digitizing Operator, Mr. A.D. Ranjith, Digitizing Operator, Ms. Thushari Perera, Research Assistant.

Research Support: Mr. M. Dayananda, Field Data Collector, Mr. Nihal Dayasena, Field Data Collector, Mr. Sarath Lionaratne, Field Data Collector, Mr. N.G. Indrajith, Field Data Collector.

Non-Research: Mr. M. Sadir, Software Developer, Mr. S.A. Anjitha Senarath, Intranet/Web Services Developer, Mr. Nishath Yapa, Data Warehouse Database Administrator, *Mr. Subramaniam Jeyakumaran, Data Warehouse Software Engineer, *Mr. Tharmanathan Ramkumar, Data Warehouse Database Administrator, Mr. P.G. Ruchira Somaratne, Data Warehouse Database Administrator, Ms. Lakmali Wijesinghe, Metadata Assistant, Ms. Sepali Goonaratne, Administrative Officer, Ms. Mala Ranawake, Administrative Officer, Ms. Janitha Godamuduna, Secretary to Director, GRD, Ms. Himani Elangasinghe, Senior Secretary, Ms. Ashra Fernando, Senior Secretary, Ms. Arosha Ranasinghe, Secretary, Ms. Samanmali Jayatillaka, Secretary, Ms. Nilupuli Pethiyagoda, Secretary, *Mr. D.W. Premachandra, Data Entry Clerk.

ASIA

Principal Researcher: Dr. Peter McCornick, Director, Asia.

Non-Research: Ms. Yvonne Weerasinghe, Senior Secretary.

IWMI Southeast Asia (Penang, Malaysia)

Principal Researcher: Dr. Andrew Noble, Head, SE-Asia.

Senior Researcher:
Dr. Chu Thai Hoanh, Senior Water Resources Engineer.

Researchers: *Mr. Jean-Louis Janeau, Soil Scientist, Dr. Arlene Inocencio, Economist.

Research Support: Ms. Teoh Shwa Jiau, GIS/RS Specialist.

Non-Research: *Mr. Suparuek Puttakhhot, System Network Administrator, Ms. Florine Lim, Office Manager.

IWMI Laos

Principal Researcher: Dr. Christian Valentin, Head, IWMI-Laos.

Senior Researchers: *Dr. Anneke De Rouw, Agronomist, Dr. Olivier Ribolzi, Hydrogeochemist, Dr. Alain Pierret, Root Systems Scientist.

Researchers: Mr. Jean-Pierre Thiebaut, Hydrologist, *Mr. Nobert Silvera, Hydrologist, Mr. Guillaume Lestrelin, Human Geographer, Mr. Emmanuel Bourdon, Soil Scientist, Mr. Yann Le Troquer, Geophysician.

Post Doctoral Scientists: Dr. Olga Vigiak, Post-Doctoral Fellow in Landscape Ecology.

IWMI Vietnam

Senior Researchers

Dr. Didier Orange, Hydrologist & Geochemist, Mr. Thierry Henry des Tureaux, Hydrologist, *Ms. Floriane Clement, Social Scientist, Dr. Pascal Jouquet, Soil Scientist and Biologist.

Non-Research: Ms. Giang Tran Thi Huong, Secretary.

IWMI Cambodia

Senior Researcher: Dr. Suraphol Chandrapatya, Agricultural Extension & Development Specialist.

Researcher: Mr. L.R. Perera, Social Scientist.

Research Officer: Ms. Wannipa Soda, Agricultural Scientist.

IWMI Uzbekistan

Senior Researchers:

Dr. Herath Manthritilake, Head, Central Asia.

Researchers: *Dr. Iskandar Abdullaev, Water Management Specialist, Dr. Jusipbek Kazbekov, Researcher, Mr. Alexander Platonov, Researcher (GIS/RS Specialist), Dr. Akmal Karimov, Consultant (Technical Coordinator of Bright Spots Project).

Post-Doctoral Scientists: Ms. Tumor Gunchinmaa, Post-Doctoral Fellow – Economics/Social Sciences.

Research Officers: Ms. Nargiza Nizamedinkhodjaeva, Research Officer, Mr. Murat Yakubov, Research Officer, Mr. Qahramon Jumaboev, Research Officer, Mr. Oytur Anarbekov, Research Officer, Ms. Ikkal Yusupova, Research Officer.

Research Support Staff: *Ms. Mariya Motorina, Consultant (Assistant on Knowledge Sharing), Ms. Yuliya Efremova, Consultant (Assistant to GIS/RS Specialist).

