



CONFERENCE/WORKSHOP ORGANISER'S REPORT

“Virtual Water in Agricultural Products: Quantification, Limitations and Trade Policy”

The opinions expressed and arguments employed in this report are the sole responsibility of the authors and do not necessarily reflect those of the OECD or of the governments of its Member countries.

Brief Description of the conference/workshop

Water researchers from around the world gathered for a three-day workshop “Virtual Water in Agricultural Products: Quantification, Limitations and Trade Policy” at LI-COR Biosciences and the Nebraska Innovation Campus on September 14, 15, and 16. The sessions were organized and sponsored by the Nebraska Water Center (NWC), part of the Robert B. Daugherty Water for Food Global Institute at University of Nebraska (WFI). Support for the workshop was provided by the Organization for Economic Cooperation and Development (OECD), University of Nebraska-Lincoln Institute of Agriculture and Natural Resources (UNL IANR) and WFI. Presentations and discussions addressed the transfer of “virtual” surface and groundwater from river basins and regional aquifer systems among OECD member countries to determine how to better define and use this concept in structuring sustainable food production systems. “Virtual water content” or simply “virtual water” is an attempt to quantify the amount of water used and exported in food production. There is tremendous debate about the sustainability of “virtual groundwater” that is used and exported from regional aquifers and its transfer to other countries.

LI-COR Biosciences hosted the first morning session, which was followed by a field trip for participants to view Nebraska Extension exhibits at the annual Husker Harvest Days irrigated farm show near Grand Island. Dr. Vangimalla (Victor) Reddy of the U.S. Department of Agriculture’s Agricultural Research Service opened the meeting at LI-COR with remarks on the work and goals of OECD’s cooperative research program on biological resource management for sustainable agricultural systems. Dr. Reddy’s remarks were followed by overview of the workshop by Dr. Chittaranjan Ray, Director of the Nebraska Water Center, and a presentation on virtual water definition and water footprint calculations by Dr. Mesfin Mekonnen, WFI. LI-COR scientists and management then toured attendees through their Lincoln-based plant that designs and manufactures specialized instruments that support many research, environmental and agriculture-based activities.

The first day’s afternoon was spent at Farm Progress Company’s Husker Harvest Days farm show. This is the largest fully irrigated working farm show in the nation. It has had an extensive Nebraska Extension and research presence since opening in 1978. Workshop participants toured the exhibits and met with NWC communicator Steve Ress, who coordinates the UNL IANR presence at the show.

Morning sessions on the workshop’s second day were keyed to “Virtual water in trade and agriculture, global markets and trade” with introductory comments by Ron Yoder, interim vice chancellor of IANR and Peter McCornick, WFI executive director. Afternoon discussions centered on “Quantification of water footprint in agro-food, fishery and forestry sectors”.

On the third and final day of the workshop, sessions were devoted to the broad topics of “Sustainability concerns for large U.S. aquifers” and “Case studies from around the world.”



Participation – details of total number of participants, countries they came from, backgrounds (academia, industry, etc.)

A total of 19 speakers gave presentations at the workshop. Additionally, another 20 attendees and panellists were present. Our support personnel also were present at the workshop for logistics and other support. The attendees were from the United States, Canada, Chile, Japan, Korea, United Kingdom, Spain, and Belgium (representing EU). Their backgrounds covered academia, consulting, and policy making. US participants were from California, Texas, Kansas, Arizona, Colorado, Illinois, and Nebraska.

Major highlights from the presentations

Highlights from the workshop presentations included a talk by David McInnes of the Canadian Agri-Food Policy Institute, in which he emphasized natural capital, trust, and policy issues as viewed through the lens of natural capital. This was followed by a presentation by Alberto Garrido of the Polytechnic University of Madrid (Spain) who showed that international trade is essential in reducing the water footprint of food production, especially for densely populated semi-arid countries. Hua Xie of the International Food Policy Research Institute discussed the potential for small-scale irrigation development in Sub-Saharan Africa and how this irrigation development can make some countries in that region a net exporter of food. Dennis Wichelns, working with the Stockholm Environmental Institute, argued that virtual water calculations do not provide any insight into optimal production and trading patterns or efficient strategies.

In subsequent presentations focused on quantification, Davy Vanham (representing the European Union) presented the water footprint for the European Union and sustainability challenges. Timothy Hess (United Kingdom) talked about embedded water in the United Kingdom diet. Megan Konar (Illinois, USA) focused on how drought impacts water footprint and virtual water transfers in the Central Valley region of California. Lara Kuepper (California, USA) demonstrated the linkage between climate change and irrigation, where increased irrigation over large areas also impacts precipitation patterns. Julian Fulton (California, USA) presented a case study of the water footprint for California. Sustainability aspects of aquifers for food production were addressed by Carole Dalin (United Kingdom), Chuck West (Texas, USA), James Butler (Kansas, USA), Palbo Alvarez (Chile), Clinton Williams (Arizona, USA), Suat Irmak (Nebraska, USA), and Timothy Green (Colorado, USA). Finally, case studies of water footprint in the context of food, energy, and water were presented by Makoto Taniguchi of Japan and Sanghyun Lee of South Korea.

Major outcomes/conclusions in terms of policy relevance

The major conclusions/outcomes of the workshop are the following:

- Water footprint computations are useful tools to examine the relative impacts of agriculture (or food production) or earth's water resources.
- There are avenues to improve the calculation procedures for water footprinting.
- The concept of "virtual" water has value in understanding the flow of water in agricultural commodities, and in some circumstances may be useful in understanding water demand for agricultural products in arid regions where such productions may not be sustainable.
- There was disagreement if "virtual" water and water footprints will have any policy implications in the context of international trade. It was emphasized that the local political environment often supersedes decision making in the context of national security or food security.



- Participants plan to share the information of the workshop to the broader audience, such as government agencies in USA and internationally.
- Proceedings will be prepared and discussions are underway to have a special issue in an appropriate journal for selected papers addressing the core of this workshop.
- The group is planning future collaborations for research proposals in the area of food, energy, and water nexus and to refine the determination of water footprints.

Relevance to CRP theme(s)

The workshop is relevant to Theme I. The Natural Resources Challenge area of the Co-operative Research Programme. It addressed water use in food/feed production and accounting methods, societal options and response to environmental protection, planning and management considerations for sustainable use of natural resources such as water.

Website for further details – please also indicate if the presentations are/will be available on the website

<http://unlcms.unl.edu/ianr/water-for-food/nebraska-water-center/virtual-water-conference>

We will add the presentations once we receive approved copied from the authors.