

Water, sanitation and climate action

Financing water and sanitation resilience contributes to climate mitigation and adaptation - so where is the money?

There is an urgent need for action to reduce the release of greenhouse gases in the water and sanitation sectors and to adapt to the effects of climate change by making communities and services more resilient. This is one of four short papers that highlight challenges, good practices and dilemmas and provide examples to inspire climate action in these sectors. They support policymakers and practitioners to promote ways to mitigate and adapt to climate change while strengthening efforts to fulfil the human right to safe drinking water and sanitation.

Mitigation is about measures to reduce greenhouse gas emissions while adaptation is about adjusting to change, including measures to prepare for extreme events such as floods and droughts and to make communities more resilient. Improving water and sanitation systems that are capable of delivering better services is itself an important means of adaptation. Strong systems are themselves resilient.

The papers are based on the experiences of Dutch-funded climate change adaptation and mitigation initiatives in the sectors and discussions with actors looking for ways to integrate climate action with activities to strengthen water and sanitation services for people in vulnerable situations. Papers have been developed on: (1) climate change mitigation, (2) climate change adaptation, (3) climate change resilience and

vulnerability and (4) climate change and finance. This paper focuses on climate change and financing water and sanitation.

From 3.3 to 3.6 billion people live in contexts that are highly vulnerable to climate change¹ while nine out of ten environmental disasters are water related². While disasters such as floods and tsunamis receive global attention, climate change relentlessly and with far less visibility undermines the lives of those who contribute least to man-made global warming. Extreme droughts, rising sea level, floods, and powerful storms multiply pressure on already overstretched water sources and mainly afflict the poor³. Women and girls make up the vast majority of the poor^{4,5} and are traditionally responsible for securing water and sanitation; this is the epitome of climate injustice.

1 <https://www.ipcc.ch/report/ar6/wg2/resources/spm-headline-statements/>

2 <https://www.unwater.org/water-facts/disasters/>

3 <https://washmatters.wateraid.org/sites/g/files/jkxoof256/files/short-changed-on-climate-change.pdf>

4 <https://www.unwater.org/publications/world-water-development-report-2020/>

5 <https://www.un.org/en/chronicle/article/womenin-shadow-climate-change>

Water and sanitation sectors face these challenges while making strenuous efforts to reach huge numbers of people who lack basic acceptable services. In 2020 a quarter of the world's population still had no access to safely managed drinking water while half the population lacked safely managed sanitation⁶. The WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) estimates that the rate of progress needs to be four times higher to achieve the relevant Sustainable Development Goal targets in SDG 6.

This drive to expand WASH services to the unreached is happening against a backdrop of increasing urbanization⁷, population growth⁸ increasing water consumption⁹ and the COVID-19 pandemic. Climate change undermines all these efforts. The 2022 IPCC report¹⁰ on adaptation states that climate-related extremes have reduced food and water security and are hindering efforts to meet the Sustainable Development Goals.

Many climate-resilient technologies and approaches demand collective behaviour change, policy changes and different methods of financing. However, water and sanitation sectors cannot easily access climate finance as many strengthening measures are regarded as 'business as usual' rather than 'climate action'. Sometimes existing methodology, done better and at greater scale, is indeed what needs to be financed.

The Dutch Ministry of Foreign Affairs is giving climate change mitigation and adaptation a higher priority. The Netherlands WASH strategy 2016-2030 proposes that water and sanitation services “contribute to climate change mitigation by using pumping systems that are energy-efficient and/or powered by renewable energy, or by using energy recovered from wastewater facilities”. A Ministry policy note “Do what we do best”¹¹ on international development and trade (June 2022) prioritises proven support programmes to build the resilience of the poor.

CLIMATE FINANCE COULD PLUG THE GAP FOR WATER AND SANITATION

The WASH sector must bridge an enormous financing gap to meet the ambitious targets in SDG 6. The World Bank estimates that it will cost approximately US\$ 114 billion a year between now and 2030 just to achieve the first two (of six) targets.¹² This requires a three-fold increase in the level of financial commitment - from 0.12% to 0.39% of the Gross Domestic Product (GDP) of 140 countries covered by the study.

