



Improving water security through a Science-Practitioner Partnership with UNICEF



Story of change: Key findings & emerging impacts

Summary

- Science-practitioner partnerships is one of the foundations informing REACH'S work to improve water security for millions of people in Africa and Asia
- The partnership with UNICEF aligned with UNICEF's global strategy in four areas: climate resilience, affordability (inequalities), water quality and sustainable services
- Major impacts from the partnership include the SafePani initiative which is providing safe and reliable water to schools and community across Khulna district in Bangladesh
- The partnership enabled REACH academic input into key UN publications such as the MICS 2019 Water Quality Thematic Report for Bangladesh, the WHO Guidelines for drinking water quality: small water supplies and the JMP report into measuring and monitoring affordability

Introduction

UNICEF has been a global, regional and national partner with REACH since 2015. A science-practitioner partnership (from here 'partnership') was one of three foundations informing REACH's work to improve water security for millions of poor people in Africa and Asia. The partnership aimed to develop and apply a risk-based framework in long-term observatories in Bangladesh, Ethiopia and Kenya. Through consultation and dialogue with UNICEF's HQ team, regional and country offices and national governments, the focus has contributed to four areas aligning with UNICEF's global strategy (2016-30): climate resilience, affordability (inequalities), water quality and sustainable services. The partnership has been founded on creating new knowledge and working collaboratively to deliver sustainable results.

 Global

Figure 1: Sanjay Wijesekera (then UNICEF Chief of Section for WASH) participating in REACH's Water Security Conference in Oxford in 2015



Why a science-practitioner partnership?

John Briscoe is reputed to have said: 'academics read but never practice and practitioners rarely read'. The blunt implication is we are more likely to achieve shared water security goals and sustainable outcomes by working together. This is simpler said than done. Different incentives, organisational cultures and competing priorities are not easy to identify or reconcile. The FCDO (formerly, DFID) designed REACH as a research programme with practitioner outcomes. This inspired the design of REACH to have collaboration and partnership at its heart from the start.

The University of Oxford as the lead organisation could only achieve the ambitious goal of improving water security for five million poor people by 2022 (now ten million people by 2024), if the programme partnered effectively. By design, REACH had to develop and execute an effective partnership at scale.

UNICEF represented an ideal partner – a respected practitioner with global networks and established government partnerships with a growing emphasis on knowledge management outside of traditional WASH competencies, including climate science, water resources and inequalities.

Making partnerships work

UNICEF describes 'partnering effectively' as to convene, broker, stimulate, leverage and influence stakeholders to prioritize children's rights to water and sanitation (UNICEF, 2016). Academia are cited as one of many partners in UNICEF's extensive collaborative network. Water security is cited in the strategy to build existing relationships with universities. Oxford had partnered with UNICEF's East and Southern African Office (ESARO) in 2014 for work on 'rural water sustainability'. This collaboration provided a platform for the more ambitious REACH programme, including the evolution of the FundiFix work in Kenya and sustainable service delivery.

UNICEF attended strategic planning meetings in the inception phase of the programme and invested senior staff time in discussing the research design and partnership platforms. Oxford staff learnt more of the opportunities and parameters of working through UNICEF's government partners which defined areas of synergy in the initial eight Observatory sites, including Bangladesh (coastal zone), Ethiopia (Wukro town) and Kenya (Lodwar town and Kitui county). Other observatories have gained interest and relevance as the programme evolved.

In 2017, Dr Ellen Dyer attended an ESARO meeting in Kenya to discuss climate and WASH with 23 staff from 18 offices. An exploratory survey provided useful insights to tailor future engagement with global initiatives, including climate indicators in the Bottleneck Analysis Tool (BAT). A BAT workshop in Geneva in 2019 and a request for guidance on indicators in 2021 has allowed Ellen to maintain this conversation and provided targeted inputs to UNICEF's work on climate resilience. This work has been supported by Prof. Katrina Charles working with Dr Jorge Alvarez-Sala to support HQ initiatives on approaches for climate resilient WASH to guide regional and country programmes.

