IWMI
International Water Management Institute

Strategic Program

Water, food and ecosystems

Agriculture is the engine of food security, the largest global user of water and, in developing countries, an important source of employment for poor people. As competition for water intensifies, food systems must become more sustainable and resilient, and better able to meet the nutritional needs of growing populations without undermining the landscapes and ecosystems on which they depend. Research is needed to enhance agricultural productivity, develop technologies and policies that promote sustainable agricultural intensification, and identify ways to integrate nature-based solutions into the management of rural landscapes.

~1 billion people

and about 500 million farms with 2 hectares or less (smallholder farms) derive their livelihoods from rain-fed and irrigated farming in developing countries

"Providing global food security while conserving ecosystems and their services requires a grand food system transformation. Integrated solutions that boost water productivity and also ensure the environmental, economic and social dimensions of sustainability across scales are essential. Healthier diets for all and addressing the needs of more than 800 million people suffering from insufficient food are urgent."

Stefan Uhlenbrook
Strategic Program Director
Water, Food and Ecosystems

Photo: Adam Öjdahl

OUTCOME	Key questions:			
More sustainable and equitable food systems as a result of water solutions that boost productivity and efficiency, reduce poverty, and conserve ecosystems and the services they provide	 How can farmers grow more food using less water?	 How, and by how much, can the productivity and incomes of smallholder farmers be raised through agricultural water management?	 What role do, and could, ecosystems play in helping to achieve and maintain water security?	 How can competing goals for food production and ecosystem conservation be balanced and achieved?

Our approach

Water management for water and food security is a change process. The Strategic Program *Water, Food and Ecosystems* explores new ways to sustainably increase agricultural productivity, increase economic returns, support human well-being and safeguard ecosystems and their services in a changing climate. Therefore, water and food production systems (including rain-fed systems, farmer-led irrigation and irrigation schemes) and their dependencies with other systems (e.g., energy) are analyzed using innovative tools and frameworks, and integrated solutions are co-developed with a range of stakeholders. Furthermore, pathways are explored to scale local solutions to sustainably support the resilience of societies.

Sustainable water infrastructure – built (grey) or natural (green) and the 'best blend' for a given situation – plays a key role for inclusive development and for conserving ecosystems. Considering all the water cycle components (including surface water, groundwater, water quality) and their interactions with people and the environment is critical to support effective institutions, policies and investments. We work from local farm scale up to transboundary basins and aquifers.

IWMI research:

- provides evidence and data analytics for making choices about agricultural water management, business models for farmer-led irrigation or reforms in large-scale irrigation schemes
- develops water solutions for sustainable intensification in agriculture (rain-fed and irrigated), including management of groundwater, water pollution, and integration of inland fisheries
- expands the application of water accounting to support improvements in water productivity across scale, river basin planning and management, policy development and water-related investments
- supports equality and empowerment of women and youth in agricultural water management
- assesses the trade-offs and synergies in planning portfolios of built and natural water infrastructure
- integrates ecosystem values, services and sustainability into water resource allocation and management practices, and water infrastructure design and operations
- supports the implementation of environmental flows and conservation of biodiversity
- develops knowledge on the hydrological impacts of restoration and applications to strengthen water security through wetland and watershed rehabilitation
- ensures that governance and incentives for protection and restoration of water-related ecosystems strengthen equality and inclusion
- combines data, processes and institutions for integrated surface water and groundwater management, including in transboundary basins

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CGIAR
IWMI is a CGIAR Research Center

The International Water Management Institute (IWMI) is a non-profit, research-for-development organization that works with governments, civil society and the private sector to solve water problems in developing countries and scale up solutions. Through partnership, IWMI combines research on the sustainable use of water and land resources, knowledge services and products with capacity strengthening, dialogue and policy analysis to support implementation of water management solutions for agriculture, ecosystems, climate change and inclusive economic growth. Headquartered in Colombo, Sri Lanka, IWMI is a CGIAR Research Center and leads the CGIAR Research Program on Water, Land and Ecosystems (WLE).

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