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Rural sanitation and climate change: Putting ideas into practice

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About The Sanitation Learning Hub

For over ten years, IDS's Sanitation Learning Hub (SLH, previously the CLTS Knowledge Hub) has been supporting learning and sharing across the international sanitation and hygiene (S&H) sector. The SLH uses innovative participatory approaches to engage with both practitioners, policy-makers and the communities they wish to serve. We believe that achieving safely managed sanitation and hygiene for all by 2030 requires timely, relevant and actionable learning. The speed of implementation and change needed means that rapidly learning about what is needed, what works and what does not, filling gaps in knowledge, and finding answers that provide practical ideas for policy and practice, can have exceptionally widespread impact. Our mission is to enable the S&H sector to innovate, adapt and collaborate in a rapidly evolving landscape, feeding learning into policies and practice. Our vision is that everyone is able to realise their right to safely managed sanitation and hygiene, making sure no one is left behind in the drive to end open defecation for good.

Photo credits

Front cover: Flooded homes in Koatriang village in Akobo county, South Sudan
Credit: Save the Children South Sudan

This page: Home and household toilet above floodwater in Indonesia
Credit: Freya Mills

Next page: Raised toilet in village in East Nusa Tenggara, Indonesia
Credit: Juliet Willetts

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1. Introduction

> ***At community level, most of the infrastructure are built through local materials and many times not adapted to resist flooding and heavy rainfalls…so the facilities are destroyed or they collapse. This is a big issue for us. As a result, behaviour change is affected.*** *(KII, North Africa)*

This quote describes one practitioner's experience with programming in the context of growing climate issues, an increasingly common experience.

The Sustainable Development Goals advocate achieving sustainable sanitation for all before 2030. Yet over 2 billion people still lack access to basic sanitation facilities. Ensuring good sanitation and hygiene practices for everybody means eradicating open defecation, tackling existing challenges with access and use, and ensuring all sanitation facilities are safely managed. Climate change is an added complexity in an already challenging landscape – it exacerbates these challenges and has cascading effects on health and livelihoods.

Societies have already created an increase in global average temperature of approximately 1.0°C since pre-industrial times, resulting in measurable increases in the frequency, duration, and intensity of climate phenomena such as extreme heat waves and precipitation (Hoegh-Guldberg et al. 2018). Continued heating will further exacerbate these events. Climate change impacts disproportionately affect already disadvantaged and marginalised groups. There is a real risk that progress made in improving rural sanitation access and coverage will slow, or even reverse.

The global sanitation sector has taken initial steps to incorporate responses to climate change into rural sanitation programming and services. However, much of the discussion has focused on technological improvements. There is limited actionable guidance on how the rural sanitation and hygiene sector can make systemic changes through planning and implementing project delivery, enabling demand, changing behaviour, addressing social norms, monitoring and evaluation, and more at the local level. Furthermore, the voices of vulnerable people, households, and communities who are at the forefront of experiencing climate change impacts on sanitation are largely absent in existing discussions.

This publication aims to address these gaps in rural sanitation and hygiene thinking through:

- unpacking the reasons behind the limited progress towards addressing climate change in the sanitation and hygiene sector;
- exploring climate impacts on rural sanitation and hygiene practices;
- placing people, households, and communities at the centre of programming; and
- providing actionable ideas to integrate climate thinking into rural sanitation and hygiene programming at the household and community level.

Rural sanitation practitioners already consider many types of risk in the design and implementation of programmes. This publication supports rural practitioners in civil society and government to add a climate lens to existing programmes. It provides the sector with a menu of options and ideas from a climate change perspective. It is not a prescriptive list or a 'one size fits all' approach. Practitioners can draw on various ideas and parts of this guidance and modify them to suit specific programmatic and regional contexts. The quotes included are from interviews with sanitation and hygiene practitioners. They describe their experience with programming in contexts increasingly challenged by climate related concerns.

1.1. Methods

This publication builds on previous work by the Institute for Sustainable Futures, University of Technology Sydney (ISF-UTS), on climate and sanitation, and involved a literature review and interviews with 19 rural sanitation experts from across different regions.

We drew on literature on community-based adaptation (CBA) (**Box 1**) and the climate change–sanitation nexus. We then combined the findings from the literature with the experiences and knowledge of practitioners and the research team[1] to identify, create, and develop actionable ideas for sanitation implementers to take forward at a local level.

Box 1. Community-based adaptation (CBA)

Community-based adaptation to climate change is a community-led process. It enables drawing on local knowledge, priorities, capabilities, and experiences to respond and cope with climate change impacts (Reid et al. 2009). CBA is grounded in the philosophy of participatory development practice (Dodman and Mitlin 2013), particularly with regard to programme design and implementation. The guidance in this publication has drawn on the various lessons learnt documented in CBA literature and applied them to the sanitation and hygiene sector.

Critiques of CBA have suggested that social stratification within communities can lead to the unequal distribution of benefits from a CBA intervention, and even further entrenchment of inequalities (Ayers and Forsyth 2009). Consequently, the 'community' can be counterproductive as an entry point for responding to climate change.

The following techniques recommended in the CBA literature may produce more equitable and meaningful engagement and outcomes, and have informed the ideas shared in this publication:

1. **Prior to implementation, explore social stratification within the community:** Seek to understand relationships between different social groups and how they might affect the success of the intervention.
2. **Engage with different groups within the community on planning and ownership:** Ownership of the intervention(s) by a relatively neutral group (e.g. a community-based organisation or advocacy group) or along locally accepted social boundaries – such as extended familial lines – may lessen the risk of elite capture.
3. **Foster cooperation and cohesion between groups:** Facilitate different groups of people in the community to understand one another's different challenges and needs when it comes to climate impacts on sanitation, and encourage them to support one another throughout the intervention and beyond.
4. **Incorporate conflict mediation and resolution processes in the intervention and beyond:** Expect that disagreements will arise throughout implementation and set up processes for formal institutions (e.g. government or traditional indigenous bodies) to step in and help settle disputes fairly when needed.
5. **Build on existing strengths and celebrate achievements:** Make an effort to learn about what community members are proud of accomplishing together in the past, and seek to replicate successful practices.

1 The research team comprised staff from ISF-UTS, the Sanitation Learning Hub, and Petra Bongartz (independent consultant).

2. What's stopping us from acting?

Climate change has emerged as a major developmental concern over the last two decades. It has led to engagement through more investment and financing, research, and integration in programming in a variety of developmental sectors. However, the water, sanitation, and hygiene (WASH) sector has received a marginal portion of climate finance and sanitation actors have been relatively slow to integrate climate concerns into thinking and programming (Whiting 2015).

Drawing on literature and key informant interviews with sanitation practitioners, a list of barriers to action is presented in **Table 1**. It is followed by a short summary of how this publication addresses these barriers.

Table 1. Barriers to climate action in the rural sanitation sector

1.	**Perception of the climate change problem**
1.1.	It is seen as a slow-developing problem to be handled in the future
1.2.	Climate change responses are crosscutting and multisectoral, making it challenging to interface with sanitation and hygiene programming
1.3.	Sanitation and hygiene programming is already complex and adding climate considerations risks undermining or diluting existing efforts
1.4.	Concepts and climate data are perceived to be too confusing, discouraging WASH practitioners from engaging
2.	**How impacts are understood**
2.1.	Climate impacts are seen as less urgent to address in comparison to other critical sustainability and equality challenges
2.2.	It can be difficult to separate climate change risks and impacts from other environmental changes
2.3.	The links between climate change and rural sanitation are unclear, and insufficient evidence has been established so far
2.4.	Uncertainty about how climate change will affect rural sanitation in the future
3.	**Appropriate engagement and responses**
3.1.	Climate change response is perceived to be the responsibility of ministries and organisations not directly related to WASH (e.g. Ministry of Forestry)
3.2.	Climate change is seen as a biophysical problem to be solved by environmental scientists
3.3.	Climate change is seen as a global problem that needs to be addressed at national and international levels, beyond the remit of sanitation programmes
3.4.	There are limited tools and actionable recommendations on how rural sanitation implementers can actively adapt and respond to climate change within programming efforts
3.5.	WASH actors are excluded from inter-sectoral working groups/ committees on climate change and vice versa

The following sections contribute towards addressing some of these barriers:

- **Section 3** highlights parallels between climate change and sanitation and hygiene terms and concepts.
- **Section 4** illustrates various ways in which climate hazards impact rural sanitation and hygiene practices.
- **Section 5** provides actionable ideas to get started on integrating climate thinking into existing rural sanitation and hygiene thinking, programming, and practice.
- **Section 6** provides advice on establishing mechanisms for collaboration and learning to break down siloes and strengthen the knowledge base.
- **Section 7** summarises principles for the ideas and critical questions posed in this publication and identifies gaps in knowledge and practice that require more attention from the sector.