Climate finance, aimed at both mitigating emissions that contribute to climate change and adaptive actions to minimise negative impacts of climate change, has the potential to contribute. WaterAid's Climate Policy Initiative found that climate finance flows averaged US\$ 574 billion a year for 2017 and 2018. Most of this funding supported mitigation (US\$ 537 billion) rather than adaptation (US\$ 42 billion). Of adaptation investments, US\$ 13 billion was allocated to water and wastewater projects.¹³

WaterAid describes three main climate finance mechanisms¹⁴:

- **Multilateral climate funds:** High-income country governments pay into these funds as part of their obligations to the United Nations Framework Convention on Climate Change (UNFCCC); the largest is the Green Climate Fund (GCF).
- **Bilateral climate funds:** These funds flow from one government to another, usually through an existing development agency.
- **Private finance:** Private sources of climate finance are mainly used for renewable energy and green transport rather than climate change adaptation.

The Green Climate Fund is an increasingly major source of adaptation finance. It was established at COP16 in 2010 and funded its first projects in 2015. This fund devotes 50% of its expected annual US\$ 10 billion

6 <https://washdata.org/report/jmp-2021-wash-households-LAUNCH-VERSION>

7 Just under 1-in-3 people in urban areas globally live in a slum household and by 2050 it's projected that more than two-thirds of the world population will live in urban area (<https://ourworldindata.org/urbanization>)

8 Low-income countries have annual population growth estimated at 2.6% <https://data.worldbank.org/indicator/SP.POP.GROW?locations=XM>

9 Per person consumption going up due to lifestyle changes, commodities, and access to better services.

10 <https://www.ipcc.ch/report/ar6/wg2/>

11 <https://www.government.nl/documents/policy-notes/2022/10/10/policy-document-for-foreign-trade-and-development-cooperation-do-what-we-do-best>

12 This total comprises the annual costs of safe water (US\$37.6 billion), basic sanitation (US\$19.5 billion), safe faecal waste management (US\$49 billion), and hygiene (US\$2.0 billion): <https://www.worldbank.org/en/topic/water/publication/the-costs-of-meeting-the-2030-sustainable-development-goal-targets-on-drinking-water-sanitation-and-hygiene>

13 <https://www.climatepolicyinitiative.org/wp-content/uploads/2020/12/Updated-View-on-the-2019-Global-Landscape-of-Climate-Finance.pdf>

14 <https://washmatters.wateraid.org/publications/short-changed-on-climate-change>



Posing with her new connection is Cherry Ann E. Lucagbo, who lost her house and livelihood during the tropical storm Sendong floods in 2011. These are newly installed meter stub-out and water connections by the Cagayan de Oro Water District for flood survivors, in the relocation site Berjaya-Gawad Kalinga, Bugo, Cagayan de Oro City in the Philippines.

© Arienne Gilsenbergh

Strengthening the resilience of the water operator and the catchment area- Philippines

The 'Ridge to Coast, Rain to Tap' project in Cagayan de Oro, the Philippines aims to reduce flood vulnerability and improve the resilience of the water supply system. It began an integrated approach in January 2018, working directly on water supply infrastructure and strengthening management in the river basin, with both capacity development and technical assistance. Cagayan de Oro Water District (COWD) operations are being boosted by GIS mapping, hydraulic modelling and other management tools. Water supply coverage and sanitation services are being expanded to up to 7,000 households in relocation areas and 4 nearby schools, mostly consisting of residents who lost their homes in the 2011 Sendong flood. In the upstream Cagayan de Oro River Basin (CDORB), several pilot reforestation interventions are being implemented in partnership with local indigenous people to demonstrate effective and sustainable ways for strengthening the catchment area. The project aims to contribute to an enabling environment in which public and private stakeholders in CDO and Bukidnon Province cooperate to reduce the risks of flood.

<https://projects.rvo.nl/project/nl-kvk-27378529-fdw16012ph/>

spend to adaptation activities, with half of that going to the Small Island Development States (SIDS), least developed countries (LDCs), and African States. Currently, there are only seven WASH projects, six of them in SIDS, but 15 additional WASH projects (of 47 total water projects) are in development.

