UK aid
from the British people

Reading Pack

Tackling the Global Water Crisis: The Role of Water Footprints and Water Stewardship

Dr Nick Hepworth

Water Witness International

August 2021

Shared water security is an essential accelerator for social and economic progress; namely, getting girls into school, creating jobs and economic growth, enabling food security, climate resilience, clean energy, and mitigating conflict.
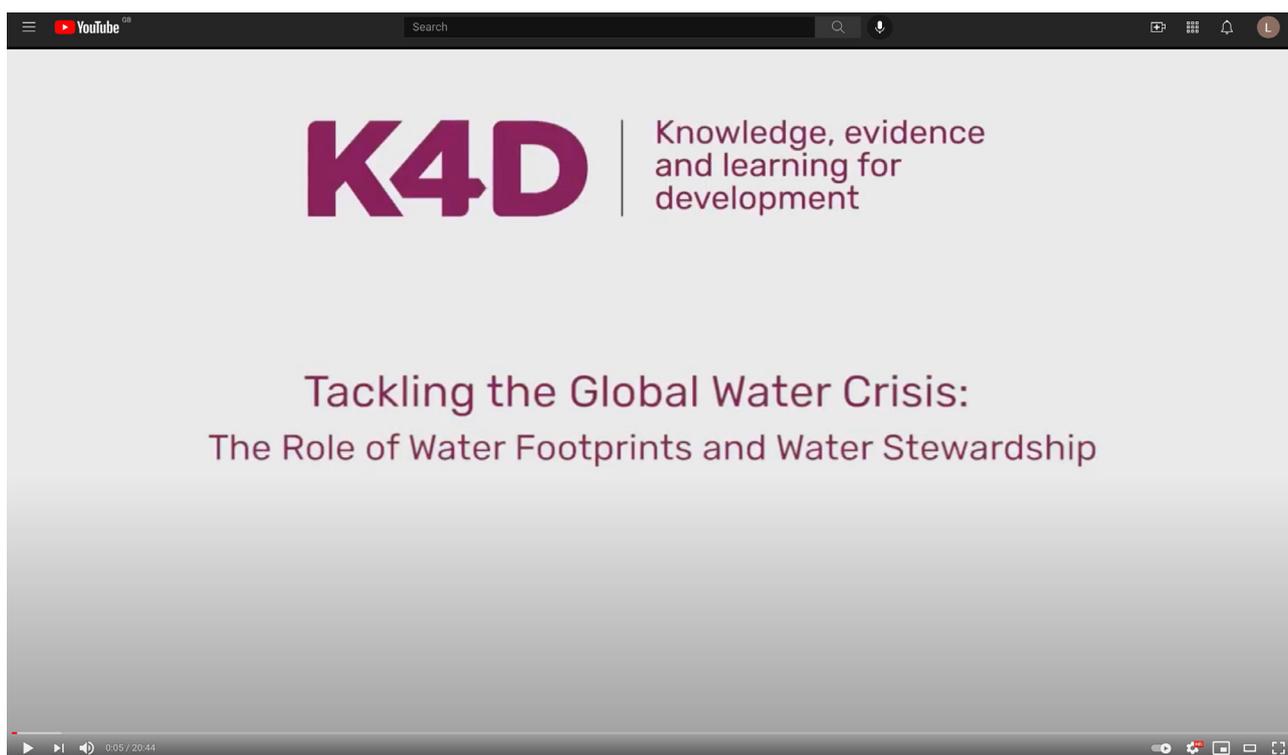
Water security is a useful unifying concept and goal that brings together the multiple objectives of water managers: human health needs for safe water supply, sanitation and hygiene; the needs of nature, food production, and economic activity; as well as the management of water-related hazards. Water security is defined as:

> the reliable availability of an acceptable quantity and quality of water for production, livelihoods, health and ecosystems, coupled with an acceptable level of risk from hazards including drought, flooding, pollution and conflicts.[1]

Shared water security underscores the importance of equity and inclusion, and the vital caveat that water security for some must not come at the expense of water security for others.