Non-Research: Mr. Ilhom Babaev, Finance and Administration Officer, *Ms. Liliya Gatina, Accountant, *Ms. Dildora Hojimatova, Personal Assistant to Head, IWMI-Central Asia, Mr. Alexy Filonenko, IT Specialist/Administrative Support Staff, *Ms. Gulbakhor Umarakhunova, Personal Assistant, Mr. Ilya Pak, Driver/Office Assistant, Mr. Ilshat Tukhvatullin, Driver/Office Assistant, Ms. Olga Petrova, Cleaner/Office Assistant.

IWMI Iran

Researchers: Dr. Asad Sarwar Qureshi, Head, IWMI-Iran.

Research Officers: Mr. Ilyas Masih, Research Officer, Mr. Poolad Karimi, Research Officer, *Mr. Ahmad Fatehi Marj, Research Officer, *Mr. Ali Akbari, Research Officer.

Research Support: Ms. Sara Marjanizadeh, Research Fellow

Non-Research: Ms. Atefeh Davarzaman, Secretary, Mr. Reza Taramashloo, Driver/Office Assistance, Ms. Soudabeh Gavshanian, Cleaner.

IWMI Hyderabad

Principal Researchers:

Dr. Madar Samad, Principal Researcher/Head - India and Nepal.

Senior Researchers:

Dr. Priyanie Amerasinghe, Researcher - Bio-Medical Science, Dr. Robert Simmons, Soil Scientist.

Researchers: Dr. Anju Gaur, Researcher - Water Resources Engineering, Dr. Petra Hellegers, Researcher - Water Economist (Joint Appointment with IWMI & WUR), Dr. Deepa Joshi, Researcher - Gender & Livelihoods, *Ms. Jetske Bouma, Environmental Economist (Joint Appointment with IWMI & University of Tilburg).

Post-Doctoral Scientists: *Dr. Trent Biggs, Post-Doctoral Scientist/Water Quality, Dr. Sylvain Massuel, Post-Doctoral Fellow - Hydrology.

Associate Expert:

Mr. Mattia Celio, Associate Expert - Water Management.

Research Officers: *Mr. P. Narayana, Senior Research Officer - Energy Water Management, Mr. Murali Krishna Gumma, Research Officer (GIS & Remote Sensing), Mr. T.P. Gangadhara Rao, Research Officer (GIS & Remote Sensing), Mr. Kaushal Garg, Scientific Officer - Hydrology, *Ms. M. Gayathri Devi, Research Officer - Urban Agriculture and Wastewater Livelihoods, *Ms. Cecilia Abraham, Communications Officer - Virtual Academy for Semi Arid Tropics.

Research Support: Ms. R. Rama Devi, Research Assistant, Ms. Urmila Matha, Research Assistant, Mr. Sreedhar Acharya, Officer (Data Analysis), Ms. Saba Ishaq, Scientific Officer (Urban & Peri-urban Agriculture), *Ms. Sweta Agrawal, Associate (Information Management).

Non-Research: *Ms. P. Roja Rani, Administrative Officer, Ms. Judith Christiana, Administrative Associate, Ms. Navanitha Raghupathi, Administrative Associate, *Mr. Raja Prakash, Associate - Data Entry, Mr. B.S.C Sekhar, Office Assistant, Mr. Mohammed Qadir, Driver-cum-General Assistant.

IWMI New Delhi

Senior Researchers: Dr. B.R. Sharma, Liaison Officer/Senior Researcher, Dr. Upali Amarasinghe, Senior Statistician.

Post-Doctoral Scientists:

Dr. Anik Bhaduri, Post-Doctoral Fellow - Resource Economics.

Research Support: Mr. B.K. Anand, Research Consultant.

Non-Research: Ms. Meena Negi, Administrative Associate, Mr. Sanjay Singh Bisht, Driver-cum-General Assistant.

IWMI Anand

Principal Researchers: Dr. Tushaar Shah, Senior Advisor to the DG.

Senior Researchers:

Dr. Sanjiv Phansalkar, Senior Researcher and ITP Leader.

Post-Doctoral Scientists: Dr. Sunderrajan Krishnan, Post-Doctoral Fellow in Water Resource Systems and Policy.

Researchers: Dr. M. Dinesh Kumar, Senior Scientist (Hydrology), Mr. Shilp Verma, Consultant.

