

Calculating comprehensive water footprint indicators with a global MRIO model. The case of EXIOBASE 2.0 (for special session on CREEA)

Topic: The EXIOBASE Global MRIO database – new insights developed in the projects CREEA and DESIRE (Compiling and Refining Environmental Accounts / Development of a System of Indicators for a Resource Efficient Europe)

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Issues related to the availability and use of water, such as water scarcity or over exploitation, are often localized phenomena to be dealt with not only on the national but rather on the watershed level, as aimed at, for instance, by the Water Framework Directive of the European Commission. However, local water depletion is often closely tied to consumption in other countries and world regions, as water used to produce exported products is 'embodied' in traded commodities.

The agricultural sector is by far the biggest water user worldwide, followed by the energy sector. Hence, with increasing trade in cereals as well as food and feed products also the volumes of traded embodied water is getting larger. Various attempts exist to quantify the water quantities necessary to grow a certain crop and to produce specific agricultural products respectively. Among these, two of the most important datasets are published by the Water Footprint Network and by ETH Zurich.

In this paper we will for the first time apply the EXIOBASE multi-regional input-output (MRIO) system version 2.0, with the base year 2007, extended with the two different data sets on water consumption. We will illustrate the potentials for using a MRIO model extended with water data to calculate the amounts of water embodied in final consumption. The results of the calculations with both data sets will be compared (1) to evaluate differences in the two datasets in use and (2) with other methods to analyse water use and consumption, such as the Water Footprint methodology (UTwente) and life-cycle assessment methodologies (ETH Zürich) which focus on evaluating the environmental impacts of water appropriation. This comparison sheds light on the strengths and weaknesses of the different methodologies, and helps identifying main areas of methodological improvements.