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Radical overhaul of agriculture can create farms that enhance rather than degrade the world's ecosystems, says new report

New practices could double agricultural production, protect natural systems and be "game changer" for global food security

STOCKHOLM (22 August 2011)—According to the authors of new research released today at the World Water Week in Stockholm, a radical transformation in the way farming and natural systems interact could simultaneously boost food production and protect the environment—two goals that often have been at odds. The authors warn, however, that the world must act quickly if the goal is to save the Earth's main breadbasket areas—where resources are so depleted the situation threatens to decimate global supplies of fresh water and cripple agricultural systems worldwide.

A new analysis resulting from the joined forces of the International Water Management Institute (IWMI) and the United Nations Environment Programme (UNEP) outlines the urgent need to rethink current strategies for intensifying agriculture, given that food production already accounts for 70 to 90 percent of withdrawals from available water resources in some areas. The report, *An Ecosystem Services Approach to Water and Food Security*, finds that in many breadbaskets, including the plains of northern China, India's Punjab and the Western United States, water limits are close to being "reached or breached." Meanwhile, 1.6 billion people already live under conditions of water scarcity, and the report warns that number could soon grow to 2 billion. The current situation in the Horn of Africa is a timely reminder of just how vulnerable to famine some regions are.

"Agriculture is both a major cause and victim of ecosystem degradation," said Eline Boelee of IWMI, the lead scientific editor of the report. "And it is not clear whether we can continue to increase yields with the present practices. Sustainable intensification of agriculture is a priority for future food security, but we need to take a more holistic 'landscape' approach."

Meanwhile, a separate report by IWMI, *Wetlands, Agriculture and Poverty Reduction*, warns against seeking to protect wetlands by simply excluding agriculture. It argues that policies focused simply on wetland preservation and ignore the potential of 'wetland agriculture' to increase food production and contribute to reducing poverty.

"Blanket prohibitions against cultivation do not always reduce ecosystem destruction and can make things worse," said Matthew McCartney of IWMI, who co-authored the report. "For example, the grassy 'dambo' wetlands of sub-Saharan Africa often provide vital farmland to the

rural poor. Banning farming in these areas, however, has exacerbated rather than reduced ecosystem destruction. It has prompted deforestation upstream and led to a shift from farming to grazing in the wetlands themselves so that, overall, there has been a much greater impact on these natural systems. What is needed is a balance: appropriate farming practices that support sustainable food production and protect ecosystems.”

New Alliance Between Agriculture and Environment Groups

The two reports seek a new path toward achieving both food security and environmental health. They focus on radically reorienting practices and policies so that farming occurs in ‘agroecosystems’ that exist as part of the broader landscape, where they help maintain and supplement clean water, clean air and biodiversity.

“We are seeing a growing trend of alliances between traditionally conservationist groups and those concerned with agriculture,” said David Molden, Deputy Director General for Research at IWMI. UNEP is the voice of the environment of the United Nations, and IWMI is part of the world’s largest consortium of agricultural researchers, the Consultative Group on International Agricultural Research (CGIAR).

“For instance,” Molden continued, “UNEP has adopted food security as a new strategic concern. And IWMI and its partners in the CGIAR are developing a multi-million dollar research program that will look at water as an integral part of ecosystems to help solve issues of water scarcity, land and environmental degradation. IWMI has also recently become a key partner with the Ramsar Convention on Wetlands on the topic of the relationship between wetlands and agriculture.”

“The various political, research and community alliances now emerging are challenging the notion that we have to choose between food security and ecosystem health by making it clear that you can’t have one without the other,” he added.

Examples of Successful Integration in the Field

UNEP and IWMI and collaborators have identified multiple opportunities to use trees on dryland farms that will intensify the amount of food produced per hectare of land area while helping to improve the surrounding ecosystem. They note that by integrating trees and hedgerows, farmers can prevent runoff and soil erosion and retain more water for nourishing their crops.

Another example of innovative thinking include better water and soil management in rainfed systems in sub-Saharan Africa, which have demonstrated the ability to reverse land degradation while at the same time increasing crop yields by twofold or threefold.

Overall, the authors say it’s time for decision-makers at the international, national and local level to embrace an agroecosystem approach to food production. These changes could include providing more farmers with incentives to adopt improved practices through ‘payments for environmental services (PES)’.

One example being explored by the CGIAR’s Challenge Program on Water and Food (CPWF) is the potential for benefit sharing in river basin areas of Peru, Ecuador and Colombia. Upstream users value the water for irrigation and ecotourism and also have a spiritual affiliation with the ecosystem. The hydropower companies need a steady stream to support electrification of the growing urban population downstream. Large-scale farms and agro-industry also need increasing supplies of water.

“More and more agriculture needs to be brought into the ‘green economy’,” said Alain Vidal of the CPWF. “We need to value farming practices that protect our precious water resources in the same way we are beginning to value forest management that helps reduce greenhouse gas emissions, especially because those natural resources support the livelihoods of the most vulnerable.”

In the report, *An Ecosystem Services Approach to Water and Food Security*, experts from UNEP, IWMI and 19 other organizations acknowledge that one major impediment to adopting a more sustainable approach to food production is that it requires a new level of cooperation and coordination among officials and organizations involved in agriculture, environmental issues, water management, forestry, fisheries and wildlife management—individuals and groups who routinely operate in separated, disconnected worlds.

“It is essential that in the future we do things differently. There is a need for a seminal shift in the way modern societies view water and ecosystems and the way we, people, interact with them,” said David Molden. “Managing water for food and ecosystems will bring great benefits, but there is no escaping the urgency of this situation. We are heading for disaster if we don’t change our practices from business as usual.”

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The International Water Management Institute (IWMI) is a nonprofit, scientific research organization focusing on the sustainable use of land and water resources in agriculture, to benefit poor people in developing countries. IWMI’s mission is “to improve the management of land and water resources for food, livelihoods and the environment.” IWMI has its headquarters in Colombo, Sri Lanka, and regional offices across Asia and Africa. The Institute works in partnership with developing countries, international and national research institutes, universities and other organizations to develop tools and technologies that contribute to poverty reduction as well as food and livelihood security (www.iwmi.org).

The CGIAR Challenge Program on Water and Food (CPWF) was launched in 2002 as a reform initiative of the CGIAR. The CPWF aims to increase the resilience of social and ecological systems through better water management for food production (crops, fisheries and livestock). The CPWF does this through an innovative research and development approach that brings together a broad range of scientists, development specialists, policymakers and communities to address the challenges of food security, poverty and water scarcity. The CPWF is currently working in six river basins globally: Andes, Ganges, Limpopo, Mekong, Nile and Volta (www.waterandfood.org).