Research Support: Mr. Debdoot Mohanty, Manager, CIn Cell, Dr. Rakesh Tiwary, Consultant, *Dr. O.P. Singh, Consultant, Mr. Santanu Ghosh, Consultant, Ms. Amrita Sharma, Consultant, Ms. Trishikhi Raychoudhury, Consultant, Dr. Rajnarayan Indu, Consultant, Mr. Nirmalya Choudhury, Consultant, Ms. Zankhana Shah, Consultant, Mr. Nitin Bassi, Consultant, Mr. Ankit Patel, Consultant, *Mr. Shekhar Sinha, Consultant, *Mr. Malkit Singh, Consultant, *Ms. Archana Purohit, Consultant, *Ms. Chaitali Purohit, Consultant, Mr. Kairav Trivedi, Consultant, Mr. Vikas Kakkar, Consultant, Mr. Amit Kumar Patel, Program Associate, Mr. Manoj Kumar Sharma, Team Leader NGI, *Mr. M.M. Kapadia, Field Coordinator, NGI, Mr. Ajinkya Borkar, Consultant, NGI.

Non-Research: Mr. Pankaj Kole, Consultant - Project Monitoring and Administration, Mr. P. Reghu, Executive Assistant, Ms. Alpa Dave, Consultant (Communications), NGI, Mr. Bijumon George, Systems Associate, Mr. Anil Parikh, Consultant (Accounts), Mr. M. B. Upadhyaya, Administrative Associate.

IWMI Nepal

Researcher: Dr. Dhruva Pant, Head, IWMI-Nepal.

Research Support: Ms. Pratima Shrestha, Consultant, *Ms. Rasy Chitrakar, Consultant (Program Support).

Non-Research: *Mr. Sudarshan Pandey, Office Manager (Nepal).

IWMI Pakistan

Researchers: Mr. Abdul Hakeem Khan, Head, IWMI Pakistan.

Research Officers: Mr. Aamir Nazeer, Economist, Mr. Sarfraz Munir, Junior Researcher (WM), Mr. Asghar Hussain, Spatial Data Analyst, Mr. Tariq Mehmood, Research Officer.

Non-Research: Mr. Ata-ur-Rehman, Research Officer, Mr. Tabrez Ahmad, Secretary/Personnel Assistant, Mr. Moghis Ahmad, Accountant, Mr. Asif Mahmood, Manager IT, Mr. Riaz Wicky, Driver/Office Assistant, Ms. Farzana Taj, Librarian, Mr. Pervaiz Ramzan, Transport Incharge.

Faisalabad Field Office

Research Support: Mr. Waqas Ahmad, Research Assistant, *Ms. Naveed Farah, Research Assistant.

Non-Research: Mr. Muhammad Saleem, Driver, Mr. Muhammad Yousaf, Cook cum Chowkidar.

AFRICA

IWMI Southern Africa (Pretoria)

Principal Researchers: *Dr. Douglas Merrey, Principal Researcher, Dr. Barbara van Koppen, Rural Sociologist Poverty, Gender, and Water.

Senior Researchers: Dr. Hilmy Sally, Head, Southern Africa, *Dr. Cliff Mutero, SIMA Coordinator, Dr. Sylvie Morardet, Agricultural Economist, *Dr. Dominique Rollin, Agronomist, Mr. Christian Cheron, Rural Water and Forestry Engineer.

Researchers: Dr. Everisto Mapedza, Researcher - Social and Institutional Scientist, Dr. Amy J. Sullivan, Social Scientist, Mr. Yogesh Bhatt, Outreach Coordinator, Dr. Mutsa Masiyandima, Hydrologist, Dr. Pius Chilonda, Sub-Regional Coordinator, Strategic Analysis & Knowledge Support Systems.

Post-Doctoral Scientists: Dr. Jayashree S. Pachpute, Post-Doctoral Fellow - Land & Water Productivity.

Research Support: Mr. Thulani Magagula, Hydrologist - RS/GIS.

Non-Research: Ms. Mary Njonge, Office Manager, Mr. Kobus Ras, IT Specialist, *Ms. Carol Valerie Whipp, Financial Administrator, Ms. Dudu Mazibuko, Financial Administrator, Ms. Rachel Mashele, Junior Secretary, Ms. Maite Sotsaka, Communication Coordinator, Ms. Boitumelo Mogapi, Administration Clerk, Mr. Hosiab Ngenwenya, Driver/Messenger, Mr. Harold Magagula, Driver.

