

WATER FIGURES

TURNING RESEARCH INTO DEVELOPMENT

QUARTERLY NEWSLETTER OF THE INTERNATIONAL WATER MANAGEMENT INSTITUTE



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Research to Face the Future

In a world hit by crisis after crisis, there is an urgent need for more investment in agricultural research and development. Research holds the key to finding solutions to the growing problems of food security, water scarcity and poverty. Policymakers and donors must realize that even in the face of the current global financial crisis, research is a priority need if we are to prevent an economic catastrophe that will hit developing countries the hardest.



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Coping with the Water Crisis

In 2008, we witnessed for the first time in many years, a worldwide food crisis. The world also faces a steadily growing water crisis. If that isn't enough, we are now deep in the midst of a global financial crisis. This could mean less funding for research and development, leading to less relief for the poor. But research is crucial if we are to find solutions to current and future challenges. And unlike in the past, where research was the means and the end, research must now be followed by tangible impact. Obviously, a new mind-set is needed.

A growing concern for IWMI is the world water crisis and its implications on food security, poverty, health and the environment. To help the world adapt to the water crisis, IWMI has reshaped its research agenda. The new research agenda is based on 4 simple elements:

1. Providing knowledge and understanding on how much water is available and how it is currently used.
2. Identifying ways in which water can be used more productively in rainfed and irrigated agriculture.
3. Looking at how wastewater can be reused and returned to the environment without risk of negative health impacts for farmers and consumers.
4. Identifying policy, institutional, regulatory and social options to facilitate better management and sharing of water resources.

The Asia-Pacific region has been identified as a key area where the impacts of water scarcity, climate change and poverty will be felt. To help the region cope with future challenges and accelerate economic growth, a network of "knowledge centers" known as "knowledgehubs" was launched in June, with the mission of providing countries in the region with the knowledge, resources, training and tools they need to overcome their water problems. This initiative is driven by the Asian Development Bank, UNESCO-IHE and the Public Utilities Board (PUB), Singapore, and is endorsed by the Asia-Pacific Water Forum. IWMI and FAO will lead the Hub on Irrigation Service Reform. Given the wide experience and expertise the two organizations have in irrigation management and reform, they will seek to "reinvent irrigation in Asia" and revitalize the water sector. Water is an enigma. There is still much to learn about it, and we need research as much as we need water. Without the two, there really can be no future.

Dawn Rodriguez
Editor

EVENTS

Nile Basin Development Forum 2008 Conference

November 17-19 in Khartoum, Sudan.

Theme: "Environment and Water Resources Management for Peace and Regional Cooperation in the Nile Basin".

CPWF Second International Forum on Water and Food (IFWF2)

November 10 -14 in Addis Ababa, Ethiopia

CGIAR Annual General Meeting 2008

December 1 -5 in Maputo, Mozambique.

This year's theme is "Investing in Agricultural Science: The Best Bet for the Future".

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Cover image: Water for multiple uses. People bathe and wash clothes in an irrigation canal in Southern Sri Lanka. Photo credit: B. R. Ariyaratne

IWMI Annual Research Meeting (ARM)

IWMI's Annual Research Meeting (ARM) was held from the 28th to 30th October at IWMI Headquarters in Sri Lanka. The meeting was attended by researchers from IWMI's regional offices in Africa and Asia, and the IWMI Board of Governors. It provided a platform for knowledge sharing, presentation of research carried out during the year, and planning for the transition to IWMI's new research themes, along with serious discussion on key research issues.



Research with Impact - A New Thrust Forward

“We want to develop a culture of ensuring IWMI research has impact on the key development challenges facing us”.