3. Understanding climate change language

Climate change discourse contains numerous concepts that can be a barrier for sanitation experts wanting to engage in climate change discussions. The Intergovernmental Panel on Climate Change (IPCC) provides definitions for many of them in its assessment report. Although these definitions can appear dense, some climate change concepts are similar to those used in sanitation practice. **Table 2** explains some commonly used climate change in its assessment reportconcepts and relates these to concepts frequently seen in the WASH sector.

Table 2. Common climate change concepts and relation to WASH concepts

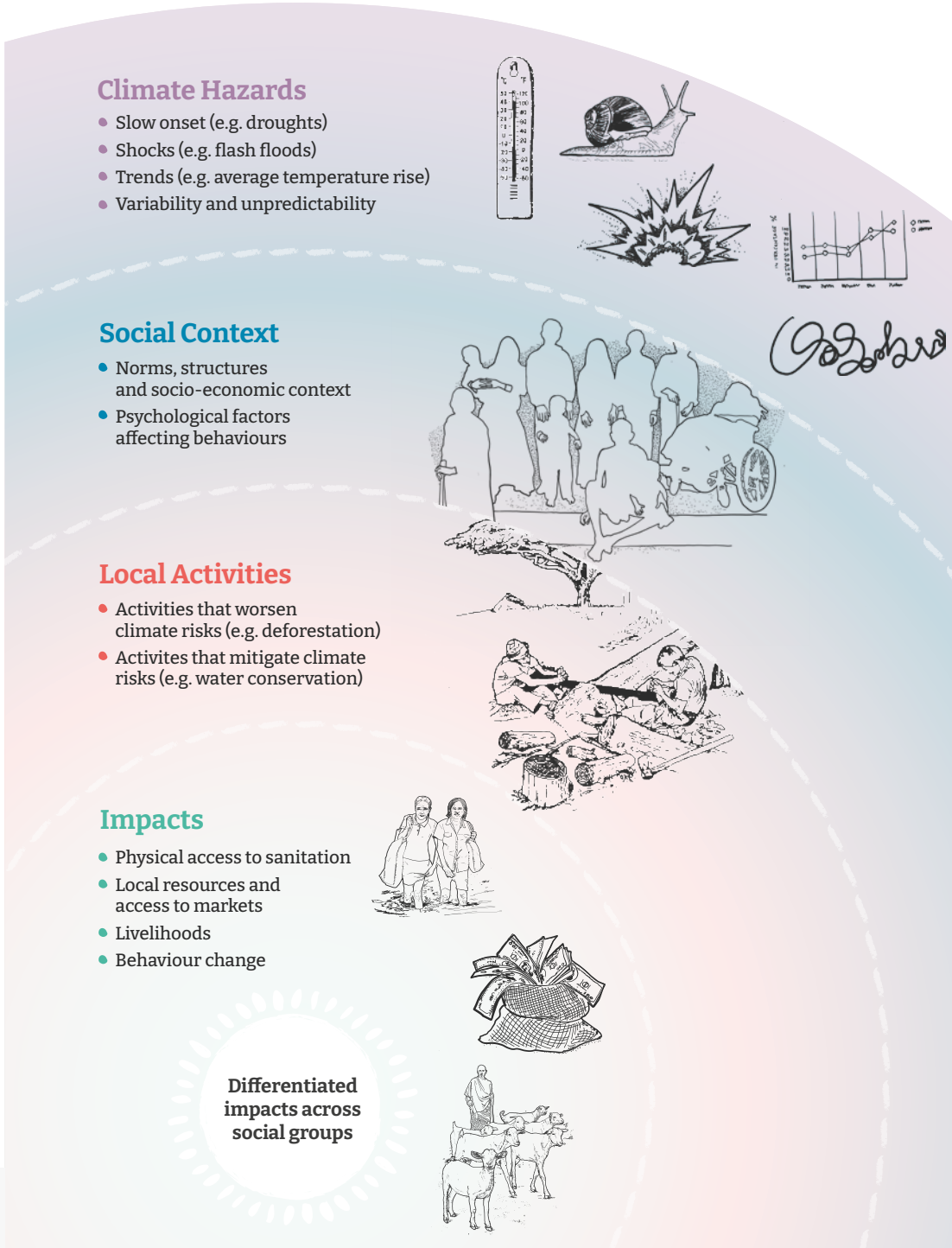
Climate Change Concept	Climate Change Meaning	Related WASH concept	WASH-relevant meaning(s)
Adaptation	Making an adjustment to an expected climate change hazard	**Control measure (e.g. in water safety planning)**	Activities and processes that can be used to prevent, eliminate, or significantly reduce the occurrence of a water safety hazard (WHO 2012)
Adaptive capacity	**(1)** The ability of individuals or groups to anticipate and respond effectively to specific anticipated climate hazards (e.g. flood preparedness and response planning) **(2)** The presence of crucial components of human development that form the foundation for all adaptation actions (e.g. health, education, livelihood security, mobility)	**(1) Risk management capacity** **(2) Empowerment**	**(1)** The ability of individuals or groups to carry out tasks or responsibilities to identify and manage risks to WASH quality and availability **(2)** A process of transforming relations of power, achieved by individuals or groups of people, becoming aware of the systemic nature of their lower status and power and building their capacity to challenge and change this (Water for Women Fund 2018)
Exposure	**(1)** The degree to which something comes into contact with a physical climate hazard or its impact. Exposure can refer to duration, magnitude, frequency, or geographic distribution	**(1) Exposure**	**(1)** Human contact with chemical, physical, or biological agents via WASH that cause harm to human health **(2)** The degree to which WASH behaviour change messaging reaches target audiences
Resilience	**(1)** How well something can resist climate change hazards to stay the same or how quickly it can return to normal after being disturbed. **(2)** How readily something can change in response to unpredictable climate change in order to continue to provide its overall service or function	**Sustainability**	WASH outcomes are effective, suitable, and continuous over the long term
Sensitivity	The degree to which something is affected or modified when it is exposed to a climate hazard or its impact	**Severity**	The magnitude and/or consequences of harm if something is exposed to a hazard. Severity is used to determine the level of risk of a hazard (along with likelihood of the hazard)
Vulnerability	A predisposition or tendency to be harmed by climate change more easily than others.	**Vulnerability**	Susceptibility to losing or failing to obtain adequate WASH access, or to suffering more severe consequences where WASH services are inadequate.

4. A framework for understanding impact pathways of climate change on rural sanitation

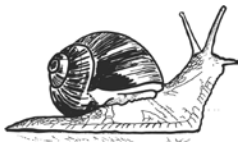
Climate change impacts sanitation via numerous, interlinking pathways. Climate change creates or worsens **climate hazards**. The **social context** and **local activities** shape how these hazards **impact physical access to sanitation infrastructure, access to local resources and markets**, and **livelihoods** needed to support safe sanitation. These impacts, and the burden of responding to them, are felt differently across society depending on the social context. Negative impacts are disproportionately felt by already vulnerable people, which exacerbates existing inequalities.

These impact pathways are summarised in the framework shown in **Figure 1** which was adapted from literature on global environmental change for a rural sanitation context. In reality, the pathways are complex, dynamic, and non-linear, and can be interpreted subjectively. The depicted framework is a simplification for easier understanding. Each component of the framework is explained in the following sections.

Figure 1. Climate change impact pathways for rural sanitation



A climate hazard is the potential occurrence of a climate-related event, trend, or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources (IPCC 2014). Hazards can be categorised in four ways (Cannon pers. comm. 2020):

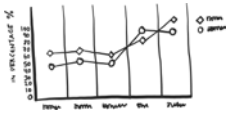


Slow onset:

Events that gradually emerge over extended periods of time such as droughts, sea-level rise, and salinisation.

Shocks:

Events that occur acutely within a short timeframe such as cyclones (but effects may be felt long after).



Trends:

Long-term (i.e. over decades) changes in climate variables such as increases in average temperatures or average annual rainfall.

