IRC

POSITION PAPER

Water, sanitation and climate action

Safe water and sanitation services for all: fundamental to climate change adaptation

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 adaptation - action taken to prepare for change and become more resilient.

From 3.3 to 3.6 billion people live in contexts that are highly vulnerable to climate change[1] while nine out of ten environmental disasters are water related[2]. 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 poor[3]. 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 sanitation[6]. 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 urbanization[7], population growth[8] increasing water consumption[9] and the COVID-19 pandemic. Climate change undermines all these efforts. The 2022 IPCC report[10] 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 CHANGE ADAPTATION

The UNFCCC (The United Nations Framework Convention on Climate Change) defines (climate change) adaptation as the "*adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.*"

Climate change disrupts the predictability of water sources (quality, quantity and flood risks), which threatens the sustainability of water and sanitation services and affects poor communities and people in vulnerable situations disproportionally. Adaptation in the water and sanitation sectors is primarily aiming at increasing the resilience of communities and the water and sanitation systems to cope with unexpected events (whether in terms of timing, frequency or magnitude) and secondly aimed at improving the sustainability of the water and sanitation systems to continue to function under anticipated changing conditions in the future.

A key message from the Office of the United Nations High Commissioner for Human Rights (OHCHR) is the need to ensure that all persons have the necessary capacity to adapt to climate change. States have signed up to NAPAs (National Adaptation Programmes of Action) and NDCs (Nationally Determined Contributions to the Paris Agreement) as frameworks for climate change adaptation that facilitate collective action by individuals, governments, communities, private companies and civil society.

For water and sanitation climate change adaptation means *strengthening* systems to make the water and sanitation sectors more sustainable and robust for all, increasing the adaptive capacity and resilience of all stakeholders *and* prioritising responding to the need of people in vulnerable situations. This also includes protecting water sources and making the facilities more robust. Many leading global organisations like UNICEF[12] and Sanitation and Water for All (SWA)[13] have embraced this position.

Successful development of water and sanitation services for the population is almost always about reducing vulnerability. Adaptation can be seen as a continuum: on the one side activities that seek to reduce vulnerability to specific climate change impacts and, on the other, activities that seek to address development-related vulnerability factors (poverty and other non-climate change related factors). Reducing a

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 https://www.unicef.org/documents/unicef-guidance-note-climate-resilient-wash

13 https://www.sanitationandwaterforall.org/news/2022-smm-outcome-document

system's exposure to climate-related hazards is a vital component of the climate change adaptation approach. This type of adaptation measure can include building climate-resilient infrastructure in selected locations, as well as defining plans for moving and re-housing people from flood zones or high-risk areas.

SANITATION AND CLIMATE CHANGE ADAPTATION

A learning brief[14] by SNV Netherlands Development Organisation on climate change and urban sanitation draws on conceptual perspectives developed in the field of global environmental change, and the experiences of SNV and the Institute for Sustainable Futures at the University of Technology Sydney.

The brief outlines six principles to guide the development of climate change-responsive urban sanitation systems:

- Optimised and robust hardware to sustain shocks
- Flexible options and diversified risk
- Adaptive management to withstand disturbances
- Raised awareness and knowledge to minimise impact
- System dynamics considered
- Attention to the distributional effects of equity

AID Foundation sanitation workers discharge faecal sludge at the FSTP in Jenaidah. They are a private service provider outsourced by the municipality.

SNV: Urban Sanitation and Hygiene for Health and Development (USHHD) approach in Bangladesh

An approach developed by SNV and the Government of Bangladesh for city-wide sustainable sanitation services is building capacities to achieve financially viable and safely managed services that leave no-one behind.

A main challenge is the regular flooding of the coastal cities and low-land cities particularly affecting poorer communities. The intrusion of water into the sanitation containments (septic tanks) via the drains results in overflows of faeces. In addition, low solid waste collection rates result in waste littering and clogging the drains, exacerbating climate change effects.

With the government of Bangladesh, SNV co-developed national guidelines in faecal sludge management, emptying procedures and treatment operations that are safe for consumers, the environment and pit emptiers/sanitation workers. Technical solutions include prefabricated plastic septic tanks with backflow valves to prevent water intrusion, and the installation of shallow soak wells where there is a high-level water table or limited space. SNV also promotes timely and regular emptying of sludge containments before the rainy season. SNV has supported the authorities to improve planning and preparedness using a Management Information System that helps anticipate which areas may be affected by forecast climate events, so that septic tanks can be emptied before a flood or cyclone arrives.