Key Findings

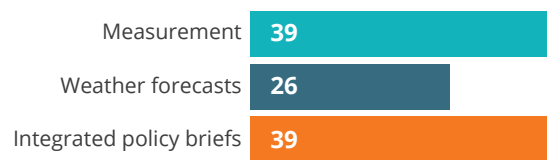
At the global level, there have been long-term consultations in the areas of climate resilience and measuring affordability. REACH staff include research scientists contributing to global work modelling climate systems, which has been advanced specifically in East Africa with clear applications to Ethiopia and Kenya.

Measuring and monitoring affordability remains a challenge for the Joint Monitoring Programme to quantify progress on SDG6.1. In response, Dr Guy Hutton has led a JMP task force supported by a global expert panel to promote new thinking and guidance. REACH staff have supported this consultation since 2018. Prof Rob Hope and Michael Rouse have been on the panel supported by REACH's methodological work on water diaries led by Dr Sonia Hoque.

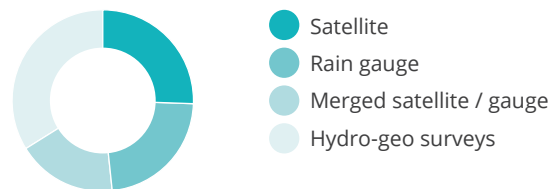
Figure 2: Results of a REACH Survey of the types and sources of climate data in use by UNICEF ESARO

What kind of climate data do you currently use?

Positive responses in each category (total =104)



Measurement



Weather forecasts



Integrated policy briefs



Global consultations, public events and webinars have led to the conclusion of the work with the publication of a report by Guy's team in April 2021.

At the country level, more extensive collaboration has been achieved through local partnerships with leading academic institutions and frequent field visits by the Oxford team.

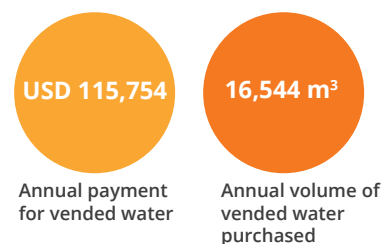
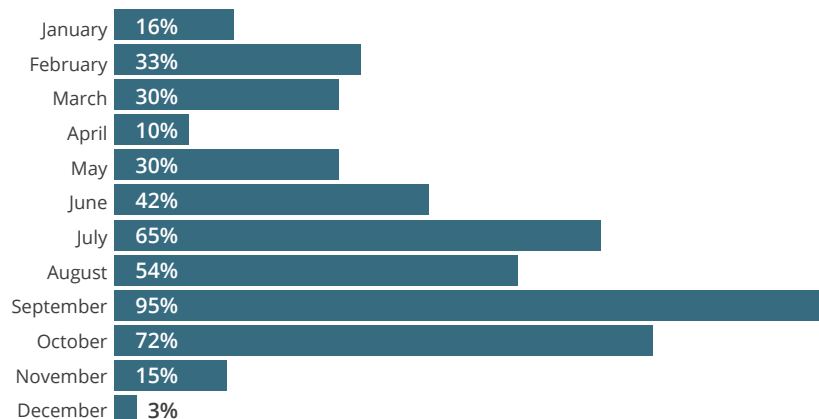
Kenya

Earlier collaboration between University of Oxford and UNICEF on the FundiFix model was expanded to include water quality, climate resilience and inequalities during Dr Andrew Trevett's tenure as UNICEF Kenya's Chief of WASH. The findings and implications of professional service