Colin Chartres - Director General, IWMI

The challenges of physical water scarcity, economic water scarcity, the impacts of climate change on water resources and deteriorating water quality set the backdrop of IWMI's new research agenda for the next few years and indicate that the need for scientific and institutional solutions to our water resource problems has never been greater. The new research agenda covers 4 thematic areas:

Theme 1: Water Availability and Access

A critical issue for IWMI will be to assist in the development of water allocation processes that identify and preserve the water rights and access to water for the poor. Strategies to adapt to the impacts of climate change will also be a part of this theme.

Theme 2: Productive Water Use

This theme addresses primarily how water is used, and can be used more productively, in irrigated, rainfed and wetland agroecosystems, thus contributing to sustainable intensification and increased food production. It will also look at how irrigation can be revitalized.

Theme 3: Water Quality, Health and the Environment

The overall goal of the theme is to explore and evaluate strategies that enhance water quality, increase food production and alleviate poverty whilst minimizing negative impacts on human health and the environment.

Theme 4: Water and Society

This theme will address the key institutional and socioeconomic issues that arise as developing countries face the challenges of physical and economic water scarcity and hydrological variability, both existing and as expected with climate change. It will also carry out impact assessments.

One of the most critical challenges for IWMI over the next five years is to ensure that research output has impact. High science citation scores certainly give recognition to the quality of our science, but we need to know the number of people benefiting from our research. IWMI has introduced impact pathways for its research projects, to describe how research outputs which are developed can be used by those outside the projects to achieve developmental outcomes and impact. Project staff and stakeholders work together to map how knowledge and research products must scale out and scale up, in order to achieve the project's development goals. An important feature of impact pathways is that it encourages participants to think beyond the scope of a single project. Research rarely ever achieves significant development outcomes in a typical project life span of three years. Hence, impact pathways encourage

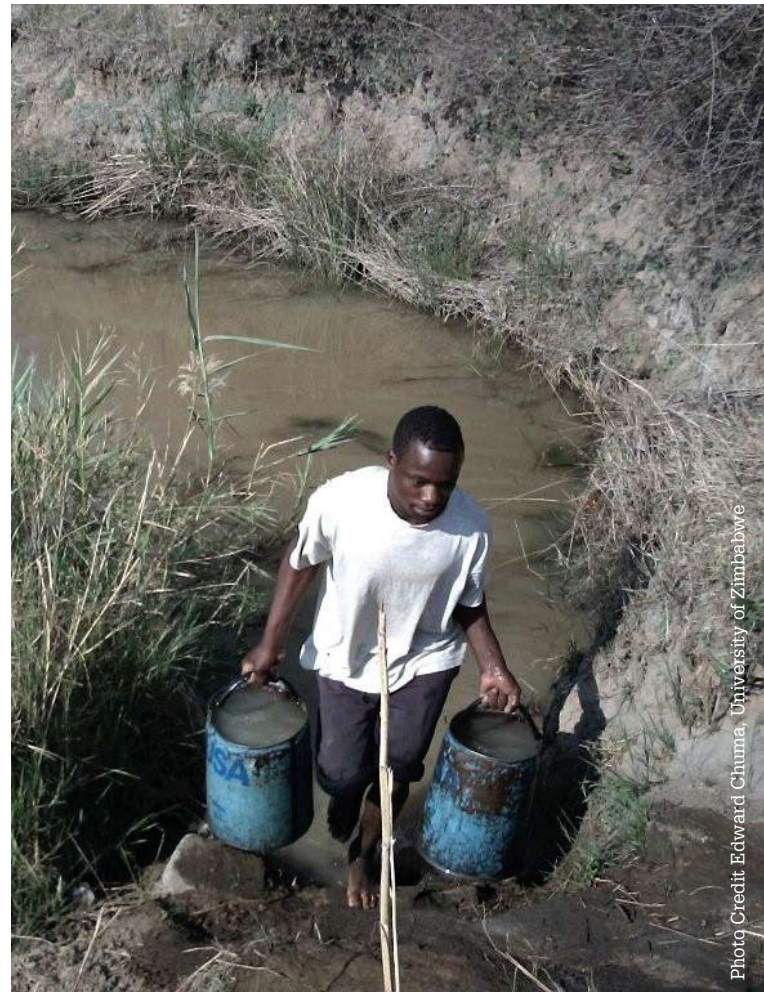


Photo Credit: Edward Chuma, University of Zimbabwe

Wetland in Matopos, Zimbabwe. Wetlands are of growing importance in the face of water scarcity. For the rural poor, they provide water for agriculture.