Seizing WASH and health gains in a period of climate uncertainty | SNV

14 https://snv.org/assets/explore/download/201908-climatechange-learning-brief-lr_0.pdf

A background paper by SuSanA[15] states that sanitation has been largely overlooked in climate change mitigation and adaptation strategies and in the disbursement of finance for climate action and disaster risk reduction. SuSanA recommends similar technical and non-technical measures as the SNV brief. The technical measures are broadly divided in flood-proofing sanitation and ecosystem-based adaptation. The first includes raising (pit) latrines above flood levels and installing urine-diverting dry toilets. The second promotes planted soil filters for sewerage treatment, with pond systems and greywater irrigation of green spaces. Features such as permeable paving, ponds, wetlands, gardens and ditches are recommended to improve stormwater retention.

DRINKING WATER AND CLIMATE CHANGE ADAPTATION

Climate change increases water stress and droughts. Adaptation can begin by improving the monitoring (quantity and quality) of both ground and surface water resources to anticipate changes in availability linked to climate stresses. It must also include measures to reduce leakages in the network and to increase access and expand water storage capacity. It may prepare technical systems to be able to operate safely below their nominal capacity and in extreme weather conditions.

The MUS (Multiple Use Water Services) approach has 20 years of experience with strengthening the resilience of (mostly rural) communities. This focuses on the needs in rural and peri-urban communities for water not only for drinking and washing, but also for developing livelihoods with such things as kitchen gardens and water near the household for animals. MUS is a *participatory, integrated and poverty-reduction-focused approach which takes people's multiple water needs as a starting point for integrated services, moving beyond conventional sectoral barriers*[16]. Breaking through sectoral barriers is a major challenge for MUS, and it may as well be for many climate change adaptation measures. By embracing MUS as a climate change adaptation measure, MUS can be put higher on the agendas of the water and agriculture sectors and have MUS contributing to the strengthening of the climate resilience of communities. IWMI (International Water Management Institute) and IRC have been leading and facilitating the global MUS partnership and platform for many years. Currently the partnership is housed by the Rural Water Supply Network (RWSN) and the approach has been integrated into community water strategies by many organisations and in a number of national water strategies, including Nepal and Ethiopia.

Dutch ICT professionals improve water supply in refugee camps

The water supply in refugee camps can be improved in a relatively simple way with the help of information and communications technology (ICT). In refugee camps, it is not always possible to find out exactly how much water is being used or even whether the right quantity of water has actually been delivered.

One example of how to address this is shown by an example from UNHCR, supported by the Dutch Surge Support water (DSS water) programme of RVO (Netherlands Enterprise Agency), in Tanzania. Software engineer Alexander van Oostenrijk worked on a platform to monitor water consumption and production. During a short mission to the Nduta refugee camp in Tanzania, the system was put into practice. The water levels of the water tanks in the camp are read remotely, using radio signals (as there is no internet) and a depth sensor to send data to a monitoring platform that then records changes in the levels. For this innovation, UNHCR won a prize of 1 million euros from the European Commission, with which it can co-finance the roll-out in other countries. The software is open source and therefore freely available.

https://www.unhcr.org/news/latest/2020/9/5f6c5a424/unhcr-wins-1m-prize-novel-water-tech-refugee-camps.html

15 https://www.susana.org/_resources/documents/default/3-3678-7-1566223290.pdf

16 https://www.ircwash.org/sites/default/files/Koppen-2006-Multiple.pdf

A 12-year-old fetches water for her family every day when she is not going to school. She also uses the water for the trees in the garden. According to the family, the water is clean for drinking and preparing food and coffee.

Self-supply family wells for Multiple Use water Services in Ethiopia

The MUStRAIN project focused on developing opportunities for multiple-use water services in Ethiopia linked to innovative water harvesting technologies and household-led investment in water supplies (self-supply). The project, supported by the Dutch Partners for Water programme, contributed to the scaling and embedding of self-supply as a full-service delivery model in the water sector of Ethiopia.

Self-supply is an improvement to water supply services developed largely or entirely through user investments, usually at household level. Family wells come in many shapes, depths, technologies and water sources and having a well and sharing it among relatives and the neighbourhood is an old traditional practice in some areas. The most widely used self-supply facility in Ethiopia is the privately owned family well, usually dug by hand. The prime motive for having your own well varies from place to place depending on the livelihood of the users. In pastoral areas, the well would be largely for livestock watering and domestic use. In areas without adequate communal water supplies, it may be primarily for domestic uses followed by animal watering, especially for young and weak animals that cannot travel far for grazing or watering. Irrigation of vegetables, fruits and nurseries at home gardens may then be third priority. In other areas, particularly zones of high value crop production and areas close to markets, household irrigation is the major driving force for shallow groundwater development with drinking and domestic supply being secondary. The experiences have been scaled by The Ministry of Water, Irrigation and Energy of Ethiopia and development partners. Policies and guidelines have been developed and programmes implemented to accelerate self-supply facilitating multiple use of water services.

https://www.ircwash.org/sites/default/files/mustrain_case_2_self_supply_family_wells.pdf