Its significance for controlling the spread of COVID-19, and in preventing the avoidable deaths of over 800,000 people in low-income countries each year dramatically emphasise the importance of universal access to safe water, sanitation and hygiene (WASH) for disease control and health.[2]

Water is fundamental to addressing the biodiversity crisis and the climate emergency. Alongside its principal roles in adaptation, and resilience to intensifying cycles of drought and flood events, there are opportunities to reduce the 10% of global greenhouse gas emissions which are currently contributed by the water sector.[3] Shared water security is therefore one of the most important global priorities of our age, and will underpin attainment of the Sustainable Development Goals, or push many of them out of reach. Failure to act effectively will impose an incalculable human and ecological toll, and will constrain economic productivity by as much as 6% a year by 2050.[4,5]

In this video Nick Hepworth provides an overview of the topics covered in this Reading Pack. Click here to view the video on our YouTube feed.

[1] Grey, D., Sadoff, C.W. (2007). Sink or swim?: Water security for growth and development. 545–571. doi:10.2166/wp.2007.021.

[2] https://www.who.int/news-room/fact-sheets/detail/sanitation

[3] See *Stop floating, start swimming, interlinkages and prospects for future action*. Retrieved from: https://everydrop-counts.org/imglib/pdf/Water%20Climate%20Report%202020.pdf

[4] World Bank Group (2016).

[5] The starkest account of the conjoined water and climate crises is provided by ICIMOD's modelling of the effect of 1.5 degree warming on the Himalayan glaciers, the meltwater rivers they feed, and the 2 billion people – or quarter of humanity – which depend on them. Wester, P. *et al.* (Eds.) (2019). *The Hindu Kush Himalaya assessment: Mountains, climate change, sustainability and people*. Springer. https://link.springer.com/book/10.1007/978-3-319-92288-1

Understanding the water crisis

Understanding the root causes of the water crisis helps to situate the related concepts and practices of water footprint assessment and corporate water stewardship, and their relevance within the global response. The Comprehensive Assessment of Water Management, a collaboration between hundreds of scientists to establish whether the world will run out of water, concluded that there is enough water to feed humanity, address inequality, and maintain our ecosystems, but only if we rapidly change how water is managed.[6] Its findings support a global consensus that whilst the hydrological context and shifting demand are an important backdrop, the water crisis is primarily one of poor governance.

According to the Comprehensive Assessment, the solution lies in strong state institutions that can make and enforce decisions regarding the use, protection, and allocation of water resources. These institutions must be able to reconcile competing demands, administer secure water rights, develop infrastructure, and support smallholder farmers. Delivery requires a massive increase in human and financial resources, underpinned by stronger accountability, political prioritisation and bold leadership. In effect, tackling the water crisis demands a radical and rapid reshaping of the political economy around water.

'Business-as-usual' approaches are unlikely to trigger this change. Despite some success in mobilising funds, capacity, and reform, the water sector has struggled to deliver and sustain improved water and sanitation services where needs are greatest. Even with substantial donor support, the impact of integrated water resource management (IWRM), the "wheel-house" of water security, has been limited, with only 40 per cent of countries on track with implementation.[7] This has a direct consequence for climate vulnerability because basin authorities – the implementers of IWRM – play a key role in effective planning and response to drought and flood events. If we are to reach the ambitious water-related targets within SDG 6, then fresh tactics are urgently needed.

Virtual water and water footprints

Building on Tony Allan's landmark research on virtual water,[8] **water footprint assessment and accounting provide new ways to understand, communicate, and stimulate action for water security.** Allan's breakthrough was to highlight that societies can meet their needs for food security even in constrained hydrological settings by importing produce and "embedded water" from elsewhere. Methodologies for quantifying and tracking this virtual water flow were refined by Arjen Hoekstra and the Water Footprint Network. A sophisticated and standardised set of approaches and data sets now exist which allow us to quantify and trace the water footprint of countries, companies, cities, commodities, products, and citizens, to basins of production. A water footprint indicates the total volume of freshwater used to produce goods and services, and includes volumes consumed as blue (withdrawn from lakes, rivers, and aquifers), green (rainfall), and grey (polluted) water.

