

Have you added water management to your solutions for *mitigation* to climate change?

There is no question that we must take steps to limit our emissions of greenhouse gases. The challenge is to create 'no regret' mitigation solutions that will not punish the poor or compromise our capacity to grow food, fuel and the raw

materials for the thousands of domestic, industrial and cultural products that drive our economies. Any adverse impacts on water will definitely be a cause for regret.

Examine the water implications of mitigation measures

Mitigation initiatives, like biofuel production, carbon sequestration and reforestation, have significant implications for agriculture and water management. Agricultural water management is part of the mitigation equation.

ACTION ITEM 1. MANAGE WATER FOR AFFORESTATION & REFORESTATION

In 2005, the United Nations Framework Convention on Climate Change Clean Development Mechanism created carbon markets that are driving billions of dollars in investment into projects in afforestation and reforestation, tree plantations and agroforestry. The negative impacts of these initiatives on water availability and access are generally ignored.

Explore IWMI's solutions for: Water balance and afforestation/reforestation – agriculture ecosystems and environment – carbon sequestration, land degradation and water management – conservation agriculture – water demand and supply accounting

ACTION ITEM 2. ADDRESS THE ENERGY-WATER FOOD NEXUS

Biofuel production is increasing the demand for agricultural land, driving up food prices and providing incentives for more deforestation, at the expense of natural ecosystems. Growing crops for biofuels requires large quantities of water — already a major constraint to agriculture in many parts of the world. For every joule of energy we produce from biofuel to offset carbon, we pay a similar price in the amount of water used.

Explore IWMI's solutions for: Energy subsidies and water management – institutional analysis – modeling water allocation



ACTION ITEM 3. MANAGE DAMS FOR MULTIPURPOSE USE

In our energy-hungry world, hydropower dams are back on the agenda, especially in Africa where less than 5% of the potential capacity has been tapped. Treating dams as multipurpose structures can multiply the mitigating effects.

Explore IWMI's solutions for: Multiple use – multi-stakeholder dialogue – environmental flows – hydropower and irrigation – Integrated Water Resources Management – small reservoirs

ACTION ITEM 5. REDUCE FOOD WASTE

Nearly half the food we grow is wasted as it moves from fields to dinner tables. Wasted food is wasted water – hundreds of millions of liters. And since agriculture is such a heavy producer of greenhouse gases, reducing food waste also means reducing emissions.

Explore IWMI's solutions for: Water productivity – water footprinting

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ACTION ITEM 4. MEASURE WATER FOOTPRINTS

Just as every action, product or service has a carbon footprint, it also has a water footprint. Whenever we reduce our carbon footprint, we save water. Whenever we save water, we cut down on emissions of a range of greenhouse gases, not just carbon. We need to think in terms of two footprints, not just one.

Explore IWMI's solutions for: Measuring water footprints – reducing water footprints – water productivity



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Learn more about IWMI solutions or talk about your ideas with:
David Molden, Deputy Director General of Research d.molden@cgiar.org
Vladimir Smakhtin, Theme Leader Water Availability and Access, v.smakhtin@cgiar.org



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Redoubling our efforts to improve agricultural water management in response to climate induced changes affecting water availability, poverty and food production.

Have you added water management to your solutions for climate change?

Entering the 21st century, we face two major and closely related challenges with regard to water. The first: How do we divide a fixed amount of water among a variable and growing number of users? The second: How do we manage water in response to climate change?



Climate change is not just "one more pressure" on water - it's a wake-up call. It's time to change the way we think about water now, or suffer increasingly severe consequences in the decades ahead.

With each passing year we gather more evidence of changes in weather and climate patterns.

What is less visible, but no less alarming, is the growing threat to our capacity to produce enough food under new and uncertain climate conditions. Food production and food prices are pillars of social stability. If we compromise the ability of hundreds of millions of small farmers to grow enough food to feed us all, we are courting a grim future. Let's not go there.

Given the reality of increased water scarcity and variability, we need to seriously rethink how we manage water for agricultural production and integrate these solutions with domestic, industrial and environmental uses.



Have you added water management to your solutions for *adaptation* to climate change?