Variability and unpredictability:

Increasing contrast between seasons (such as increasing contrast in rainfall patterns between wet and dry seasons) and increasing unpredictability of climate and weather.

Social contexts shape and differentiate impacts from climate hazards on people's access to sanitation and hygiene. A complex array of social factors combine to create inequalities that cause some people to suffer from climate hazards more than others. CLTS Frontiers 10: Equality and non-discrimination (EQND) in sanitation programmes at scale (part 1) identifies five 'clusters of disadvantage' that affect the ability of people to construct, access, use, or maintain a latrine.[2] These same clusters shape how people experience climate impacts on sanitation in three broad ways

2 The five clusters are 1) Poverty and lack of physical or economic related assets; 2)Physical or mental health related challenges; 3) Limited social capital and challenges from beliefs, practices, skills, knowledge, and attitudes; 4) Geographical challenges and vulnerabilities to risk; and 5) Marginalisation, discrimination, and powerlessness.

1. **The extent to which different people are exposed to climate hazards** (e.g. marginalised people forced to live on hillsides prone to landslides).
2. **The degree of sensitivity that different people have to climate hazards** (e.g. poor people using low-quality toilets that are more likely to contaminate groundwater sources during heavy rainfall than wealthier people using higher-quality toilets).
3. **Influence on people's levels of resilience or capacity to resist, cope, adapt, transform, or recover from climate impacts** (e.g. different levels of access to climate information used to anticipate and plan for impacts; different levels of power to decide how household money is spent to implement adaptations).

Psychological factors contribute to determining whether people practise or change behaviours to proactively respond to climate change impacts. These factors may be grouped into five broad categories (adapted from Montreux and Barnett 2017):

1. **Risk attitudes:** People's perceptions of the probability and severity of climate risks, their own ability to effectively respond, and the costs and benefits of taking action to sustain sanitation access.
2. **Personal experience:** People who have experienced climate impacts on sanitation may be more likely to act in the future to avoid a repeat of negative outcomes. Equally, they may become fatigued with repeated efforts to repair or replace sanitation facilities.
3. **Trust and expectations in authorities:** People who do not trust authorities may not take their advice on preparing sanitation for climate change impacts. Additionally, people may view governments or NGOs as being responsible for undertaking all preparations.
4. **Place attachment:** In situations where climate change necessitates the relocation of living spaces (e.g. erosion from sea-level rise threatening the foundations of sanitation facilities and homes), people may be reluctant to move due to cultural and emotional ties to a place.

5. **Competing concerns:** People facing multiple climatic and non-climatic stressors may not see sanitation as a priority for allocating time and resources.

While the social context shapes how climate hazards are experienced, climate hazards also influence the social and psychological factors themselves. This contributes to an ever-changing context.

> ***When we have flooding… we have impact on infrastructure, sanitation facilities… and behaviour change. That creates a fatigue. Imagine, you already have limited resources, you build on infrastructure base and create social norms… And then you have a storm and you lost again that infrastructure. And then you have to rebuild it. And then you lost it. We need to be realistic that people go back to open defecation.*** *(KII, North Africa)*

Local activities worsen or lessen the risks from climate hazards. For example, climate-change-driven increases in intensity of rainfall can combine with human-driven deforestation to create flash floods and landslides. Or impacts of a decrease in rainfall can be partially offset by water demand management practices.

Impacts on physical access to sanitation: Climate hazards can damage or destroy facilities, disrupt the functionality of the facility, or make it difficult to access particularly for people with physical limitations. WASH practitioners provided the following reflections of their own experiences:

> ***Now within a shorter time span, there is heavy rainfall… it creates a sort of landslide and the toilet is not close by home… during this time they are not able to access the toilet facilities. That is a challenge for people with disabilities.*** *(KII, South Asia)*
>
> ***They build traditional facilities – handmade. So just a small intensity of flooding causes the facilities to break down. So most of the communities are slipping back… We did have some successful sanitation marketing where the entrepreneurs were able to reduce the costs of building raised platforms for the latrine, but the problem is it is a wet latrine. So it's flood-proof, but when it comes to a long dry season it cannot be used.*** *(KII, Southeast Asia)*

> ***We have schools in many rural areas… when there's no water or flooding causing facilities to collapse, the kids go back to open defecation… [in addition] Infrastructure are buried under sand during a sandstorm…*** *(KII, North Africa)*

Impacts on access to local resources and markets: Climate hazards can cut off access to markets that provide products and services related to sanitation, particularly for those living in remote areas. Availability of water and other local resources for the construction and operation of sanitation facilities can also be affected. WASH practitioners provided their own reflections in this regard:

> ***In some cases of extreme events, communities have no connections to the city and are blocked off… They are cut off from markets. Normally they have a lot of interaction with the city… they cannot access health systems which are mainly in the city.*** *(KII, South America)*
>
> ***After CLTS [community-led total sanitation] when the communities became ODF [open defecation free], there was an initiative to do trenching to dispose waste from household pits into trenches on land allocated by the local government… but with flooding conditions it becomes difficult to transport and dispose the waste in a proper way… and water is filling the trenches and causing the sludge to overflow.*** *(KII, South Asia)*
>
> ***Households which do not have enough resources to depend on groundwater extraction through pumps and borewells. Even if you have a pump and a borewell it doesn't necessarily guarantee you water, but it certainly safeguards a large extent. Climate hazards definitely impacts those households a lot more who have… zero resources against extreme events… droughts can impact sanitation and people will revert to open defecation.*** *(KII, South Asia)*

Impacts on livelihoods: Climate hazards can affect people's livelihoods, which in turn affects their ability to meet their sanitation needs. The ways that sanitation and livelihoods (and all other aspects of life) are connected to climate change impacts are context-specific and can be difficult to predict. Examples that WASH practitioners provided include:

> ***If you have a bad drought, that means the crops will die. Here it's heavily dependent on the weather. So if the weather goes one way or the other, the family loses the crops and doesn't have the money to buy their own food let alone build a toilet.*** *(KII, Southeast Asia)*
>
> ***This year it was hard for us to promote sanitation, especially in those areas that were flooded last year. We called meetings, but nobody cared because they had other problems. They can't buy seedlings, why worry about a toilet? We had a massive promotion campaign about discounts on sanitation products, and they said 'No, it's not our priority'*** *(KII, Southeast Asia)*
>
> ***When there is drought, there is hunger, economies are poor. The willingness for sanitation goes down, so people are unable to build more toilets, people are unable to afford to build more sustainable systems. Whether it is drought or more extreme precipitation, people are affected either way.*** *(KII, East Africa)*

Due to the social context, each of these impacts are felt unequally. People experience them in different ways and vulnerable groups tend to suffer more. The burden of response – the time and resources spent preparing for and responding to climate change impacts on sanitation – is also differentiated across people. The unequal level of impact, in turn, further entrenches social inequality, which creates a vicious cycle of vulnerability.

For a case study of differential impacts of climate on rural sanitation in Indonesia, see Socially Inclusive Responses to Climate Change Impacts on WASH - Indonesia.

The next section, 'Actionable ideas for supporting local responses to climate change for rural sanitation' is guided by this framework. **Table 3** shows which sub-sections pertain to each part of the framework.

5. Actionable ideas for supporting local responses to climate change for rural sanitation

Although many sanitation stakeholders want to take steps towards understanding and addressing climate change impacts, there is a dearth of practical advice and recommendations on how to start. This is especially true at local levels in rural contexts, where climate impacts are experienced most acutely. Hence, there is a need for guidance on ways that people within communities can prepare for and respond to climate impacts in sanitation.

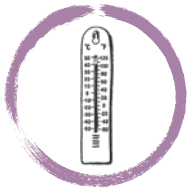
This section presents actionable ideas for addressing climate change impacts in rural sanitation programming and services at a local level across two areas:

5.1 Understanding climate change impacts on local contexts

5.2 Responses for supporting sustainable and equitable rural sanitation

The ideas in this section were developed following recommendations from community-based adaptation literature, interviews with rural sanitation experts, and peer-review from sanitation practitioners.

