



# A WATER-SECURE WORLD

# IWMI

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**THE INTERNATIONAL WATER MANAGEMENT INSTITUTE (IWMI) OPERATES AT THE INTERFACE OF RESEARCH AND DEVELOPMENT TO PROVIDE EVIDENCE-BASED SOLUTIONS TO SUSTAINABLY MANAGE WATER AND LAND RESOURCES FOR FOOD SECURITY, PEOPLE'S LIVELIHOODS AND THE ENVIRONMENT.**

IWMI's vision of 'A water-secure world' encompasses:

- ◆ food, energy and water resources;
- ◆ urbanization and demographic change;
- ◆ human and environmental health; and
- ◆ climate change.

It also incorporates the principles of efficiency and equity to achieve food security, halt environmental degradation, reduce poverty and foster economic growth.

### IWMI'S EXPERTISE

- ◆ Applied scientific research to maximize water productivity, alleviate poverty and preserve the integrity of ecosystems.
- ◆ Modeling of complex biophysical and hydrological processes to explore the trade-offs inherent in alternative development scenarios.
- ◆ Socioeconomic assessments of poverty, policy and water use.
- ◆ Impartial, scientifically verified policy recommendations on water management.
- ◆ Capacity building for sustainable development.



PHOTO SONALI SENARATNA SELLAMUTTU / IWMI

**“Water issues have never been as acute as they are today. A host of factors are having a major impact on water availability, how that water is used, and how we, as a research-for-development organization, must respond.”**

JEREMY BIRD, DIRECTOR GENERAL, IWMI

# PRESSURES ON THE WORLD'S FOOD AND WATER SUPPLIES

## ENERGY SUPPLY AND ACCESS

Farmers increasingly depend upon energy to access water. However, water is also in demand for other forms of economic development, such as hydropower generation. Managing this water-food-energy nexus is highly complex. It presents clear opportunities, as well as risks, and has implications for the livelihoods of smallholder farmers and global food security.

## GENDER INEQUITY

The majority of people living in extreme poverty are women. Women farmers, in particular, face significant challenges in accessing affordable agricultural water management technologies. Unequal access to credit and information further hinders investment, marketing and management choices.

## DEMOGRAPHIC CHANGE

Young people make up a quarter of today's global population. Many migrate to urban areas to seek new opportunities, yet their unemployment remains high. Future water management research needs to take into account those that remain in rural areas to support a new generation of farmers.

## URBANIZATION

Half of the world's population now lives in towns and cities. This number is expected to increase to two-thirds by 2050. Agriculture in and around urban areas is expanding to meet the growing demand for food, but there are competing demands for water and land. With farmers frequently relying on wastewater for irrigation, this can present public health risks. However, if safely collected and processed,

urban waste offers a significant source of nutrients for farming.

## AGRICULTURAL COMMERCIALIZATION AND TRADE

In developing countries, foreign direct investment in agricultural land has surged. The crops grown as a result of these so-called 'land grabs' are often for export, usually to the investing country. While these investments may adversely affect food and water security, with prudent regulation they could be turned into major opportunities for economic growth.

## CLIMATE CHANGE

Climate change is adding further uncertainty to future food and water security. More extreme and unpredictable weather events, such as floods and droughts, are forecast. These events will disrupt food production, especially among smallholders. Effective planning is essential for increasing resilience, to ensure farmers are prepared and natural systems can be protected.



PHOTO PRASHANTH VISHWANATHAN / IWMI

# WORKING IN PARTNERSHIPS, WE MAKE A **DIFFERENCE...**

## IN INDIA ...

The IWMI-Tata Water Policy Research Program is a collaborative initiative that aims to find sustainable solutions to growing water stress in many parts of India. Of particular interest is the water-food-energy nexus. Current projects include a proposal to link solar panels powering agricultural pumps to the electrical grid, so that farmers can sell excess power rather than using it to over-pump groundwater. The State Government of Gujarat, among others, has already set up a pilot scheme based on the initial research.

## IN ETHIOPIA ...

Since its foundation, IWMI has explored how best to achieve sustainable water management on small farms in Asia and Africa. These insights have been influential in shaping an ambitious new initiative of the Ethiopian government to boost food production and the incomes of five million farmers by targeting investments in household irrigation.

## IN GHANA ...

Our studies on recovering and reusing resources is changing how municipalities deal with waste. A public-private partnership in the town of Techiman, inspired by IWMI research, will turn 5,000 cubic meters of fecal sludge into safe fertilizer pellets every year. These can be sold to local farmers, creating jobs, improving crop yields and reducing the risk of environmental pollution.

## GLOBALLY ...

IWMI is a key partner in many international initiatives. Its scientists have provided technical input into the indicators for the United Nations Sustainable Development Goals (SDGs), and is well positioned to assist individual countries in setting and monitoring their SDG targets for water. IWMI personnel also play an active role in the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) and other multilateral bodies.

**TOP (OPPOSITE)** IWMI scientists check a data-logger on an irrigation canal in Pakistan. By providing canal managers and farmers with real-time information on water depth and flow, the performance of irrigation systems can be greatly improved.

**BOTTOM (OPPOSITE)** Assessing plant growth using safe fertilizer derived from human waste. IWMI research into resource recycling can help deal with urban waste by developing valuable new products.

PHOTO GRAEME WILLIAMS / IWMI

## IN LAO PDR ...

IWMI leads the Mekong River Basin component of the CGIAR Research Program on Water, Land and Ecosystems (WLE), which aims to improve the governance and management of water resources. By working closely with government agencies and power companies, IWMI has pioneered new approaches to hydropower development that seek to mitigate the impacts on local livelihoods and protect vital natural systems.





