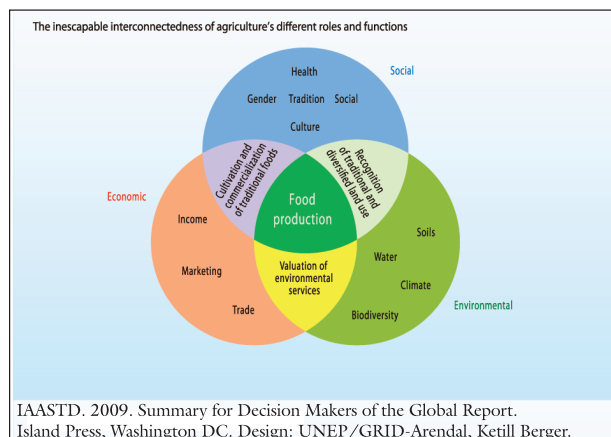


# Integrated Solutions to the Water, Agriculture and Climate Crises\*

The dramatic convergence of multiple crises—global warming, hunger and depletion of natural resources such as water—compels us to shift from the dominant industrial agriculture model and consider a new way forward. Because agriculture is multifunctional (i.e., food, feed, fibers, biofuels, medicinal products, environmental services, landscape amenities, social and cultural values), it could play a critical role in addressing global challenges related to climate, water, social justice and food.<sup>1</sup> This year, three major international meetings seek to identify solutions to the water, food and climate crises: the World Water Forum (March), the UN Commission on Sustainable Development (May) and the United Nations Framework Convention on Climate Change (December). The time is ripe to identify the interconnections between the three crises and develop complementary policy options and action steps.



## Reaching limits

In December 2008, the number of undernourished people worldwide stood at 963 million, an increase of more than 40 million since the last estimate.<sup>2</sup> Worldwide, 1.069 billion people do not have access to safe drinking water; 2.612 billion people do not have water to meet their basic sanitation needs.<sup>3</sup> Food deficit nations, almost all of them in the Global South and already water scarce, are further compromised by climate change, as they have limited resources for climate adaptation or to undertake mitigation efforts. Even as many global institutions recognize these limits, the

strategies being proposed often involve simply more of the same approach that has brought us here in the first place.

## Agriculture and climate change

While the IPCC estimates that agriculture's contribution to greenhouse gas (GHG) emissions is approximately 12 percent,<sup>4</sup> according to Greenpeace International,<sup>5</sup> the percentage is anywhere from 16-30 percent when land use, transportation, packaging and processing are included in the calculations. The percentage could very well go higher when cross-sectoral emissions are included.

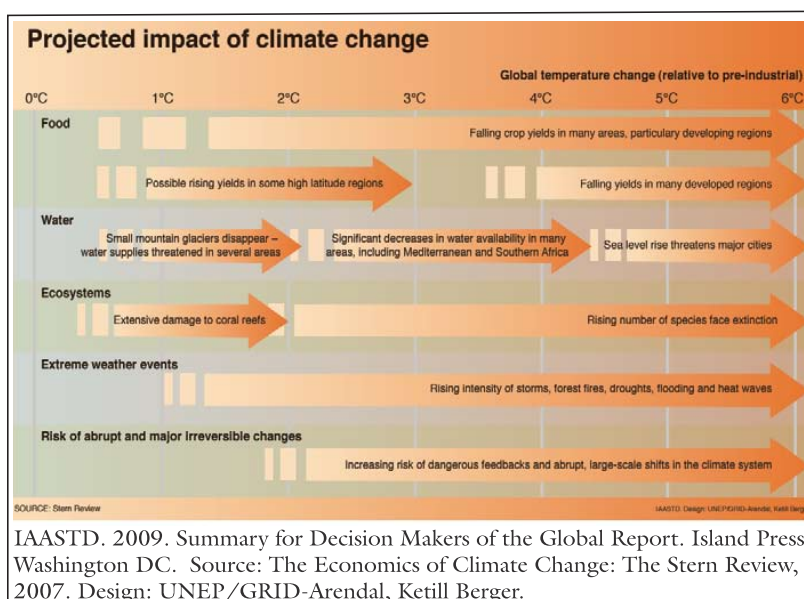
Industrialized farming, which depends on intensive resources to produce crops and livestock for increased trade, is largely responsible for these high numbers. A shift from several practices associated with industrial farming systems to more sustainable agricultural systems (with greater use of organic matter) could be significant in terms of reducing agriculture's contribution to GHG emissions.

## ***Irrigated agriculture***

Globally, irrigated agriculture accounts for almost 70 percent of total water withdrawn for human use from rivers, lakes, reservoirs, ponds and aquifers (this does not include water used in rain-fed farming systems or water used in food processing). The needs of intensive industrial agriculture have driven a large number of massive water infrastructures and water diversions, damming rivers for irrigation, for hydro-electric power, and in some cases, for flood control. By the end of the century there were more than 45,000 major dams globally. Half of the world's large dams supply water for irrigation, with the largest number in China, India, Pakistan and the United States.<sup>6</sup> Another major technological transformation in the second half of the 20<sup>th</sup> century—the tube-well—enabled industrial agriculture to expand to areas where such massive water transfers for irrigation were not feasible. Unlike traditional wells, tube-wells gave access to water in large quantities by driving a tube into deep aquifers and using a pump to suck water up. Easy access to state-subsidized energy services and equipment enabled expansion of industrial farming to otherwise water-stressed areas of Asian countries such as China, India and Pakistan. There is much opportunity for improvement in irrigation water use efficiency both at the stage of delivery from source to farm gate (lining of the canal, repairing of leaks), and at the farm level (shifting to more efficient irrigation technology and better water management practices, including moisture management).