Table 3. Common climate change concepts and relation to WASH concepts



Climate Hazards

Assessments to collect information
Section 5.1.1

Social Context

Assessments to collect information
Section 5.1.2

Responses to improve the situation
Section 5.2.3

Local Activities & Impacts on Livelihoods

Assessments to collect information
Section 5.1.3

Responses to improve the situation
Section 5.2.4

Impacts on physical access to sanitation

Assessments to collect information
Section 5.1.4

Responses to improve the situation
Section 5.2.1

Impacts on local resources & markets

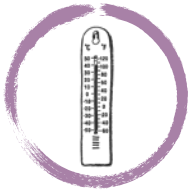
Assessments to collect information
Section 5.1.5

Responses to improve the situation
Section 5.2.2

5.1. Understanding climate change impacts on local contexts

Local contexts shape the ways communities, and different people living within a community, experience and respond to climate impacts. The following sub-sections outline example activities for assessing local contexts to understand the different climate impact pathways for sanitation as shown in **Figure 1.**

These assessments create an evidence base for linkages between climate and sanitation and enable informed decision-making for designing sanitation interventions.



5.1.1. Assessing local climate hazards

Understanding the climate hazards confronting a community is often a basis for designing appropriate responses.

Collect information on past, current, and future climate hazards from formal reports or datasets.

For example, information about the hazards experienced in an area may be found from:

- the World Bank Climate Change Knowledge Portal;
- national or regional meteorological reports and profiles;
- national climate change adaptation strategies, plans, or reports; and
- reports from NGO climate change or disaster risk reduction assessments.

Local knowledge of past and current climate hazards affecting the area is also valuable. Key informant interviews or focus group discussions with local people who are knowledgeable about environmental impacts (e.g. Ministry of Environment staff and community members) provide the most locally relevant information.

Box 2. Challenges in predicting future climate hazards

Information on how climate change hazards are likely to emerge in the future can be gathered from climate change projections. However, the precision of climate-change projections at local levels is low, so they should not be relied on heavily for decision-making.

Meanwhile, reflecting on past experiences also has limitations for preparing for future climate impacts if there is reason to believe that new, unprecedented climate hazards will emerge (e.g. sea-level rise or wildfires).

Drawing on both climate science and local knowledge helps to reduce some uncertainty. However, interventions to support sanitation should be adaptable to a range of different possible climate impacts in case unexpected impacts occur (see **Section 5.2.1** on choosing sanitation options). Keeping in mind that resilient sanitation services require flexibility and continual learning as the environment changes is also helpful.

5.1.2. Assessing the social context

Relationships, social norms, and beliefs influence how people experience and respond to climate impacts. It is useful to explore the social context within the community and within households to understand people's different needs and behaviours, and how different people may benefit from a particular sanitation intervention.

An example of a participatory activity designed to help understand the social context within households is described in **Box 3**.

Box 3. Household decision-making and responsibilities around sanitation and climate

This activity involves facilitating community members to discuss how sanitation is managed at the household level, including when climate stress is experienced.

First, community members consider household decisions and responsibilities relating to sanitation. For example, community members think about who in their household makes decisions about, or is responsible for carrying out, the following actions:

- Collecting water for flushing the toilet and personal hygiene.
- Keeping the sanitation facility clean.
- Making sure children wash their hands regularly.
- Disposing of children's faeces.
- Making repairs to the sanitation facility.
- Arranging to have pits or tanks emptied when needed.

- Choosing what features a household sanitation facility should have.
- Spending money on sanitation facility upgrades.

Community members then consider scenarios with very hot and dry weather, and with very rainy and stormy weather. They are asked to reflect on the following questions:

- Who in the household takes on additional work for sanitation when the weather is hot and dry, or rainy and stormy? Why?
- Do household decision-making roles change under extreme weather conditions? Why?
- Do some family members move in or out of the house during certain seasons (e.g. migrating for work)? How does this affect decision-making and responsibilities in the household?
- What, if anything, should be changed about household decision-making and responsibilities so that everyone in your family is supported and not over-burdened?

The results of this activity can shed light on who is likely to benefit most from a proposed sanitation intervention. For example, a climate-proof latrine superstructure may help men who are responsible for making repairs, but provide little benefit for children who are tasked with collecting water for flushing during the dry season. It can also reveal norms around decision-making and responsibilities that can be changed to support more equal relationships.

See the Climate Change Response for Inclusive WASH guidance notes for Indonesia and Timor-Leste for examples of activities that integrate gender, climate change, and WASH.

Formative research can be used to learn about which behaviours and beliefs should be encouraged and sustained, and which should be changed. When conducting formative research to inform behaviour change campaigns, make sure to:

Value local experiences and knowledge. As with good development practice, local knowledge is a good starting point to help people think and reflect on their personal experiences of the effects of climate disturbances and coping mechanisms. This validates their current experiences and clarifies immediate priorities for programming. Unpacking the psychological factors (See **Section 4**) behind how responses are prioritised enables practitioners to identify which of these mechanisms are sustainable and which are maladaptive.

Identify and promote positive behaviours. Certain behaviours may enable effective responses to climate impacts, or they may inhibit them. Examples of relevant behaviours to consider are:

- frequent assessment and reflection of risks and trends they have experienced;
- refraining from washing out containments during floods;
- continuing to wash hands and maintaining good menstrual hygiene management practices during droughts and periods of reduced water access;
- building toilets closer to home;
- reinforcing physical paths and routes towards latrines regularly;
- prioritising male and female latrines equally; and
- reinforcing hygiene among children and safely managing children's faeces.

Case study #1 profiles a research project that developed practical, community-based activities for understanding the intersection between climate change, WASH, and gender and social inclusion.

Case study #1:

Climate Change Response for Inclusive WASH (CCRIW)

Countries: Indonesia and Timor-Leste
Implementers and partners: University of Technology Sydney (UTS), Plan International Indonesia, WaterAid Timor-Leste
Project summary: CCRIW is a research project that seeks to enable civil society organisations to assess impacts of climate change on WASH services and gender and social inclusion outcomes.

UTS and project field staff from Plan International Indonesia and WaterAid Timor-Leste co-designed activities that help rural community members identify how local people are differently impacted by climate hazards using participatory processes that draw on local knowledge. The activities were designed to be easily implementable at local levels and not reliant on complex climate science for creating solutions (**Boxes 1, 3, 4**). CCRIW focused on rural sanitation in Indonesia and rural water in Timor-Leste.

Sample of findings on sanitation in Indonesia:

- Increased difficulty for older people and pregnant women to walk down steep slopes to collect water for toilets in the wet season.
- Gendered norms during extreme weather such as men being responsible for re-constructing damaged latrines and women being responsible for caring for sick family members.
- Women experiencing sexual harassment when needing to openly defecate due to latrine failure when there are water shortages.

Using the findings: These findings can be used to raise community members' awareness about climate impacts on sanitation, help implementers choose appropriate sites and technologies that are suitable for the local climate hazard context, and highlight to community members and stakeholders the social norms contributing to differential impacts that must be addressed.

See the guidance notes and case study findings (to be published in English, Indonesian, and Tetun) from the pilot phase at the CCRIW project website.

5.1.3. Assessing climate impacts on sanitation via livelihoods and other local activities

Activities that people carry out for their livelihoods and other local activities interact with climate hazards, which has consequences for sanitation. Climate hazards can detrimentally affect livelihoods, which, in turn, harm sanitation practices. Meanwhile, livelihood activities or other practices can exacerbate climate risks (e.g. deforestation) or reduce them (e.g. water conservation).

Develop an understanding of local livelihoods and other local activities in the community or catchment that interact with climate hazards, to identify indirect impacts of climate change on sanitation. This can be done during a standard situational analysis. **Box 4** describes the impact diagram activity, which can engage local sanitation users to understand the interconnections between sanitation, human activities, and livelihood contexts.

Box 4. Impact diagram

The 'impact diagram' activity involves participants using picture cards that represent different activities or local features to identify their interlinkages with sanitation and the climate.

First, participants (in separate groups of women and men) imagine a scenario that is very hot and dry or very rainy. The participants lay down picture cards that represent features or activities within the community or wider catchment that are affected by that weather.

Next, participants think about what other features or activities are subsequently affected, or contribute to subsequent effects. For example:

- Dry weather leads to water shortages, which in turn leads to reduced crop or livestock yield.
- Extreme dry or wet weather destroys crops, which in turn leads male family members to migrate to urban areas for income.
- Storm surges cause erosion, which in turn causes housing and infrastructure to become unstable. Climate Change Response for Inclusive WASH guidance note for Timor-Leste

Picture cards are laid down to represent each aspect that is affected and a line is drawn between to them to represent the connection.

The participants continue branching out a chain of impacts, which eventually should include aspects of water and sanitation. They then discuss how different people in the community are affected by the chain of impacts.