Water footprint assessment tells us that, for example:

> 1,700 litres of water are needed to produce a bar of chocolate;[9]

> 8,000 litres of water are used to make a pair of jeans;[10]

> 12,000 litres of water are used in the production of a mobile phone;[11]

> The average UK household uses 11,148 litres – or the volume of 74 bathtubs – of embedded water every day; and

> **64% of this embedded water is from outside the UK.**[12]

---

[6] Comprehensive Assessment of Water Management in Agriculture (2007).

[7] UN-Water (2018). *Progress on IWRM: Global baseline for SDG Indicator 6.5.1. Degree of IWRM implementation*.

[8] Allan (2011).

[9] Mekonnen, M. M., Hoekstra, A. Y.(2011) The green, blue and grey water footprint of crops and derived crop products, 1577–1600 https://doi.org/10.5194/hess-15-1577-2011

[10] Water Footprint Network (2016). *Towards sustainable water use in the cotton supply chain*. https://waterfootprint.org/media/downloads/Assessm_water_footprint_cotton_India.pdf

[11] Water footprint calculator, Grace Communications Foundation (2015) https://www.watercalculator.org/wfc2/q/household/

[12] Chapagain and Orr (2008). UK Water Footprint: The Impact of the UK's Food and Fibre Consumption on Global Water Resources WWF-UK

Towards fair water footprints

Unlike carbon, the optimal response is not necessarily to seek a reduced water footprint. Whilst the volume of water used and water efficiency are important, they are not the most salient measures, and reduction in use is not always the most relevant or appropriate response. The natural replenishment of water within the hydrological cycle, and water storage, means that in most locations there exists a level of use which is sustainable without imposing negative impacts on other water users, communities, or nature. In fact, pursuing footprint reduction could be damaging to economic development, trade, and job creation for countries and communities which depend on the export of thirsty agricultural commodities, extractives, mining, and manufacturing for globalised supply chains.

The priority question is therefore whether water footprints are sustainable, or "fair". Research suggests they are not, with 55% of the UK's external water footprint found to land in basins where water use is unsustainable.[13] Investigations into the impacts of food and clothing production in the South for consumers in the North expose the catastrophic irresponsible water use within our water footprints.[14]

Fair water footprints are defined as water uses which:

> Cause zero pollution;

> Use water within sustainable limits;

> Respect the human right to water and sanitation; and

> Protect nature and increase climate resilience.

Fair water footprints can ensure that globalised supply chains support, rather than undermine, shared water security, accelerating progress on development, water supply, and climate adaptation. By prioritising the fairness of their water footprints, consumers, corporations, and development partners can mobilise support for good water governance. Globalised supply chains are estimated to account for or influence over 70% of the world's water use and pollution, employ an estimated one in five of the world's population, and reach the places with the most difficult water and climate challenges. Given this scale, reach, and influence, **prioritising fair water footprints has the potential to be transformative**.

Water stewardship

Water footprints connect powerful actors – companies, markets, investors, and consumers – to the global water and climate crises. They create new incentives and mechanisms to target and trigger action, and to strengthen accountability for ethical production in supply chains. Water stewardship is the strategic and operational response to prioritising fair water footprints for shared water security.

Through water footprinting, companies and their critics have been able to ask new and far-reaching questions about corporate water use, its impacts, and its risks. Water-related business risks have been characterised as:[15]

> Physical, meaning disruption to production through lack of water, unreliable supply, or poor water quality;

> Regulatory, concerning legal action, licence to operate, fees and charges; and

> Reputational, meaning damage to brand or company image through association with unethical practices, pollution, water grabs via "field-to-front page" scrutiny.