IWMI West Africa (Ghana)

Principal Researchers: Dr. Akiya Bahri, Director, Africa, Dr. Pay Drechsel, Theme Leader, Agriculture, Water and Cities.

Senior Researchers: Dr. Boubacar Barry, Glowa Project Coordinator, Dr. Liqa Raschid-Sally, Waste Water Specialist, IWMI West Africa.

Researchers: Mr. Mehmood Ul Hassan, Head, IWMI West Africa, Dr. Olufunke Cofie, Soil Scientist, *Dr. Adesola Olutayo Olaleye, Wetland Agronomist, Dr. Regassa Ensermu Namara, Economist, Dr. Hammou Laamrani, Researcher – Health.

Post-Doctoral Scientists: *Dr. Adetola Ibidunni Adeoti, Agricultural Economist, Dr. Anne Chaponniere, Post-Doctoral Fellow.

Research Officers: Mr. Theophilus Otchere-Larbi, Capacity Building and Training Officer - under RUA II project, Mr. Raymond Kasei, Research Officer, Mr. Bernard Keraita, Irrigation and Water Engineer, Mr. Philip Amoah, Environmental Scientist, Mr. George Danso, Agricultural Economist, Mr. Emmanuel Obuobie, Water Engineer, Mr. Ernest Mensah Abraham, Knowledge Management Officer, *Mr. Luke Nsugnana-Ang Abatania, Research Officer, Mr. Godsway Kafui Cudjoe, Research Officer – Ghana Strategy Support Program (IFPRI).

Research Support: Mr. Gerald Forkuor, Research Assistant, Mr. Mark Osa Akrong, Assistant Research Officer, Mr. Kwame Osei Boateng, Research Assistant, Mr. Maxwell Selase Kwasi Akple, Assistant Research Officer.

Non-Research: Mr. Lookie Kojo Amuzu, Office Manager, Ms. Charlotte Amponsah, Finance Officer, Mr. Eric Korankye, IT Officer, Mr. George Mortey, Administrative Officer, Ms. Patience Abuchow, Administrative Assistant, Ms. Linda Beccles, Administrative Assistant, Mr. Daniel Ofori, Accounts Officer (Glowa Volta), Ms. Lydia Amoah, Admin. Assistant (Challenge Program), Ms. Tonya Schuetz, Programme Manager, Mr. Eli Sokpoli, Driver (Glowa Volta), Mr. Ebenezer Aboah, Cleaner/Gardener, Mr. David K. Orchard, Driver (Glowa Volta), Mr. Martin Ofori, Driver, Mr. Daniel Twumasi, Driver, Mr. Salisu Adams, Driver (Glowa Volta), Mr. Alfred Ghartey Driver (IFPRI), Mr. Edward Osei Boateng, Cleaner/Electrician.

IWMI East Africa and Nile Basin (Ethiopia)

Senior Researchers: Dr. Seleshi Bekele Awulachew, Head, East Africa, Dr. Matthew McCartney, Hydrologist, Dr. Eline Boelee, Health and Irrigation Specialist, Dr. Yasir Abbas Mohamed, Senior Researcher (Joint Appointment with IWMI and UNESCO-IHE), Dr. Tilahun Amede, Scientist – Water-livestock research (Joint Appointment with IWMI & ILRI).

Researchers: Mr. Philippe Lemperiere, Agronomist & Irrigation Specialist, Ms. Gayathree Jayasinghe, Biometrician.

Post-Doctoral Scientists: Dr. Godswill Makombe, Post-Doctoral Fellow – Economist, *Dr. Michiko Ebato, Post-Doctoral Fellow in Gender in Multiple Use Water Supply Services in Sub-Saharan Africa.

Research Support: *Mr. Desalegne Simachew, Liaison Scientist MUS Project, Dr. Fitsum Hagos, Social Science/Economist, Mr. Makonnen Loulseged, Water Resources Specialist, Mr. Michael Menker, Irrigation/Agricultural Engineering.

Non-Research: Ms. Nigist Wagaye, Senior Programme Assistant, Ms. Aster Deneke, GIS, IT & Database Expert, Ms. Tsegereda Lemma, Secretary, Mr. Daba Dandena, Driver.

HOSTED PROGRAMS

Global Water Partnership Secretariat (GWP)

Principal Manager: Mr. Lalith Dassenaik, Coordinator, IWMI-GWP Resource Centre.