See the Climate Change Response for Inclusive WASH guidance note for Timor-Leste for more details on how to conduct this activity

5.1.4. Assessing climate impacts on physical access to sanitation

Climate hazards have direct physical impacts on sanitation access. These impacts can be determined in a variety of ways through drawing on expert assessments (e.g. Modified Water Safety Plans and Sanitation Safety Plans) and local knowledge.

Use participatory activities with local stakeholders and community members and draw on local knowledge to identify how past and current hazards have affected sanitation, and to raise awareness among the participants (see **Box 5**).

Box 5. Climate hazard mapping for sanitation

This activity facilitates women and men to identify the locations where climate hazards affect the community (e.g. where it floods, where landslides occur, etc.) by drawing a map of where they live.

Following a standard community mapping activity where important features of the community and sanitation are mapped (on paper or on the ground), participants then identify where local climate hazards affect sanitation. For example:

- Where waterlogging from heavy rain or storm surges occur.
- Where landslides are most likely to occur.
- Waterpoints that become cut off during a prolonged dry season.

They then discuss how these climate impacts affect sanitation access for women, men, children, and people with disabilities in different ways.

The results of the mapping activity can provide insights on locations for building toilets and stimulate discussion to understand local climate risks.

See the Climate Change Response for Inclusive WASH guidance note for Indonesia for more details on how to conduct this activity.

Case study #2:

Community-based Water Security Improvement Planning (CWSIP)

Country: Solomon Islands
Implementers and partners: Plan International Australia and Live & Learn in partnership with International Water Centre and CSIRO
Project summary: The CWSIP approach, currently in its pilot phase, adopts methods from various water safety and water security planning techniques (e.g. UNICEF's climate resilient WASH development), to identify and address risks to water quality and availability through Participatory rural appraisal/Participatory learning and action (PRA/PLA), with an emphasis on climate change risks and social inclusion.

Strategies:

1. **Participatory methods:** Using participatory methods familiar to rural sanitation practitioners, such as community mapping and transect walks, community members identify how slow-onset climate hazards and extreme events create risks for water safety and security. Sanitation and open defecation are a focus because of the potential for climate hazards, like heavy rainfall, to spread excreta into living spaces and water sources.
2. **Interpreting climate data:** The project has partnered with CSIRO's climate specialists to help access and interpret climate data to identify and communicate local risks. Drawing on the available climate data, CSIRO has created maps to show where flooding and storm surges are most likely to occur in the future, and the implications of changes to water catchments. This information complements local knowledge to inform the identification of future hazards in participatory activities at the community level.
3. **Equitable risk management:** Further, CWSIP adapts techniques from the Guide to Equitable Water Safety Planning to identify how risks and impacts are experienced by different segments of the community. The project also works with people in the community along cultural or familial lines, instead of a suite of village representatives, to strengthen cohesion and inclusion when implementing solutions to control risks.

Box 6. Accounting for the journey to the latrine when provisioning climate resilient latrines

Climate impacts do not just disrupt access to sanitation by affecting the functionality of latrines and services – they also affect people's journey to the latrine.

Sanitation accessibility audits are commonly used in the WASH sector to reveal barriers to the physical accessibility of latrines. However, these are often conducted on pleasant days conducive to holding participatory activities outdoors. Consequently, barriers created or worsened by the weather might not be front of mind for participants.

Encouraging participants of sanitation accessibility audits to think about very dry, or very rainy, scenarios can help them identify how the climate influences latrine access. See the Climate change response for inclusive WASH guidance note for instructions on how to carry out a climate-sensitive sanitation accessibility audit.

Also see the 'Compendium of accessible WASH technologies' for more information on reaching facilities.

5.1.5. Assessing climate impacts on local resources and access to markets that support sanitation

Sanitation technologies are dependent on and affected by the natural environment in the catchment, which may be disrupted by climate change. Sanitation is also dependent on access to affordable local markets. Identifying the water and other natural resources and markets needed to build and sustain sanitation, and how they might be affected by climate change, helps community members and implementers choose the most appropriate sanitation option.

Box 7 describes a mapping activity to facilitate discussion about local resources and markets used for supporting sanitation.

Box 7. Mapping natural resources and roads to markets

In the this activity, participants think about resources they will need to build and maintain latrines. They then discuss how access to these resources would be affected under different climate scenarios.

First, on a community map or an aerial image of the community (e.g. from Google Earth), community members identify the locations of resources they would need to build and maintain sanitation facilities. For example:

- Which plots of land would be preferred to construct sanitation facilities?
- For water-based toilets and for hygiene, where would water be collected from?
- Where would local building materials and materials for making repairs or maintenance (trees, stones, gravel, sand, etc.) be sourced from?
- Where are the roads to urban centres or other places where affordable items for sanitation facilities can be purchased?

Next, community members consider what happens, or could happen, to this resource base under different climate scenarios. For example:

- When it is very hot and dry, will enough water still be available from the main sources to flush toilets and practise good hygiene?
- When it is very rainy, will the preferred plots of land for constructing sanitation facilities become flooded or exposed to landslides?
- Are local building and maintenance materials available all year-round, or are there seasons when they become difficult to access?
- Are the roads to the markets accessible all year-round, or are there times when they become difficult to access?
- Do the prices of sanitation products and services fluctuate over the seasons or when extreme weather occurs?

The answers to these questions can help community members and implementers consider which types of sanitation facilities will be sustainable, or what strategies are needed to cope with climate hazards.

See Engagement on biodiversity conservation and climate change adaptation in Papua New Guinea: A facilitator's guide for more activities on natural resource assessment (adapted for sanitation here).

5.2. Responding to climate change impacts to support sustainable and equitable sanitation

The next step following assessments of local context is to build responses for supporting sustainable and equitable sanitation under climate change conditions. This section provides ideas and critical questions for sanitation implementers to integrate into their thinking and interventions across four areas:

1. Choosing sanitation options for the household and community.
2. Working with sanitation businesses and entrepreneurs.
3. Addressing indirect impacts on sanitation via livelihoods.
4. Strengthening equality and changing behaviours.

5.2.1. Responding to impacts on physical access – choosing sanitation options

When choosing sanitation options, encourage households and communities to think strategically about options that will provide sustainable and equitable benefits under climate change conditions. This can be done by discussing the benefits of good-quality sanitation, considering how climate can affect facilities and access in different ways (drawing on lessons learned from the assessments in **Section 5.1**), and reflecting on some critical questions:

1. What are the relative benefits of robust versus quickly repairable sanitation facilities?

During sanitation promotion processes, encourage community members and sanitation stakeholders to reflect on their own context and consider whether to strive for more robust facilities or quickly and easily repairable ones. For example:

- Robust facilities built with good-quality building materials that are installed properly may withstand high winds from cyclones or high water from floods. However, they might be costly to build and repair, and may require access to markets that are seasonally cut off to get products or services for maintenance.
- Quickly repairable facilities, such as those made from local materials, facilitate a quicker re-building process after an extreme event. However, when facilities are damaged or destroyed, this can lead to (at least temporary) open defecation, and community members must be motivated to re-build.

These options are not mutually exclusive. For instance, slabs and pits could be designed to be robust against extreme events while superstructures and handwashing stations could be designed to be quickly repaired/ rebuilt with local materials.

While there is comparatively less literature on drought-resistant latrines, there are a number of documented considerations when it comes to planning, building, and managing latrines in flood-prone areas.

These are outlined in **Box 8**.

Box 8. Guidance on developing flood-resistant latrines

Assessing the flooding conditions

1. Is flooding in the area typically slow in onset (floodwater accumulates over days or weeks) or rapid or both?
2. How frequently does flooding disrupt sanitation access and quality?
3. What level can floodwaters rise up to?

Siting latrines

4. Are there certain 'danger zones' where people should not site toilets (e.g. in relatively flood-prone areas or near drinking water sources) (see the 'hazard mapping' activity in **Box 5**)?
5. Are there high-elevation areas where communal emergency toilets can be installed? What are the trade-offs in terms of accessibility for certain groups or at different times?

Constructing/designing latrines

6. What construction techniques do community members use to prevent other infrastructure (e.g. houses) from being damaged by floods?
7. What latrine options would be suitable for the type of flooding that is experienced in the area?
8. Are these latrine options socially and culturally acceptable (e.g. will children and people with physical limitations be able to access them? Will people feel embarrassed if a raised latrine makes it more visible when they enter and exit? Are people willing to handle composted waste?)
9. Do latrine builders have the materials and skills necessary to construct these options well?
10. Are the options affordable to all users or will subsidies be needed?
11. Where are building materials sourced from? Is there a sustainable/uninterrupted supply chain?