Because of their effect on consumer and investor confidence, market share, and the financial bottom line, reputational risks are arguably the most important drivers for corporate engagement interest and action on water footprints.

With support from a wide range of donor and non-governmental organisation (NGO) initiatives, the response from multinationals facing these water risks has been the adoption of water stewardship, defined as:

> the use of water that is socially and culturally equitable, environmentally sustainable and economically beneficial, achieved through a stakeholder-inclusive process that includes both site- and catchment-based actions.[16]

Water stewardship has been conceptualised as moving up a ladder of activity, starting with companies getting their own house in order. This means ensuring efficient and legally compliant water use at sites, farms, and factories; and access to WASH for workers.

Moving up the ladder, companies engage beyond the fence line of their operations into (a) their supply chains, which may be at risk from drought or floods; and (b) catchments, communities, and cities to understand and address the "upstream" and "downstream" factors which determine their risks, resilience, and sustainability.

---

[13] Hoekstra and Mekonnen (2016).

[14] Hepworth N, Postigo J, Guemes B 2010. *Drop by drop: Understanding the impacts of the UK's water footprint through the case study of Peruvian Asparagus*. Progressio/CEPES; Hepworth, N.D., Narte, R. Neumand, S. (2021) *How fair is fashion's water footprint? Tackling the global fashion industry's destructive impacts on Africa's water and workforce health* Edinburgh: Water Witness.

[15] Hepworth Orr (2013).

[16] Alliance for Water Stewardship (2012) https://a4ws.org/about/#:~:text=We%20define%20water%20stewardship%20as,%2D%20and%20catchment%2Dbased%20actions.

Opportunities and risks

Companies have found that to mitigate their water and climate risks they need the same solutions as those identified by the Comprehensive Assessment of Water Management: strong public institutions, secure systems of water tenure, sustainable infrastructure, and support for smallholders. This alignment, and its potential to stimulate collective action and advocacy towards these objectives, is what makes stewardship exciting for water and development practitioners. Having the biggest taxpayers in a country demand political prioritisation, closing financial and human resource gaps, policy implementation, and reform for water security has been shown, in a handful of cases, to get results for the public good.[17]

Engagement of corporations in water governance comes with the risk of policy and resource capture, and the securitisation of water for companies at the expense of water security for all. This risk is very real – the secret pipe giving preferential access to factories in times of drought is a disturbingly common phenomenon. After all, companies have a statutory duty to serve the needs of their shareholders, which may not always coincide with the needs of downstream water users or neighbouring communities. To counter this, a principled, transparent, and inclusive approach is paramount to protect the integrity and legitimacy of water stewardship – backed by stronger legal requirements for corporations to respect human rights and ecosystem protection throughout their operations.[18]

Key stewardship initiatives

Water stewardship initiatives of note include the **CEO Water Mandate**, which for over a decade has led convening, thought leadership, and knowledge sharing on water stewardship. **CDP's Water Disclosure Programme**[19] curates a due diligence and reporting mechanism for company performance on water used by almost 3,000 multinationals, and a growing number of global investors, banks, and pension funds. The **Alliance for Water Stewardship (AWS)** has developed a global water stewardship standard and certification programme.

Like forest stewardship certification, the **AWS standard guides and recognises responsible water use, adherence to local laws, and global best practice at production sites**. By providing for third-party certification, the AWS system is the most credible mechanism for holding companies to account for responsible water use at site level. Applications demonstrate the transformative potential of the AWS standard, particularly in Africa where it has:

> Triggered investment in wastewater treatment and water rights administration associated with flower farms in Kenya;[20]

> Supported sugar estates to protect RAMSAR wetlands, and tea co-operatives to improve WASH in Malawi;[21]

> Stimulated support for smallholder barley farmers supplying breweries in Tanzania;[22]

> Informed standard operating procedures for water protection at industrial estates across South Africa; and

> Focused action for pollution control, WASH, and COVID-19 control for workers across Ethiopia's garment sector.