CGIAR Challenge Program on Water and Food (CPWF)

Principal Researcher: Dr. Jonathan Woolley, Coordinator - Challenge Program on Water and Food.

Principal Manager: Ms. Pamela George, Program Manager - Challenge Program on Water and Food.

Research Officers: Ms. Priyantha Jayasuriya Arachchi, Data Analyst.

Non-Research: Ms. Marcia F. Macomber, Capacity Building Officer, Ms. Amena Mohammed, Communications Coordinator, Ms. Sharon Perera, Executive Assistant, Ms. Marene Abeyesekere, Finance Administrator, *Ms. I. Deborah Tracey Koch, Administrative Officer, Ms. Stephni Fernando, Administrative Officer.

International Centre for Underutilised Crops (ICUC)

Principal Researcher: Dr. Hannah Jaenicke, Director, International Centre for Underutilised Crops,

Research Officer: Mr. A.H.M. Sampath Abeyrathne, Processing and Small Business Development Specialist.

Non-Research: Ms. Sushilla Rajamanie, Administrative Officer.

* Staff left in 2006/2007 (period covered – 01 Jan 2006 to 31 March 2007)

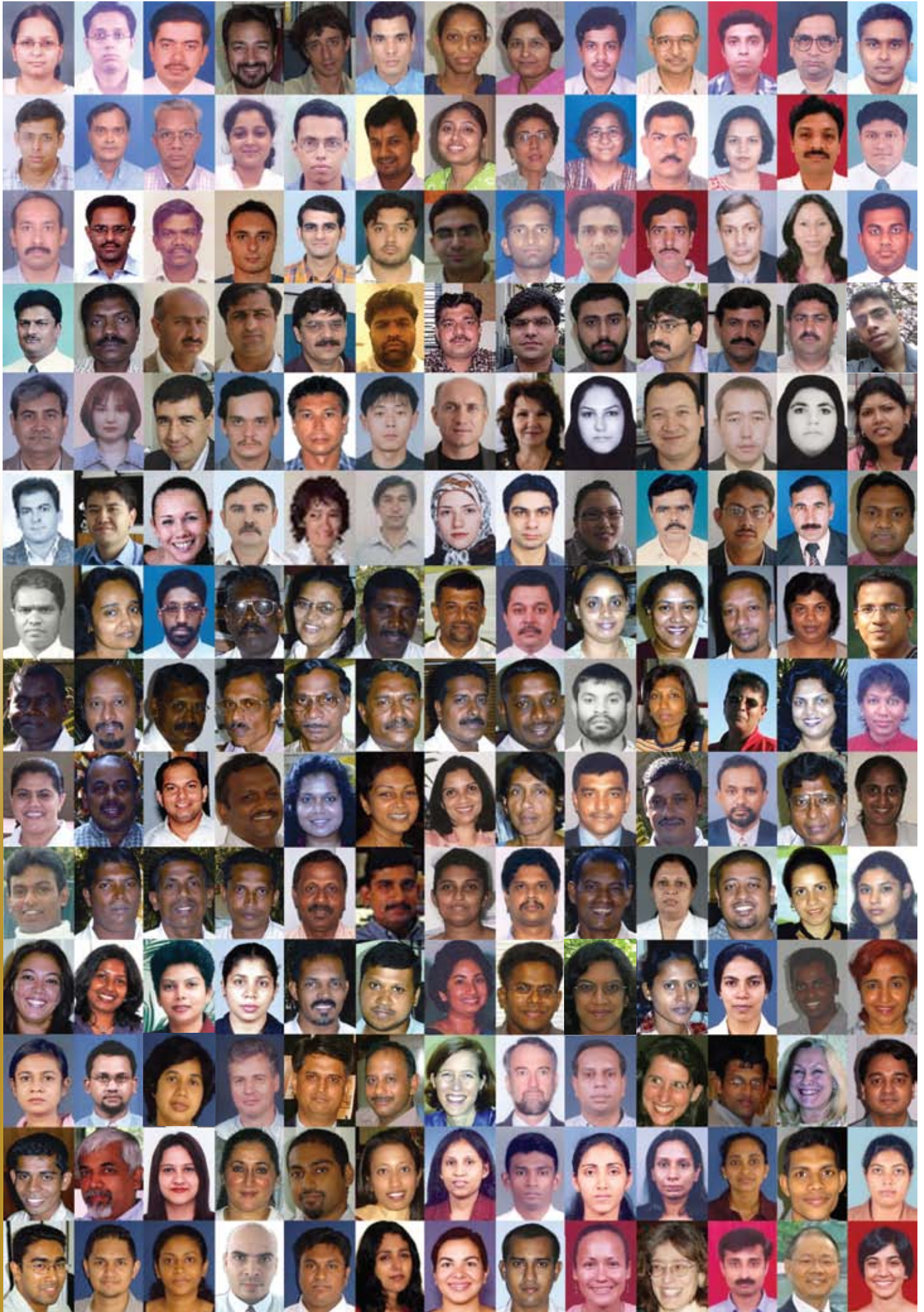


Views diverge sharply on the competing choices for water for food and for ecosystems. By bringing together diverse groups of people with different perspectives, it is possible to find common ground.

Comprehensive Assessment of Water Management in Agriculture

Photo Credit: Nadia Manning

IWMI STAFF





IWMI PUBLICATIONS LIST 2006

I. Peer Reviewed Outputs

- Research Reports
- Comprehensive Assessment Research Reports
- Journal articles
- Books
- Book Chapters
- Conference/Workshop Proceedings
- Conference/Workshop Proceedings – Chapters
- Other Technical Reports
- Editorials/Book Reviews
- Theses (MSc/PhD) Accepted
- Research Reports (ICUC)
- ICUC Conference/Workshop Proceedings and other peer reviewed articles

II. Non-Peer Reviewed Outputs

- Journal Articles
- Working Papers
- CPWF Working Papers
- Monographs
- Monograph Chapters
- Policy Briefs
- Water Figures
- Comprehensive Assessment Newsletter
- Conference/Workshop Proceedings
- Conference/Workshop Proceedings – Chapters/ Paper presented
- ICUC Conference/Workshop Proceedings
- Other Outputs
- Project reports
- Discussion papers
- Newsletters
- Other technical outputs
- Newspaper articles
- Miscellaneous

III. Keynote Addresses and other Presentations

- Keynote speeches/presentations
- Invited papers
- Conference/workshop presentations
- Conference/workshop poster presentations
- ICUC Conference/workshop poster presentations

Notes:

- IWMI authors highlighted.
- NARS-based authors underlined.

