



Tropentag, October 5-7, 2011, Bonn

“Development on the margin”

## Domestic Blue and Green Virtual Water Transfers in China: Is Water Scarcity Really a Driver?

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### Abstract

This study contributes to the research field of virtual water by estimating the blue and green virtual water transfers within China, a country with severe regional water scarcity problems. Due to the lack of data from official statistics, model outputs from the economic landuse model MAgPIE (Model of agricultural production and its impact on the environment) are used to estimate inner-Chinese trade. Virtual blue and green water transfers are then estimated using blue and green water consumption values from the biophysical crop and vegetation model LPJmL (Lund-Potsdam-Jena managed Land Dynamic Global Vegetation and Water Balance Model).

Production patterns for the year 2005 for 15 food crop groups are delivered on a 0.5° resolution by MAgPIE\_trade, which are used to calculate the surplus or deficit, as a result of a supply and demand equation, for 8 sub-regions in China. After accounting for international trade, trade flows within China underlie the assumption, that deficits are met with the excess volumes produced in the sub-regions with food surplus. Using crop-specific virtual water contents derived from the crop and vegetation model LPJmL on a 0.5° resolution, product trade flows can be transformed into blue and green water transfers.

On the basis of the results, the following questions will be answered: Does virtual water “flow” from water abundant to water scarce regions within China and how big is the throughput? What is the share of green and blue virtual water transfers? Which scarce resources drive domestic trade?

In recent literature, international trade is discussed as one option for regional water management. Results of this study give necessary information to evaluate the potential of the virtual water transfers, for the special case of food production, trade and large scale water management within China.

**Keywords:** China, virtual water