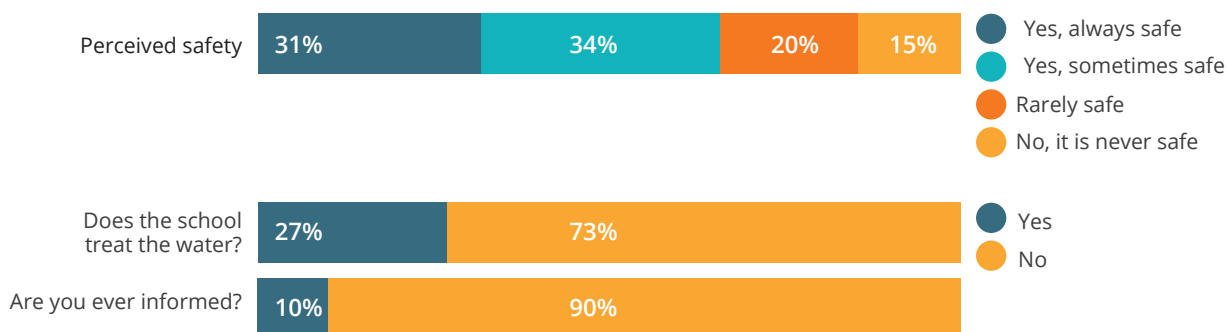
delivery provided evidence to inform the role of professional service providers in the National Water Act in 2016. This work has been expanded into the first draft County Water Bill in Kitui County with support from the University of Nairobi's Professor Albert Mumma. UNICEF have partnered with Oxford in this work including co-leading one of the concept teams for the USAID Sustainable WASH Systems Learning Partnership (2016-2021). The USAID work has advanced work on auditing WASH in schools and healthcare facilities leading to a joint report with UNICEF on safe water in schools in April 2021 to contribute to UNICEF's new WASH in schools network (WiNS). Two of the key recommendations identify the issues of climate resilience and water quality for school water supplies; this provides strategic links with wider work in other UNICEF country offices and at the HQ level on school water supplies.

Figures 3 & 4: Climate resilience (top) and water quality (bottom) are two key issues identified in the 'Delivering safely-managed water to schools in Kenya' report produced in collaboration with UNICEF Kenya.

Percentage of pupils reporting 'high vending', Sep 2018–Oct 2019



Perceived water safety, treatment and access to safety information



Ethiopia

The UNICEF partnership has focussed on improving water security for the urban poor, with a focus on climate resilience and inequalities within piped systems. Collaboration on small town water security in Wukro, Ethiopia, strengthened capacity for climate resilience through UNICEF's and FCDO's investments in the water system. In 2018, Wukro had achieved piped water for 97% of the urban population, although [collaborative research](#) identified inequitable challenges from unreliable intermittent supplies. Entrepreneurs, particularly poor women who use small businesses for economic survival, were excluded from water allocation, forced to pay high prices for vended water to meet their needs, while those in neighbourhoods with more consistent services profited from selling water. Since 2020, the town of Wukro has been severely affected by the Tigray conflict and its aftermath. [UNICEF's work on WASH](#) in the Tigray region continues.

Bangladesh

Collaborative work with UNICEF and its partnership with the Department for Public Health and Engineering (DPHE) has focussed on water quality and sustainable service delivery. REACH's country team employed a project officer to work with UNICEF staff as part of the collaboration. Ms Tazrina Ananya's work was so well-received she was hired by the UNICEF office to and now supports WASH programming in at Cox's Bazaar.

As part of UNICEF's support to the MICS 2019, Prof Katrina Charles was recruited to co-lead the Government of Bangladesh's national water quality assessment report with Prof Kazi Matin Ahmed from the University of Dhaka. The analysis highlighted the challenge of climate resilience in water systems and inequalities in access to safe water nationally, and has gone on to inform the WHO Guidelines for drinking-water quality: small water supplies and MICS sampling methods in Bangladesh and South Sudan.

Figure 5: Secretary of the Local Government Division Mr Muhammad Ibrahim announces Government of Bangladesh support for the SafePani Model at the UN Water Conference, March 2023.



The water quality work features in coastal observatory to support the design of a new institutional model to deliver safe drinking water services. The 'SafePani' model is a joint initiative with DPHE which emerged from multiple studies since 2016, including Alex Fischer's PhD project, working paper and policy briefs, co-authored by UNICEF staff, including Monirul Alam, Syed Adnan and Dara Johnston. SafePani has evolved from the thinking and work co-led by Dr Peter Harvey under the earlier PCA in ESARO and contributes specifically to the sustainable services theme in UNICEF's global strategy. The SafePani model has advanced from a pilot phase in Khulna District in 2021 to government-funded programme from 2024.

