The water footprint – a practical tool for water-resilient value chains and catchments

Fifteen thousand litres of water for a kilogram of beef, and a thousand litres of water for a kilogram of avocados. Whenever there is mention of the water footprint, people usually associate it with water consumption for certain products. But the concept has a much bigger potential, as our authors show.

By Derk Kuiper and Erika Zarate

According to the Water Footprint Network, producing 1 kg of cotton in India consumes 22,500 litres of water.

THE WATER FOOTPRINT

The water footprint is an indicator of freshwater use. Blue and green water footprints measure volumes of water consumed (evaporated or incorporated into a product), either from surface and ground sources (blue water footprint) or from rainwater (green water footprint). The water footprint is a geographically explicit indicator, showing not only volumes of water use, but also the location (Hoekstra et al., 2011).

In 2004, Arjen Hoekstra, a professor at the University of Twente, Netherlands, showed that a Dutchman drinking his nice cup of morning coffee actually consumed 140 litres of water. He had introduced the water footprint concept (see Box) in the scientific world back in 2002, but this time, the concept reached the public beyond the scientific community. The idea of consuming water while drinking a cup of coffee was powerful and contributed to increasing the understanding of water use in the value chains of commodities. Soon after, water footprints of commodities like sugar, cotton, beef, or energy started to appear beyond scientific papers in order to raise awareness and reach a wider public. Naturally, multinationals with agricultural value chains grew interested and also a bit anxious about the water footprint, which might potentially create a perhaps not so desired transparency on water consumption in commodity value chains. At the time, the water footprint contributed by increasing the understanding of the idea that the impacts on water consumption and water pollution of commodity production occurred in one place while consumption was mostly occurring at another place. This immediately brought up a notion of assuming responsibility for water use in production geographies and the need for value chains to take action.

Diverging opinions

While many embraced the concept, the water footprint was also strongly attacked by some research groups and industry bodies. They claimed that the 140 litres of water used for a cup of coffee did not say anything about the environmental and social impact of the water consumption. They were right about that, in the sense that the 140-litre number represented a global average and was used for awareness raising. However, they missed a key piece of knowledge embedded in the original concept as introduced by Hoekstra. The water footprint was never defined to show the impact of that water consumption, but rather as a measure of the volume of water consumed in a certain catchment in a specific period of time. Sadly, the water footprint suffered under these attacks and lost some of its appeal to the outer world. It did not however lose its conceptual strength or the interest of a group of people who continued to carry out research but also to develop practical applications using the water footprint as a solid tool to drive forward the sustainability of agricultural value chains. Today, we are witnessing a rebirth of the water footprint concept. It is becoming one of the key indicators to drive water sustainability in agricultural value chains.

Transparency on water consumption and engagement in water

Water footprints can nowadays be calculated by anybody in the world thanks to open access methodology and data. As a result, water footprint datasets have become more locally specific, and slowly, transparency on water consumption in many places around the world is increasing. Because of the open nature of the water footprint and the underlying data, water footprint data has the potential to become widely and transparently available to everybody engaging in water. This means that not only companies but also communities, civil society and governments can have access. The water footprint provides a solid information source supporting dialogues between stakeholders on shares of water consumption in specific places and time periods, and can inform the water allocation discussion as well as management arrangements for various uses.

Water footprints have the potential to align the water consumption of a commodity with the water situation in a locality. For example, the water footprint of coffee is nothing more than an estimation of the water consumed by the coffee plant and the subsequent processing in the production locality. This volume of water consumed by the coffee production and pro-

cessing is connected directly to the local water situation and at the same time, indirectly, to a commodity value chain. It is this logic that helps companies with global value chains to understand their water consumption and their contribution to the water situation in their sourcing locations. While it is still early days, there are already companies that are starting to understand how this will help them to drive value chain water sustainability. For example, we are working with a global food processing company that sources raw materials from all over the world. Through our work they now understand the water use associated with the raw material they buy and how they can work with value chain partners to help improve or at least not worsen the local water situation.

In practical terms, how exactly?

Blue and green water footprints can be directly connected to the local water situation by linking blue and green farm water consumption with the water balance of the catchment, command area or administrative and hydrological unit for allocation of available water resources. The water footprint of several farms in a catchment forms the water footprint of a sector, and the water footprint of all sectors in a catchment forms the water footprint of that catchment. The water footprint of the catchment refers to the evaporative component in that catchment. If the catchment has an unsustainable water balance, there will be water flows being extracted from the catchment (i.e. the evaporative flow) faster than the renewal capacity of the same catchment, and therefore, there will be depletion and an unsustainable situation. This means an important water risk for the value chains sourcing a commodity – and its water in virtual form – from that place. A company can quantify its share of water footprint in the catchment, and moreover, can use the water footprint to conduct crop water use benchmarking across different catchments. Understanding the crop water footprint, the shares of crop water footprints in catchments and the benchmark of crop water footprints across catchments provides strong intelligence for water risk management in value chains and catchments.