Management before and after flooding

12. Are early warning systems to alert people about potential flooding in place, or could these be set up?
13. What strategies can users take to prepare when heavy rainfall is expected (e.g. emptying prior to flooding season; sealing off pits and tanks if flood levels begin to inundate toilets)?
14. Following a flood, who will lead a clean-up campaign and what needs to be done?

Resources on flooding and rural sanitation

Resilient WASH systems in flood-prone areas by CARE Netherlands: Techniques for siting and constructing on-site excreta disposal systems including pros and cons of different technologies (pp. 52–61).

Sanitation in rural flood settings by the Global WASH Cluster: Emergency response actions for rural sanitation when flooding is experienced.

Excreta disposal in emergencies: Strategies for difficult situations by Peter Harvey: Techniques for constructing latrines in areas with high water tables and emergency response options for flooding.

Pit latrines for special circumstances by WEDC: Tips for constructing raised or elevated latrines in flood-prone areas.

The search for appropriate latrine solutions for flood-prone areas of Bangladesh by Golam Morshed and Abdus Sobhan: A case study of how different latrine options were evaluated for a flood-prone area in Bangladesh.

Flood-resistant ecological sanitation takes off in a rural community by Stockholm Environment Institute: A case study of a pilot project that implemented flood-resistant ecological sanitation toilets in a rural village in Bihar, India.

2. What strategies can be used to ensure sanitation facilities are operational and accessible year-round?

During sanitation promotion, encourage community members to reflect on their local context and consider how they will be able to access a sanitation facility through different seasons, and how different community members will face different accessibility issues.

Promote and prioritise technologies that are appropriate for the local context. It may also be helpful to encourage people to maintain multiple options.

Given the substantial uncertainty of how exactly the climate will change at local levels, encourage community members to consider multiple climate scenarios and choose arrangements that would enable sanitation access regardless of how the local climate changes (information from the assessments in **Section 5.1** will be especially helpful). Consider the following questions:

- Will the resources (e.g. water) needed to operate and maintain particular sanitation options be available year-round?
- What sanitation options are most likely to continue functioning under different weather extremes in this area?
- Can certain sanitation products or services be provided locally if access to markets are cut off?
- Can certain sanitation technologies be modified to adapt to the changing seasons (e.g. converting a flush toilet to a dry toilet when there are water shortages)?
- Can households be supported to diversify their access to sanitation through maintaining or sharing different types of facilities (e.g. household flush toilets and communal dry toilets)?
- Do householders or the community need special training to build, operate, and maintain climate-resistant technologies?

3. Should financial mechanisms or hardware subsidies be used to support resilient sanitation infrastructure?

There is debate over the question of whether financial mechanisms or hardware subsidies should be used to support sanitation coverage and access (Kohlitz, Carrard and Willetts 2019). Climate change raises the stakes on these issues. For example, the costs of robust toilets that are resistant to extreme weather may be unaffordable to many households. When considering engaging local government and the private sector on providing support to communities, reflect on the following questions to decide whether these forms of subsidy are appropriate:

- Does existing data indicate high levels of poverty that could limit the ability of households to build quality latrines?
- Does government policy on the timing of financial and hardware subsidies exist? What has been the local experience with these kind of subsidies?
- Does the community have a history of receiving subsidies, or are nearby communities receiving subsidies?
- Are materials locally available for households to build good-quality latrines or do they need assistance accessing these?
- Can government disaster funds, or village savings and loan schemes, be used for building or repairing climate-resistant communal latrines?

5.2.2. Responding to impacts on resources and markets – working with local sanitation businesses and entrepreneurs

Sanitation businesses and entrepreneurs can provide products and services that enable people to successfully adapt to climate change impacts. However, they may also find themselves affected by climate hazards and require support.

Ways to support sanitation businesses and entrepreneurs to respond to climate change impacts include:

1. Involve service providers in community-based participatory activities to understand climate impacts on local contexts (see **Section 5.1**) and build their awareness of common issues that affect different segments of society.
2. With latrine producers (and potentially community members), co-design affordable and accessible latrines that are suitable for the local context and resistant to local climate hazards. Train latrine producers to build and market these products.
3. Support service providers to understand how seasonality and climate hazards affect markets and supply chains (e.g. what time of year are manual labourers available for building sanitation products? What impact would climate hazards have on their supply chains and customers?) and develop operational plans for providing their services around different climate scenarios (e.g. scheduling emptying services before the rainy season begins).

4. Provide information to businesses and entrepreneurs on how they can access climate information, including early warning systems for hazards, and make preparations accordingly.
5. Connect local entrepreneurs to microfinancing institutions or climate adaptation financing schemes that can help them obtain capital and training for new products and services that are responsive to climate change.

Case study #3:

Tackling climate change in practice: Sanitation Marketing Systems (SanMarkS)

Country: Bangladesh
Implementers and partners:
iDE Bangladesh, UNICEF Bangladesh
Project summary: The SanMarkS project, (2015 - 2019, SDC, and UNICEF) followed a sanitation marketing approach to identify latrine options suitable for different climatic zones and supported latrine producers to provide these options.

Strategies:

1. **Understanding local contexts:** iDE spent extensive research time in different 'climatic zones' – flood-prone areas, drought-prone areas, and coastal areas exposed to rising sea level – to understand what latrine options were appropriate for the contexts and climate hazards. Human-centred design was used to engage communities in designing suitable sanitation products, service delivery models, and marketing/demand-creation/behaviour change materials.
2. **Conducting resilience audits:** Building on this formative research, iDE conducted internal audits of the programme, recommended products, and market structures. The audits drew on the Emergency Market Mapping and Analysis (EMMA) approach and used colour-coded dashboards to analyse weak links in sanitation markets during disasters and develop local solutions for mitigating impacts when markets are disrupted.
3. **Strengthening supply chains:** Following a period of cross-pollination where the team from each climatic zone supported one another in finalising designs, iDE integrated the sanitation products and processes into local markets. To integrate the products and processes, associations of latrine producers were formed in each zone, trained in building, installation, marketing, and repair, and connected with NGOs and government for relevant smart subsidy schemes.

5.2.3. Responding to impacts on livelihoods – addressing indirect impacts on sanitation

Sanitation stakeholders may feel that addressing climate change impacts on livelihoods is beyond their remit or outside their field of expertise. However, people simply will not be able to implement or sustain any climate responses to improve sanitation if they do not have their basic livelihood needs met. In turn, if climate change impacts on sanitation are left unaddressed, their livelihoods may further decline.

The consortium approach described in **Section 6.2** is one way to tackle this issue. Partnerships between sanitation stakeholders and agriculture or other livelihood stakeholders can address climate impacts on the sanitation–livelihood link. There are numerous mutually beneficial links that sanitation and livelihood stakeholders can explore together:

- How does ensuring access to safe sanitation under climate change improve the health and well-being of people so they can be more productive with their livelihood practices?
- What livelihood practices strengthen or weaken the natural environment (e.g. by impacting soil health and stability, water cycles, deforestation, groundwater, etc.) and consequently influence sanitation?

- How can women and men support one another in sharing sanitation and livelihood responsibilities when climate stress is experienced?
- How can climate-responsive sanitation technologies and services create new income opportunities, particularly in areas where climate events cut off supply chains?
- During extreme dry periods, how should families allocate scarce water resources to meet sanitation, hygiene, and food production needs?
- How can strategies to support climate-resilient agriculture create income for families that can be used to improve sanitation?
- How can treated waste be safely used as a fertiliser or soil conditioner for crops that are strained by climate change?

5.2.4. Addressing the social context – strengthening equality and changing behaviours

Strengthening equality at the community level contributes to ensuring climate response interventions provide equitable benefits. **Box 1** described techniques for overcoming community power dynamics than can undermine the distribution of benefits from an intervention.

Existing community empowerment and gender and social inclusion processes used in the sanitation sector are already excellent starting points for equitable responses to climate change. To integrate climate change considerations, reflect on these processes and ask:

- How do our community empowerment and gender and social inclusion processes put disadvantaged people in a better position to respond to the challenges of climate change?
- How can we more deliberately and explicitly account for climate risks in these processes (e.g. if an intervention aims to balance the burden of WASH workloads within the household, can this intervention also address WASH workloads during climate extremes?)?