The standard is now being used in 42 countries and by some of the world's largest companies including Apple, Coca Cola, Danone, Diageo, Google, Nestle, and Unilever.

---

[17] See Newborne, P. Dalton, J. (2019). *Review of the International Water Stewardship Programme. Opportunities and challenges of promoting water stewardship, for practitioners, policy-makers and donors* IUCN, ODI, DFID.

[18] CEO Water Mandate and Water Integrity Network (2015) *Guide for managing integrity in water stewardship initiatives: A framework for improving effectiveness and transparency*. Retrieved from: https://ceowatermandate.org/files/integrity.pdf

[19] Formally known as the Carbon Disclosure Programme

[20] Hepworth, N. Agol, D. (2011) *Exploring the value of water stewardship standards in Africa: Findings of the AWS Kenya case study* Marks and Spencer/GIZ, presented at the Oxford Water Security, Risk and and Society Conference, 2012

[21] Water Witness (2020). *Water stewardship Malawi briefing notes series* https://waterwitness.org/reports-resources

[22] Water Witness (2018). *Maji SASA evaluation, preliminary report*. Retrieved from: https://waterwitness.org/reports-resources

Future priorities

Water stewardship is now being adopted in sites and supply chains of the world's largest companies to support sustainable water use and good water governance, including in some of the world's most challenging water and climate settings. More work is needed to finalise product labelling and companywide assurance – but the tools for ensuring sustainable water footprints are largely at hand. They can drive legal compliance on water within supply chains, even in places without effective environmental enforcement. At best, by mobilising influential actors and strengthening sector oversight, they can stimulate collective action, political will, and new investment, and help to mould a healthier political economy for water management, where water is properly valued and protected, and the most vulnerable users and nature are prioritised.

Although rapid progress has been made over the past decade, the scale, pace, and vigour of water stewardship uptake still falls well short of that required to make a meaningful impact on the water crisis. To accelerate uptake and establish responsible stewardship and fair water footprints as the business norm within globalised production and consumption, the following priorities need to be addressed:

1 **Civil-society oversight, media coverage and public engagement:** To amplify and focus public demand for fair water footprints, and to strengthen the reputational drivers for companies to act, civil society scrutiny of private sector water performance and tenacious media coverage are needed. The resources for civil society to undertake this whistleblowing and watchdog role are currently lacking, and in many places closing civic space is a constraint.

2 **Strengthening policy, governance, and political leadership:** Commitment and action by governments in both "producer" and "consumer" countries will play an important enabling role, through for example: due diligence and mandatory reporting legislation; modified trade agreements; pre-qualification for import and export licences; and following virtual water trade routes with targeted technical assistance and investment. Political championing of fair water footprints and stewardship as a central pillar of recovery from the pandemic and response to the biodiversity and climate crises are necessary.

3 **Harnessing financial markets:** Due diligence and safeguarding across the financial services sector, banks, investment firms, and insurance companies should drive investment towards water stewards and divestment from those that pollute, abuse rights, or persist with destructive practices.

4 **Research, knowledge, and collaboration:** Stewardship initiatives still suffer from a lack of robust impact evaluation. More evidence and knowledge are needed to guide stewardship, to deepen understanding of the relationships between stewardship and corporate tax justice, and the viability of corporate activism on water. Methodologies for establishing sustainable use limits and for reconciling trade-offs between water for "virtual" export and local needs will be useful, along with stronger collaboration and complementarity between water stewardship support programmes.