The partnership has fostered new collaborations on WASH in healthcare facilities and assessment of the potential for spread of antimicrobial resistant infections in hospitals via poor water quality and hygiene. This has influenced UNICEF's investments in WASH in HCF, FCDO's investments to support Bangladesh's national policy on WASH in HCF, and is building capacity for WASH-FIT (Water and Sanitation for Health Facility Improvement Tool). It also fostered collaborations on wastewater based epidemiology for COVID-19 in Bangladesh with KTH and icddr,b.



Scientific impacts

Understanding and responding to water security and inequality pathways is a primary scientific contribution of the REACH programme. The partnership with UNICEF has allowed work on climate resilience and water quality to be more clearly evaluated in all three countries. The MICS report, Kitui schools report and academic papers in npj Clean Water provide evidence of partnership in this work.

Water quality research also informed a key dimension of the institutional design of the SafePani model in Bangladesh. The process of how institutions allocate risks and responsibilities has been studied in Bangladesh through the work of Dr Alex Fischer leading to theoretical and empirical insights co-published with UNICEF staff (Fischer et al. 2020). This work is consolidated in the SafePani report published with UNICEF and government of Bangladesh staff, with the partnership led by key national officers being integral to the expansion of the SafePani model.

Affordability remains a policy and economic concept in search of consensus. The traditional ratio measure of household water costs divided by income or expenditure has known limitations despite its use by JMP and other global agencies. This is problematic, particularly for vulnerable individuals who may never spend any money on water and be classified as having access to affordable water. Dr Guy Hutton has led new work recognising the conceptual challenges and charting new approaches, supported by the water diary work from REACH in Bangladesh and Kenya (Hoque and Hope, 2020; Hoque and Hope, 2018).

Poverty impacts

The policy and practice work is translating into direct and indirect impacts for vulnerable individuals and at-risk communities:

- Uptime offers evidence of impacts for [over one million rural water users in Africa](#) securing reliable water in droughts and during the COVID-19 crisis
- In Bangladesh, SafePani is providing safe and reliable water to [schools and community health clinics across Khulna district](#), with potential to scale nationally and expand to more healthcare facilities.
- In Ethiopia, the collaboration informed the development of REACH-WISER to explore the impact of intrahousehold dynamics on water security, which has been scaled up to include sites in Bangladesh and Kenya.
- In Kenya, work on testing a professional service delivery model for water and hygiene in rural clinics has reached over 70,000 people. At a cost of less than USD 1 per patient per year, the work provides a basis to address the water and hygiene inequalities exposed by COVID-19 ([Katuva et al., 2020](#)). However, neither national government nor county government have responded to the opportunity with services remaining inadequate for vulnerable populations.

Policy and practice impacts

The partnership is contributing to policy reform in various stages of implementation. Sustainable service delivery models are exemplified by the work of the FundiFix model in Kenya now supporting the Uptime consortium with five million rural water users in 17 countries with contracts for guaranteed reliable services. In Bangladesh, the service delivery model is being adapted to the local context and challenges through the SafePani model.

In all three countries, national and sub-national programmes of water policy are in process. REACH and UNICEF staff are supporting this work informed by work on climate resilience, water quality and inequalities.

Capacity Building

The partnership has actively engaged in building capacity in early career professionals, collective learning and knowledge development, particularly with government partners, and, of course, professional engagement.

- Early career professionals include Oxford PhD students (Fischer, Nowicki, Ong) and UNICEF staff (Ananya) supported by more senior staff members.
- Collective learning has included workshops and meetings with government staff introducing science and evidence from other contexts to co-develop appropriate work. For example, Dr Saskia Nowicki provided training to UNICEF and DPHE staff on Tryptophan-like Fluorescence (TLF) as a measure of microbial contamination in Dhaka; Dr Ellen Dyer led a training on climate risks in East Africa at the ESARO regional workshop.
- Professional engagement and dissemination has included multiple global events at Stockholm World Water Week, UNC Water and Policy conference, and online webinars attracting significant audiences globally.

