



## Water, climate change and resilience

Climate-induced changes in water resource systems impact economies, food systems, cities, energy, health, ecosystems, and the security of communities. Smallholder farmers and those disconnected from water infrastructure are particularly at risk. Shifting water availability requires solutions and services that harness advances in technology, policies and finance. To support developments in planning and investment, digital modeling is required on future scenarios of water availability and allocation. Of particular importance are advances in policies and technologies for disaster preparedness and response, climate-smart strategies for water storage and the development of financial remediation schemes such as insurance.



**150 million**

people will be displaced by 2050  
due to droughts and floods

“Climate impacts are first felt through water. Droughts and floods of increasing severity, rising sea levels, fast-disappearing glaciers, and hurricanes of unprecedented strength ensure water is headlining many of the planet’s most pressing problems. Water availability continues to decline as a result of changing patterns of rainfall. Decision-makers from national governments through to river basin or city authorities require new projections where past conditions are no longer a reliable predictor for the future. IWMI’s mission is to support the most vulnerable through advances in science, technology and policies.”





**Rachael McDonnell**

*Strategic Program Director*

*Water, Climate Change and Resilience*



*Photo: Prashanth Vishwanathan / IWMI*

OUTCOME	Key questions:			
Improved climate change adaptation and mitigation with greater resilience to natural disasters and societal disruption through increased use of water-smart solutions	 <p data-bbox="422 367 595 517">How can farmers adapt to climate change?</p>	 <p data-bbox="692 367 874 533">How can water management help make development more resilient?</p>	 <p data-bbox="952 367 1169 636">What are the best ways to increase preparedness for water-related disasters and reduce risks for vulnerable communities?</p>	 <p data-bbox="1206 367 1436 636">How can the dangers of water as a risk multiplier for conflict and migration in fragile communities be reduced?</p>

### Our approach

This Strategic Program’s approach to adaptation planning, whether for national, river basin or city level, is based on thinking that accommodates growing uncertainties within and between sectors. This means knowledge development that brings technical solutions linked with political and economic incentives that are developed within social and environmental contexts. Through digital modeling of future likely conditions, solutions may be designed that help manage the trade-offs of when, where, who and how water is allocated.

The Strategic Program also advances the monitoring, forecasting, and risk and impact management of dynamically changing water shocks and stresses: floods, drought, extreme precipitation, and changing seasonality. The goal is, through IWMI’s knowledge and experience, to equip people and societies with the means to make the robust and flexible adjustments across systems, sectors and scales that are needed to withstand, recover from, and anticipate the impacts of climate change. Water management provides these vital levers and tools for resilience. Enhanced water management can thus be an enabler of both adaptation and more sustainable, water-conscious development across sectors and communities.

### IWMI research:

- integrates modeling, monitoring and scenario planning for surface water and groundwater to help governments and partners plan and operationalize climate change adaptation
- further develops and deploys flood and drought monitoring and forecasting technologies for improving disaster preparedness
- uses river basin modeling and field assessment tools to analyze the hydrological impacts of adaptation and mitigation solutions such as nature-based solutions or new energy technologies
- empowers effective water governance and policy developments for climate change adaptation and mitigation
- strengthens gender-responsive implementation of climate-smart agriculture
- improves and scales up the application of financial risk transfer products for smallholder and estate farming
- integrates data and analytical tools, research and knowledge on institutions, equality and inclusion, and facilitates capacity development and dialogue in programs for building river basin resilience
- enhances knowledge of how water relates to social, economic and environmental drivers of migration, and promotes the use of this evidence in policies on migration



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).

**International Water Management Institute (IWMI)**

**Headquarters**  
127 Sunil Mawatha, Pelawatte, Battaramulla, Sri Lanka

**Mailing address:**  
P. O. Box 2075, Colombo, Sri Lanka  
Tel: +94 11 2880000  
Fax: +94 11 2786854  
Email: [iwmi@cgiar.org](mailto:iwmi@cgiar.org)  
[www.iwmi.org](http://www.iwmi.org)