Global shifts of green house gas emissions and requirements for water and bio-productive land

Topic: Modelling global water issues
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In order to avoid shifts in environmental burden among regions and different environmental issues, a set of three footprint indicators was proposed. Carbon footprint is intended for an evaluation of human contribution to climate change in the form of green house gas emissions, water footprint is intended to evaluate human requirements for fresh water, and ecological footprint is intended for tracking human need for bio-productive land. For the first time, these three indicators were calculated altogether within a joint framework of a multi-regional input output model (GTAP 7).

The ecological and water footprints are based on linking economic sectors with consumption of primary products and direct requirements on land and water. Greenhouse gas emissions are taken directly from the GTAP 7 database. The conversion of primary crops into ecological footprint is based on the methodology proposed by global footprint network. Greenhouse gas emissions are converted into CO2 equivalents using global warming potentials for 100 years published by the intergovernmental panel for climate change.

In our contribution we will briefly introduce the method which we have developed and used. Then we will discuss effects of international trade for shifting the environmental burden expressed by these indicators. We will show the main global virtual flows of water, bio-productive land, and green house gas emissions.