It is also important to modify behavioural change activities and communication to suit emerging climate realities. Activities can begin from communication about risks and trends people have experienced and reflecting on the implications of those for the future.

Activities aimed at enhancing capacity to respond to climate hazards can help people to cope and manage uncertainties in the short-term and help plan in the long-term. Some strategies include: **Building local adaptive capacity:** Opportunities include training to create household budgets for sanitation infrastructure, encouraging the habit of marking calendars/ blocking time to inspect infrastructure before wet and dry seasons, training community members to perform operational and maintenance tasks on latrines and handwashing facilities, peer-to-peer learning among masons and builders to tackle retrofitting needs and damage restoration.

- **Building capacity of facilitators to include climate related concerns:**[3] Enhance knowledge and skills among facilitators to help households and communities think about adaptive responses. This can help communities integrate newer climate realities into sanitation-related project activities, instead of having to respond and cope with climate hazards after their impact.
- **Modifying local engagement processes:** During triggering activities, adapt transect walks and community meetings to also identify climate-related impacts like muddy paths, flow of wastewater and stormwater, areas where water stagnates, and more. Use local words for climate disturbances to normalise them and help draw concrete connections among these experiences. Reinforce these learnings during follow-up activities to remind people to consider previous experiences of climate impacts while making decisions around infrastructure and ease of access.

Strategies for incorporating climate change into behaviour change activities through building relationships and collaborative efforts include:

- **Cultivating a relationship with local people and institutions (Reid and Huq 2007):** Drawing on the trust and interaction afforded by these relationships can enable more honest and open discussions on their perception of climate impacts, risks, and responses.

3 Interview. Bertrand, F., 2020. Climate Change and Sanitation, 8 July 2020

- **Emphasising the need for mobilising collective action at the local level:** Resilience and adaptive actions require different local groups to work together for sustainable outcomes. As with community-led total sanitation (CLTS) triggering, communicate that individual households (however privileged through status or wealth) can still be impacted if the rest of the community is exposed to climate risk.

It is important to consider communication tools, methods, and strategies for successful behaviour change programming. Communication can be modified to reflect the strategies presented above in the following ways:

- **Be mindful of tone and methods:** Frequent damage to infrastructure can cause fatigue in communities who need to respond constantly. Anxiety, fear, resignation, or discouragement can strain social ties and dampen motivation to maintain good sanitation and hygiene practices. Compassion and sensitivity towards how climate impacts affect infrastructure and behaviour are needed.
- **Create a two-way dialogue and communication:** Two-way communication allows people to feedback their concerns and be involved in various aspects of programming (UNICEF 2020). It can also help to tailor messaging to different groups of people with different priorities, needs, and responses to impacts, while also ensuring that messaging remains updated and evolves continually to suit emerging impacts.
- **Establish multiple channels of communication (Social Science in Humanitarian Action 2020):** Different channels of communication (various media, radio, community drama, printed pictures, and words) can reach different people. Using multiple channels of communication ensures that messages reach women, men, children, illiterate people, and other groups.
- **Ensure that communication is relevant and actionable (CARE 2019):** Communication about responding to climate change should be linked to and integrated with people's existing concerns and priorities. Discussions about challenges and impacts should be followed by dialogues about how individuals, households, and communities can take specific actions to improve their situation now and in the future. This can alleviate resignation or anxiety stemming from frequent impacts and create a more empowering culture of local engagement.

6. Establishing collaboration and learning to mainstream climate change into sanitation

Climate change is a new and daunting challenge for many rural sanitation stakeholders. Collaboration and shared learning will help stakeholders navigate this space and provide support to one another. Collaboration across sectors is also key to addressing the crosscutting and multi-sectoral nature of climate change impacts.

Drawing from literature on community-based adaptation and monitoring and evaluation for climate change projects, this section highlights three areas related to establishing collaboration and learning:

1. Engaging stakeholders to address climate change impacts on rural sanitation.
2. A consortium approach to collaboration at the local level.
3. Modifying approaches to monitoring, evaluation, and learning (MEL).

6.1 Engaging stakeholders to address climate change impacts on rural sanitation

Some rural sanitation stakeholders may be reluctant to engage with actions to address climate change for a variety of reasons. Strategies for gaining buy-in from stakeholders on climate change include:

1. **Presenting evidence on the links between climate change and sanitation:** Produce case studies, videos, and other learning materials that document people's first-hand experiences and other evidence of climate impacts on sanitation.
2. **Integrating climate change into existing sanitation programmes, strategies, and WASH forums.** Consider climate change a crosscutting issue like gender equality. Examine each component of a sanitation programme or strategy (e.g. sanitation marketing, CLTS, etc.) (alongside people with climate expertise if possible) to explore how considerations of climate change can be incorporated. In

particular, identify what local government and other stakeholders do best (i.e. strengths) and integrate climate change thinking into this.

3. **Referring to national policies and strategies for climate change adaptation.** Although they often do not specifically name sanitation, it may be possible to identify how the sanitation sector can contribute to these policies and strategies (and therefore may be eligible for national funding). Push for the creation of national sanitation and climate change policies and technical working groups to make the mandate even more explicit, and to establish a stronger link between sanitation and climate change at the national level.

Local government is especially important to engage. Community engagement must be continual over the long term because climate change unfolds slowly over many years. Local government is best positioned to provide this long-term engagement. Therefore it is critical that local government authorities have a strong understanding of climate change issues for sanitation, have methods for integrating considerations of climate change into their services, and budget accordingly. Each of the ideas in this publication should be carried out in collaboration with local government.

6.2 A consortium approach at the local level

A challenge for climate change response programming is the wide scope of climate change impacts. A consortium model is a way to tackle the breadth and complexity of climate change impacts on sanitation, and to address the broader local activities (as identified in the framework in Figure 1) that also influence sanitation.

A consortium model comprises an implementation partnership arrangement of WASH and non-WASH NGOs, government departments, researchers, private sector actors, and/or community-based organisations from different sectors. Some NGOs have WASH departments and non-WASH departments that also work on climate change programming – these are an easy entry point for cross-sectoral collaboration.

Benefits of a consortium model include (Climate Concern 2015; Webb et al. 2015):

1. Sharing resources and expertise to address climate impacts that cut across different sectors.
2. Collaboration on the development of new tools to fill gaps in addressing climate change impacts on sanitation that they have jointly identified.
3. Coordinating climate change interventions so that they are complementary.
4. Sharing lessons learned.
5. Coordination and consistency of communication and campaigns creates unified messages to communities.
6. Pooling efforts to create stronger advocacy on climate change and rural sanitation to national government, donors, the private sector, and civil society.
7. Cross-collaboration may open doors to new funding sources.

Box 9 shows some tips for forming an effective consortium to address climate change impacts locally.

Box 9. Tips for forming and starting a sanitation and climate change consortium

1. **Develop a shared vision and framework:** People and organisations have different understandings of what resilience and other climate change concepts mean. A shared vision and framework helps to facilitate clear communication, collaboration, and shared reflection and learning.
2. **Have a lead agency to steer the consortium and give roles to each member:** Each partner should know what their role in the consortium is so that their time and resources are recognised and valued.
3. **Build on existing programmes and processes:** Rather than creating a new climate change programme, explore how the consortium can integrate climate change considerations into existing sanitation programming and government support systems.

4. **Develop a shared MEL system:** This can be challenging because different partners have their own indicators and reporting requirements. However, a broader MEL design that sits above individual agency MEL systems is beneficial for shared reflection and joint learning.
5. **Invest in relationship building and partner coordination:** A consortium model requires dedicated planning and management to work well. Members should plan on investing in building personal and organisational relationships, and form a management committee to support regular and purposeful engagement between partners.
6. **Set up a designated platform for collaboration:** Online platforms can be used to exchange information and advice, and facilitate networking.

Read Tools for CBA: Lessons from NGO collaboration in Vanuatu to learn more about how a consortium of NGOs worked together on supporting community-based adaptation.

