

Synthesis, Lessons, Conclusions: “Water for Food in a Changing World”



Photo: P. Gleick 2008

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Summary

- ◆ The challenges of growing food are increasing because of growing constraints on water, energy, land, and more.
- ◆ We've made **great progress** (expansion of irrigated land; better yields); but progress is slowing (or must speed up).
- ◆ We have two major challenges:
 - Find new ways to tackle old problems
 - Understand and address new problems

Major Issues?

- ◆ Water needs for food will grow substantially without improvements in efficiency or changes in demand/diet/population size.
- ◆ We anticipate increasing competition/conflicts with water for urban and ecosystem needs.
- ◆ Traditional sources of supply are increasingly constrained... (e.g., “closed” river basins, limits to new dams in some regions, unsustainable groundwater withdrawals.)
- ◆ Investments in irrigation are falling or mis-directed.
- ◆ Climate change is a reality.

Synthesis: Five Themes

- ◆ Ignore Ideology
- ◆ Integrate, don't Isolate
- ◆ Innovate
- ◆ Improve Information
- ◆ Initiate and Implement

Ignore Ideology; Expand Thinking

- ◆ Ideological fights? Fun but not productive...
 - Infrastructure versus no infrastructure?
 - Markets, privatization versus rights
 - International trade wars; subsidies
 - GMOs
- ◆ It is too easy to get the technology right but the institutions wrong (Briscoe, Catley-Carlson, Ingram, others)
- ◆ Solutions for **X** (Africa or small landholders) may look different from solutions for **Y** (Asia or large-scale systems) (Fererres, Bahri,...)
- ◆ Challenge fundamental beliefs
 - Stationarity of climate? Silver-bullet solutions?

Integrate; Do Not Isolate

- ◆ Examples of the failure to integrate?
 - Biofuels policy is an excellent example of how to do the wrong thing with enthusiasm and of the failure to integrate across issues (energy, food, land...)
 - Increased water use in one sector has traditionally come at expense of other users, esp. the environment; groundwater pollution; salinity (Loucks, Bahri, Safriel, Garrido,...)
 - 20th century water policy focused on narrow set of benefits (hydropower, flood protection, irrigation, recreation) without integrating impacts on ecosystems, local communities, culture...

Integrate; Do Not Isolate

- ◆ Sustainable water solutions inevitably come from a merging of approaches.
 - Technology *and* non-structural solutions.
 - Non-traditional sources of water (Falkenmark/Hoff, Llamas,...)
 - More comprehensive view of food system: not just field/farm productivity, but entire “food chain” – from “field to fork” (Hoff, Barghouti, ...)
 - Understand needs from other sectors: energy, food, health, ecosystems...(Fererres, Safriel, Barghouti, Dinar, Ortega,...)
 - Broader conception of trade (e.g., virtual water) (Yang, Falkenmark,...) and environmental policy (e.g., Spain, western North America) (Ingram, Garrido, Wilder, Varela Ortega,...)

Innovate: New Thinking

- ◆ Rethink water “supply” (Kraik, Falkenmark, Yang, Safriel, Loucks, Briscoe...
 - Look at both **blue** *and* **green** water.
 - Use the concept of “virtual water” as tool for planning.
 - Evaluate “non-traditional” sources (treated wastewater; rainwater harvesting, conjunctive use of groundwater, desalination.)
 - Don’t forget **quality** issues: Match the “qualities” of water available with the quality of water needed.
 - Don’t forget **ecosystem** issues: Must meet human and environmental needs together.
 - Build traditional supply infrastructure where/when needed, but to new standards.

Innovate

- ◆ Rethink water “demand” (Ferereres, Bahri, Craik, Garrido,...)

Move away from idea of using “water” toward idea of maximizing “benefits” that water provides: e.g., more “crop per drop,” through improving yields or reducing water use per unit of production.

- New crop varieties;
- New irrigation methods (deficit irrigation)
- New irrigation technologies

Innovate

- ◆ Rethink “institutions” or “management” (Briscoe, Catley-Carlson, Ingram, Garrido, Wilder, Varela Ortega,...)
 - Bringing natural science, social science, politics, and water together more effectively.
 - Equity as central; not peripheral
 - Participation is key, but is hard to do and doesn't always lead to substantive change.
 - “Basin management” is key, but is hard to do and doesn't always lead to substantive change.
 - “Trading” is key, but...

Improve Information

- ◆ Monitor and measure; the role of science
 - Collect key data; we cannot make good decisions in the **absence of good information**.
 - We cannot make good decisions with **bad information**.
- ◆ Communications/Education
 - Scientists to Policy Makers (What do we **know**? How do we **communicate** it?)
 - Policy Makers to Scientists (What do we **need** to know to make decisions?)
 - Everyone can communicate better with the public. (Footprint...)



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Initiate and Implement: Priorities for Food in a Changing World

- ◆ Meet needs of the poorest, but especially Africa.
- ◆ Don't ignore population.
- ◆ Improve efficiency/productivity.
- ◆ Focus on effective approaches to technology and investment.
- ◆ Focus on effective approaches to management.

Water for the Future?

- ◆ Successful solutions to water problems are available and being implemented every day. Build on success; learn from failure.
- ◆ Successful solutions will be those that move beyond ideology, integrate concepts, communicate new information in new ways, and lead to new actions.



Suggestions for Future Forums?

- ◆ Emphasize solutions and success stories, not just problems.
- ◆ Explore ideas of integration and interdisciplinary tools.
- ◆ Explore ideas for communicating ideas.
- ◆ Continue integrating science and policy.
- ◆ Invite policy makers.

Thank you

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