researchers to think beyond what needs to happen after the end of the project. For a start, IWMI is already determining the numbers of poor people who may be impacted by specific water interventions in India and sub-Saharan Africa.

This is a new approach and it is also a subject of controversy. Some argue that a research project ends with a published research report and recommendations, while others say research must deliver impact beyond the research accomplished.

What do you think? Post your comments on our blog: <http://blog.iwmi.org/>



How Can We Cope with Water Scarcity?

Implement better storage of water and rainwater harvesting techniques. Water storage helps the poor cope with “climate shocks”.



Provide supplementary irrigation to make up for erratic rainfall supplies. Providing 100 liters per square meter for supplemental irrigation during dry spells could more than double agricultural and water productivity.

Address underperformance at irrigation system and field level as well as in rainfed systems. Irrigation could contribute 55% of the total value of food supply by 2050.



Diversify crops and integrate livestock, fisheries and forestry to improve water productivity.

Turn wastewater or effluent from cities into a safe resource for agriculture.



Use wetlands wisely. They filter and clean polluted water and are a source of livelihoods to the rural poor.



Improve irrigation infrastructure and governance.

Future Shock ?



Expect a **20-60%** increase in the demand for water.

Population growth, rising incomes and changing diets will **double food demand** over the next few decades.



Biofuel development and hydropower production will add further pressure on water resources and the environment.



In some areas, total rainfall will increase causing **flooding, crop damage and erosion.**



The **impact of climate change** will vary depending on geography and scale.



In other areas, total rainfall may decrease and **droughts** will be more frequent.



“Knowledgehubs” - Meeting the Water Sector Needs of the Asia-Pacific Region

HERATH MANTHRITHILAKE

In June 2008, a network of water knowledge hubs known as “Knowledgehubs” was formally launched in Singapore. These knowledge hubs are located in different parts of Asia and the Pacific, and specialize in different areas of water management. Their aim is to help countries in the Asia-Pacific region to develop their water sectors and face future challenges. The initiative is led by the Asian Development Bank (ADB), UNESCO-IHE and the Public Utilities Board (PUB), Singapore. The network is endorsed and supported by the Asia-Pacific Water Forum. IWMI, together with FAO, will lead a Knowledge Hub on Irrigation Services Reform. Currently there are 12 confirmed hubs operating and 4 candidate hubs hoping to join the network.

Irrigation plays an important role in agricultural production, rural development and livelihoods in Asia. The current position of irrigation systems in Asian countries is characterized by incomplete and/or degraded infrastructure, “dinosaur” institutions and outdated management practices which are struggling to meet the region’s 21st century requirements. The only way forward is reforms that address policy, institutional, managerial and technical issues in a comprehensive and systematic manner.

Rapid population growth and intense competition for water between different sectors, combined with the effects of globalization, urbanization, climate change and soaring food prices, apply



Distributing water for irrigation in Pakistan. The irrigation sector in Asia must adapt, reform and modernize to meet current and future challenges.

multiple pressures on current irrigation systems. These systems should undergo certain improvements to ensure poverty reduction, food security, better rural livelihoods and increased water productivity. Irrigation systems should also help conserve ecosystem services, while maintaining a region’s cultural heritage.

