



RESEARCH
PROGRAM ON
Water, Land and
Ecosystems



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UNDER EMBARGO UNTIL 00:01 STOCKHOLM 4 SEPTEMBER 2013

Healthy ecosystems are the key to productive agriculture

New book urges fundamental re-think to unite farmers and conservationists for sustainable development

STOCKHOLM (4 SEPTEMBER 2013) — We must prioritize the health of ecosystems and water supplies if we are to grow enough food to feed the world's rising population. This is the key message of the book **Managing Water and Agroecosystems for Food Security**, launched today at Stockholm World Water Week. Only by strengthening the natural services that ecosystems provide, such as soil retention, pollination and water purification, will we be able to reverse recent environmental degradation of agricultural lands and water bodies sufficiently to support the farming, fisheries and aquaculture vital for future food production, warn the authors.

“We need to raise food production by some 70 per cent by 2050 to feed the nine billion or more people who will inhabit the planet by then,” says Andrew Noble, Program Director for the CGIAR Research Program on Water, Land and Ecosystems (led by the International Water Management Institute), which published the book, in partnership with the United Nations Environment Program (UNEP). “However, food security is currently jeopardized by the unsustainable nature of our agricultural systems, which is limiting our ability to produce food. Water use is key, as the extraction of water for irrigating crops, coupled with pollution from pesticides and fertilizers, has significant impacts on downstream ecosystems that are fundamental to ensuring the health and functionality of our food production systems. The bottom line is, degraded ecosystems are less able to sustain water flows, particularly in light of climate change.”

The situation in parts of the tropics exemplifies the complex linkages between ecosystems, water and food production. With pressure on farmland high, agriculture has expanded on to wooded land. The resulting loss of tree cover and compacted soil have reduced the infiltration of water and increased run-off, causing severe erosion and salinization. In this way, degradation of the ecosystem has had a negative impact on water quality and flows. Such disruption means less water is available to support the ecosystem services that benefit agriculture, such as nurturing vegetation growth and underpinning the yields of edible plants, and so a downward spiral of decline has ensued.

In 11 chapters, the book's authors investigate how we can stop such vicious cycles, and move from a position where the Earth's ecosystems are degraded, and 870 million people are undernourished, to sustainably providing food for Earth's future population. First, they

consider the drivers and challenges for food security, including the globalisation of food markets and climate change. Then they look at how water underpins all ecosystem services and examine how agriculture depends upon, and influences, water in the context of ecosystems. These investigations set the scene for detailed chapters covering varying approaches to managing water within agroecosystems, in contexts ranging from wetlands to drylands.

The authors explain that different geographical, socioeconomic and development contexts will require very different approaches. For example, regions with agricultural economies, such as Africa's Niger, Volta and Nile basins, would benefit from improvements to rainfed agriculture, which could raise productivity, provide basic needs, develop markets and infrastructure, and enhance food security. Water management practices, such as harvesting rainwater in small ponds or tanks, planting specific crops to conserve soil water and making better use of groundwater are already helping to improve livelihoods in dryland parts of South Asia, West and Southern Africa, and Ethiopia.

In contrast, transitional economies, such as in Asia's Indus, Ganges, Mekong and Yellow river basins, would benefit from institutional support, as economic and population growth raise demand for food and water. Such economies face competition for water supplies from agriculture, industry and cities; reduced water quality; and health issues caused by insufficient protection against water-related hazards. Institutional development could enhance capacity and benefit sharing by enabling transparent, informed and broadly based processes of change. Meanwhile, industrial economies, such as those in the Andes and São Francisco basins of South America, require action to sustain the ecosystem services that underpin water supplies for urban, industrial, agricultural and hydropower needs.

"Water is fundamental to maintaining the health of ecosystems and the services they provide," explains lead author and editor Eline Boelee, of Water Health (Netherlands) and until recently a senior researcher at IWMI. "Meanwhile, food production – from growing crops to rearing livestock and raising fish – is dependent on thriving ecosystems. Therefore, ensuring future food security is dependent on managing water in agriculture in a way that nurtures, rather than degrades, ecosystems. This book offers guidance on how we can make the shift from the current situation, where agriculture is damaging the natural environment, to one where we manage water, land and ecosystems in a way that is mutually supportive and contributes to food security and wealth."

***Meet Dr Andrew Noble and some of the book's authors at the launch event today!
5.30pm at the IWMI exhibition booth at Stockholm World Water Week. All welcome***

[Managing Water and Agroecosystems for Food Security](#). Comprehensive Assessment of Water Management in Agriculture Series. Edited by Eline Boelee, Water Health, Netherlands (formerly with the International Water Management Institute). Published by [CABI](#) in association with the CGIAR Research Program on Water, Land and Ecosystems and UNEP.

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The CGIAR Research Program on Water, Land and Ecosystems formulates its research agenda around sustainable intensification while still protecting the environment and lifting

millions of smallholder farm families out of poverty. The program focuses on the three critical issues of water scarcity, land degradation and ecosystem services. It will also make substantial contributions in the areas of food security, poverty alleviation and health and nutrition. The initiative combines the resources of 11 CGIAR centers, the FAO and numerous external partners to provide an integrated approach to natural resource management research. This program is led by the International Water Management Institute (IWMI). wle.cgiar.org

The International Water Management Institute (IWMI) is a non-profit, scientific research organization focusing on the sustainable use of water and land resources in developing countries. It is headquartered in Colombo, Sri Lanka, with regional offices across Asia and Africa. IWMI works in partnership with governments, civil society and the private sector to develop scalable agricultural water management solutions that have a real impact on poverty reduction, food security and ecosystem health. www.iwmi.org

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