Reading and resources

> Water Witness International https://waterwitness.org/

> Alliance for Water Stewardship https://a4ws.org/

> CDP https://www.cdp.net/en

Water governance, the global water crisis, and climate emergency

> UNDP (2006). *Human Development Report 2006. Beyond scarcity: power, poverty and the global water crisis*. New York NY: United Nations Development Programme. Retrieved from: http://hdr.undp.org/sites/default/files/reports/267/hdr06-complete.pdf

> World Bank Group (2016). *High and dry: Climate change, water, and the economy*. Washington, DC: World Bank. Retrieved from: https://www.worldbank.org/en/topic/water/publication/high-and-dry-climate-change-water-and-the-economy

> Comprehensive Assessment of Water Management in Agriculture (2007). *Water for food, water for life. A comprehensive assessment of water management in agriculture*, London: Earthscan and Colombo: International Water Management Institute. Retrieved from: https://www.iwmi.cgiar.org/assessment/files_new/synthesis/Summary_SynthesisBook.pdf

Virtual water and water footprinting

> Allan, T. (2011). *Virtual water: Tackling the threat to our planet's most precious resource*. London: Taurus.

> Hoekstra, A. Y. and Mekonnen, M. M. (2016). Imported water risk: The case of the UK. *Environmental Research Letters 11*(5) 055002. Retrieved from: https://waterfootprint.org/media/downloads/Imported_water_risk-_the_case_of_the_UK.pdf

> Hoekstra, A. Y. and Mekonnen, M. M. (2011). The water footprint of humanity. *PNAS: Proceedings of the National Academy of Sciences*, February, 109(9), 3232–7. Retrieved from: https://www.pnas.org/content/109/9/3232

> Rosa, L., et al. (2019). Global unsustainable virtual water flows in agricultural trade. *Environmental Research Letters 14* 114001. Retrieved from: https://doi.org/10.1088/1748-9326/ab4bfc

Water stewardship

> Hepworth, N. and Orr, S. (2013). Corporate water stewardship: New paradigms in private sector water engagement. In B. Lankford, K. Bakker, M. Zeitoun & D. Conway (Eds.), *Water security: Principles, perspectives and practices*. London: Earthscan Publications.

Principles and standards

> Alliance for Water Stewardship (2018). The AWS Standard 2.0. Retrieved from: https://a4ws.org/the-aws-standard-2-0/

> CEO Water Mandate. (2010). *Guide to responsible business engagement with water policy*. Oakland CA: Pacific Institute and United Nations Global Compact.

About this Reading Pack

The K4D professional development Reading Packs provide thought-provoking introductions by international experts and highlight the emerging issues and debates within them. They aim to help inform policies that are more resilient to the future.

K4D services are provided by a consortium of leading organisations working in international development, led by the Institute of Development Studies (IDS), with the Education Development Trust, Itad, University of Leeds Nuffield Centre for International Health and Development, Liverpool School of Tropical Medicine (LSTM), University of Birmingham International Development Department (IDD) and the University of Manchester Humanitarian and Conflict Response Institute (HCRI).

For any enquiries, please contact helpdesk@k4d.info

About the author

Dr Nick Hepworth is Executive Director of Water Witness International, the British charity leading action, research and advocacy for a fairer water future of shared water security. Nick has over 25 years of experience in water management and climate resilient development as a government regulator, academic, activist, consultant and advisor to governments, development banks, corporations and communities. His research and academic practice focus on testing new approaches and generating evidence to guide sustainable and equitable water use, governance and policy in sub-Saharan Africa. Nick is currently co-Chair of the UK WASH Network and a Research Fellow at the University of Glasgow and University of East Anglia.

Acknowledgements

Thanks to Tim Brewer, Research Practice Lead at Water Witness for useful feedback and suggestions.

Suggested citation

Hepworth N.D., (2021). *Tackling the Global Water Crisis: The Role of Water Footprints and Water Stewardship*. K4D Reading Pack. Brighton, UK: Institute of Development Studies DOI: 10.19088/K4D.2021.109

K4D

UKaid
from the British people

CONTACT

Email
info@k4d.info

Twitter
@K4D_info

Website
https://www.ids.ac.uk/K4D