The GCF has prepared guidelines for a simplified approval process for future proposals. The GCF will consider water and sanitation projects that are evidence-based with quantifiable mitigation and/or adaptation potential that goes beyond 'business as usual' development. Proposals should include sanitation, cover the whole water cycle (e.g., recharge and abstraction), be powered at least partly by renewable energy, and should not exacerbate water scarcity issues. Projects are expected to transform the water and sanitation sectors in the country.

Unless it grows, the GCF can only make a small dent in water and sanitation sector financing in low- and middle-income countries even if all its available funds

were spent on these two sectors. In practice, projects cover multiple sectors (like hydropower in energy and irrigation in agriculture), as well as the four water sub-sectors of climate resilient water and sanitation, integrated flood management, integrated drought management, and integrated water resources management (IWRM).

Climate resilient projects are at risk of failure when 'resilience' is narrowly defined as something only related to climate. Lack of resilience in the provision of water and sanitation services is usually a result of weak systems which need to be strengthened to withstand the full impact of climate change. Strong systems for maintenance and finance can enable services to be sustained, while weak monitoring systems undermine the ability to make evidence-based decisions. Even water components that are more directly linked with climate change, such as water source protection and improved water resource management, remain difficult to fund under these guidelines.

INNOVATION IN FINANCING

Experiences with targeted climate change adaptation investments in Kenya show strong positive impacts on households and communities. The County Climate Change Fund (CCCCF) is a pioneering mechanism to facilitate the flow of climate finance to county governments and strengthen community participation in the use of those funds to build resilience in a changing climate¹⁵. The Kenya mechanism was piloted in Isiolo County and subsequently scaled out to Garissa, Kitui, Makeni and Wajir. In 2018 households in Isiolo, Makeni and Wajir reported that they had doubled their access to water, saving an average of two hours a day on water collection.

The changes provided direct benefits of more than KES 400 million (€3 million) a year across the three counties, representing an 8% increase in annual household income, an average net annual benefit of more than €100 per household. There is also evidence of a cascade of other benefits: improved livelihoods; food security; economic opportunities (small-scale irrigation, vegetable gardens, tree nurseries); reduced costs of accessing water; improved livestock health; fewer conflicts within and between communities; and strengthening of customary Isiolo Boran methods of

managing natural resources. Women were key beneficiaries, having greater access to water for domestic use and spending less time fetching it. They use the time on other domestic work, supporting children to learn, or strengthening livelihoods for example by setting up small businesses.

Globally, robust utilities are vital to ensuring sustainable access to water and sanitation and enhancing resilience in cities that are adapting to climate change. However, many utilities are not creditworthy due to operational weaknesses and the poor state of their assets. A number of initiatives support these utilities to enhance creditworthiness so that they can attract loans to finance infrastructure investments, especially from domestic financiers. One example is the Urban Water Catalyst Fund (UWCF)¹⁶. This is a joint initiative of WaterWorX (the Dutch partnership programme for Water Utilities), the German development bank KfW, and the German Agency for International Cooperation (GIZ) to assess the feasibility of a facility that would support urban water utilities to obtain public and commercial finance and strengthen their resilience. Although this fund is not branded as climate finance its objective of building resilient utilities is completely in line with climate adaptation action.



Water filling at the kiosk for delivery.

© Kishan Naravati

Safe Water Enterprise in India

Spring Health offers an affordable supply of safe drinking water through water kiosks in rural and peri-urban areas in the state of Odisha, India. Spring Health uses electro-chlorination technology to disinfect water from village wells and this treated water is made available to people through a subscription and franchise-based model. In Odisha's rural areas, people often cook on cookstoves using wood as fuel. By eliminating the need to boil water, carbon emissions are considerably reduced.

In 2014, Aqua for All partnered with Spring Health to start a carbon credits project in India. Two years later, the first 50 water kiosks were certified and again a year later the first batch of carbon credits issued and sold.