## ***Rain-fed agriculture and food security***

Rain-fed agriculture, practiced in many parts of the developing world and in temperate regions of the Global North, supports the livelihoods of many marginal groups that practice small-holder agriculture. Far more vulnerable to climate-related stresses, and accounting for over 80 percent of agricultural land, rain-fed agricultural systems not only require the greatest adaptation to climate change, but have also been identified as pivotal to addressing food crisis.



## ***Agriculture and water quality***

Intensive irrigation water use, in combination with industrial farming systems, has resulted in widespread soil and water contamination from pesticide and fertilizer runoff, affecting quality and quantity of water available for other uses and resulting in habitat degradation. Pesticide and fertilizer runoff is one of the biggest causes of water quality deterioration and environmental degradation in North America and Europe.



## ***Women at the center***

One cannot talk about the food, climate or water crises without talking about women and children. Women are the keepers of water in varying parts of the world. In many places they are responsible for getting it and using it for the multiple needs of their families, both in rain-fed and irrigated farming systems. They are particularly affected by the quality and reliability of local water sources, yet they often lack any control over water management because of their social status.

## ***Comprehensive solutions***

Solutions to the water crisis, food security and climate change need to be considered in terms of fairness and equity, rights, responsibilities and stewardship. Governments must act to:

1. Adopt a rights-based approach in national and regional water and agricultural policies and investment decisions, as per the General Comments on the Right to Food (UN General Comment 12) and the Right to Water (UN General Comment 15). These national measures must be coordinated to ensure water availability for ecosystem needs and for basic needs of people<sup>7</sup>;
2. Support agro-ecological practices through the recommendations of the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD, 2008). This should include an investment in research and extension outreach regarding the climate change mitigating potential of multifunctional agriculture;
3. Harmonize approaches to water, agriculture and climate at the World Water Forum Ministerial (March 2009), the UN Commission of Sustainable Development (UNCSD-17, May 2009) and the United Nations Framework Convention on Climate Change (UNFCCC, December 2009);
4. Ensure that water availability is prioritized for ecosystem needs and for basic needs of people;
5. Safeguard women's human rights. Recognize women's involvement in farming and other rural activities, including food production and water management in the current ecological and economic environment; and
6. Ensure that voices of small-holders are central to policy reform; their concerns must be part of any global, regional and national solutions for food and water security.

## ***Conclusion***

As the world continues its current patterns of production and consumption, the future is at great risk. It is no longer possible for us to seek solutions for individual problems in an isolated manner. What is most needed is the collective political will to move in a direction that is sustainable, equitable and fair.

***\*This fact sheet is based on the full report *Integrated Solutions to the Water, Agriculture and Climate Crises* by Shiney Varghese. Available at [www.tradeobservatory.org](http://www.tradeobservatory.org).***



## Notes

<sup>1</sup>International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD), *Executive Summary of the Synthesis Report*, (Washington, DC: Island Press, 2009), [http://www.agassessment.org/docs/IAASTD\\_EXEC\\_SUMMARY\\_JAN\\_2008.pdf](http://www.agassessment.org/docs/IAASTD_EXEC_SUMMARY_JAN_2008.pdf) (accessed March 7, 2009).

<sup>2</sup>Food and Agriculture Organization, “Number of hungry people rises to 963 million,” Rome: FAO News Room, December 2008, <http://www.fao.org/news/story/en/item/8836/icode/> (accessed January 24, 2009).

<sup>3</sup>World Health Organization/UNICEF, “Meeting the MDG drinking water and sanitation target: the urban and rural challenge of the decade,” Global Water Supply and Sanitation Assessment, (World Health Organization and United Nations Children’s Fund, 2006), 6-7, [http://who.int/water\\_sanitation\\_health/monitoring/jmpfinal.pdf](http://who.int/water_sanitation_health/monitoring/jmpfinal.pdf) (accessed January 12, 2009).

<sup>4</sup>Intergovernmental Panel on Climate Change, *Climate Change 2007: Chapter 8 “Agriculture,”* 2007, [www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-chapter8.pdf](http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-chapter8.pdf) (accessed March 12, 2009).

<sup>5</sup>Greenpeace, “Cool Farming: Climate Impacts of Agriculture and Mitigation Potential,” Greenpeace, 2008, <http://www.greenpeace.org/international/press/reports/cool-farming-full-report> (accessed March 12, 2009).

<sup>6</sup>World Commission on Dams, *Dams and Development: A New Framework for Decision-making: the Report of the World Commission on Dams*, Earthscan, 2001.

<sup>7</sup>Jean Marc Faures and Guido Santini, “Water and the Rural Poor: Interventions for improving Livelihoods in Sub-Saharan Africa,” FAO Land and Water Division, 2008, <ftp://ftp.fao.org/docrep/fao/010/i0132e/i0132e.pdf> (accessed February 10, 2009).