Selected Outputs

Scientific articles and reports

[“Bangladesh MICS 2019: Water Quality Thematic Report”](#), Government of Bangladesh, Bangladesh Bureau of Statistics, and UNICEF, 2021

[The measurement and monitoring of water supply, sanitation and hygiene \(WASH\) affordability: a missing element of monitoring of Sustainable Development Goal \(SDG\) Targets 6.1 and 6.2](#). New York: United Nations Children’s Fund (UNICEF) and World Health Organization, 2021.”

Fischer, A., Hope, R., Manandhar, A., Hoque, S., Foster, T., Hakim, A., Islam, M. S., Bradley, D. (2020). [Risky responsibilities for rural drinking water institutions: The case of unregulated self-supply in Bangladesh](#). *Global Environmental Change*, 65.

Katuva, J., Hope, R., McBurney, E., Gladstone, N., Koehler, J., Nyaga, C., Njung’e, D. (2022). [Improving water and handwashing services in rural health care facilities in Kitui County, Kenya](#). Policy Brief, Sustainable WASH Systems Learning Program and REACH Programme.

Hope, R., A. Fischer, S.F. Hoque, M.M. Alam, K. Charles, M. Ibrahim, E.H. Chowdhury, Z.H. Mahmud, M. Salehin, T. Akhter, D. Johnson, S.A. Hakim, P. Thomson, J.W. Hall, J., O. Roman, N.E. Achi, and D. Bradley (2021). [Policy reform for safe drinking water service delivery in Bangladesh](#). REACH Working Paper 9, University of Oxford, UK.

Hope, R., Katuva, J., Nyaga, C., Koehler, J., Charles, K., Nowicki, S., Dyer, E., Olago, D., Tanui, F., Trevett, A., Thomas, M., and Gladstone, N. (2021). [Delivering safely-managed water to schools in Kenya](#). REACH Working Paper 8, University of Oxford, UK. ISBN 9781-874370-82-6.

Kebede, S., Charles, K., Godfrey, S., MacDonald, A., and Taylor, R.G. (2021). [Regional-scale interactions between groundwater and surface water under changing aridity: evidence from the River Awash Basin, Ethiopia](#). *Hydrological Sciences Journal*.

Policy briefs

Fischer, A., Hope, R. Hoque, S., Hakim, A., and Alam, M. (2020). [Redistributing risk management responsibilities to achieve the Sustainable Development Goal \(SDG\) for safely-managed drinking water in rural Bangladesh](#). REACH Policy Brief.

REACH (2018). [Understanding river water quality risks to promote economic growth and reduce poverty in Dhaka](#). REACH Policy Brief.

REACH (2018). [Resilient options for improving drinking water security in coastal Bangladesh](#). REACH Policy Brief.

REACH (2018). [Sustaining safely managed drinking water services in rural schools in Chandpur District, Bangladesh](#). REACH Policy Brief.

REACH (2017). [Achieving and sustaining safely managed drinking water in Bangladesh](#). REACH Policy Brief.

REACH (2016). [Maintaining Africa’s water infrastructure: findings from a Water Audit in Kitui County, Kenya](#). REACH Policy Brief.

Other outputs:

RWSN Webinar, June 2020 '[Affordability – can rural people pay for water in a crisis?](#)'

RWSN Webinar, April 2018 '[Small town WASH services: meeting the needs of the urban poor](#)'

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Story of change themes



Groundwater



Land



Coasts



Gender



Schools



Services



Health



Climate



Cities



Basins

REACH is a global research programme to improve water security for the poor by delivering world-class science that transforms policy and practice. The REACH programme runs from 2015–2024 and is led by Oxford University with international consortium of partners and funded with UK Aid from the UK Government's Foreign, Commonwealth & Development Office. Project code 201880.