# SUSTAINABLE SOLUTIONS

**MORE CROP PER DROP**



**MANAGING CLIMATE RISK**



**RECYCLING WASTEWATER**



**PRODUCTIVE ECOSYSTEMS**



**SHARING BENEFITS**



**BALANCED GROWTH**



# HOW OUR EXPERTS CAN HELP

- ◆ Measuring water use in agriculture to work out sustainable management strategies.
- ◆ Using satellite technology to assess the water productivity of irrigation systems.

- ◆ Using cutting-edge computer modeling to pinpoint where communities are at risk from floods and droughts.
- ◆ Recommending adaptation strategies to maximize resilience.

- ◆ Developing innovative business models for the safe use of organic waste and wastewater.
- ◆ Investigating and promoting safe practices in the collection, processing and use of wastewater.

- ◆ Measuring the flow of water through ecosystems to establish environmental limits for water use.
- ◆ Demonstrating how communities can benefit from the ecosystems they steward.

- ◆ Analyzing how all sectors of society access and use water.
- ◆ Developing policies that ensure a fair share for all.

- ◆ Analyzing the relationship between the demands for water, food and energy.
- ◆ Developing policies that balance the needs of competing water users.



PHOTO PRASHANTH VISHWANATHAN / IWMI

## PARTNERSHIPS

IWMI achieves its impact through partnerships at all levels.

Visit our website to find out more about IWMI's collaborative approach.

- ◆ Private sector
- ◆ International organizations
- ◆ Development agencies and investors
- ◆ Nongovernmental organizations
- ◆ National and local government bodies
- ◆ Academic institutions
- ◆ Community organizations



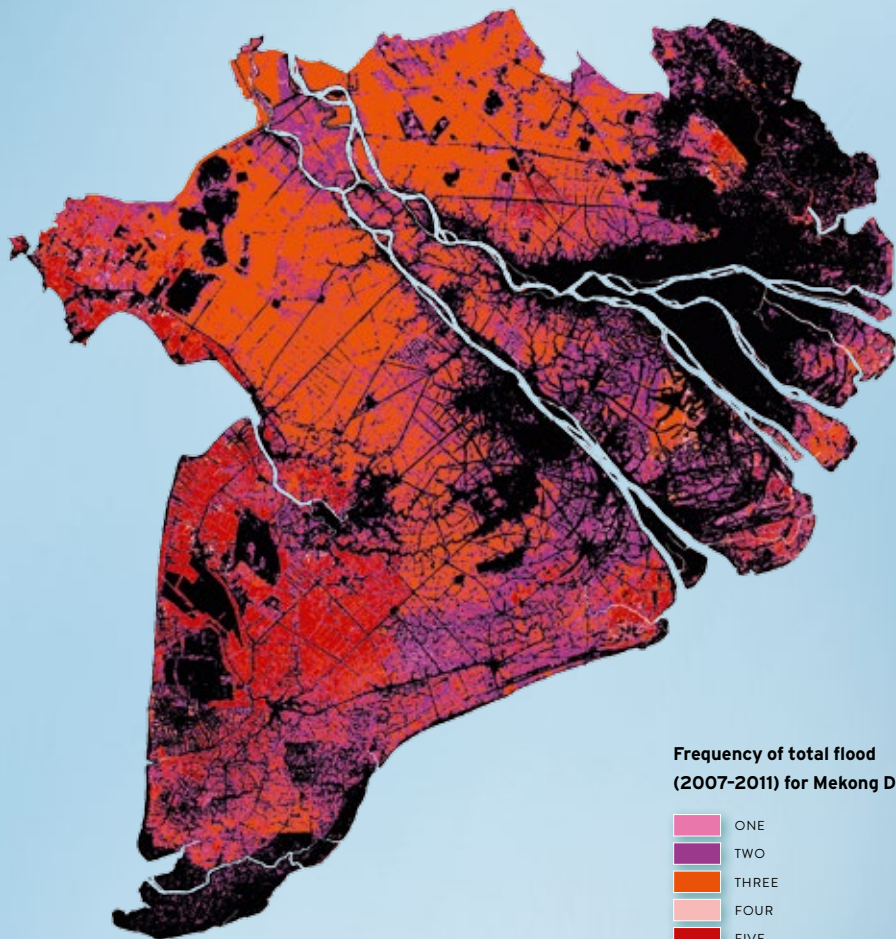
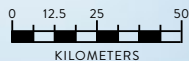


PHOTOS GODONG / UNIVERSAL IMAGES GROUP / GETTY IMAGES (TOP) ABBIE TRAYLER-SMITH / PANOS (BOTTOM)

# REMOTE SENSING

IWMI's expertise in remote sensing and computer modelling allows it to produce detailed maps that can help planners respond to development challenges. This map shows flooding incidence in the Mekong Delta in Southeast Asia and is part of an initiative to provide real-time information on flood risk. This can then be used to help plan for flood relief and develop insurance products to help smallholder farmers cope with extreme weather events.

IWMI Water-related Disaster Management Unit



**Frequency of total flood (2007-2011) for Mekong Delta**





The **International Water Management Institute (IWMI)** is a non-profit, scientific research organization focusing on the sustainable use of water and land resources in developing countries. IWMI is a member of CGIAR, a global research partnership for a food-secure future. It leads the CGIAR Research Program on Water, Land and Ecosystems (WLE), which develops solutions to sustainably intensify agriculture while identifying ways to reverse environmental degradation and lifting millions of farm families out of poverty.



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