6.3 Modifying approaches to monitoring, evaluation, and learning

The complexities of climate change create many challenges for MEL. This section describes eight challenges and solutions for climate change MEL (Bours et al. 2014), adapted to a sanitation and hygiene context:

1. **Adaptation to climate change is a continual process.** There is no measure or benchmark that can prove that 'adaptation' or 'resilience' has been achieved. Instead, focus MEL on measuring processes or strategies. For example, monitoring whether local government incorporates considerations of climate into its sanitation promotion messaging.
2. **Long timeframes stretch beyond programme cycles.** Climate change evolves gradually and it may not be possible to fully assess the impact of an intervention until many years have passed. Institutionalise MEL in government systems and create mechanisms for periodic reflections to ensure sanitation services and monitoring still suit emerging conditions.
3. **Uncertainties about future impacts.** It is difficult to predict how climate change impacts will occur at local levels in the future, and therefore what exactly should be monitored and evaluated. Use MEL methods to examine flexibility of the intervention as a measure of success. For example, to what extent are community members being enabled to access sanitation in both increasingly wet and increasingly dry conditions, such as through availability of local supply chains in all seasons?
4. **Measuring avoided impacts of climate change.** Given the complexity in predicting climate change impacts, it is difficult to know what would have happened in the absence of an intervention. Focus MEL on ensuring that sanitation development is staying 'on track' – that is, that equitable and sustainable development of sanitation is continuing despite changes in the climate and in sanitation programming.
5. **Tracking a 'moving' target.** Climate change may cause profound changes to a setting. This can mean that comparisons to a baseline set of data lose validity. For example, if climate change causes massive changes in the migration of people into or out of an area over the course of a programme, this can affect rates of sanitation coverage in the area. Consequently, baseline data on sanitation coverage may lose value for assessing how well the intervention improved coverage. When interpreting data, be mindful of major contextual shifts such as this.
6. **Climate change impacts are context specific.** Local geographic and social factors shape how climate impacts are felt, so generic indicators may not be appropriate and comparisons across different places are challenging. Sanitation and hygiene MEL methods may already be tailored to specific localities and climate change indicators can be integrated into this.
7. **Interventions may span multiple scales and sectors.** It is likely not feasible to standardise measures across scales and sectors. If a consortium approach is taken to address multiple sectors (**Section 6.2**), a broader theory of change that sits above discrete sectoral MEL systems is needed (**Box 9**). See the guidance note on the 'theory of change approach to climate change adaptation programming' by Bours et al. for more information.

8. **Measuring attribution of climate change and interventions.** It is impossible to untangle climate change from other forces (e.g. changing land use) that impact sanitation, and therefore to measure the extent to which an intervention offsets negative impacts of climate change at a local scale. Instead, use MEL to show how an intervention leads to outcomes that collectively make it more likely that sanitation users and providers are ready for climate change. For example, 'raised awareness of where to get information on early warnings about extreme weather' and 'knowledge of how to prepare a sanitation facility for an extreme event'.

Case study #4 profiles an NGO sanitation programme that established mechanisms to facilitate learning about climate change impacts within their programme.

Case study #4:

Promoting learning about climate change within sanitation programming

Country: Chad
Implementer: UNICEF Chad and regional civil society
Project Summary: UNICEF Chad is working with national and local government towards communities becoming open defecation free, through improving the enabling environment for CLTS and strengthening policy for more sustainable outcomes.

Strategies:

1. **Discussions about local solutions:** During monitoring visits by UNICEF and local NGO partners, community members raised concerns around floods, unstable soil, drought, and cracking soil, for which they required additional support. This led to longer conversations between practitioners and local communities on solutions that can be developed locally. Ideas included using sandbags to reinforce latrine walls and enable water drainage around latrines.
2. **Sharing of ideas among practitioners in civil society and local government:** Practitioners from UNICEF Chad, local NGOs, and local government are part of a WhatsApp group to routinely share ideas and innovations on climate change response. There are plans to formalise this sharing with the Ministry of Water and Sanitation to foster and capture these ideas and promote this process through producing a technical guide with local knowledge.
3. **Sharing learning across communities:** In cases where solutions are difficult to find at the village level, UNICEF also enables learning from villages nearby or regionally – particularly when communities face similar challenges with climate impacts on building their own latrines after CLTS triggering.

7. Conclusions

The climate crisis is affecting life everywhere in the world, and people feel its effects most acutely at local levels. Climate hazards impact rural sanitation at the community level via numerous pathways but, to-date, the sanitation sector has produced inadequate guidance for action at a local level.

The ideas put forth in this publication are a work in progress and further development of practical guidance is needed to guide sanitation implementers. Sharing of experiences and thoughts on addressing climate change impacts on sanitation at a local level are critical to evolving the sanitation sector. Our hope is that this publication is a useful starting point for sanitation stakeholders to build action research and trials that will translate ideas into practice.

The following principles summarise the ideas and critical questions posed throughout this publication to support local action in the sanitation sector. These principles reflect good practices as recommended in the community-based adaptation literature and have been modified to suit climate, sanitation, and hygiene programming needs.

1. **Recognise that climate change can be integrated in sanitation programming:** Programming and services for climate change and sanitation do not have to start from scratch. Think about climate impacts within ongoing sanitation programming efforts to mobilise established channels and add to activities already taking place.
2. **Trust in practitioners' experiences with local engagement:** Many recommendations for addressing climate change are already accepted as good development and WASH practices. Recognise that practitioners regularly engage with ideas of risk and ensuring sustainable and equitable sanitation and hygiene outcomes. Therefore, they are already engaging with climate related concerns, albeit framed differently. Building on existing strengths and ways of working will help practitioners to tackle climate concerns more confidently.
3. **Lift up local knowledge and experiences:** Local perceptions of risk will inform how different people understand climate impacts, frame this problem, respond to climate hazards, and prioritise their needs. Understand these perceptions and develop strong relationships with local people, institutions, and stakeholders. Interventions are more likely inclusive and equitable if they reflect the priorities and desires of local people, and if they have ownership over planning and implementation.
4. **Utilise opportunities to engage with practitioners in similar circumstances:** Peer-to-peer learning among practitioners engaged in similar concerns (within and across sectors) is a major source of practical knowledge. It can help practitioners understand various past, present, and future challenges and establish working relationships for more systematic efforts. Utilise existing networks, and create new ones, at various levels both formally and informally to collaborate, share, and learn about different ideas that can be modified to suit local contexts.
5. **Understand the differentiation of local impacts and responses:** Climate hazards impact people and communities in different ways. Their responses vary due to factors such as their geographical location, seasonality, type of home and latrine, level of income, gender, age, capacity for mobility, and more. Make an effort to understand differential impacts and design interventions to support different needs.
6. **Build local relationships and engage stakeholders regionally and across the sector:** A collaborative approach will draw on a variety of strengths to bolster adaptation efforts and sustain outcomes. Building trust and strong relationships will help stakeholders support each other while also ensuring that community priorities and needs are considered and represented in discussions and during decision-making.
7. **Encourage and plan for regular reflection and learning processes:** Practitioners, community members, and other stakeholders should regularly engage in reflection and assessment of ongoing challenge and ways to adapt. This will build on existing efforts, consider various trade-offs during decision making, and create a culture of flexibility to help minimise climate risks. .

Many knowledge and practice gaps with respect to climate change and rural sanitation remain. While priorities for research and learning will become clearer as experience increases, the following is a sample of areas ripe for exploration and development through research and practice. These needs were identified following a review of global literature on sanitation and climate change:

- Lift up rich stories of how people experience and respond to climate impacts on sanitation in their own words to understand differentiated impacts and various ways of coping.
- Explore how social structures and norms shape the resilience and vulnerability of different sanitation users.
- Assess climate impacts on sanitation service providers and consider practical ways for them to respond.
- Gain a deeper understanding of socio-environmental interactions that influence and are influenced by sanitation and climate.
- Collect evidence of direct links between sanitation, climate, and health.
- Evaluate the effectiveness of particular actions or strategies for responding to climate change impacts on rural sanitation.

- Develop, strengthen, and expand collaborations and networks on climate and sanitation.
- Document lessons learned from NGOs and governments that have piloted sanitation and climate change interventions.
- Create MEL indicators and strategies for sanitation and climate change
- Generate effective behaviour change strategies that consider how climate impacts influence people's sanitation and hygiene behaviours.
- Share experiences, plans, and ideas broadly with the WASH and other sectors to build a climate action movement.

Stronger commitment from the global and national sanitation sectors to address these areas and others are sorely needed. Advocating for climate action, both in terms of adaptation and mitigation of greenhouse gas emissions, must become commonplace in the WASH sector to secure this commitment. Doing so will contribute to more equitable and sustainable sanitation access under a changing climate.

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