Peer Reviewed Outputs

RESEARCH REPORTS

- 1. Abdullaev, Iskandar; Ul Hassan, Mehmood; Manthrilake, Herath; Yakubov, Murat.** 2006. The reliability improvement in irrigation services: Application of rotational water distribution to tertiary canals in Central Asia. Colombo, Sri Lanka: IWMI. 22p. (IWMI Research Report 100)
- 2. Aslam, M.; Prathapar, S. A.** 2006. Strategies to mitigate secondary salinization in the Indus Basin of Pakistan: A selective review. Colombo, Sri Lanka: IWMI. 22p. (IWMI Research Report 97)
- 3. Boelee, Eline; Madsen, H.** 2006. Irrigation and schistosomiasis in Africa: Ecological aspects. Colombo, Sri Lanka: IWMI. 34p. (IWMI Research Report 99)
- 4. Drechsel, Pay; Graefe, S.; Sonou, M.; Cofe, Olufunke.** 2006. Informal irrigation in urban West Africa: An overview. Colombo, Sri Lanka: IWMI. 34p. (IWMI Research Report 102)
- 5. Giordano, Meredith; Samad, Madar; Namara, Regassa.** 2006. Assessing the outcomes of IWMI's research and interventions on irrigation management transfer. Colombo, Sri Lanka: IWMI. 28p. (IWMI Research Report 106)
- 6. Kashaigili, J. J.; McCartney, Matthew; Mahoo, H. F.; Lankford, B. A.; Mbilinyi, B. P.; Yawson, D. K.; Tumbo, S. D.** 2006. Use of a hydrological model for environmental management of the Usungu Wetlands, Tanzania. Colombo, Sri Lanka: IWMI. 39p. (IWMI Research Report 104)
- 7. Overgaard, Hans.** 2006. Malaria mosquito resistance to agricultural insecticides: Risk area mapping in Thailand. Colombo, Sri Lanka: IWMI. 62p. (IWMI Research Report 103)
- 8. Smakhtin, Vladimir; Anputhas, Markandu.** 2006. An assessment of environmental flow requirements of Indian river basins. Colombo, Sri Lanka: IWMI. 36p. (IWMI Research Report 107)
- 9. Thenkabail, Prasad; Biradar, Chandrashekhar; Turrall, Hugh; Noojipady, Praveen; Li, Yuanjie; Vithanage, Jagath; Dheeravath, Venkateswarlu; Velpuri, Manohar; Schull, M.; Cai, Xueliang; Dutta, Rishiraj.** 2006. An irrigated area map of the world (1999) derived from remote sensing. Colombo, Sri Lanka: IWMI. 65p. (IWMI Research Report 105)
- 10. van Koppen, Barbara; Moriarty, P.; Boelee, Eline.** 2006. Multiple-use water services to advance the millennium development goals. Colombo, Sri Lanka: IWMI. v, 44p. (IWMI Research Report 98)
- 11. Zomer, Robert; Trabucco, Antonio; van Straaten, Oliver; Bossio, Deborah.** 2006. Carbon, land and water: A global analysis of the hydrologic dimensions of climate change mitigation through afforestation / reforestation. Colombo, Sri Lanka: IWMI. 38p. (IWMI Research Report 101)