On a daily basis, Spring Health supplies safe water to more than 150,000 people in over 250 rural villages in Odisha. These activities are partly financed by the sales of carbon credits on the voluntary carbon market, while Spring Health has also managed to attract impact investors. This safe water enterprise has contributed to creating around 750 jobs for people in different sectors (engineers, scientists, project managers, chlorine production, etc) and has helped boost the business for local shops and tuk-tuk drivers that sell the water as well.

<https://www.springhealth.in/>

<https://aquaforall.org/news/carbon-credits-a-catalytic-instrument-for-increasing-investments-in-water-and-sanitation/>

15 <https://pubs.iied.org/sites/default/files/pdfs/migrate/G04415.pdf>

16 <https://www.dutchwatersector.com/news/urban-water-fund-as-catalyst-for-resilient-utilities>



Employees building ceramic filters in a factory.

© Hydrologic

Carbon credits for additional revenues – Hydrologic Cambodia

Hydrologic is a social enterprise in Cambodia that produces and markets ceramic water filters to rural customers to provide safe water. The business model includes instalment-based payments, after-sales services and sales of carbon credits to generate additional revenue. Hydrologic has sold more than 460,000 ceramic water filters since 2001 and has been profitable since 2012. Hydrologic claims that about 900,000 people (6% of Cambodia's population) are using their filters, saving time and money and reducing air pollution and carbon emission, since they no longer boil the water they filter. Almost half of these customers live on US\$ 1.25 – 2.50 per person per day. It is calculated that each Hydrologic water filter in use leads to a reduction of 1.03 tons of CO₂ emissions per year. Hydrologic sells these carbon credits as voluntary emission reductions. Companies, governments and citizens can buy them to offset their carbon footprint. Deutsche Post, DHL, Veolia and Coca-Cola are the main buyers of Hydrologic's carbon credits. By the end of 2017 Hydrologic had sold more than US\$ 500,000 worth of carbon credits.

<https://nexusfordevelopment.org/project-portfolio/make-clean-water-a-reality/>

Safe water enterprises (SWEs) provide a modular, decentralised approach to delivering safely treated drinking water in the developing world and are seen as a complementary model to the centralised systems, with the potential to attract investors who want positive social and environmental change as well as profit – known as 'impact investors'. According to a Dalberg report¹⁷ climate change will negatively impact the water supply for approximately 5.1 billion people, with water quality and affordability most at risk. Nearly 5.1 billion people live in regions of the world that are likely to face high or 'moderate high' climate risk over the next 10 years. Of these, 3.1 billion people don't have access to safe drinking water and form the potential customer base for SWEs, which offer decentralised operations, flexibility in response to (climate) stress events and less capital-intensive production – making them highly adaptive and cost-effective. SWEs in about 65% of target markets will be able to shape a resilience response due to public finance availability or customer willingness to pay extra; the other 35% (the most vulnerable regions) will require special support. However, the high cost for consumers, and the fact that SWEs are not yet supported by national governments as a service delivery model are weaknesses that still have to be resolved.

Carbon credits are tradable certificates that allow companies to compensate for their emissions of CO₂ or other greenhouse gases as part of their sustainability agenda. Depending on the industry, carbon offset can be mandatory or voluntary. The formal carbon market is linked to the official compliance schemes under the

Kyoto Protocol where countries ratified maximum levels of emissions. Under the Kyoto agreement, projects have to be nationally approved and undergo verification and registration under the United Nations Framework Convention on Climate Change.

Carbon credits essentially provide a market-oriented mechanism which requires greenhouse gas emissions to be quantified and mobilises investments in carbon-mitigating interventions. This contributes to reducing overall greenhouse gas emissions and obtains additional revenue for certified GHG-mitigating initiatives. The Gold Standard is a not-for-profit organisation established by international NGOs to ensure projects that reduce carbon emissions feature highest levels of environmental integrity and contributed to sustainable development. According to the Gold Standard impact registry¹⁸ a growing number of water and sanitation initiatives are getting certified for carbon credits as they contribute to reducing emissions and mitigating climate change. Some examples include reducing fuel consumption needed to boil water, treating organic and human waste instead of dumping it in landfill (so reducing methane emissions), and replacing wasteful fuel types such as charcoal with biomass fuels. Under the Gold Standard, the number of water purification projects increased from 83 in 2018 (1.3 million tonnes in CO₂ emissions avoided) to 185 in 2019 (1.4 million tonnes in CO₂ emissions avoided) and the number of waste management initiatives grew from 6 in 2018 (reducing 0.8 million tonnes in CO₂ emissions) to 15 in 2019 (reducing 1.6 million tonnes in CO₂)¹⁹.