Over two decades of research and experience have convinced us that technical solutions by themselves are of no practical use to water managers or water users unless they are supported by people with power to make decisions and ensure that solutions are integrated into governance and institutional processes.

IWMI's research suggests that the following agricultural and water management actions are appropriate "no regrets" responses to climate change:

ACTION ITEM 1. TRANSFORM WATER GOVERNANCE

In all forms of governance, policy determines action. Climate change impels us to base adaptation policy advice on realistic assessments of socioeconomic, cultural and political realities.

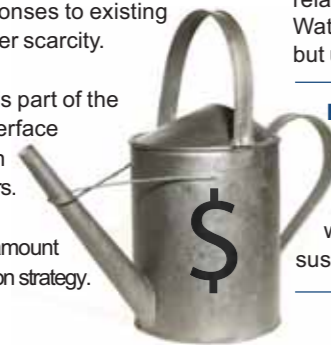
Explore IWMI's solutions for: Policy analysis – water governance – institutional change – people's participation – learning alliances –

ACTION ITEM 2. REVISIT WATER STORAGE

Flexible water storage options
Water storage options, from ensembles of small reservoirs to natural wetlands, are among the most practical, immediate and cost-effective responses to existing variability and climate-induced water scarcity.

Soil management: Soil moisture is part of the hydrological cycle. It acts as an interface between runoff, evapotranspiration and infiltration into groundwater aquifers.

Farming practices that retain the right amount of soil moisture are an important adaptation strategy.



Groundwater banking:
Discharge from hydropower dams to recharge aquifers helps ensure that farmers and pastoralists have sufficient and reliable supplies of water under increasingly variable and severe drought conditions.

Explore IWMI's solutions for: Water storage planning and management – wetlands – soil improvement – conservation tillage practices – groundwater management

ACTION ITEM 3. MANAGE WATER DEMAND

Economic incentives for reducing water use:
Managing water more effectively means increasing farm yields and significantly reducing greenhouse gas emissions. Water pricing currently bears little or no relationship to water scarcity or the true cost of water. Water pricing, allocation, and water rights are effective but underused tools to manage demand.

Explore IWMI's solutions for: Assessing the impact of water pricing on agricultural water use and farmers' profits – identifying key issues in water pricing reforms – water rights and water allocation incentives – water pricing policies and water demand management for sustainable use of water resources –

ACTION ITEM 4. INCREASE WATER PRODUCTIVITY

It is no coincidence that poverty and food insecurity are highest where water productivity is lowest. Increasing water productivity is an effective means of intensifying agricultural production, improving community resilience and reducing the environmental degradation that exacerbates climate change.

Explore IWMI's solutions for: Basin-level water allocation policies – water productivity technologies and practices – agro-ecosystems integration – wastewater use –

ACTION ITEM 5. PRODUCE MORE FOOD PER UNIT OF WATER

60% of the world's food is produced on rainfed cropland. We know that climate change will alter rainfall patterns, and that constitutes a major threat to our food supply and livelihoods.

Rainfed irrigation: Small investments for supplemental irrigation in combination with improved soil, nutrient and crop management can more than double water productivity and yields in small-scale rainfed agriculture. Upgrading rainfed agriculture means a new era of investment in the continuum between rainfed and irrigated agriculture.

Revitalize irrigation: Irrigation reform is the only viable option for ensuring food security for many of the countries most directly affected by climate change. A large portion of our future food requirements can be met if we revitalize investment and adapt our engineering approaches and management practices in irrigated agriculture.

Explore IWMI's solutions for: water productivity – land and water management – irrigation system management and reform –

ACTION ITEM 6. MONITOR WATER & PROVIDE FEEDBACK

Information for adaptive management:

Adapting to changes in water availability and seasonal distribution is possible, but we need to know the direction and magnitude of these potential changes with some degree of certainty. One way to do this is to link existing hydrological models to climate change models to make better predictions and guide policy. Many regions remain poorly gauged and existing data collection networks are in decline with limited access to data. We need to address the many technical, administrative, cultural and political barriers to data sharing and exchange.

Explore IWMI's solutions for: Modelling – GIS & Remote Sensing – data management tools and resources –

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