COMPREHENSIVE ASSESSMENT RESEARCH REPORTS

- 12. Boisvert, R.N.; Chang, Hung-Hao.** 2006. Multifunctional Agricultural policy, reduced domestic support and liberalized Trade: An Empirical Assessment for Taiwanese Rice. Colombo, Sri Lanka: IWMI Comprehensive Assessment Secretariat. 48p. (IWMI Comprehensive Assessment Research Report 14)
- 13. Molle, Francois.** 2006. Planning and managing water resources at the river-basin level: Emergence and evolution of a concept. Colombo, Sri Lanka: IWMI Comprehensive Assessment Secretariat. 32p. (IWMI Comprehensive Assessment Research Report 16)
- 14. Molle, François; Berkoff, J.** 2006. Cities versus agriculture: Revisiting intersectoral water transfers, potential gains and conflicts. Colombo, Sri Lanka: IWMI Comprehensive Assessment Secretariat. vi, 70p. (IWMI Comprehensive Assessment Research Report 10)

15. Neiland, A.E.; Bene, C. 2006. Tropical river fisheries valuation: A global synthesis and critical review. Colombo, Sri Lanka: IWMI Comprehensive Assessment Secretariat. 49p. (IWMI Comprehensive Assessment Research Report 15)

16. Noble, Andrew; Bossio, Deborah; Penning de Vries, F. W. T.; Pretty, J.; Thiyagarajan, T. M. 2006. Intensifying agricultural sustainability: An analysis of impacts and drivers in the development of 'bright spots'. Colombo, Sri Lanka: IWMI Comprehensive Assessment Secretariat. 35p. (IWMI Comprehensive Assessment Research Report 13)

17. Stenhouse, J.; Kijne, Jacob. 2006. Prospects for productive use of saline water in West Asia and North Africa. Colombo, Sri Lanka: IWMI Comprehensive Assessment Secretariat. 41p. (IWMI Comprehensive Assessment Research Report 11)

18. Woyessa, Y. E.; Pretorius, E.; van Heerden, P. S.; Hensley, M.; van Rensburg, L. D. 2006. Impact of land use on river basin water balance: A case study of the Modder River Basin, South Africa. Colombo, Sri Lanka: IWMI Comprehensive Assessment Secretariat. 31p. (IWMI Comprehensive Assessment Research Report 12)

JOURNAL ARTICLES

19. Abdullaev, Iskandar; Kazbekov, Jusipbek. 2006. Notes from Fields: Review to Article on Common Pool Resources and the Transfer of Governance Technology – Water User Associations in Uzbekistan (by John C. Pierce, Mark Stephan, Nicholas S. Lovrich, Jr., Madina Khalmirzaeva, Abdulkhakim Salokhiddinov and Edward P. Weber). *Comparative Technology Transfer and Society*, 4:(3)

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21. Al-Jabri, Salem A.; Lee, Jaehoon; Gaur, Anju; Horton, Robert; Jaynes, Dan B. 2006. A dripper-TDR method for in situ determination of hydraulic conductivity and chemical transport properties of surface soils. *Advances in Water Resources*, 29:239-249. ISI

22. Amoah, Philip; Drechsel, Pay; Abaidoo, R. C.; Ntow, W. J. 2006. Pesticide and pathogen contamination of vegetables in Ghana's urban markets. *Archives of Environmental Contamination and Toxicology*, 50:1-6. ISI

23. Atapattu, S.S. 2006. The transformation of the shallow water coral communities of Hikkaduwa, Sri Lanka following temperature anomalies in 1998. *Pakistan Journal of Oceanography*, 2: 23-39.