The main challenge is that self-supply does not have wide acceptance from professionals or donors, although it is widely adopted by citizens. Possibly self-supply will get a boost in recognition and support through the push for Locally Led Adaptation approaches[17]. Self-supply is often perceived as being more vulnerable to climate change impacts, due to use of shallow groundwater resources. However, these perceptions are rarely founded on evidence. Rainfall that recharge (shallow) aquifers in drought-prone areas comes often by short intense showers, which are often not adequately captured in rainfall statistics. Self-supply systems can relatively easily be rebuilt by the households themselves after a disaster. While communities and households continue to sort out their own water supply, the discussion among governments and donors to encourage or deter self-supply continues. See for example a recent study by UNICEF Indonesia[18].

ODI recommends looking at the water safety planning (WSP) as a tool for climate change adaptation: "*One more approach that can be adapted to include climate risk screening, or water point vulnerability to climate change, is water safety planning. Originally developed as a tool for assessing threats to water quality* (WHO 2004), *water safety plans* (WSPs) *can be extended to include water availability and reliability concerns, and scenario-based planning for climate change. An 'extended' WSP would be designed to ensure the safety and reliability of adequate supplies of water through the use of a comprehensive risk management approach, ideally from catchment through to consumption and use, with significant end-user participation in both the identification of risks and in their mitigation.*"[19]

17 https://www.wri.org/initiatives/locally-led-adaptation/principles-locally-led-adaptation

18 https://www.unicef.org/indonesia/media/13706/file/Self-supply%20for%20safely%20managed%20water.pdf

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

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A water ambassador (age 14) illustrated the impacts of the polluted Adiyar River in Chennai, India, and imagined a sustainable future. This activity was part of the water ambassador literacy programme implemented by the City of 1000 Tanks, co-funded by by the Goethe-Institut/Max Mueller Bhavan Chennai and led by IRCDUC, Uravugal Social Welfare Trust, and OOZE Architects and Urbanists.

City of 1000 Tanks, Chennai, India

City of 1000 Tanks is a proposal developed by the Water as Leverage for Resilient Cities Asia programme, which is promoting and piloting holistic urban design and planning. The City of 1000 Tanks intends to develop a Water Balance Model across the city by collecting rainwater, treating wastewater and runoff pollution with decentralised Nature-Based Solutions, and by recharging both to the underground aquifer. This will mitigate climate change-induced droughts by increasing groundwater reserves and prevent saline intrusion from sea-level rise. Simultaneously, it will mitigate risks associated with high-frequency floods as well as sewage pollution. https://www.cityof1000tanks.org/

DILEMMA

The distinction between climate change adaptation activities and 'normal' development activities is not always clear. This overlap has led to high-quality examples of water and sanitation climate resilience interventions being branded as "business as usual" and therefore ineligible for climate action financing. Strengthening water and sanitation systems is about making them more resilient and sustainable even when under stress. Many "business as usual" water and sanitation activities and above all those that have incorporated local IWRM principles, like the MUS approach, are effectively climate action. Stronger systems deliver improved service levels and reliability and include the development of resilient infrastructure and strengthening of the capacity to respond to climate hazards. The challenge for the sector is to have convincing narratives to advocate for the inclusion of water and sanitation in NAPAs and NDCs at national levels, and in financing mechanisms at the global level.

The other side of the coin of the dilemma about the continuum between development and climate action is what is the most immediate issue and what is the best action to deal with it? In most places, climate change may not yet be the biggest immediate threat for healthy livelihoods. But it hardly matters which is the biggest threat, because solutions are often the same, or have a common set of actions. Stronger water and sanitation systems are vital for addressing challenges, and they all involve technical solutions, planning, finance etc. For example, effective monitoring is essential for planning and delivering services, and it also provides an early warning system of climate change stress.

CONCLUSIONS

Large parts of the rural and urban population in 2022 have no access to safely managed water and sanitation and often lack basic levels of services. The water and sanitation sectors fail to deliver water and sanitation services that are equitable because of limited capacities of service authorities at national and local level and service providers and because of huge financial shortfalls. Financing these gaps to achieve the SDG 6 targets now seems almost impossible by 2030. It is encouraging that many in the sector are switching to a systems strengthening approach as the only way to realise sustainable services that in the end make technical systems for delivering access to water and sanitation more robust and which make communities more climate resilient. Arguing along those lines, the climate action and climate change agendas are perfectly aligned and the adaptation dilemma can be seen as non-existent. Working on stronger water and sanitation systems in all its aspects is climate action.

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Ministry of Foreign Affairs

Visiting address
Bezuidenhoutseweg 2
2594 AV The Hague
The Netherlands

Postal address
P.O. Box 82327
2508 EH The Hague
The Netherlands

T +31 70 304 4000
info@ircwash.org
www.ircwash.org