



Photo: Michael Moore, SIWI

Water for Food, Water for Life

Influencing What Happens Next

Will there be enough water to grow enough food for a growing population over the next 50 years or will we run out of water? It is possible to produce the food, but it is probable that today's food production and environmental trends will lead to crises in many parts of the world.

In many parts of the world the demand for water is outstripping the resource and ecosystem degradation is rising rapidly. Only if we act to improve water use in agriculture will we meet the acute water challenges society will face over the coming 50 years.

The Comprehensive Assessment of Water Management in Agriculture (CA), a five-year programme, evaluated the benefits, costs and impacts of the past 50 years of water development and determined what future actions are needed for the next 50 years. The assessment pulled together the work of more than 700 scientists and practitioners from around the world to study the water management challenges communities face today, and the solutions they have developed in different parts of the world, to meet these challenges. The CA findings will enable better investment and management decisions for the future from governments, water managers, development specialists and policy makers.

One litre per calorie

A main driver of water use and scarcity today comes from us – and what we eat. As a rule of thumb, about one litre of liquid water gets converted to water vapour to produce one calorie of food. Every person is responsible for consuming between 2,000 and 5,000 liters of water every day, depending on our diet and how the food is produced – far more than the 2 to 5 litres we drink every day. A heavy meat diet requires much more water than a vegetarian diet.

In developed countries water scarcity poses no threat to what appears on the dinner plate. In contrast, the relation between water and food is a real struggle for over two thirds of the world's 850 million under-nourished people, where water is a key constraint to food security. In the future more people will need more water for food, fiber, industrial crops, livestock and fish.

There is already physical water scarcity in parts of India and China, two water use giants. Because of rapid economic growth in both countries, diets are changing, with more dependence on animal products. In China, per capita meat demand has quadrupled over the last 30 years, and in India milk and egg products are becoming increasingly popular – meaning an accelerated demand for more water to grow more food. Scientists predict that the global food demand will double over

the next 50 years. In the worst case scenario where practices don't change, water use will also double. Agricultural practices are changing, but not fast enough.

About 80% of agricultural evapotranspiration – when crops turn water into vapour – comes directly from rain and about 20% from irrigation. According to the assessment, targeting smallholder farmers in both rainfed and irrigated areas offers the best chance for reducing poverty quickly in developing countries. Rainfed areas are home to the highest number of poor people. Upgrading these rainfed lands through better water management holds the greatest potential to increase productivity, and decrease poverty. Since climate change is expected to hit these areas hard, better water systems will be a key to helping people cope with dry spells.

The way forward

With wise policies and investments in irrigation, it is possible over the next 50 years to limit future growth in water withdrawals and cultivated land expansion. But, further complicating the situation are effects of climate change, the increased use of biofuels, and the necessary actions to address these. There is also a need for drastic reform in the water sector. Governments must lead the reform process, but ironically state institutions themselves are in greatest need of reform.

Action Messages

Policy Action 1: Change the way we think about water and agriculture.

Instead of a narrow focus on rivers and groundwater, view rain as the ultimate source of water that can be managed. We need to consider agriculture as an ecosystem producing multiple services for people and sustaining biodiversity, and we need to protect the natural resource base on which it depends.

Policy Action 2: Fight poverty by improving access to agricultural water and its use.

Target the livelihood gains of smallholder farmers by securing water access through water rights and investments in water storage and delivery infrastructure, improving value obtained by water through pro-poor technologies and operating multiple water use systems.

Policy Action 3: Manage agriculture to enhance ecosystem services.

In agro-ecosystems there is scope to promote services beyond the production of food, fibre and animal protein. Because of increased water and land use however, some ecosystem change is unavoidable and difficult choices are necessary.

Policy Action 4: Increase the productivity of water.

Gaining more yield and value from less water can reduce future demand for water, limiting environmental degradation and easing competition for water. More food can be produced per unit of water in all types of farming systems. The poor can benefit from water productivity gains in crop, fishery, livestock and mixed systems.

Policy Action 5: Upgrade rainfed systems. A little water can go a long way.

Rainfed agriculture is upgraded by improving soil moisture conservation and providing supplemental irrigation. These techniques hold great potential for quickly lifting large numbers of people out of poverty and for increasing water productivity in Sub-Saharan Africa and Asia.

Policy Action 6: Adapt yesterday's irrigation to tomorrow's needs.

Modernisation, a mix of technological and managerial upgrading to improve responsiveness to stakeholder needs, will enable more productive and sustainable irrigation.

Policy Action 7: Reform the reform process- targeting state institutions.

A major policy shift is needed for water management investments important for irrigated and rainfed agriculture. The divide between rainfed and irrigated agriculture must be broken down and fishery and livestock practices must be linked to water management. Civil society and the private sector are important actors but the state is the critical driver, and ironically most in need of reform. Many reforms have been based on “blueprint solutions” which follow a model that may have been successful elsewhere. Reforms must take into account the history, culture, environment and vested interests that shape the scope for institutional change.

Policy Action 8: Deal with tradeoffs and make difficult choices.

Informed multi-stakeholder negotiations are needed to make decisions on water use and allocation. Other users such as fishers and smallholders must develop a strong collective voice. Some choices made now can be a benefit, or a cost for future generations. There is a need to identify incentives or mechanisms to compensate those who stand to lose in water decisions. The choices are difficult but need to be made for tomorrow.

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Photo: Mats Lanmerstad

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The Comprehensive Assessment of Water Management in Agriculture is co-sponsored by The Consultative Group on International Agricultural Research (CGIAR), the Secretariat of the Convention on Biological Diversity, the Food and Agriculture Organization of the United Nations and the Ramsar Convention on Wetlands and supported by a range of donors. The Assessment book, “Water for Food, Water for Life,” of the Comprehensive Assessment of Water Management in Agriculture is available from

Earthscan. www.earthscan.co.uk Information about the CA and a summary of findings is available at: www.iwmi.org/assessment.

The Swedish Network for the Comprehensive Assessment of Water Management in Agriculture, a Swedish Water House cluster group, coordinated Swedish expert input into the synthesis of the landmark report. The involvement reinforced links between Swedish and international actors. For more information, visit www.swedishwaterhouse.se.