To address the complex challenges faced by irrigation systems, countries in the region urgently need to reform their irrigation sectors. This means harnessing already available scattered knowledge, generating new knowledge, sharing and brokering it, building capacity to deliver services and managing irrigation systems efficiently. The experience and knowledge which can help these reforms, is either hiding in the minds of experts or lying within organizations. In this context, new knowledge partnerships and networking are essential. The proposed regional water knowledge hubs are expected to serve this purpose. Existing centers of excellence in the region will offer their services to a range of clients and partners in the region. Stakeholders will include governments, donors, development agencies, the irrigation sector, academic institutions, private sector organizations, farmers and civil society.

IWMI, FAO and ADB, along with many other international organizations, have researched and advocated irrigation service reforms in Asia for some years. While the concepts are well accepted by governments and institutions, implementation is still weak. Large investments are still being made in old, classical irrigation

models and with limited results. Many irrigation agencies are still functioning in a supply-driven mode and need to adopt demand-driven, participatory and service-oriented strategies. At the same time, many reform programs have failed to reach their objectives. There is an urgent need to strengthen regional and national coordination and cooperation; and further advocate and disseminate workable and successful irrigation service reforms, concepts, theories and approaches, along with effective implementation. Irrigation service reforms must be incorporated into national strategies, policies, plans and programs. Local capacity building should be strengthened to promote successful service reforms in Asian countries. This cannot be done without new knowledge.

The Knowledge Hub on Irrigation Services Reform will build on IWMI-led knowledge syntheses and global research initiatives such as the Comprehensive Assessment of Water Management in Agriculture, FAO's Regional Irrigation Modernization Program and other relevant programs and projects, as well as the CGIAR Challenge Program on Water and Food (CPWF) and the groundwater governance program.

The knowledge generated through collaborative research, support to irrigation agencies and system managers, and shared with a range of stakeholders at different levels will have the greatest impact on poverty in Asia, speeding up economic development and achievement of the Millennium Development Goals.

The mission of the proposed knowledge Hub on "Irrigation Service Reforms" is to serve as the 'one stop-knowledge shop' or state-of-the-art Knowledge Center for diverse stakeholders, who are interested and actively involved in Irrigation Service Reforms.

The irrigation sector is increasingly coming under pressure from several sides, which call for it to adjust, reform and modernize to meet current and future challenges. There will be no end to these pressures and changes. The long-term goal of the Knowledge Hub would be to inject new life into the irrigation sector in the Asia-Pacific region, by establishing a network of learning/reforming Irrigation Management Organization (IMOs), and upgrading technology and management practices with the latest research and development.

In the short-term, the proposed knowledge hub would connect people and organizations to the irrigation knowledge domain where the best information, analyses, people and organizations, are available. This will promote knowledge sharing and capacity development services to clients on irrigation service reforms.

For a start, the Knowledge Hub on Irrigation Service Reforms will evaluate pertinent issues related to irrigation performance and service reforms. It will collate available/existing information and bring together knowledge, experts, champions and organizations around those issues. It will also develop and establish "communities of practice"; disseminate good practices and advocate policy development, while providing capacity development programs in collaboration with partners and clients. To facilitate knowledge exchange and synthesis, the hub will develop and promote the adoption of common monitoring, evaluation and performance benchmarking tools. A website has been set up with access to tools and resources. A concept paper on the future of Irrigation in Asia is being jointly developed by IWMI and FAO, at the request of the Asian Development Bank.