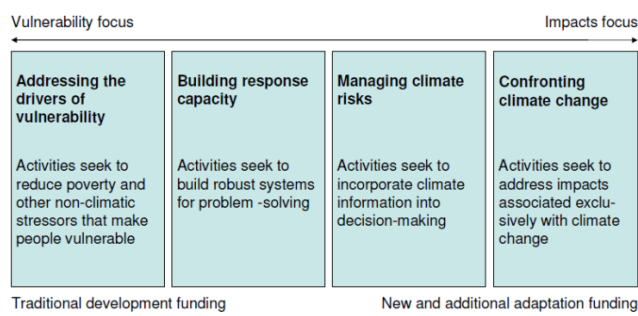
17 <http://safewater.enterprises/wp-content/uploads/2020/12/Rapport-v5.pdf>

18 <https://registry.goldstandard.org/projects?q=&page=1>

19 <https://aquaforall.org/wp-content/uploads/2021/07/Aqua-for-All-Carbon-credits.pdf>

DILEMMA

The relationship between adaptation and ‘normal’ development has long been a subject of debate. Adaptation interventions often mirror ongoing sustainable development, making it hard in terms of financing to identify incremental additional costs over and above ‘development as usual’. The search for ‘extra’ finance for the water and sanitation sectors faces this challenge. An ODI Overseas Development Institute paper from as far back as 2011²⁰ argues that adaptation interventions are best viewed as a continuum from activities that overlap almost completely with traditional development practice, to explicit adaptation measures targeted at distinct climate impacts, where the incremental cost is more clearly identifiable and quantifiable.



An example of the former would be efforts to increase access to improved water supply, and so reduce dependence on unprotected and more vulnerable sources. Examples of the latter would include the building of sea walls to protect against rising sea levels, or higher capacity storm drains to cope with flash floods. Most adaptation and mitigation activities in the water and sanitation sectors are both climate action and development activities. Climate change increases the urgency to close the funding gap for safe water and sanitation but the challenge to acquire the funds becomes ever bigger as climate action is increasingly built into ‘normal’ development and is therefore seen as business as usual. For example, rainwater harvesting to mitigate drought improves access to water and increases resilience demands. It demands large storage capacity with high investment costs, but these investments are not likely to attract climate change funds.

20 https://assets.publishing.service.gov.uk/media/57a08abf40f0b652dd00089c/60826_ODI-BGSworkingpaper-337.pdf

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CONCLUSIONS

Many in the WASH sector hope that climate finance can fill the financing gap. However, climate finance is mostly provided as loans and because the full costs of water and sanitation services are hard to recover from users, the cash flow is not sufficient to attract investors. In particular, rural water and sanitation services seldom qualify for climate financing, apart from some limited finance in the form of grants. Sanitation and Water for All indicated that just 6% of Green Climate Fund (both loans and grants) go to water and sanitation. In addition, the procedures for accessing climate funding are time-consuming and complicated and require the capacity to formulate projects and applications. The Green Climate Fund requires the focus of the fund to be on ‘additional’ components, while traditional development activities do not qualify. In practice, only projects with larger budgets stand a chance.

There are attempts to access finance through innovative instruments that make operators more viable and therefore more attractive for investors and through the carbon credit market which provides some scope for additional revenues. However, securing this type of finance requires a high level of effort and has not yet reached scale. Safe water enterprises that have emerged over the past 20 years with their decentralised systems have some advantages compared with larger centralised systems in terms of adaptive capacity. However, these too lack a path to scale if they are not recognised and supported by national Governments.

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