The future

Taking the enormous growth in tech and data access into account will increase the efficiency of water footprint calculation. Satellite data will increasingly support the validation and verification of these calculations. The widespread access to more reliable and localised water footprint data will facilitate the drive of water sustainability in global value chains and the catchments these value chains depend on.

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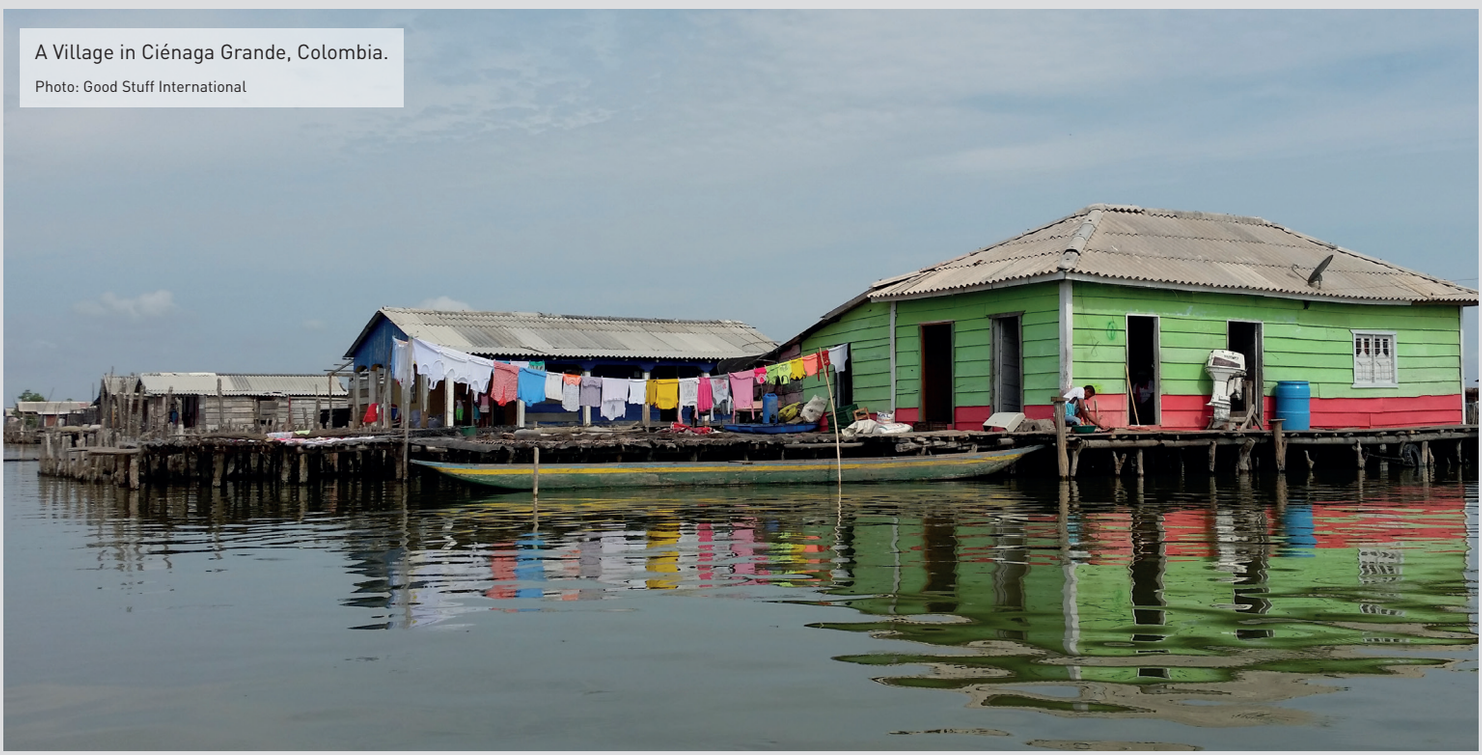
References: **www.rural21.com**



A Village in Ciénaga Grande, Colombia.
Photo: Good Stuff International

Good Stuff International is a consultancy company specialised in supporting people and organisations to become sustainable water users. For example, we work for the World Wildlife Fund (WWF) to support the multi-stakeholder Water Stewardship Platform in Northern Colombia. The Platform was founded in 2015 by WWF and the private sector and is a space where stakeholders collaborate to design strategies and to carry out concrete projects for the sustainable use of freshwater in Frío and Sevilla Catchments to sustain water flow to the Ciénaga Grande Wetland (see image). We have used the water footprint as key information on water productivity and water efficiency of different stakeholders to drive collective action.

More information on the Water Stewardship Platform can be found in the brochure:

http://www.goodstuffinternational.com/images/PDF/WWF_Flyer_Kolumbien_WEB.pdf