24. Awulachew, Seleshi Bekele. 2006. Modelling natural conditions and impacts of consumptive water use and sedimentation of Lake Abaya and Lake Chamo, Ethiopia. *Lakes & Reservoirs: Research and Management*, 11:73-82. ISI

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26. Biggs, Trent; Thenkabail, Prasad; Gumma, Murali Krishna; Scott, Christopher; Parthasaradhi, G. R.; Turral, Hugh. 2006. Irrigated area mapping in heterogeneous landscapes with MODIS time series, ground truth and census data, Krishna Basin, India. *International Journal of Remote Sensing*, 27(19):4245-4266. ISI

27. Bossio, Deborah; Fleck, J. A.; Scow, Kate M.; Fujii, Roger. 2006. Alteration of soil microbial communities and water quality in restored wetlands. *Soil Biology & Biochemistry*, 38:1223-1233. ISI

28. Briet, Olivier; Galappathy, G. N. L.; Amerasinghe, Priyani; Konradsen, Flemming, 2006. Malaria in Sri Lanka: One year post-tsunami. *Malaria Journal*, 5:42. 19p. ISI

29. Cai, X.; C. de Fraiture.; Hejazi, M. 2006. Retrieve Irrigated and Rainfed Crop Data Using a General Maximum Entropy Approach. *Irrigation Science*. doi : 10.1007/s00271-006-0046-8 ISI

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- 44. George, B.A.; Malano, H.M.; Davidson, B.; Turral, H.** 2006. Development of a GIS Based Data Collection and Software Utility For Asset Management, *Water Asset Management International*, 2(2): 20-24.
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- 46. Giordano, Mark.** 2006. Agricultural groundwater use and rural livelihoods in Sub-Saharan Africa: A first-cut assessment. *Hydrogeology Journal*, 14:310-318. ISI
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- 48. Hellegers, P. J. G. J.; Perry, C. J.** 2006. Can irrigation water use be guided by market forces?: Theory and practice. *International Journal of Water Resources Development*, 22(1):79-86. ISI
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- 51. Jouquet, P.; Bernard-Reversat, F.; Bottinelli, N.; Orange, Didier; Rouland-Lefevre, C.; Toan, Tran Duc; Podwojewski, Pascal.** 2006. Influence of change in land use and earthworm activities on carbon and nitrogen dynamics in a steep land ecosystem in Northern Vietnam. *Biology and Fertility of Soils*, 33p. ISI
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- 53. Kashaigili, Japhet; Mbilinyi, Boniface; McCartney, Matthew; Mwanuzi, Fredrick L.** 2006. Dynamics of Usangu plains wetlands: Use of remote sensing and GIS as management decision tools. *Physics and Chemistry of the Earth*, 31:967-975. ISI
- 54. Khan, M. Ajmal; Ansari, Raziuddin; Gul, B.; Qadir, Manzoor.** 2006. Crop diversification through halophyte production on salt-prone land resources. *CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources*, 1(048):8p.
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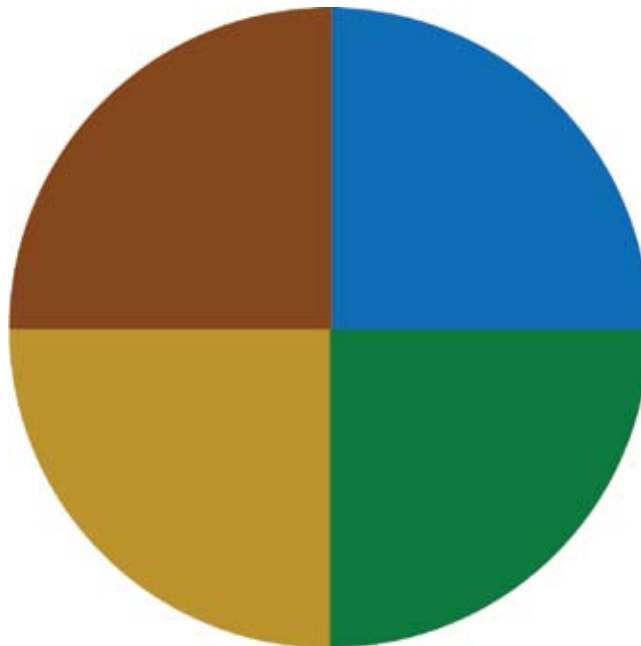
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