Water: Key for adapting to climate change

International Water Management Institute, November 2007

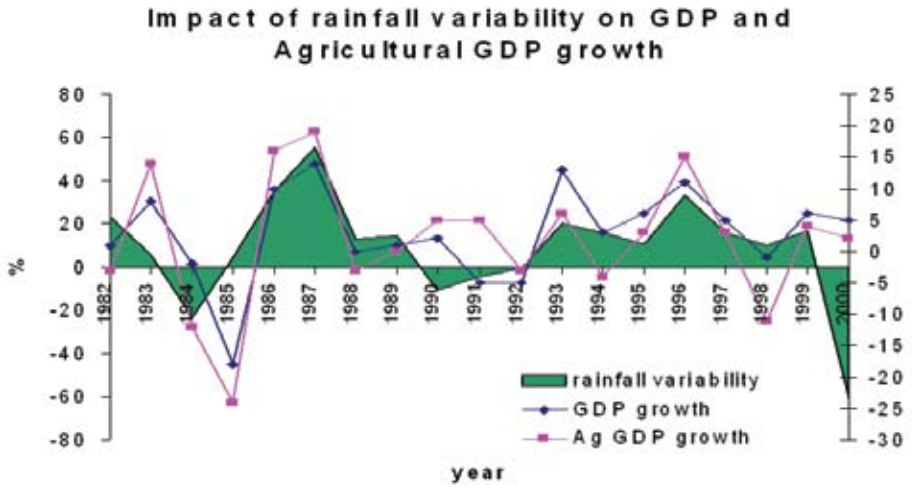
UN Secretary General Ban Ki-moon recently called for urgent action on global warming: "I believe we are on the verge of a catastrophe if we do not act. … The overarching message is: we can beat this". IWMI's Director General Colin Chartres shares his concerns and optimism: "Adapting to the impacts of climate change on water resources and food production will be one of the world's most serious challenges over the next 50 years. It will be all the more difficult as the environment that provides vital ecosystem services comes under increasing stress and different users compete for water. IWMI plays a pivotal role in assisting developing countries with policies, adaptive water and crop management strategies and methods for increasing water productivity to overcome these challenges."

Mitigation is about gases, adaptation is about water

While much of the climate change debate focuses on mitigation, it is clear that adaptation is already inevitable. Climate models generally foresee an increase of global average precipitation, although the spatial patterns of change are still debated. Increased variability is expected. In some parts of Asia, rainfall might increase by 10 to 20 percent, but may also generate a dramatic increase in inter-year variability. Arid and semi-arid areas, including the Middle East, parts of China, southern Europe, northeastern Brazil, and west of the Andes in Latin America could turn drier. The absolute amount of rainfall in Africa may decline, while variability increases dramatically.

Climate change impacts on water – through rainfall, snowfall, soil moisture, riverflow and groundwater recharge- directly translating into impacts on food, livelihoods and ecosystems. Under current trends, population growth, rising incomes and changing diets, will double food demand over the next 50-80 years, and the demand for water will increase by 20 to 60 percent. Climate change will place additional stress on already stretched water systems.

The right steps taken now in agricultural water management will significantly reduce poor people's vulnerability to climate change (CC) by reducing water related risks and creating buffers against unforeseen changes in rainfall and water availability. An appropriate water research agenda is needed to fill the knowledge gaps between water, food and CC and guide the right investments. This can improve the resilience of farming communities and ensure food security. Building on its research in the water, food and livelihood nexus, IWMI is well-positioned to help develop and implement this agenda.



Country Water Resources Assistance Strategy Ethiopia, World Bank

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Building resilience through better water management

To reduce the risks to poor communities, IWMI advocates 5 key responses:

- **Thinking more creatively about water storage:** Water storage will be increasingly critical to overcome short and long-term dry spells. There are many proven ways to store water, ranging from small ponds to large reservoirs, groundwater recharge, water harvesting and soil water conservation capture and store water in fields and in the soil. These storage options can be adapted to particular situations.
- **Increases in water productivity:** Getting more value from water through higher yields, crop diversification, and integrating livestock and fisheries, is an effective way of improving rural incomes, alleviating poverty and reducing risks by diversifying income sources. At the global scale, improved productivity helps reduce greenhouse gas (GHG) emissions by curbing the need to convert land for agricultural purposes.
- **Basin water management and allocation:** Water allocation will become more difficult under CC scenarios in water scarce basins, especially with increased variability in flows. Adjustments in water allocation require both, knowledge of water flows as well as social and institutional governance mechanisms – a key area for research.
- **Early warning and insurance:** With the shift from "drought response" to "drought risk mitigation," new approaches are sought to prepare farmers for climate variability. Establishing targeted safety nets for farmers who are unable to adjust quickly enough, providing credible insurance against catastrophic asset losses and facilitating rapid recovery will all be crucial, given the expected CC impacts.
- **Changes in cropping and land use patterns:** Climate change will definitely lead to changes in cropping and land use patterns. Water management strategies to support these changes must be tailored to meet local needs.

Facing new challenges

While building on existing knowledge in new contexts provides the basis of our response, we also acknowledge new challenges requiring further insights:

- Understanding the impacts of anticipated increased investments in water storage on environment, and long-term feasibility of larger scale interventions needs urgent attention.
- Downscaling CC predictions to basin level will pose methodological challenges for hydrological predictions in "ungauged" situations.
- Impacts of mitigation measures on water availability and use are often not considered – such as the amount of water required to produce biofuels. Research can shed light on unexpected water consequences of mitigation measures.
- Evidence-based policy support to water managers and policymakers to build social resilience. Based on the above research IWMI will extract relevant policy messages and provide science-based guidance for future critical decisions about our water resources.