For more information see: <http://waterknowledgehub.iwmi.org>

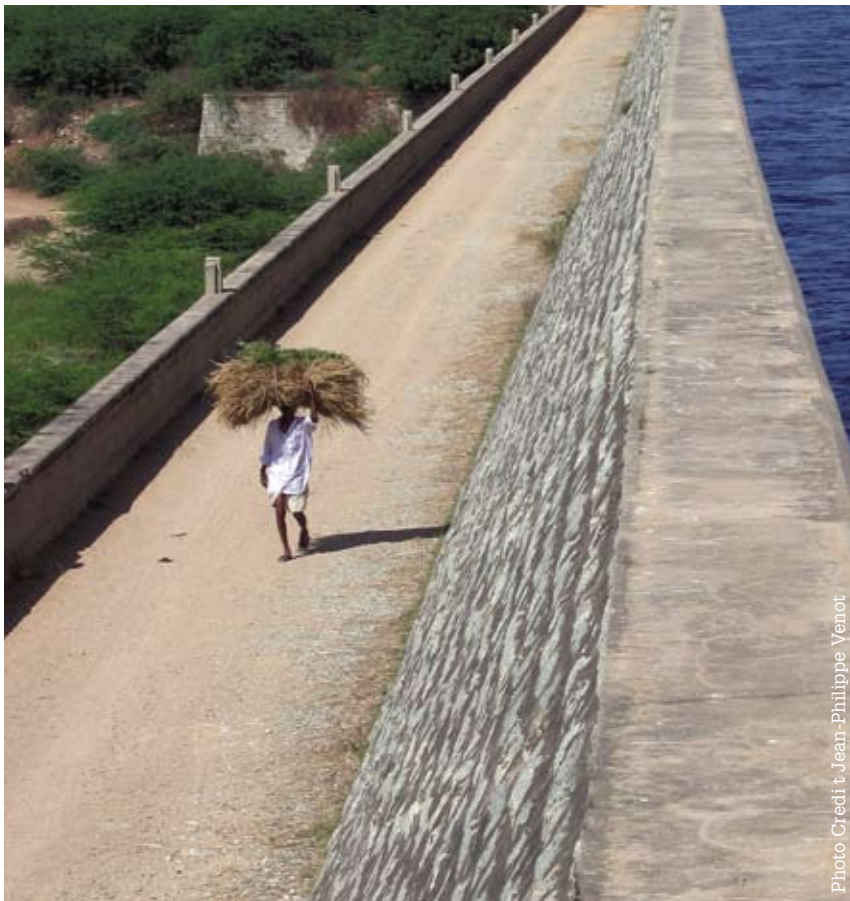


Photo Credit: t. Jean-Philippe Venot

Irrigation canal in India. Irrigation plays a vital role in agricultural production, livelihoods and rural development in Asia.



Straight Talk:

Reinventing Irrigation in Asia

An interview with Thierry Facon from FAO's regional office for Asia and the Pacific

Thierry Facon is the Senior Water Management Officer and Leader of the Natural Resources and Environment Technical Group of FAO's Regional Office for Asia and the Pacific. He manages FAO's Regional Program on Irrigation Modernization, developing a comprehensive suite of performance evaluation tools, capacity building materials, publications, and technical assistance projects. The Program is training over 1,000 irrigation engineers and managers in the region on irrigation modernization and services reform. Thierry is one of the authors of FAO's new methodology for improving management of irrigation systems: MASSCOTE. He also works on the integration of agriculture, food security and ecosystems in regional and international policy dialogue arenas such as the Asia-Pacific Water Forum. IWMI and FAO will together spearhead irrigation modernization in the Asia-Pacific region, making use of the knowledge hub network to share knowledge and promote reforms.

Q: What do you see as the key issues facing irrigation in Asia and how can irrigation modernization help?

A: The key issues today are to boost food production while achieving hydraulic equity to maintain or enhance levels of productivity of existing assets, distribute water services/values and adapt to very rapid socioeconomic development. It is an enormous challenge to simultaneously address salinity, groundwater overuse, labor shortages, competition for water and land resources, the lack of community management of water sharing arrangements, and environmental sustainability. This will require the expansion of affordable small-scale flexible irrigation, as the poorest farmers have no irrigation (production gains in moving from rainfed to irrigated agriculture are likely to be greater than those in improving the quality of irrigation). It will also require conjunctive management of surface water and groundwater resources, improved governance arrangements and more investment and irrigation modernization.

