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Water footprint as an indicator of agricultural productivity in African countries

Daniel Chico Zamanillo, Guoping Zhang, and Ruth Mathews
Water Footrpint Network, The Hague, The Netherlands

Sub-Saharan Africa is one of the regions with the largest scope for improved agricultural development that would contribute to global food security while respecting environmental boundaries. More importantly, undernourishment is a challenge for many African countries and needs to be addressed to achieve the 2030 Agenda for Sustainable Development.
This study was conducted to support the Netherlands Ministry of Foreign Affair's Inclusive Green Growth aim of increasing water use efficiency by 25% in Dutch financed projects. A water footprint profile was developed for 7 Sub-Saharan countries; Benin, Ethiopia, Ghana, Kenya, Mali, Mozambique and Rwanda. The profiles provide an overview of water use from the perspective of the goods produced within the country, the consumption of goods, in particular agricultural crops, whether these goods are produced domestically or imported from other countries and the level of blue water scarcity experienced in the country. Across all countries, key food crops such as maize, and sorghum have low water productivity relative to the global water footprint benchmark. Export crops such as tea in Kenya or cocoa in Ghana show a good performance over global production.
Furthermore, the water footprint of crops over the period 2006-2013 was compared to data from the period 1996-2005. Changes in yield and the resulting changes in the water footprint were assessed for both food and export crops. Yields in food crops improved in some countries, and in some years, but not consistently across all countries and years. The greatest gains in water productivity were in key export crops. The results provide insights into whether improvements have been made in water productivity in recent years and through comparison with the global water footprint benchmark, remaining opportunities for further gains in water productivity were identified.
Going forward, policies that will enhance further improvement in water productivity and support greater food and water security should be considered. Agricultural practices that have improved yields and reduced water footprints should be identified and evaluated for their relative contribution to higher water productivity and to guide investments in agricultural extension and technology. Crops should be selected based on their comparative advantage relative to the water footprint and yields as well as their contribution to livelihoods and economic growth. Water resource management and planning needs to meet water demands for economic development while protecting and enhancing ecosystem services. Trade-offs between water resources allocation to grow food crops versus export crops and resulting reliance on internal versus external water resources for food security should be assessed and used to guide decisions.
Achievement of the Sustainable Development Goals will require a multi-pronged approach to improving agricultural practices, strengthening farmers' livelihoods, increasing food security and protecting water security. The water footprint as it has been used in this study can support sustainable development by building an understanding of the water consumed and polluted in producing goods and identifying the opportunities for improving water efficiency and land productivity.