The ‘ water footprint ’ for Products

Producing goods and services generally requires water. To quantify the amount of water that is needed in the offset to produce agricultural goods the concept of ‘virtual water’ has been introduced by Tony Allan of Kings College in London in the early nineties (Allan, 1993; 1994). It took nearly a decade to achieve global recognition by the conceptual introduction of the ‘water footprint’ by Hoekstra (2002). This approach is based on the systematic of the ecological footprint that quantifies the consumption of resources and the generation of waste per capita (Rees 1992). In this respect the ‘water footprint’ of produced goods aims to indicate the direct and indirect water consumption of producers and consumers needed throughout the product’s life cycle. In other words the ‘water footprint’ of a person, family, community, nation or business is the total volume of fresh water used to produce the goods (including food) and services consumed. Included in this calculation is the usage of surface and ground waters as well as the waste waters produced. The virtual water thus became the currency for the calculation of the ‘water footprint’. Few examples: for the production of 1 kg of grain we need 1,000-2,000 liter of water, for one cup of coffee 140 liter of water are needed. For one kg of beef 16,000 liter of water is used which correlates to the use of water and feedstock from the animal’s life.

“The interest in the ‘water footprint’ is rooted in the recognition that human impacts on freshwater systems can ultimately be linked to human consumption,” says Professor Arjen Hoekstra, Professor, Scientific Director at the University of Twente and board of the ‘water footprint’ Network (http://www.waterfootprint.org). The ‘water footprint’ Network was founded in 2008 and represents a multi-stakeholder platform and gateway to further the ‘water footprint’ methodology and tools.

How can the ‘water footprint’ of products now impact the global economy and ecology? If one country exports a water-intensive product to another country, it exports water in virtual form. In this way some countries support other countries in their water needs. For water-scarce countries it could therefore be attractive to achieve water security by importing water-intensive products instead of producing all water-demanding products domestically and vice versa. The four most important direct factors that impact on national ‘water footprint’s are the total volume of consumption (generally related to gross national income), a water-intensive consumption pattern of people (including meat consumption), the climate and technologies. Therefore, for brands, water shortages are much more local challenges - unlike carbon, which is a global problem. A cubic meter of water wasted in many parts of north-European countries for example does not harm or deprive others in the world in the same way that a tonne of emitted CO_2 will in years to come, irrespective where it is produced.

Ultimately, businesses or individuals may want to become "water neutral" by reducing the effects of their ‘water footprint’s. For business this can be achieved e.g. by adopting technologies that require less water per unit of product. Another way could be to shift water intense production lines from areas with low water-productivity to areas with high water-productivity, thus increasing global water usage efficiency (Hoekstra and Capahain,

2007). These aspects could even be adapted to entire business units (Gerbens-Leenes and Hoekstra, 2008). Individuals could reduce their water footprint by changing their consumption behavior (e.g. exchanging rice by potatoes in North-Europe or meat by vegetables). Similar to global CO_2 offsets, consumers and businesses may also be able to offset their direct "water footprints", e.g. when local organizations sell offset-certificates or business invest with the aim to improve water resource managements (Hoekstra, 2008).

In conclusion the 'water footprint' of a product represents a information matrix related to the quality and quantity of the individual, direct and indirect water demands during a products life cycle. This information may be used to challenge the water balance of industries (production) or individuals (consumption behavior) and between countries (trade).

References:

- Allan J.A. 1993. Fortunately there are substitutes for water otherwise our hydro-political futures would be impossible. In: Priorities for water resources allocation and management, ODA, London, pp 13–26
- Allan J.A. 1994. Overall perspectives on countries and regions. In: Rogers P, Lydon P (eds) Water in the Arab World: perspectives and prognoses. Harvard University Press, Cambridge, Massachusetts, pp 65–100
- Gerbens-Leenes, P.W. and Hoekstra, A.Y. (2008) Business water footprint accounting: A tool to assess how production of goods and services impacts on freshwater resources worldwide, Value of Water Research; Report Series No.27, UNESCO-IHE, Delft, The Netherlands.
- Hoekstra A. Y. and Chapagain A. K.. 2007. 'water footprint's of nations: Water use by people as a function of their consumption pattern. Water Resour Manage; 21:35–48
- Hoekstra A.Y. 2008. Water neutral: reducing and offsetting the impacts of 'water footprint's Value of Water Research; Report Series No. *28* UNESCO-IHE Institute for Water Education, Delft, the Netherlands
- Rees W. 1992. Ecological footprints and appropriated carrying capacity: what urban economics leaves out Environment and Urbanisation; 4; 2

Links:

http://www.waterfootprint.org
http://www.unesco-ihe.org/
http://en.wikipedia.org/wiki/Water_footprint
http://de.wikipedia.org/wiki/Virtuelles_Wasser
www.wbcsd.org/web/watertool.htm
www.wbcsd.org/web/H2Oscenarios.htm
http://www.h2o-wissen.de/
http://oezepa.austropapier.at/fileadmin/Austropapier/Dokumente/vstsem-18032009-maur.pdf
http://www.youtube.com/watch?v=-nekqKEsbdU&feature=channel_page
http://www.wwf.de/themen/politik/wasserpolitik/weltwasserforum-2009/virtuelles-wasser-und-der-wasser-fussabdruck/
http://www.virtuelles-wasser.de/
http://www.footprintinstitute.com/
http://www.worldwaterweek.org/
http://www.sueddeutsche.de/wissen/552/325417/text/