Irrigation modernization, in this overall picture, is the comprehensive change process that manages the transition from outdated concepts, technologies and institutional systems, to high level, economically sustainable professional and service-oriented management bodies. These bodies can deliver the requirements for equitable, productive and sustainable agricultural water use and better irrigation services, within the framework of integrated water resources management at river basin level.

Q: How do you see IWMI and FAO working together to initiate irrigation service reforms in the Asia-Pacific region? What roles will you play?

A: IWMI and FAO can, together, build a stronger constituency for reform and assist in the emergence of feasible and effective reform pathways, building on knowledge synthesis, exchange of experience, and capacity building. Experience shows that capacity building and awareness of what can actually be achieved at different levels of responsibility generates a dynamic favoring reform, and brings immediate results.

FAO can contribute its significant experience, tools and knowledge products in irrigation services reform and modernization and its specific knowledge on successful experience that can be analyzed and disseminated. One example is the Jiamakou Irrigation System in China, which is the best-managed irrigation system I know in the region. It has a very broad network of decision-makers and irrigation system managers, and specific initiatives on capacity building, development of communities of practice, and advocacy and policy advice at the highest levels in the region. One thing we have certainly learned is that neglecting to address infrastructure and operation problems results in failed reforms, hence our emphasis on "modernization" that looks at changes in both software and hardware.

Q: The impacts of climate change, coupled with issues of poverty and food security are challenges faced by the Asia-Pacific region. Can



Photo Credit: FAO Regional Office for Asia

Left to right: Xuehui Zhang, Manager of the Jiamakou Irrigation project and Thierry Facon of FAO. Shanxi Province, China, October 2008.

improved irrigation infrastructure and management mitigate some of these negative impacts and how?

A: Poverty within irrigation systems is closely linked with poor and inequitable management. Farmers are also prevented from adopting new crops or farming practices by poor or unresponsive service delivery. Adapting to climate change will require more flexible and responsive management to cope with more variable water supply and adapt service delivery, so that farmers may adopt new cropping systems, water saving, more productive farming practices, or water management practices that contribute to climate change mitigation. Changes in delivery (more flexible, more reliable) to allow farmers to switch from paddy rice cultivation with its methane emissions, to water saving rice cultivation practices, is a good example. This requires changes in management set-up, operating procedures, and enabling water control infrastructure.

For more information see:
www.watercontrol.org;
www.spmwater-asiapacific.net

Interview by Dawn Rodriguez



Photo Credit: Julie van der Bielek

An irrigation canal in Cambodia is also used for fishing and domestic purposes.



Recent Publications

For on-line access to IWMI Research Reports and Working Papers, see <http://www.iwmi.cgiar.org/Publications/index.aspx>

Working Papers

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2. Bahri, Akissa. 2008. Case studies in Middle Eastern and North African countries. In: Jimenez, B.; Asano, T. (Eds.), *Water reuse: an international survey of current practice, issues and needs*. London, UK: IWA Publishing. pp. 558-591. (IWA Scientific and Technical Report 20).
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6. Gichuki, Francis; Molden, David. 2008. Bright basins: do many bright spots make a basin shine? In: Bossio, Deborah; Geheb, K. (Eds.), *Conserving land, protecting water*. Wallingford, UK: CABI; Colombo, Sri Lanka: International Water Management Institute (IWMI); CGIAR Challenge Program on Water and Food. pp. 149-162. (Comprehensive Assessment of Water Management in Agriculture Series 6).

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IWMI Articles in Journals

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2. Amede, Tilahun; Delve, R. J. 2008. Modelling crop-livestock systems for achieving food security and increasing production efficiencies in the Ethiopian highlands. *Experimental Agriculture* 44(4): 441-452.
3. Briet, Olivier J. T.; Vounatsou, P.; Amerasinghe, Priyanie H. 2008. Malaria seasonality and rainfall seasonality in Sri Lanka are correlated in space. *Geospatial Health* 2(2): 183-190.
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