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Water Management: Urgent Need For More Food With Less Water

Science Daily — Only if we act to improve water use in agriculture now will we meet the acute water-environment-poverty challenges facing humankind over the next 50 years. "With earth's water, land and human resources it is possible to produce enough food for the future -- but it is probable that today's food production and environmental trends will lead to crises in many parts of the world" says David Molden Deputy Director General of the International Water Management Institute.

This is the opening prognosis given in the Earthscan publication Water for Food, Water for Life: A Comprehensive Assessment of Water Management in Agriculture.

The Assessment, the first of its kind, brings together the work of over 700 specialists from hundreds of institutes around the world into the most comprehensive and authoritative assessment of water and food ever written, critically examining policies and practices of water use and development in the agricultural sector over the last 50 years.

Spearheaded by International Water Management Institute (IWMI), one of 15 CGIAR agricultural research centres striving to increase food production, increase rural incomes, and safeguard the environment, the report is co-sponsored by the Consultative Group on International Agricultural Research (CGIAR), FAO, the Ramsar Convention on Wetlands, and the Convention on Biological Diversity in a bid to find solutions to the challenge of balancing the water-food-environment needs

The assessment finds that 1/3 of the world's population live in areas where water scarcity must be reckoned with. While much of this water scarcity cannot be avoided, water problems can be averted through better water management. For example:

A litre per calorie. A main driver of water use and scarcity comes from us -- and what we eat. As a rule of thumb, about one litre of liquid water gets converted to water vapor to produce one calorie of food. "Each of us 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" says Molden. A heavy meat diet requires much more 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 world's 850 million under-nourished people, where water is a key constraint to food security.

There is already physical water scarcity in 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. Growing cities take more water, and environmental concerns are rising.

A water-food-environment dilemma. Water use in agriculture is recognized as one of the major drivers of ecosystem degradation, causing habitat loss, drying up of rivers, and reduction in groundwater levels. Flows in the Colorado River in USA, the Yellow River in China, the Indus in India and Pakistan -- all important food producing areas -- dry up because of the water needed for irrigated agriculture. Clearly limiting agricultural water use is key for environmental sustainability. Therein lies the dilemma. More people require more water for more food; more water is essential in the fight against poverty; yet we should limit the amount of water taken from ecosystems.

How much more water? To rid the world of poverty and hunger, and to feed a growing wealthier population, 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.

The Assessment shows that with wise policies and investments in irrigation, upgrading rainfed agriculture, and trade it is possible over the next 50 years to limit future growth in water withdrawals to 13% and cultivated land expansion to 9%. But, further complicating the situation

are effects of climate change, and the increased use of biofuels, and the necessary actions to address these.

"The bottom line is that water scarcity is with us to stay, and we have to learn to live with it. This will require making some hard choices now instead of deferring them until later," says Molden.

It starts at home. Jan Lundqvist of the Stockholm International Water Institute points out that "reducing losses in the food chain and being careful with our diets can lead to significant water savings. Combined with other good agricultural production practices, water use could stabilize at present levels." In developed countries, people eat more than what is healthy and 30% to 40% of food is lost between farmers fields to our forks. In developed countries, much of this loss is between the shop and our plates, and could be avoided if we are more careful.

The way forward. The Comprehensive Assessment challenges all of us -- not just policy makers and investors -- to think differently about water and food. Instead of viewing water for food as different and competing from water for environment, we need to consider agriculture as an ecosystem producing multiple services for people and sustain biodiversity, and we need to protect the natural resource base on which it depends. We need to be more proactive in our policies and reform processes, crafting water institutions to meet local needs. And we need to place the means of getting out of poverty into the hands of poor people by focusing on water as a means to raise their own food and gain more income.

Growing more food with less water -- increasing water productivity -- can reduce future demand for water, thus easing competition for water and environmental degradation. A 35% increase in water productivity could reduce additional crop water needs from 80% to 20% by 2050. "While getting more crop, fish, meat and milk per drop is important for the environment, getting more value and nutrition per drop of water is a key for poverty reduction" says Molden.

Improving access to water, and using it better are essential in the fight against poverty. Actions that target livelihood gains of smallholder farmers by securing water access through water rights and investments in water storage and delivery infrastructure are essential ingredients. The value obtained per drop of water can be improved by pro-poor water technologies, and investments in roads and markets. Multiple use systems -- operated for domestic use, crop production, aquaculture, agroforestry and livestock -- can improve water productivity and reduce poverty.

The Assessment finds that the greatest potential is found in those rainfed areas of the world that are home to the highest number of poor people. A little additional water can go a long way in these areas. "Upgrading these rainfed lands through better water management holds the greatest potential to increase productivity, and decrease poverty," says Johan Rockstrom of Stockholm Environment Institute and author of the Assessment chapter on managing rainfed agriculture. Since climate change is expected to hit these areas hard, better water systems will be a key to helping people cope with dry spells.

Poverty, hunger, gender inequality, and environmental degradation continue to afflict developing countries not because of technical failings but because of political and institutional failings. There is 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.

While water scarcity is here to stay, many of the problems associated with water scarcity can be avoided. This will require that we deal with difficult choices and tradeoffs. Reconciling competing demands on water requires informed negotiations by the many stakeholders involved in water with transparent sharing of information.

"The hope is in realizing the unexplored potential that lies in better water management along with non-miraculous changes in policy and production techniques" says Margaret Catley Carleson, Chair of the Global Water Partnership, "but world leaders must take action now." As Sunita Narain, 2005 Stockholm Water Prize Winner says, "this issue must become the world's obsession."

Note: This story has been adapted from a news release issued by International Water Management Institute.