

Water Footprint Assessments

Blue, Green And Virtual Water

Increasing water scarcity in many parts of the world and concerns about unsustainable use of freshwater is intensifying efforts to carefully scrutinise the consumption and pollution of water associated with various human activities. Water footprint assessments is a relatively new concept which aims to examine both direct and indirect water use along production and supply chains.

WATER CONSUMPTION OCCURS WHEN WATER EVAPORATES, IS INCLUDED INTO A PRODUCT, IS NOT RETURNED TO A CATCHMENT, OR IS NOT RETURNED DURING THE SAME PERIOD IT WAS EXTRACTED. WATER FOOTPRINT ASSESSMENTS CAN BE CONDUCTED FOR A PROCESS STEP, A PRODUCT, A CONSUMER OR GROUP OF CONSUMERS, A GEOGRAPHICALLY DELINEATED AREA, A NATION, OR HUMANITY. WATER FOOTPRINTS ARE EXPRESSED AS A UNIT VOLUME OF WATER PER UNIT TIME OR PER UNIT PRODUCT.

Globally, agricultural production uses the largest fraction of our freshwater, with the industrial and domestic sectors also having significant impacts on this resource. Growing international trade of water intensive products means that freshwater now needs to be considered as a shared resource between nations. In the case of crop production, the volume of water evaporated (soil evaporation plus crop transpiration) is far greater than the volume incorporated into the product or used in any further production stages. The water used to produce a kilogram of sugar, for example, takes around 1 800 litres of water to grow, a kilogram of rice 2 500 litres, and a kilogram of beef around 15 500 litres of water. When these products are exported, this water – termed “virtual water” – can also be considered exported.

Blue and green water

Not all water is considered equal. Blue water refers to surface water

(rivers, dams and lakes) and groundwater that can be used for a variety of human activities, including irrigation, industrial and domestic uses. Green water refers to water originating from rainfall that is available in the soil for plant growth, but cannot be used for other purposes. In rainfed regions, only green water consumption is therefore considered, while for irrigated sugarcane production, both blue and green water consumption takes place.

Distinguishing between blue and green water is becoming increasingly important because of the common value to society associated with blue water, more especially in water-scarce catchments. Beef from cattle grazing on natural veld grown using green water will have a lesser impact on resources than beef from cattle raised in a feedlot and fed maize produced under irrigation (blue water), even though overall water consumption might be equal in both cases.

In the irrigated areas of the sugar industry, strategies to reduce blue water consumption by increasing green water consumption, for example through careful irrigation management, will result in a more favourable water footprint.

Outlook

The South African sugar industry supplies significant amounts of sugar to local and international markets. Anticipated labelling of commercial products with a water foot-

print means that accurately quantifying and communicating blue and green water consumption for sugar produced in our climatically diverse regions is essential. A water footprint with a higher ratio of green to blue water consumption is viewed more favourably.

At regional to national scales, water footprint assessments have a major role to play in improving our understanding of and ability to manage our water resources. Being a water-scarce country, the vast amounts of virtual water South Africa exports with our food products needs to be assessed within the context of catchment water availability to other sectors, international trade benefits, job creation, environmental impacts and other factors. ✓

Source: Hoekstra, A.Y., Chapagain, A.K., Aldaya, M.M. and Mekonnen, M.M (2011) The water footprint assessment manual: setting the global standard. Earthscan, London, UK.

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